United States Department of Agriculture

January 3, 2023

Bradley Poore
NYDOT
317 Washington Street
Watertown, NY 13061

Re: FPPA Review for NY 12E over the Black River Bridge Replacement

Mr. Poore,

I have received the materials with the information needed to complete a Farmland Conversion Impact Rating (NRCS-AD-1006) for the project cited above in response to a request made by Katy Stringer of Foit-Albert Associates on behalf of NYDOT for review in accordance with the Farmland Protection Policy Act (FPPA).

Based on the information provided on the NRCS-AD-1006 Part VI, it is determined that the final number of points that the proposed bridge replacement site would receive is less than 160 points. The total LESA point value for a project is determined by adding the Land Evaluation (LE) score determined in Part V of the form to the Site Assessment (SA) score as determined in Part VI. The maximum value that a site can receive in Part V is 100 points, and as the SA score for this project is 39 points, the total LESA score would not exceed 160.

According to the FPPA Manual 440-V-CPM – Amed 12 – 523.10 Part B Lands Not Subject to Provisions of the FPPA, lands that receive a combined score of less than 160 points from the LESA criteria are not subject to the Act. No further action is required regarding the FPPA for this project. Please keep this letter with the FPPA documents you submitted for review as this is the final determination. Please provide copies to the agency that is providing federal funding to the project.

If you have any questions about this determination, please feel free to contact me.

Respectfully,

Daniel Ufnar
State Soil Scientist
daniel.ufnar@usda.gov
315-477-6538

CC: Katy Stringer, Environmental Scientist, Foit-Albert Assoc.

APPENDIX C - *Traffic Information*

NEW YORK STATE OF OPPORTUNITY. | Department of Transportation

KATHY HOCHUL
Governor

MARIE THERESE DOMINGUEZ
Commissioner

TO: Kent Collier, Project Manager

FROM: Rebecca Swartzentruber, Regional Safety Evaluation Engineer

SUBJECT: HIGHWAY SAFETY INVESTIGATION STUDY

DATE: July 27, 2022

Attached please find the following TE 156a package:

STUDY #	RM RANGE	DESCRIPTION
73RA73	12E 7301 2028 - 2040 12F 7301 1022 - 1039 971H 7301 1000 - 1002	PIN 778009– NY Route 12E over Black River, T/Brownville, Jefferson Co.

If you have any questions regarding this study, please call me at (315) 272-8770.

cc: Safety Evaluation File

Study Number 73RA73 PIN Number 778009 Inventory Number	Traffic Engineering and Safety Division Highway Safety Investigation Report TE 156a	County Jefferson Municipality Brownville SH 1845/1182/9439 AADT 5093/10070/6968

Route Number or Street Name: 12E (East and West Main St.), 12F, & 971H (Bridge Street)	Reference Marker: 12E 7301 2028 - 2040 Reference Marker: 12F 7301 1022- 1039 Reference Marker: 971H 7301 1000 -1002

@ Intersection with Route Number or Street Name: 12E: Gould Street, Washington Street, Brown Boulevard, Storehouse Street, Franklin Street, and William Street. 12F: Floral Drive, Old Rome State Road, and Evans Road. 971H: SR 12E and SR 12F.

REASON FOR INVESTIGATION:	RECOMMENDATION:
[ ] Identified by Accident Surveillance System [ ] Police Hazard Report [ ] Response to Complaint or Inquiry [ ] Regionally Initiated [X] Other - Capital Project PIN 7780.09 NY Route 12E over Black River	[X] Capital Improvement [ ] Traffic Control Improvement [ ] Maintenance Improvement [ ] Other [ ] None

2008 PIL @ RM 12F 7301 1035 – 1037, 2008 PII @ RM 12F 7301 1037

(A) PROBLEMS IDENTIFIED:

During the 36-month period (01/01/2019 thru 12/31/2021) there were 61 crashes (19 deer hits, 16 rear end, 8 run off road, 5 right angle, 3 left turn, 3 side swipe/U-turn, 2 hit debris, 1 head on, 1 overtaking, 1 backing, 1 pedestrian hit-fatality, and 1 animal hit) within the limits studied on SR 12E, SR 12F, and SR 971H. 30 crashes were on SR 12F, 13 crashes were on SR 12E, 4 crashes were on SR 971H, 9 crashes were at the intersection of SR 12E and SR 971H, and 5 crashes were at the intersection of SR 12F and SR 971H.

SR 12E:
The 13 crashes on SR 12E include 5 rear end, 3 deer hits, 2 left turn, 1 right angle, 1 run off road, and 1 hit debris. The crash rate is 1.79 acc/mvm which is below the statewide average crash rate of 3.73 acc/mvm.

SR 12F:
The 30 crashes on SR 12F include 16 deer hits, 3 rear ends, 3 run off road, 2 sideswipe/U-turn, 1 head on, 1 right angle, 1 overtaking, 1 backing, 1 hit debris, and 1 animal hit. The crash rate is 2.09 acc/mvm which is below the statewide average crash rate of 3.73 acc/mvm.

SR 971H (Bridge Street):
The 4 crashes on bridge street include 2 rear ends, 1 sideswipe (swerving to avoid pedestrian), and 1 run off road). There is no sidewalk on this section of highway or on the bridge structure. The crash rate is 2.62 acc/mvm which is below the statewide average crash rate of 3.73 acc/mvm.

SR 12E / SR 971H (Bridge Street) Intersection:
The 9 crashes at this intersection include 4 rear ends, 2 run off road, 1 right angle, 1 pedestrian hit-fatality, and 1 left turn. There is a three-colored signal at the intersection. The intersection crash rate is 1.05 acc/mev, which is higher than the statewide average crash rate of 0.32 acc/mev. The signal at this location was installed under the 2011 signal contract and helped alleviate some queuing at the intersection. However, traffic still queues on Bridge Street due to NB vehicles waiting to turn onto SR 12E.

SR 12F / SR 971H (Bridge Street) Intersection:
The 5 crashes at this intersection include 2 rear end, 2 right angle, and 1 run off road. At the intersection of SR 12F and SR 971H there is a right turn only lane for SR 12F WB traffic turning onto SR 971H, a yield for SR 971H traffic turning onto SR 12F WB, and a 'Stop' for SR 971H traffic turning onto SR 12F EB. The intersection crash rate is 0.42 acc/mev, which is higher than the statewide average crash rate of 0.19 acc/mev.

SR 971H connects SR 12E and SR 12F. There are 2 paper mills along this section, Neenah Paper Mill and Brownville Specialty Paper (closed). Neenah trucks frequently cross the road to transport supplies between buildings, stopping traffic on Bridge Street to load/unload at the driveways and loading docks. This creates queues on the bridge and at the SR 12E intersection. There are back-to-back truck crossing signs with flashing lights at the north end of SR 971H/Bridge Street and an additional truck crossing sign north of the bridge.

Traveling north on 971H is a combination horizontal curve and down grade approaching the bridge. There are narrow shoulders, shallow ditches, and limited recovery area between the road and rock cut. There was previously a pattern of northbound vehicles that lost control on this curve/down grade. During this study one vehicle lost control on the snow-covered roadway and hit guiderail. The bridge on SR 971H is in poor condition, and there are operational issues associated with the highway geometry and signal operations.

Study# 73R073 was done in 2010, recommending a new signal be installed at the intersection of SR 971H and SR 12E. This was installed under the 2011 signal contract (PIN 780492). It was also recommended to improve the horizontal/vertical alignment, shoulders, and clear zone on SR 971H. At this time businesses on both sides of the bridge had expressed concerns about access and safety issues associated with queueing traffic.

(B) PROPOSED SOLUTION

Capital Project PIN 7780.09 - SR 12E over Black River will replace the existing bridge with a new structure on a new alignment approximately 0.61 miles to the west. This will solve existing structural, operational, and access issues while maintaining connectivity between the Towns of Brownville and Hounsfield.

The existing bridge will be removed, and a new utility bridge installed in its place to carry the water line on the existing structure. The existing intersection of SR 12F and SR 971H will be reconfigured with simplified lane configurations. The intersection will be stop-controlled, without the right turn lane for SR 12F WB traffic turning onto SR 971H, or the right turn lane for SR 971H traffic turning onto SR 12F WB.

The proposed bridge approaches along SR 12E and 12F will be widened to accommodate right turn lanes onto the bridge, along with a left turn lane on the SR 12F eastbound approach. The new structure will also include sidewalk for future pedestrian traffic.

(C) ACTION TAKEN

Regional Design and Main Office Traffic were notified of these findings. Entered in PIES program.

Number of Months	Begin Date	End Date	Number of Accidents			
			Fatal	Injury A & B	Injury C	PDO & NR
36	01/19	12/21	1	6	11	43

Are Benefit/Cost calculations attached? No

Principal Investigator: Rebecca Swartzentruber, PE1

Approved: 07-26-2022

NOTE: It is a violation of law for any person, unless they are acting under the direction of a licensed professional engineer, architect, or land surveyor, to alter an item in any way. If an item bearing the stamp of a licensed professional is altered, the altering engineer, architect, landscape architect, or land surveyor shall stamp the document and include the notation "altered by" followed by their signature, the date of such alteration, and a specific description of the alteration.

Study # 73RA73
PIN 778009 - NY Route 12E over Black River
S.R. 12E at Gould St, S.R. 971H/Bridge St,
Washington St, C.R. 54, Storehouse St,
Franklin St, and William St,
S.R. 12F at Floral Dr, Old Rome State Rd,
S.R. 971H, And Evans Rd
T/Brownville and T/Houndsfield, Jefferson County
RM 12E 7301 2028-2040,
RM 12F 7301 1022-1039,
RM 971H 7301 1000-1002
All Locations Approx.
Page 1 of 4

NORTH

Accident Severity Legend
Fatal
A
B
C

BLACK RIVER

#6,13,19,57 DEER HIT
#17 OTHER DEER CARCASS
#23 BACKING
#31,54 U-TURN,SIDESWIPE
#32 RIGHT ANGLE
#50 OTHER ANIMAL
#65 REAR END

19
SR 12F
12F 7301 1036
65
50
STOP
32
23
54
31
FLORAL DR
12F 7301 1037
57
13
12F 7301 1038
HIGH-LITE STRIPING
Study Limits
6
17
12F 7301 1039
SR 12F

Symbol	Manner of collision	Symbol	Description
←	moving vehicle		sign post
←→	backing		utility pole
←	overturning		tree
←←	rear end		parked veh
←	out of control		snowbank
←	overtaking		fixed object
←	side turn		bike
←	U turn		bus
←	turning vehicle		motorcycle
	pedestrian		
←	deer		

Study # 73RA73
PIN 778009 - NY Route 12E over Black River
S.R. 12E at Gould St, S.R. 971H/Bridge St,
Washington St, C.R. 54, Storehouse St,
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S.R. 12F at Floral Dr, Old Rome State Rd,
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T/Brownville and T/Houndsfield, Jefferson County
RM 12E 7301 2028-2040,
RM 12F 7301 1022-1039,
RM 971H 7301 1000-1002
All Locations Approx.

NORTH

Accident Severity Legend
Fatal
A
B
C

Symbol	Manner of collision	Symbol	Description
←	moving vehicle		sign post
←→	backing		utility pole
↩	overturning		tree
←←	rear end		parked veh
↜	out of control		snowbank
↖	overtaking		fixed object
↗	side turn		bike
↩	U turn		bus
↵	turning vehicle		motorcycle
	pedestrian		
	deer		

12E 7301 2033
12E 7301 2032
12E 7301 2031
12E 7301 2030
12E 7301 2029
12E 7301 2028
971H 7301 1002
971H 7301 1001
971H 7301 1000
12F 7301 1032
12F 7301 1033
12F 7301 1034
12F 7301 1035
12F 7301 1031
12F 7301 1030
12F 7301 1029

WILLIAM ST
FRANKLIN ST
CHURCH
STEWARTS
CR 54/BROWN BLVD
AMERICAN LEGION
WASHINGTON ST
SR 12E
STOREHOUSE ST
BLACK RIVER
GREENLEAF PAPER MILL
97/BRIDGE ST
GOULD ST
Study Limits
SR 12F
EVANS RD
D&S GARAGE
JODI'S DAIRY BAR
OLD ROME STATE RD
SUNOCO
PADDY HILL

#8,47 LEFT TURN AGAINST OTHER VEHICLE
#12,36,39,56 REAR END
#62 RIGHT ANGLE

#1 RIGHT ANGLE
#5 TOO FAST,HIT CURB
#18 LEFT TURN AGAINST OTHER VEHICLE
#25 OTHER,HIT COUCH
#26,35,45,58,60 REAR END
#38 PEDESTRIAN
#53 SIGN POST,CURB,ROLLOVER
#64 FIXED OBJECT,SIGN POST

#46 COLLISION WITH GUIDERAIL

#11,52 RIGHT ANGLE
#14,41 REAR END
#30 LOST CONSCIOUSNESS,EXITED ROADWAY STRIKING SEVERAL OBJECTS
#33 COLLISION WITH FENCE,UTILITY POLE, AND BUILDING + ROLLOVER
#59 HEAD ON
#61 AVOIDING PEDESTRIAN + SIDESWIPE
#63 ROLL BACK REAR END

#48 DEER HIT
#55 REAR END

#40 DEER HIT
#42 REAR END
#67 OVERTAKING

Study # 73RA73
PIN 778009 - NY Route 12E over Black River
S.R. 12E at Gould St, S.R. 971H/Bridge St,
Washington St, C.R. 54, Storehouse St,
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S.R. 12F at Floral Dr, Old Rome State Rd,
S.R. 971H, And Evans Rd
T/Brownville and T/Houndsfield, Jefferson County
RM 12E 7301 2028-2040,
RM 12F 7301 1022-1039,
RM 971H 7301 1000-1002
All Locations Approx.

NORTH

#15,27,51 DEER HIT

#34 REAR END

Accident Severity Legend
Fatal
A
B
C

12E 7301 2040

12E 7301 2039

12E 7301 2038

12E 7301 2037

12E 7301 2036

12E 7301 2035

12E 7301 2034

SR 12E

Study Limits

15

51

34

27

SR 12E

SR 12E

BROWNVILLE CEMETERY

ALL OUT PIZZA

ALL GOOD AUTO SERVICE

PROPOSED ALIGNMENT
FOR NEW BRIDGE
LOCATION IS APPROXIMATE
FOR REFERENCE ONLY

BLACK RIVER

Symbol	Manner of collision	Symbol	Description
←	moving vehicle		sign post
←←	backing		utility pole
←↺	overturning		tree
←←	rear end		parked veh
←~	out of control		snowbank
←⌐	overtaking		fixed object
↖	side turn		bike
↶	U turn		bus
↵	turning vehicle		motorcycle
	pedestrian		
	deer		

Study # 73RA73
PIN 778009 - NY Route 12E over Black River
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S.R. 971H, And Evans Rd
T/Brownville and T/Houndsfield, Jefferson County
RM 12E 7301 2028-2040,
RM 12F 7301 1022-1039,
RM 971H 7301 1000-1002
All Locations Approx.
Page 4 of 4

NORTH

PROPOSED ALIGNMENT
FOR NEW BRIDGE
LOCATION IS APPROXIMATE
FOR REFERENCE ONLY

#3,4,9,16,21,22,29,37,43,49
DEER HIT

#24 LOST CONTROL
EXIT ROADWAY
STRIKING OBJECTS

#66 LOST CONTROL
AND EXIT ROADWAY

Accident Severity Legend
Fatal
A
B
C

SR 12F

Study Limits

4

37 21 16

22 29

3

24 66

43 49

9

PADDY HILL

12F

12 F 7301 1022

12 F 7301 1023

12 F 7301 1024

12 F 7301 1025

12 F 7301 1026

12 F 7301 1027

12 F 7301 1028

Symbol	Manner of collision	Symbol	Description
←	moving vehicle		sign post
←→	backing		utility pole
←	overturning		tree
←←	rear end		parked veh
←	out of control		snowbank
←	overtaking		fixed object
←	side turn		bike
←	U turn		bus
←	turning vehicle		motorcycle
	pedestrian		
←	deer		

Chris Geroux

From: Chris Geroux
Sent: Tuesday, July 05, 2022 2:36 PM
To: Chris Geroux
Subject: FW: PIN 7780.09 - NY Route 12E over Black River: Design Speed Confirmation for New Alignment

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From: Docteur, Aaron (DOT) <Aaron.Docteur@dot.ny.gov>
Sent: Tuesday, July 5, 2022 12:17 PM
To: Collier, Kent E. (DOT) <Kent.Collier@dot.ny.gov>
Cc: Grill, Jeff (DOT) <Jeff.Grill@dot.ny.gov>; Reff, Kristopher H. (DOT) <Kristopher.Reff@dot.ny.gov>
Subject: RE: PIN 7780.09 - NY Route 12E over Black River: Design Speed Confirmation for New Alignment

Kent,

Yes, 45 MPH is an acceptable design speed for the new alignment.

Aaron

Aaron L. Docteur, P.E.
Regional Traffic Engineer

New York State Department of Transportation, Region 7
317 Washington Street, Watertown, NY 13601
(315) 785-2327 | aaron.docteur@dot.ny.gov

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

From: Collier, Kent E. (DOT) <Kent.Collier@dot.ny.gov>
Sent: Tuesday, July 5, 2022 12:15 PM
To: Docteur, Aaron (DOT) <Aaron.Docteur@dot.ny.gov>

Cc: Grill, Jeff (DOT) <Jeff.Grill@dot.ny.gov>; Reff, Kristopher H. (DOT) <Kristopher.Reff@dot.ny.gov>
Subject: PIN 7780.09 - NY Route 12E over Black River: Design Speed Confirmation for New Alignment

Aaron,

Way back in the beginning of this project we had discussions with Traffic and Planning and had all agreed on using a functional classification of urban minor arterial for the new alignment. We had also settled on a 40 mph design speed for the route.

Since the inception of the project, FHWA have added a "context class" to the design criteria table which allows you to better match the roadway to the surroundings. DQAB wants us to use a "rural" context class (urban minor arterial functional classification/Arterial design classification) to match the segments of NY Route 12E and NY Route 12F that we are intersecting with the new highway. The minimum design speed for this context class is listed as 45 mph (HDM 2.7.2.1A). We can't have a non-standard design speed so we will need to alter the design speed from 40 mph to 45 mph.

We will not be redesigning anything at this late stage so unfortunately this will result in a non-standard superelevation which we will have to justify. DQAB is fine with this non-standard feature justification though. This segment of highway is very short and I don't believe that cars will be able get up to high speeds.

Can you verify that 45 mph is an acceptable design speed for the new highway?

Regards,

Kent E. Collier, P.E.
Structural Engineer and Regional Bridge Evaluation Engineer
N.Y.S. Department of Transportation, Region 7
317 Washington Street - Watertown, NY 13601
315-785-7962 | Kent.Collier@dot.ny.gov

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

Chapter 18, Appendix A - CAPITAL PROJECTS **COMPLETE STREETS CHECKLIST** **(**18A-4)

PIN:	7780.09	**Project Location:**	Towns of Brownville & Hounsfield, Jefferson County
Context:	◉ **Urban / Village** ○ **Suburban** ○ **Rural**		
Project Title:	NY Route 12E over Black River Bridge Replacement		

STEP 1- APPLICABILITY OF CHECKLIST

1.1	Is the project located entirely on a facility where bicyclists and pedestrians are prohibited by law and the project does not involve a shared use path or pedestrian/bicycle structure? *If **no**, continue to question 1.2. If **yes**, stop here.*	○ **Yes** ◉ **No**
1.2	a. Is this project a 1R* Maintenance project? *If **no**, continue to question 1.3. If **yes**, go to part b of this question.*	○ **Yes** ◉ **No**
1.2	b. Are there opportunities on the 1R project to improve safety for bicyclists and pedestrians with the following Complete Street features? • Sidewalk curb ramps and crosswalks • Shoulder condition and width • Pavement markings • Signing *Document opportunities or deficiencies in the IPP and **stop here.*** ** Refer to Highway Design Manual (HDM) Chapter 7, Exhibit 7-1 "Resurfacing ADA and Safety Assessment Form" under ADA, Pavement Markings and Shoulder Resurfacing for guidance.*	○ **Yes** ◉ **No**
1.3	Is this project a Cyclical Pavement Marking project? *If **no**, continue to question 1.4. If **yes**, review EI 13-021* and identify opportunities to improve safety for bicyclists and pedestrians with the following Complete Streets features:* • Travel lane width • Shoulder width • Markings for pedestrians and bicyclists *Document opportunities or deficiencies in the IPP and **stop here.*** ** EI 13-021, "Requirements and Guidance for Pavement Marking Operations - Required Installation of CARDS and Travel Lane and Shoulder Width Adjustments".*	○ **Yes** ◉ **No**
1.4	Is this a Maintenance project *(as described in the "Definitions" section of this checklist)* and different from 1.2 and 1.3 projects? *If **no**, continue to Step 2. If **yes,** the Project Development Team should continue to look for opportunities during the Design Approval process to improve existing bicycle and pedestrian facilities within the scope of project. Identify the project type in the space below and **stop here.***	○ **Yes** ◉ **No**

STEP 1 prepared by: C. Geroux, Creighton Manning Engineering Date: 5/2/2022

STEP 2 - IPP LEVEL QUESTIONS (At Initiation)	**Comment / Action**

2.1	Are there public policies or approved known development plans (e.g., community Complete Streets policy, Comprehensive Plan, MPO Long Range and/or Bike/Ped plan, Corridor Study, etc.) that call for consideration of pedestrian, bicycle or transit facilities in, or linking to, the project area? *Contact municipal planning office, Regional Planning Group and Regional Bicycle/Pedestrian Coordinator.*	○ **Yes** ◉ **No**	
2.2	Is there an existing or planned sidewalk, shared use path, bicycle facility, pedestrian-crossing facility or transit stop in the project area?	◉ **Yes** ○ **No**	Existing sidewalks are located on NY Route 12E. New sidewalk is being installed on the new bridge.
2.3	a. Is the highway part of an existing or planned State, regional or local bicycle route? *If **no**, proceed to question 2.4. If **yes**, go to part b of this question.* b. Do the existing bicycle accommodations meet the minimum standard guidelines of HDM Chapter 17 or the AASHTO "Guide for the Development of Bicycle Facilities"? * *Contact Regional Bicycle/Pedestrian Coordinator* ** Per HDM Chapter 17- Section 17.4.3, Minimum Standards and Guidelines.*	○ **Yes** ◉ **No** ○ **Yes** ○ **No**	
2.4	Is the highway considered important to bicycle tourism by the municipality or region?	○ **Yes** ◉ **No**	
2.5	Is the highway affected by special events (e.g., fairs, triathlons, festivals) that might influence bicycle, pedestrian or transit users? *Contact Regional Traffic and Safety*	○ **Yes** ◉ **No**	
2.6	Are there existing or proposed generators within the project area (*refer to the "Guidance" section*) that have the potential to generate pedestrian or bicycle traffic or improved transit accommodations? *Contact the municipal planning office, Regional Planning Group, and refer to the CAMCI Viewer, described in the "Definitions" section.*	◉ **Yes** ○ **No**	Generators exist within the Village of Brownville, which is less than 0.5 miles from the new roadway intersection with NY Route 12E.
2.7	Is the highway an undivided 4 lane section in an urban or suburban setting, with narrow shoulders, no center turn lanes, and existing Annual Average Daily Traffic (AADT) < 15,000 vehicles per day? *If **yes**, consider a road diet evaluation for the scoping/design phase. Refer to the "Definitions" section for more information on road diets.*	○ **Yes** ◉ **No**	

2.8	Is there evidence of pedestrian activity (e.g., a worn path) and no or limited pedestrian infrastructure?	○ **Yes** ◉ **No**	

STEP 2 prepared by: C. Geroux, Creighton Manning Engineering Date: 5/2/2022

Bicycle/Pedestrian Coordinator has been provided an opportunity to comment: ◉ **Yes** ○ **No**

ATTACH TO IPP AND INCLUDE RECOMMENDATIONS FOR SCOPING/DESIGN.

STEP 3 - PROJECT DEVELOPMENT LEVEL QUESTIONS (Scoping/Design Stage)			**Comment / Action**
3.1	Is there an identified need for bicycle/pedestrian/ transit or "way finding" signs that could be incorporated into the project?	○ **Yes** ◉ **No**	
3.2	Is there history of bicycle or pedestrian crashes in the project area for which improvements have not yet been made?	○ **Yes** ◉ **No**	
3.3	Are there existing curb ramps, crosswalks, pedestrian traffic signal features, or sidewalks that don't meet ADA standards per HDM Chapter 18?	◉ **Yes** ○ **No**	The sidewalk on the existing bridge is non-standard.
3.4	Is the posted speed limit is 40 mph or more and the paved shoulder width less than 4' (1.2 m) (6' in the Adirondack or other State Park)? *Refer to EI 13-021.*	○ **Yes** ◉ **No**	
3.5	Is there a perceived pedestrian safety or access concern that could be addressed by the use of traffic calming tools (e.g., bulb outs, raised pedestrian refuge medians, corner islands, raised crosswalks, mid-block crossings)?	○ **Yes** ◉ **No**	
3.6	Are there conflicts among vehicles (moving or parked) and bike, pedestrian or transit users which could be addressed by the project?	◉ **Yes** ○ **No**	Vehicles and bicycles share the lanes on existing bridge. The proposed bridge will have dedicated shoulder for bicyclists.
3.7	Are there opportunities (or has the community expressed a desire) for new/improved pedestrian-level lighting, to create a more inviting or safer environment?	○ **Yes** ◉ **No**	
3.8	Does the community have an existing street furniture program or a desire for street appurtenances (e.g., bike racks, benches)?	○ **Yes** ◉ **No**	

3.9	Are there gaps in the bike/pedestrian connections between existing/planned generators? *Consider locations within and in close proximity of the project area. (Within 0.5 mi (800 m) for pedestrian facilities and within 1.0 mi (1600 m) for bicycle facilities.)*	○ **Yes** ◉ **No**	
3.10	Are existing transit route facilities (bus stops, shelters, pullouts) inadequate or in inconvenient locations? (e.g., not near crosswalks) *Consult with Traffic and Safety and transit operator, as appropriate*	○ **Yes** ◉ **No**	
3.11	Are there opportunities to improve vehicle parking patterns or to consolidate driveways, (which would benefit transit, pedestrians and bicyclists) as part of this project?	○ **Yes** ◉ **No**	
3.12	Is the project on a "local delivery" route and/or do area businesses rely upon truck deliveries that need to be considered in design?	◉ **Yes** ○ **No**	This roadway will be traveled by trucks.
3.13	Are there opportunities to include green infrastructure which may help reduce stormwater runoff and/or create a more inviting pedestrian environment?	○ **Yes** ◉ **No**	
3.14	Are there opportunities to improve bicyclist operation through intersections and interchanges such as with the use of bicycle lane width and/or signing?	○ **Yes** ◉ **No**	

STEP 3 prepared by: C. Geroux, Creighton Manning Engineering Date: 5/2/2022

Additional comments, supporting documentation and clarifications for answers in step 1, 2 or 3:

MEMORANDUM

Creighton Manning

ENGINEERS
PLANNERS
SURVEYORS

Date: May 13, 2022

To: Project File
From: Mark Nadolny and Mark Sargent, P.E.
cc: Chris Geroux, P.E.

Project: PIN 7780.09
New York Route 12E over Black River Bridge Replacement

Re: Appendix C – Detailed Traffic Assessment

Existing and Future Projected Traffic Volumes

The traffic analysis focuses on the weekday AM and PM peak periods since these times correspond to peak operations on the surrounding roadway network. Traffic counts were conducted at the Bridge Street/NY Route 12E (East Main Street)/CR 190 intersection and at the Bridge Street/NY Route 12F intersection in May 2017 during the morning peak period (6:30 to 8:30 a.m.) and during the afternoon peak period (3:00 to 5:00 p.m.). Peak hours were determined to be 7:30 to 8:30 a.m. and 4:00 to 5:00 p.m., respectively. The traffic volumes were factored to Existing 2020 traffic conditions. The Existing traffic volumes are shown on Figure C-1.

In addition, a continuous 24-hour automatic traffic recorder (ATR) count was conducted by NYSDOT in June 2014 (speed and classification) and October 2018 (volume only) on Bridge Street between NY Route 12E/CR 190 and NY Route 12F. The existing traffic data was used to develop future traffic volumes at the study area intersections.

Based on the NYSDOT *Project Development Manual – Appendix 5*, bridge replacement projects should have a design year of ETC (Estimated Time of Completion)+20 years for bridge improvements. An ETC of 2025 will be used for the traffic analysis in this project.

Future traffic forecasts were prepared for the ETC through ETC+20 design years. Historical traffic volume data found in the latest version of the *Traffic Data Report* published by NYSDOT indicates that traffic volumes in the vicinity of the site have varied from approximately -1% to +0.7% over the last several years; therefore, the Existing 2020 traffic volumes were increased by a ½ percent per year growth rate and are shown on Figures C-2 through C-5. The 2020 existing and anticipated ETC (2025), ETC+10 (2035), and ETC+20 (2045) design year traffic volume forecasts on the study area roadway are shown in Table C-1.

Table C-1 – Existing and Forecast Traffic Volumes			
Year	ADT	DHV	DDHV
Route	From E. Main Street to Route 12F		
Existing (2020)	7,070	665	425
ETC (2025)	7,250	690	440
ETC+10 (2035)	7,620	725	465
ETC+20 (2045)	8,010	760	485
Route	NY Route 12F from NY Route 180 to NY Route 12E (Bridge Street)		
Existing (2020)	4,585	450	275
ETC (2025)	4,700	465	285
ETC+10 (2035)	4,940	490	300
ETC+20 (2045)	5,195	515	315
Route	NY Route 12E from CR 190 to CR 53		
Existing (2020)	5,165	46	310
ETC (2025)	5,295	475	320
ETC+10 (2035)	5,570	500	335
ETC+20 (2045)	5,850	525	355

Note: ETC is the Estimated Time of Completion
ADT = Average Daily Traffic (ADT=8.2% of the DHV based on NYSDOT data)
DHV = Design Hourly Volume (two-way). Based on PM peak hour data.
DDHV = Directional Design Hourly Volume (one-way). Based on PM peak hour data.

It is anticipated that the provision of a new crossing over the Black River located approximately 2/3 of a mile west of the existing crossing will change traffic conditions in the project area. Traffic volumes in the project area were redistributed to the new bridge crossing based on a review of NYSDOT information, population centers, and probable distribution patterns of existing motorists. The ETC (2025), ETC+10 (2035), and ETC+20 (2045) traffic forecast conditions on the new bridge after relocation of the crossing are shown in Table C-2 while the future AM and PM peak hour turning movement volumes for the new project area intersections are shown on Figures C-2 through C-5.

Table C-2 – Alternative A Build Traffic Volumes			
Year	ADT	DHV	DDHV
Route	Bridge Street from NY Route 12E to Route 12F		
ETC (2025)	6,700	630	405
ETC+10 (2035)	7,045	660	425
ETC+20 (2045)	7,405	695	445
Route	NY Route 12F from NY Route 180 to NY Route 12E (Bridge Street)		
ETC (2025)	6,165	605	305
ETC+10 (2035)	6,480	635	320
ETC+20 (2045)	6,810	670	335
Route	NY Route 12E from CR 190 to CR 53		
ETC (2025)	11,340	1,010	645
ETC+10 (2035)	11,920	1,060	680
ETC+20 (2045)	12,530	1,115	715

ADT = Average Daily Traffic (ADT=8.2% of the DHV based on NYSDOT data)
DHV = Design Hourly Volume (two-way). Based on PM peak hour data.
DDHV = Directional Design Hourly Volume (one-way). Based on PM peak hour data.

Existing, Future No-Action, and Future Alternatives Design Year Levels of Service

Level of service (LOS) is defined by the measure of how well an intersection operates for signalized, unsignalized, and roundabout intersections. The LOS of an intersection is largely influenced by the volume of traffic entering the intersection, the directional split of the traffic, the intersection geometry, and the type of traffic control. Existing condition operational analyses were conducted for the study area intersections.

The results of the analyses describe operating conditions in terms of control delay which is the portion of total delay that includes initial deceleration delay, queue move up time, stopped delay, and final acceleration delay for signalized and unsignalized intersections. In developed or urban areas, LOS C or above is considered desirable and LOS D is considered the minimum acceptable LOS. LOS criteria vary between signalized, unsignalized, and roundabout intersections based on the *Highway Capacity Manual*, 6th Edition as shown below.

Level of Service Criteria (For Intersections)

Signalized/Roundabout (Delay seconds/vehicle)	LOS	Unsignalized (Delay seconds/vehicle)
0 to 10	A (Little or No Delay)	0 to 10
10 to 20	B (Short Traffic Delay)	10 to 15
20 to 35	C (Average Traffic Delay)	15 to 25
35 to 55	D (Long Traffic Delays)	25 to 35
55 to 80	E (Very Long Traffic Delay)	35 to 50
> 80	F (Delay Unacceptable to Drivers)	> 50

The level of service and vehicle delays for individual intersection movements for Existing, and ETC through ETC+20 years are presented in Table C-3 for existing conditions and the future no-action alternative. The detailed LOS reports are included under Attachment A.

Table C-3 – Existing and No-Build Intersection Level of Service and Delays (sec)

Intersection	AM Peak				PM Peak			
	Existing (2020)	ETC (2025)	ETC+10 (2035)	ETC+20 (2045)	Existing (2020)	ETC (2025)	ETC+10 (2035)	ETC+20 (2045)
Bridge Street/NY Route 12E								
NY Route 12E EB TR	A (6.8)	A (6.9)	A (7.2)	A (7.6)	B (10.6)	B (10.8)	B (11.4)	B (12.0)
NY Route 12E WB LT	A (4.1)	A (4.2)	A (4.4)	A (4.7)	A (9.3)	A (9.5)	A (10.0)	B (10.5)
Bridge Street NB LR	B (18.8)	B (18.9)	B (19.2)	B (19.6)	B (11.6)	B (11.8)	B (12.3)	B (12.9)
Overall	A (8.5)	A (8.6)	A (8.8)	A (9.2)	B (10.6)	B (10.9)	B (11.4)	B (12.0)
Bridge Street/NY Route 12F								
NY Route 12F EB LT	A (7.4)	A (7.4)	A (7.4)	A (7.4)	A (7.9)	A (7.9)	A (8.0)	A (8.0)
Bridge Street SB LR	B (14.8)	C (15.4)	C (16.3)	C (17.7)	B (14.4)	B (14.8)	C (15.8)	C (17.1)

The following summarizes the detailed level of service analysis of Existing and No-Build conditions:

- Bridge Street/NY Route 12E (East Main Street)/CR190 – The analysis indicates that this intersection will operate at an overall LOS A/B during the AM and PM peak hours with all approaches operating at LOS B or better for Existing through ETC+20 design year conditions.

- Bridge Street/NY Route 12F – The analysis indicates that the eastbound NY Route 12F approach will operate at LOS A during both peak hours for Existing through ETC+20 design year conditions. In addition,

the southbound left-turn movement will operate at LOS B for Existing through ETC+10 design year conditions and will operate at LOS C during the ETC+20 design year condition during both peak hours.

Build analyses were conducted for the new study area intersections created by the relocation of the Black River crossing for the ETC (2025), ETC+10 (2035), and ETC+20 (2045)design years. The Level of service summaries for the ETC through ETC+20 design years for three intersection options associated with the alternative roadway condition are presented in Table C-4 which includes LOS and vehicle delay for each intersection movement. The detailed LOS reports are included under Attachment B. The intersection options are as follows:

- Option 1 – Unsignalized Intersections
    - NY Route 12E/Bridge Street – Install a stop-sign on the northbound Bridge Street approach and provide separate left and right turn lanes. In addition, provide a shared left-turn/through lane on the westbound NY Route 12E approach and provide a through lane and a separate right-turn lane on the eastbound NY Route 12E approach.
    - NY Route 12F/Bridge Street – Install a stop-sign on the southbound Bridge Street approach and provide separate left and right turn lanes. In addition, provide an exclusive left-turn lane and a through lane on the eastbound NY Route 12F approach and provide a through lane and a separate right-turn lane on the westbound NY Route 12F approach.
    - A discussion regarding the proposed auxiliary turn lanes (left and right turn lanes) and traffic signals is provided below.
- Option 2 – Signalized Intersections
    - NY Route 12E/Bridge Street – The same geometry would be provided as summarized for Option 1; however, an actuated traffic signal would be installed at this intersection. NY Route 12F/Bridge Street – The same geometry would be provided as summarized for Option 1; however, an actuated traffic signal would be installed at this intersection.
- Option 3 – Roundabout Intersections
    - NY Route 12E/Bridge Street – Construct a single lane roundabout.
    - NY Route 12F/Bridge Street – Construct a single lane roundabout.

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Table C-4 – Alternative A Build Intersection Level of Service and Delays (sec)							
Intersection		AM Peak			PM Peak		
		ETC (2025)	ETC+10 (2035)	ETC+20 (2045)	ETC (2025)	ETC+10 (2035)	ETC+20 (2045)
Option 1 – Unsignalized Intersections							
NY Route 12E/Bridge Street							
NY Route 12E WB	L	A (8.9)	A (9.0)	A (9.2)	A (8.0)	A (8.1)	A (8.1)
Bridge Street NB	L	C (15.8)	C (16.7)	C (17.6)	D (25.4)	D (29.8)	E (36.2)
	R	B (10.1)	B (10.2)	B (10.3)	A (9.9)	B (10.0)	B (10.2)
NY Route 12F/Bridge Street							
NY Route 12F EB	L	A (7.8)	A (7.8)	A (7.8)	A (9.2)	A (9.4)	A (9.5)
Bridge Street SB	L	C (17.4)	C (19.0)	C (21.0)	C (19.0)	C (21.1)	C (23.6)
	R	A (8.7)	A (8.7)	A (8.8)	B (10.0)	B (10.1)	B (10.2)
Option 2 – Signalized Intersections							
NY Route 12E/Bridge Street							
NY Route 12E EB	T	A (4.4)	A (4.5)	A (4.6)	A (5.6)	A (5.8)	A (6.0)
	R	A (4.8)	A (4.9)	A (5.0)	A (5.7)	A (5.9)	A (6.1)
NY Route 12E WB	LT	A (4.9)	A (5.1)	A (5.4)	A (6.6)	A (6.9)	A (7.2)
Bridge Street NB	L	A (9.9)	A (9.9)	A (9.9)	B (10.0)	B (10.0)	B (10.0)
	R	B (10.3)	B (10.3)	B (10.3)	A (9.4)	A (9.3)	A (9.3)
Overall		A (5.6)	A (5.7)	A (5.8)	A (7.7)	A (7.8)	A (8.0)
NY Route 12F/Bridge Street							
NY Route 12F EB	L	A (6.3)	A (6.6)	A (6.9)	A (6.5)	A (6.8)	A (7.1)
	T	A (7.0)	A (7.3)	A (7.7)	A (5.0)	A (5.1)	A (5.2)
NY Route 12F WB	T	A (6.1)	A (6.3)	A (6.6)	A (5.6)	A (5.7)	A (5.9)
	R	A (6.5)	A (6.7)	A (7.0)	A (7.0)	A (7.3)	A (7.6)
Bridge Street SB	L	B (10.9)	B (10.9)	B (10.9)	B (12.0)	B (12.3)	B (12.6)
	R	A (7.2)	A (7.2)	A (7.1)	A (8.4)	A (8.6)	A (8.8)
Overall		A (8.5)	A (8.6)	A (8.8)	A (7.4)	A (7.6)	A (7.8)
Option 3 – Roundabout Intersections							
NY Route 12E/Bridge Street							
NY Route 12E EB	TR	A (8.0)	A (8.2)	A (8.4)	A (5.5)	A (5.5)	A (5.6)
NY Route 12E WB	LT	A (5.4)	A (5.4)	A (5.5)	A (7.6)	A (7.8)	A (8.1)
Bridge Street NB	LR	A (5.9)	A (6.0)	A (6.1)	A (6.9)	A (7.1)	A (7.3)
Overall		A (7.0)	A (7.1)	A (7.3)	A (6.8)	A (6.9)	A (7.1)
NY Route 12F/Bridge Street							
NY Route 12F EB	LT	A (7.7)	A (7.9)	A (8.1)	A (6.3)	A (6.4)	A (6.6)
NY Route 12F WB	TR	A (4.0)	A (6.8)	A (6.9)	A (7.3)	A (7.5)	A (7.7)
Bridge Street SB	LR	A (6.7)	A (4.0)	A (4.0)	A (7.0)	A (7.1)	A (7.3)
Overall		A (6.4)	A (6.5)	A (6.6)	A (7.0)	A (7.2)	A (7.4)

The following summarizes the detailed level of service analysis of Alternative A build conditions:

- NY Route 12E/Bridge Street & NY Route 12F/Bridge Street–
  - Option 1 – The analysis indicates that all movements at these unsignalized intersections will operate at LOS D or better during both peak hours for ETC through ETC+20 design year conditions.
  - Option 2 – The analysis indicates that these signalized intersections will operate at an overall LOS A during both peak hours with all approaches operating at LOS B or better for ETC through ETC+20 design year conditions.
  - Option 3 – The analysis indicates that these roundabout intersections will operate at an overall LOS A during both peak hours with all approaches operating at LOS A or better for ETC through ETC+20 design year conditions.

Options 1 and 2 Improvement Assessment

Left-Turn Lane Assessment (Options 1 and 2)
A left-turn lane assessment was conducted at each intersection to determine if an exclusive left-turn lane should be constructed on NY Route 12E and NY Route 12F in order to minimize impacts to through traffic. Left-turn lane criteria published by the American Association of State Highway and Transportation Officials (AASHTO) in *A Policy on Geometric Design of Highways and Streets, 2018* was reviewed at both intersections. A review of ETC+20 design hour traffic volumes at the NY Route 12E/Bridge Street intersection indicates that the guidelines for a westbound left-turn lane are met; however, an exclusive left-turn lane is not recommended at this location. A review of existing conditions indicates that the construction of a westbound left-turn lane would impact a cemetery, a local business, and several residential homes along NY Route 12E. It is noted that the 35-mph speed limit sign for the Village of Brownsville is currently located at the Village line approximately 500-feet east of this proposed intersection. It anticipated that speeds exiting the Village will still be low and that a left-turn lane is not required at this time. It is recommended that NYSDOT conduct an after study to determine if the existing speed limit sign should be relocated west of the intersection to promote lower speeds in the project area.

In addition, a review of ETC+20 design hour traffic volumes at the NY Route 12F/Bridge Street intersection indicates that the guidelines for an eastbound left-turn lane are not met during the AM peak hour and met during the PM peak hour. Based on existing speeds on NY Route 12F in the project area, it is recommended that an exclusive eastbound left-turn lane be provided. The detailed left-turn lane assessment is included under Attachment C.

Right-Turn Lane Assessment (Options 1 and 2)
A right-turn lane assessment was also conducted at each intersection to determine if a separate right-turn lane should be constructed on NY Route 12E and NY Route 12F in order to minimize impacts to through traffic. A review of right-turn lane guidelines published by Federal Highway Administration (FHWA) in *Signalized Intersections: An Informational Guide - Safety* indicates that turning vehicle deceleration creates a speed differential between them and the through vehicles. This can lead to delay for the through vehicles, as well as rear-end crashes involving both movements. In addition to providing safety benefits for approaching vehicles, right-turn lanes at unsignalized and signalized intersections can reduce vehicular delay and increase intersection capacity. Since specific AASHTO guidelines have not been established, FHWA recommends a review of adopted guidelines and practices from local agencies in order to determine if a right-turn lane should be considered. The Minnesota Department of Transportation published a Transportation Research Synthesis named *Right and Left Turn Lane Warrants* which summarizes right-turn lane criteria adopted by numerous local municipalities across the country. A review of this research and the anticipated right-turn and through volumes at the study area intersections indicates that right-turn lanes should be constructed on the eastbound NY Route 12E approach and on the westbound NY Route 12F approach to the Bridge Street intersections.

Signal Warrant Assessment (Option 2 Only)
The future traffic conditions and physical characteristics of both new study area intersections were compared to signal warrant criteria contained in the *2009 Manual of Uniform Traffic Control Devices* (National MUTCD), published by FHWA to determine if ETC traffic conditions would warrant the installation of a traffic signal. The National MUTCD specifies the minimum criteria that must be met in order for a traffic signal to be justified. The satisfaction of a signal warrant in itself is not necessarily justification for a traffic signal. Other engineering and operational factors must be considered. The National MUTCD contains three traffic volume related warrants which were applicable and evaluated in detail:

- Warrant 1 – Eight-Hour Vehicular Volume - This warrant is satisfied if for any eight hours of an average day the traffic volumes for Condition A or Condition B specified in Table 4C-1 of the National MUTCD are met for the main arterial and the higher volume side road approach to the intersection.
- Warrant 2 – Four-Hour Vehicular Volume - This warrant is met when for any four hours of an average day, points plotted on the graph presented on Figure 4C-2 of the National MUTCD fall above the appropriate curve.
- Warrant 3 – Peak Hour - This warrant is met when for any one hour of an average day, points plotted on the graph presented on Figure 4C-4 of the National MUTCD fall above the appropriate curve.

Detailed Signal Warrant Analysis

- Warrants 1, 2, and 3 – Table C-5 (ETC 2025 Traffic Conditions) summarizes the analysis of Warrants 1, 2, and 3 based on the traffic volume data for the NY Route 12E and NY Route 12F intersections at Bridge Street. A check mark under the "Signal Warrants Met?" column indicates that the criteria are satisfied for that hour. The detailed evaluation for Warrants 1, 2, and 3 are included under Attachment D.

Table C-5 – Summary of Signal Warrant Analysis – ETC (2025) Traffic Volume Conditions

Time Begin (1-hour period)	NY Route 12E/Bridge Street						NY Route 12F/Bridge Street					
	ETC Volumes[1]		Signal Warrants Met?				ETC Volumes[1]		Signal Warrants Met?			
	NY Route 12E	Bridge Street NB	#1		#2	#3	NY Route 12F	Bridge Street SB	#1		#2	#3
			Cond. A	Cond. B					Cond. A	Cond. B		
7:00 AM	629	106		✓			417	323	✓		✓	✓
8:00 AM	491	122					469	347	✓		✓	✓
9:00 AM	416	151	✓				499	260	✓		✓	✓
10:00 AM	351	218					530	269	✓	✓		✓
11:00 AM	361	248	✓				605	259	✓	✓	✓	✓
12:00 PM	361	242	✓				648	236	✓	✓	✓	✓
1:00 PM	371	228	✓				653	208	✓	✓	✓	✓
2:00 PM	359	305			✓		608	229	✓	✓	✓	✓
3:00 PM	480	352	✓		✓	✓	674	269	✓	✓	✓	✓
4:00 PM	552	369	✓	✓	✓	✓	806	260	✓	✓	✓	✓
5:00 PM	520	404	✓		✓	✓	782	227	✓	✓	✓	✓
6:00 PM	329	253					614	187	✓	✓		✓
Required Volumes	Two Lane Major Street		350	525	See Figure 4C-2	See Figure 4C-4	Two Lane Major Street		350	525	See Figure 4C-2	See Figure 4C-4
	Two Lane Minor Street		140	70			Two Lane Minor Street		105	53		
Overall Warrant Met?			No	No	Yes	Yes	Overall Warrant Met?		Yes	Yes	Yes	Yes

[1] Volumes on NY Route 12E, NY Route 12F, and Bridge Street as per NYSDOT data and redistribution of traffic volumes to account for bridge relocation.

Table C-5 indicates traffic volumes over the course of a typical day at the NY Route 12F/Bridge Street intersection meet all three volume warrants for ETC traffic conditions. In addition, ETC traffic volume conditions over the course of a typical day at the NY Route 12E/Bridge Street intersection meet two of the three volume warrants. It is noted that the volume criteria is met for 7 hours for Warrant 1 and that an additional hour is only three vehicles away from meeting the criteria. This indicates that ETC+10 traffic volume conditions will meet Warrant 1 at this location. It is therefore recommended under Option 2, that NYSDOT monitor these intersections after the project is complete to determine if traffic signal control should be implemented.

Option 1 Sight Distance Assessment

The available intersection sight distance from the proposed Bridge Street intersections was measured from the perspective of a passenger car and combination truck looking in both directions along NY Route 12E and NY Route 12F to determine if adequate sight lines are provided. The intersection sight distance looking straight ahead for vehicles traveling west on NY Route 12E and traveling east on NY Route 12F turning left onto Bridge Street was also measured, as illustrated in Diagram 1. The available intersection sight distance on a side street should provide drivers a sufficient view of the intersecting highway to allow vehicles to enter or exit the intersection without excessively slowing vehicles traveling at or near the operating speed on the intersecting mainline.

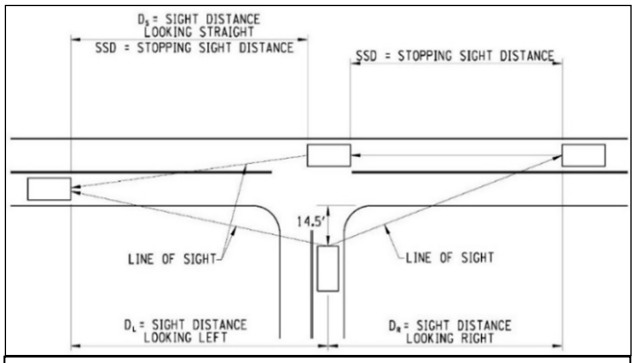


Diagram #1 - Intersection and Stopping Sight Distance

Stopping sight distance (the length of roadway ahead that is visible to the driver) was also measured on NY Route 12E and NY Route 12F at the proposed Bridge Street intersections. The available stopping sight distance on a roadway should be of sufficient length to enable a vehicle traveling at or near the operating speed to stop before reaching a stationary object in its path.

The posted speed limit on NY Route 12E and NY Route 12F is 55-mph. Traffic speed data measurements collected as part of this study show that the 85th percentile speed on NY Route 12E is approximately 55-mph in the eastbound direction and 50-mph in the westbound direction. The 85th percentile speed on NY Route 12F was measured to be approximately 60-mph in both directions. The available sight distances shown in Table C-6 are compared to the guidelines presented in AASHTO's *A Policy on Geometric Design of Highways and Streets*, 2018 and NYSDOT design guidance (EB 17-007) for 55-mph on NY Route 12E and for 60-mph on NY Route 12F.

Table C-6 – Sight Distance Summary (feet)

Intersection			Intersection Sight Distance[1]				Stopping Sight Distance[2]	
			Right Turn from Bridge Street (D_L)	Left Turn from Bridge Street		Left Turn from NY Route 12E & NY Route 12F	SSD_{EB}	SSD_{WB}
				Looking Left (D_L)	Looking Right (D_R)			
NY Route 12E/ Bridge Street	Available		915	915	>1,100	840	840	>1,100
	Recommended[3]	Passenger Car	530	610	610	445	455	455
		Combination Truck	850	930	930	610	455	455
NY Route 12F/ Bridge Street	Available		>1,100	>1,100	655	875	875	>1,100
	Recommended[4]	Passenger Car	575	665	665	490	525	525
		Combination Truck	930	1,015	1,015	665	525	525

[1] = Intersection sight distance is measured at an eye height of 3.5-ft for a passenger car and 7.5-ft for a combination truck and object height of 3.5-ft.
[2] = $SSD_{EB, WB}$ = Stopping sight distance measured for a 2-foot object located in the path of vehicles traveling eastbound and westbound on NY Route 12E and NY Route 12F.
[3] = The operating speed on NY Route 12E is 55-mph in both directions.
[4] = The operating speed on NY Route 12F is 60-mph in both directions.

Bridge Street Intersections on NY Route 12E and NY Route 12F – A review of the available intersection and stopping sight distances at the proposed Bridge Street intersections on NY Route 12E and NY Route 12F indicate that they meet AASHTO guidelines for the applicable operating speed for both design vehicles with the following two exceptions:

- NY Route 12E – Looking left to make a left-turn from Bridge Street for a combination truck (Picture #1).
- NY Route 12F – Looking right to make a left-turn from Bridge Street for a passenger car or combination truck (Picture #2).

Photo #1 – Sight Distance Looking Left on NY Route 12E

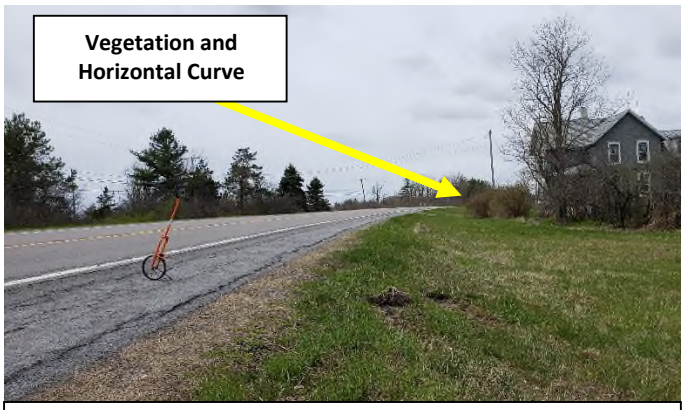


Photo #2 – Sight Distance Looking Right on NY Route 12F

The available intersection sight distance looking left for a combination truck from Bridge Street on NY Route 12E and looking right for a passenger car or combination truck from Bridge Street on NY Route 12F is limited by horizontal curves and vegetation. Figure 2C-101 found in the NYS Supplement to the NMUTCD provides guidance for the installation of "Intersection Warning" signs as mitigation for sight distance. A review of Figure 2C-101 (see figure) indicates that the available sight distance looking to the left on NY Route 12E and looking to the right on NY Route 12F from Bridge Street is less than desirable, but not critically limited; therefore, "Intersection Warning" signs are not needed.

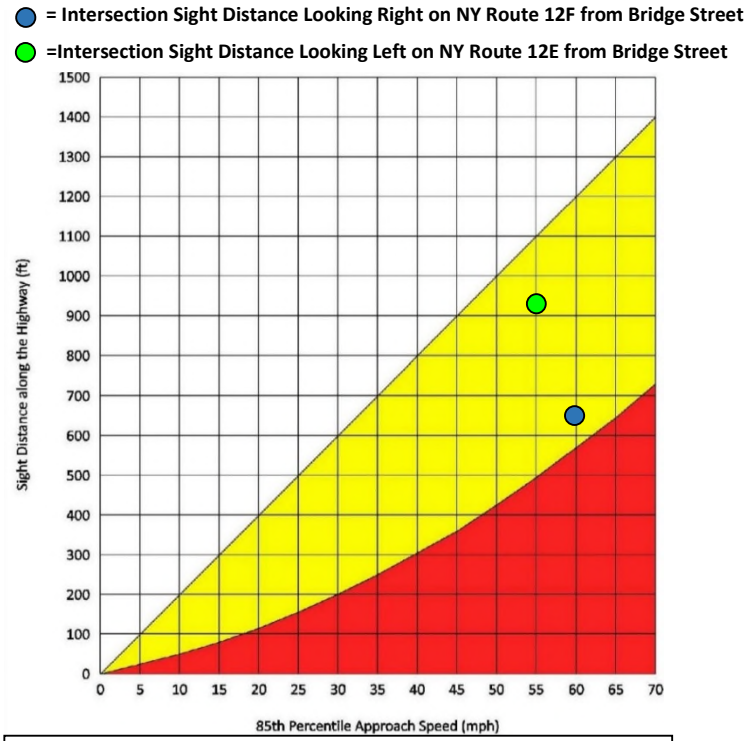


Figure 2C-101 – Guide for Intersection Warning Sign

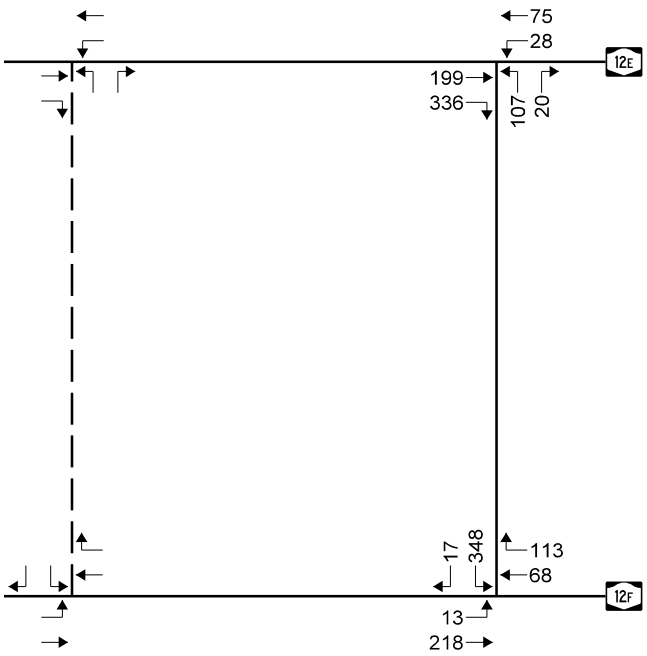
It is recommended that any vegetation located within the ROW be cleared at least 15-feet back from the traveled way. It is also recommended that any signing be placed a minimum of 15-feet back from the traveled way and the landscaping plan consider sight lines in order to maximize the visibility at the Bridge Street intersections on NY Route 12E and NY Route 12F.

Conclusion

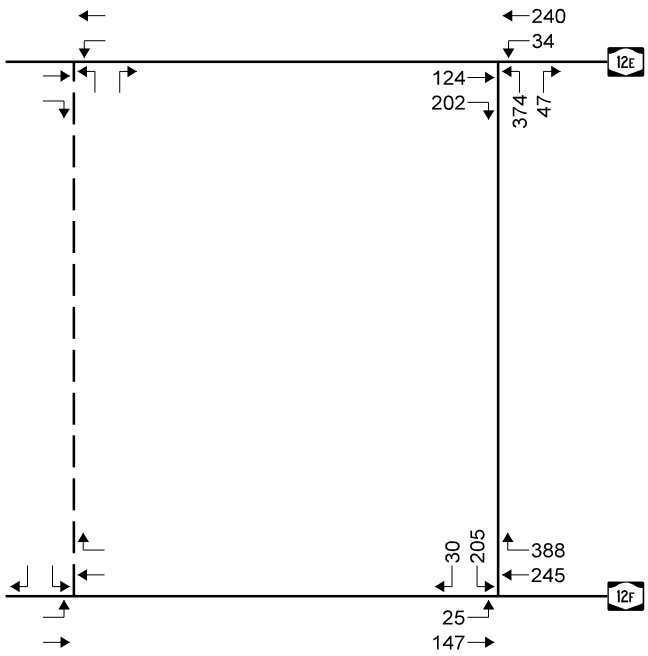
The assessment indicates that all three intersection options will operate adequately after relocation of the bridge. In consultation with the NYSDOT, Option 1 (Unsignalized Intersections) is recommended as the preferred alternative, with monitoring by the NYSDOT after the project is complete to determine if traffic signal control should be implemented at these intersections.

Attachment Index

① EXISTING 2020
AM PEAK



② EXISTING 2020
PM PEAK



EXISTING 2019
TRAFFIC VOLUMES

NY ROUTE 12E OVER BLACK RIVER BRIDGE REPLACEMENT
TOWN OF BROWNVILLE AND TOWN OF HOUNSFIELD, NY

Creighton Manning

PROJECT: 119-100	DATE: 11/2019	FIGURE: C-1

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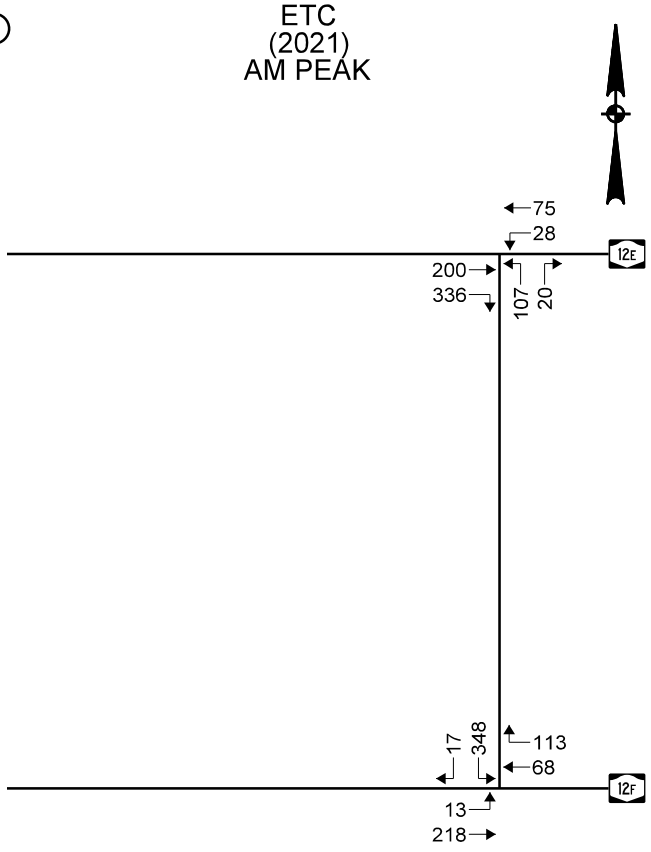

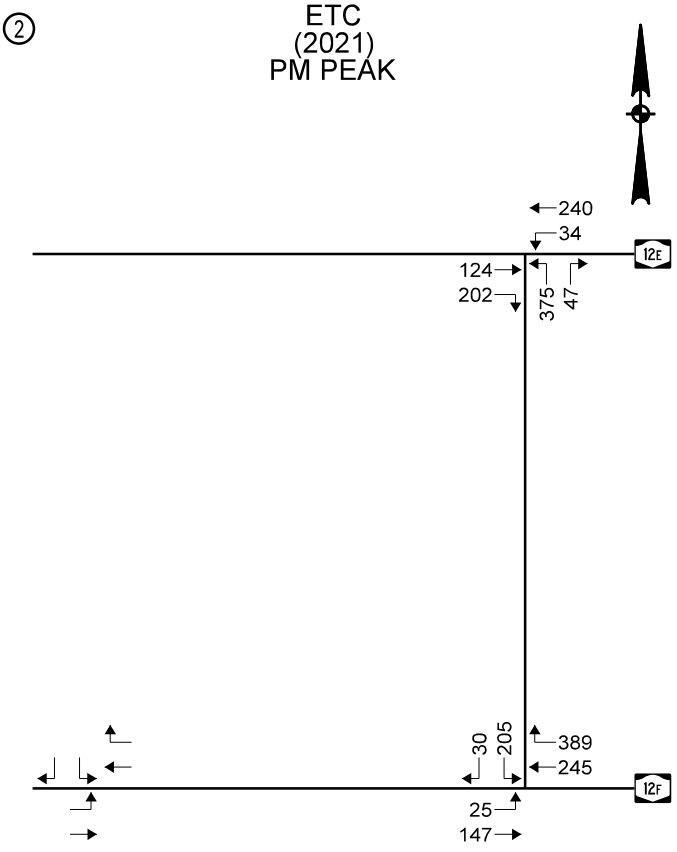

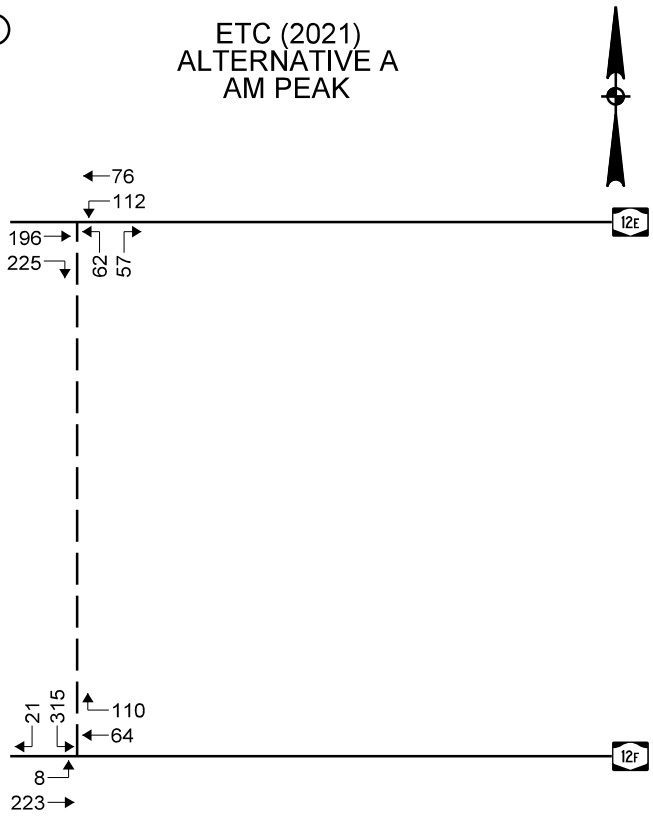

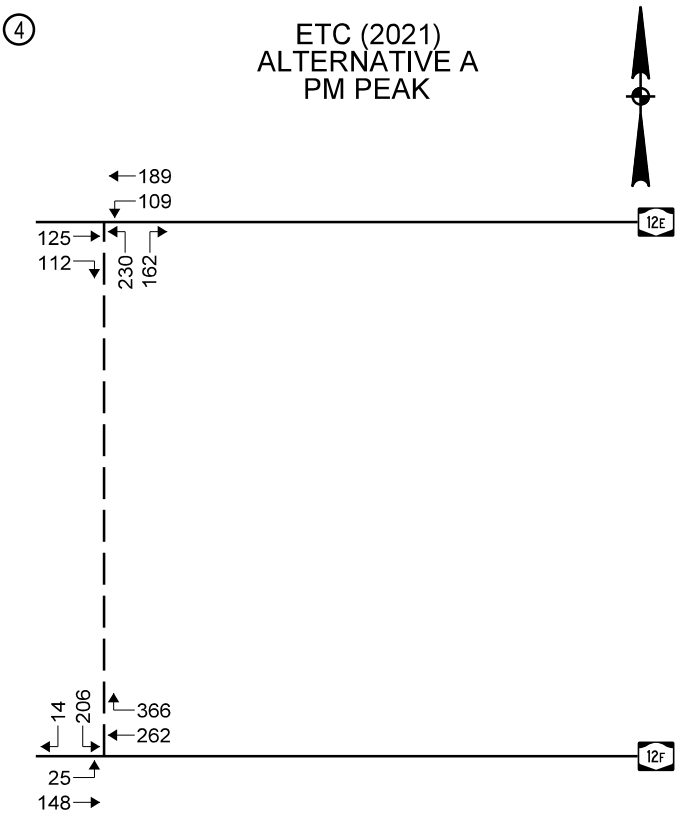

ETC (2021)
TRAFFIC VOLUMES

NY ROUTE 12E OVER BLACK RIVER BRIDGE REPLACEMENT
TOWN OF BROWNVILLE AND TOWN OF HOUNSFIELD, NY

Creighton Manning

PROJECT: 119-100	DATE: 11/2019	FIGURE: C-2

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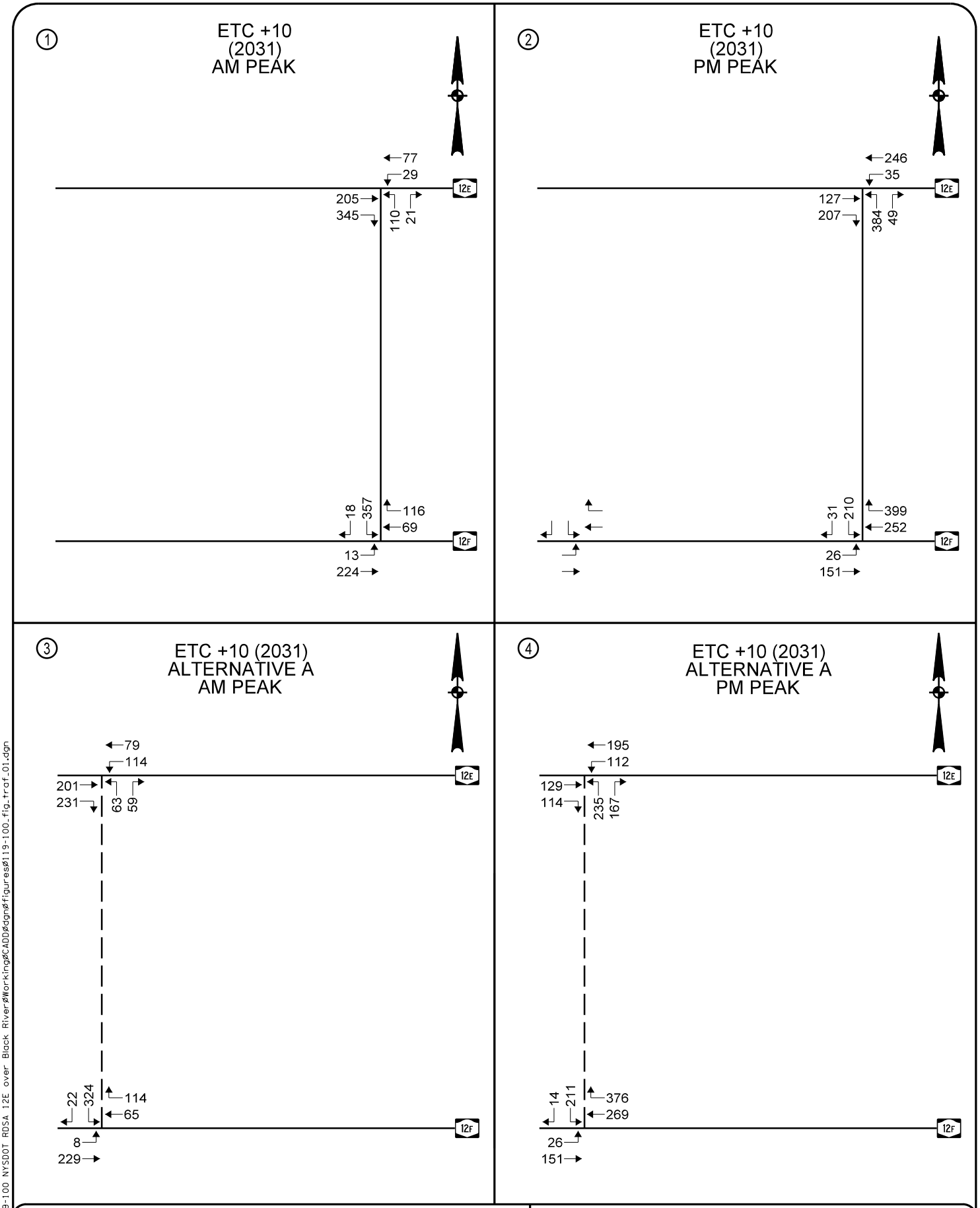

ETC +10 (2031)
TRAFFIC VOLUMES

NY ROUTE 12E OVER BLACK RIVER BRIDGE REPLACEMENT
TOWN OF BROWNVILLE AND TOWN OF HOUNSFIELD, NY

Creighton Manning

PROJECT: 119-100	DATE: 11/2019	FIGURE: C-3

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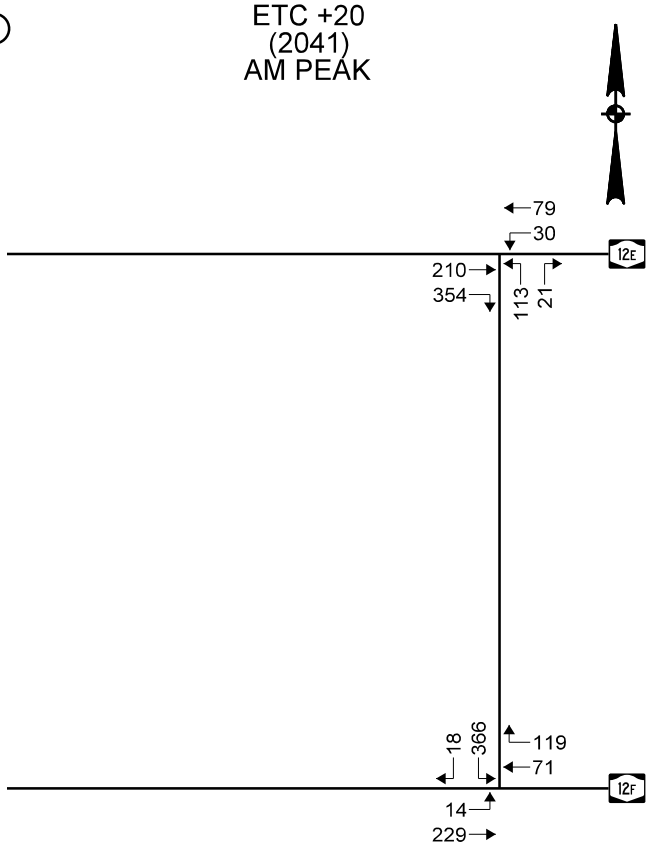

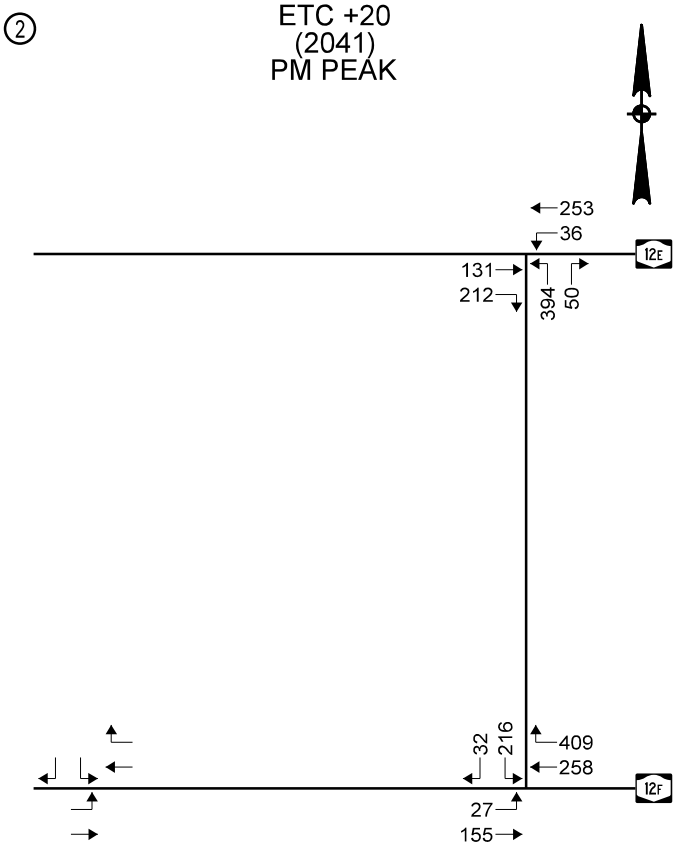

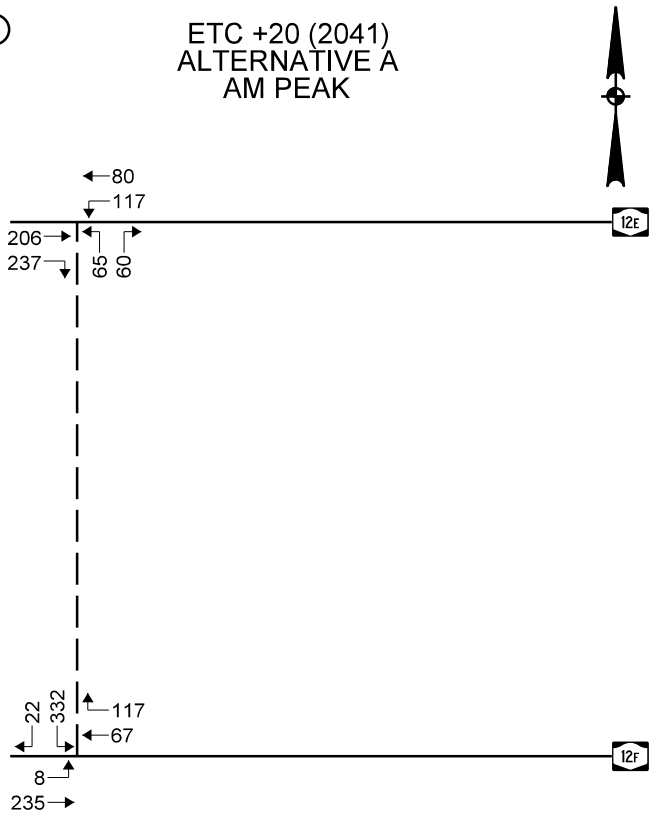

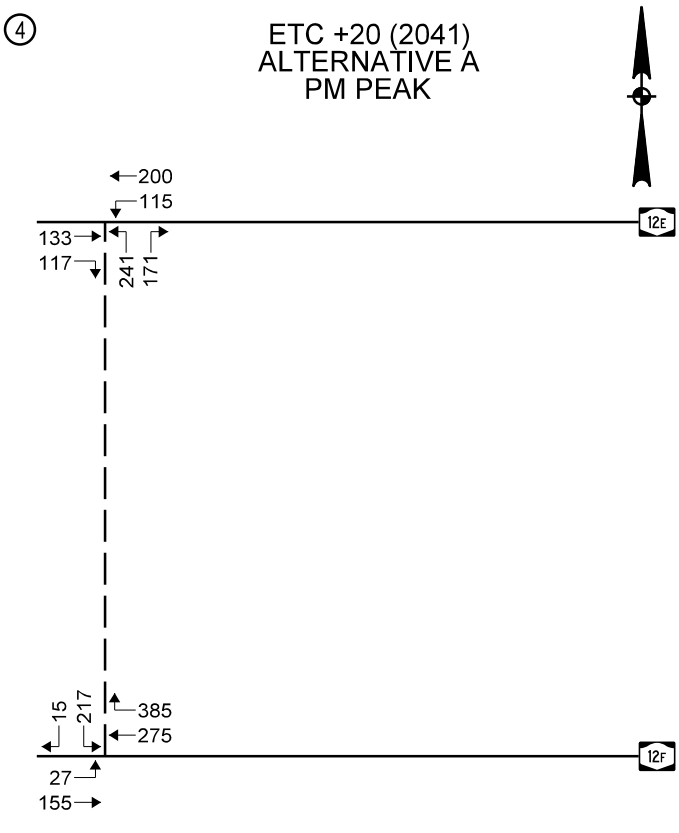

ETC +20 (2041)
TRAFFIC VOLUMES

NY ROUTE 12E OVER BLACK RIVER BRIDGE REPLACEMENT
TOWN OF BROWNVILLE AND TOWN OF HOUNSFIELD, NY

Creighton Manning

PROJECT: 119-100	DATE: 11/2019	FIGURE: C-4

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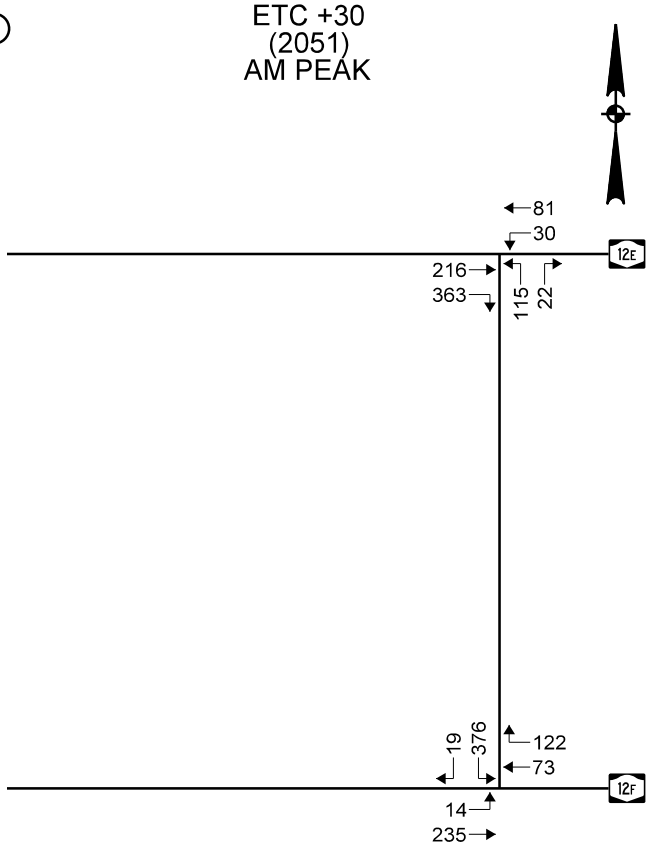

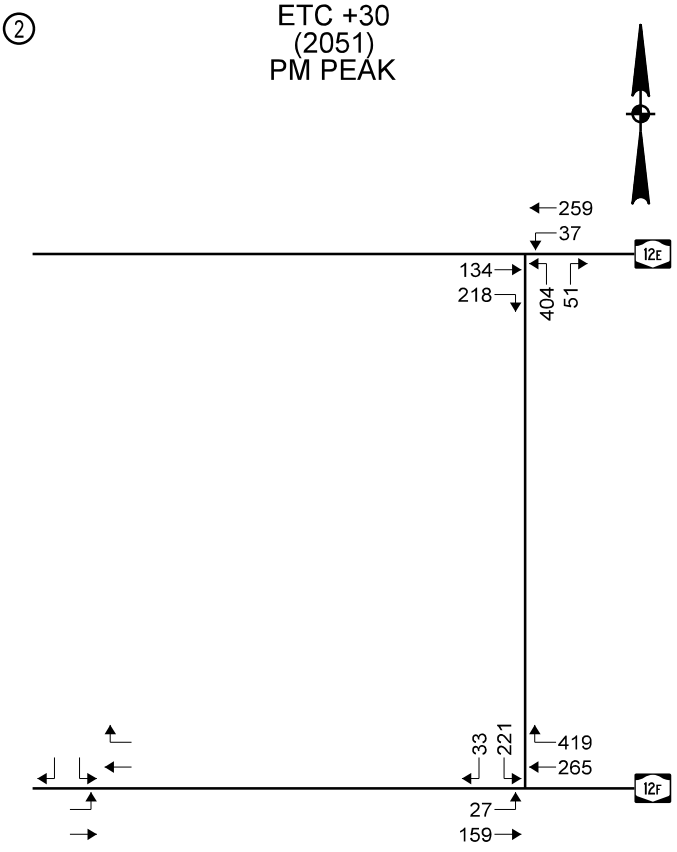

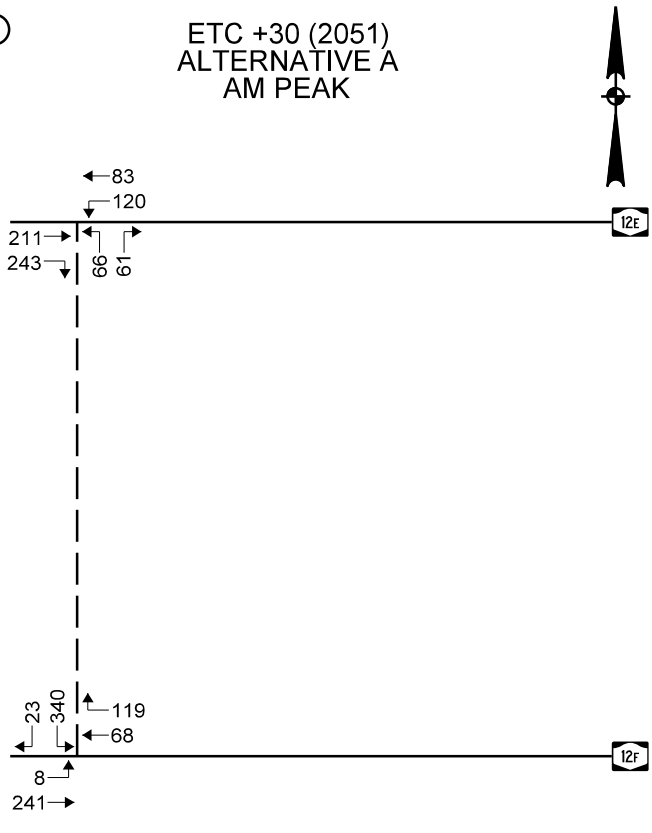

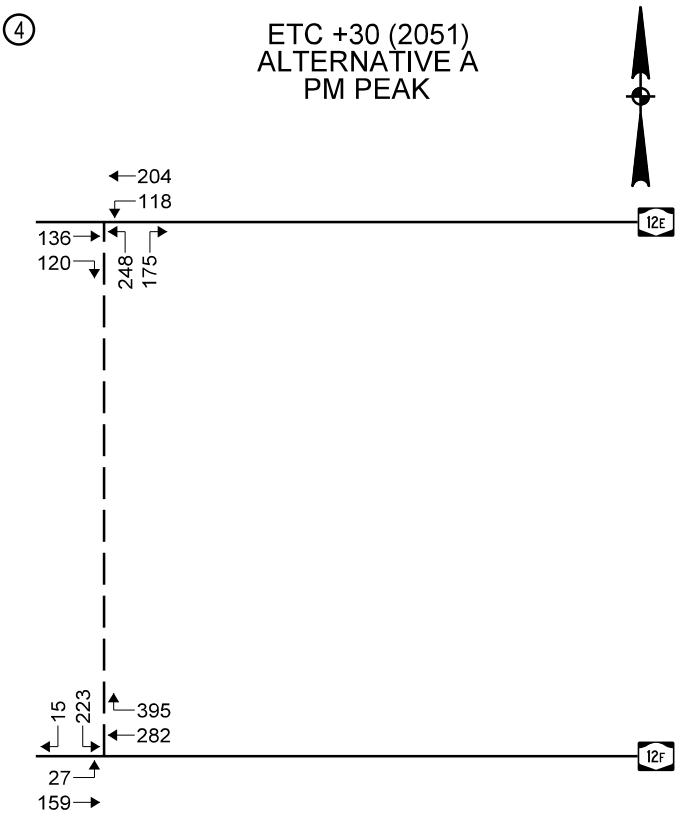

ETC +30 (2051)
TRAFFIC VOLUMES

NY ROUTE 12E OVER BLACK RIVER BRIDGE REPLACEMENT
TOWN OF BROWNVILLE AND TOWN OF HOUNSFIELD, NY

Creighton Manning

PROJECT: 119-100	DATE: 11/2019	FIGURE: C-5

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Attachment A
Existing Level of Service Analyses

PIN 7780.09 – New York Route 12E over Black River Bridge Replacement
Town of Brownville and Town of Hounsfield, New York

LOS Definitions

The following is an excerpt from the Highway Capacity Manual, 6th Edition (HCM).

Level of Service for Signalized Intersections

Level of Service (LOS) can be characterized for the entire intersection, each intersection approach, and each lane group. Control delay alone is used to characterize LOS for the entire intersection or an approach. Control delay *and* volume-to-capacity (v/c) ratio are used to characterize LOS for a lane group. Delay quantifies the increase in travel time due to traffic signal control. It is also a surrogate measure of driver discomfort and fuel consumption. The v/c ratio quantifies the degree to which a phase's capacity is utilized by a lane group. The following paragraphs describe each LOS.

LOS A describes operations with a control delay of 10 s/veh or less and a v/c ratio no greater than 1.0. This level is typically assigned when the v/c ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B describes operations with control delay between 10 and 20 s/veh and a v/c ratio no greater than 1.0. This level is typically assigned when the v/c ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

LOS C describes operations with control delay between 20 and 35 s/veh and a v/c ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D describes operations with control delay between 35 and 55 s/veh and a v/c ratio no greater than 1.0. This level is typically assigned when the v/c ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E describes operations with control delay between 55 and 80 s/veh and a v/c ratio no greater than 1.0. This level is typically assigned when the v/c ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F describes operations with control delay exceeding 80 s/veh or a v/c ratio greater than 1.0. This level is typically assigned when the v/c ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

A lane group can incur a delay less than 80 s/veh when the v/c ratio exceeds 1.0. This condition typically occurs when the cycle length is short, the signal progression is favorable, or both. As a result, both the delay and v/c ratio are considered when lane group LOS is established. A ratio of 1.0 or more indicates that cycle capacity is fully utilized and represents failure from a capacity perspective (just as delay in excess of 80 s/veh represents failure from a delay perspective).

Average control delay and queue length at roundabout controlled intersections are calculated using SIDRA Intersection. The physical geometry such as entry lane width and approach flare, and traffic volume at the roundabout are factors that influence the intersection's performance. The average delay reported using SIDRA Intersection is based on the signalized HCM Method of Delay for Level-of-Service.

Level of Service Criteria for Unsignalized Intersections

Level of service (LOS) for Two-Way Stop-Controlled (TWSC) intersections is determined by the computed or measured control delay. For motor vehicles, LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns by using criteria given in Exhibit 20-2. LOS is not defined for the intersection as a whole or for major-street approaches for three primary reasons: (a) major-street through vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through vehicles at a typical TWSC intersection skews the weighted average of all movements, resulting in a very low overall average delay for all vehicles; and (c) the resulting low delay can mask important LOS deficiencies for minor movements. LOS F is assigned to the movement if the volume-to-capacity (v/c) ratio for the movement exceeds 1.0, regardless of the control delay.

The LOS criteria for TWSC intersections are somewhat different from the criteria used in Chapter 18 for signalized intersections, primarily because user perceptions differ among transportation facility types. The expectation is that a signalized intersection is designed to carry higher traffic volumes and will present greater delay than an unsignalized intersection. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable than they are at signals, which can reduce users' delay tolerance.

The LOS criteria for All-Way Stop-Controlled (AWSC) intersections are given in Exhibit 21-8. LOS F is assigned if the v/c ratio of a lane exceeds 1.0, regardless of the control delay. For assessment of LOS at the approach and intersection levels, LOS is based solely on control delay.

Exhibits 20-2/21-8:
Level-of-Service Criteria for Stop Controlled Intersections

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio	
	v/c ≤ 1.0	**v/c ≥ 1.0**
10.0	A	F
>10.0 and ≤ 15.0	B	F
>15.0 and ≤ 25.0	C	F
>25.0 and ≤ 35.0	D	F
>35.0 and ≤ 50.0	E	F
>50.0	F	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	199	336	28	75	107	20
Future Volume (veh/h)	199	336	28	75	107	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1722	1722	1900	1900
Adj Flow Rate, veh/h	229	386	32	86	123	23
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	4	4	12	12	0	0
Cap, veh/h	317	534	231	492	163	30
Arrive On Green	0.51	0.51	0.51	0.51	0.12	0.12
Sat Flow, veh/h	616	1038	152	957	1381	258
Grp Volume(v), veh/h	0	615	118	0	147	0
Grp Sat Flow(s),veh/h/ln	0	1654	1108	0	1651	0
Q Serve(g_s), s	0.0	8.6	0.4	0.0	2.6	0.0
Cycle Q Clear(g_c), s	0.0	8.6	9.0	0.0	2.6	0.0
Prop In Lane		0.63	0.27		0.84	0.16
Lane Grp Cap(c), veh/h	0	850	723	0	195	0
V/C Ratio(X)	0.00	0.72	0.16	0.00	0.76	0.00
Avail Cap(c_a), veh/h	0	2185	1747	0	1629	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	5.6	4.0	0.0	12.8	0.0
Incr Delay (d2), s/veh	0.0	1.2	0.1	0.0	5.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.2	0.1	0.0	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.8	4.1	0.0	18.6	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	615			118	147	
Approach Delay, s/veh	6.8			4.1	18.6	
Approach LOS	A			A	B	

Timer - Assigned Phs		2		4		8
Phs Duration (G+Y+Rc), s		9.0		20.9		20.9
Change Period (Y+Rc), s		5.5		5.5		5.5
Max Green Setting (Gmax), s		29.5		39.5		39.5
Max Q Clear Time (g_c+I1), s		4.6		10.6		11.0
Green Ext Time (p_c), s		0.4		4.8		0.7

Intersection Summary	
HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	218	68	113	348	17
Future Vol, veh/h	13	218	68	113	348	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Stop	-	Yield
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	2	15	8	2	18
Mvmt Flow	14	242	76	126	387	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	76	0	-	0	225	76
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	149	-
Critical Hdwy	4.1	-	-	-	6.63	6.47
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.2	-	-	-	3.519	3.471
Pot Cap-1 Maneuver	1536	-	-	-	753	938
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	864	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1536	-	-	-	745	938
Mov Cap-2 Maneuver	-	-	-	-	745	-
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	864	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1536	-	-	-	771
HCM Lane V/C Ratio	0.009	-	-	-	0.526
HCM Control Delay (s)	7.4	0	-	-	14.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	336	28	75	107	20
Future Volume (veh/h)	200	336	28	75	107	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1722	1722	1900	1900
Adj Flow Rate, veh/h	230	386	32	86	123	23
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	4	4	12	12	0	0
Cap, veh/h	318	533	231	492	163	30
Arrive On Green	0.51	0.51	0.51	0.51	0.12	0.12
Sat Flow, veh/h	618	1037	152	956	1381	258
Grp Volume(v), veh/h	0	616	118	0	147	0
Grp Sat Flow(s),veh/h/ln	0	1654	1107	0	1651	0
Q Serve(g_s), s	0.0	8.6	0.4	0.0	2.6	0.0
Cycle Q Clear(g_c), s	0.0	8.6	9.0	0.0	2.6	0.0
Prop In Lane		0.63	0.27		0.84	0.16
Lane Grp Cap(c), veh/h	0	851	723	0	195	0
V/C Ratio(X)	0.00	0.72	0.16	0.00	0.76	0.00
Avail Cap(c_a), veh/h	0	2183	1744	0	1627	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	5.6	4.0	0.0	12.8	0.0
Incr Delay (d2), s/veh	0.0	1.2	0.1	0.0	5.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.2	0.1	0.0	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.8	4.1	0.0	18.7	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	616			118	147	
Approach Delay, s/veh	6.8			4.1	18.7	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	9.0	20.9	20.9
Change Period (Y+Rc), s	5.5	5.5	5.5
Max Green Setting (Gmax), s	29.5	39.5	39.5
Max Q Clear Time (g_c+I1), s	4.6	10.6	11.0
Green Ext Time (p_c), s	0.4	4.8	0.7

Intersection Summary	
HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	218	68	113	348	17
Future Vol, veh/h	13	218	68	113	348	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Stop	-	Yield
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	2	15	8	2	18
Mvmt Flow	14	242	76	126	387	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	76	0	-	0	225	76
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	149	-
Critical Hdwy	4.1	-	-	-	6.63	6.47
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.2	-	-	-	3.519	3.471
Pot Cap-1 Maneuver	1536	-	-	-	753	938
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	864	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1536	-	-	-	745	938
Mov Cap-2 Maneuver	-	-	-	-	745	-
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	864	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1536	-	-	-	771
HCM Lane V/C Ratio	0.009	-	-	-	0.526
HCM Control Delay (s)	7.4	0	-	-	14.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	205	345	29	77	110	21
Future Volume (veh/h)	205	345	29	77	110	21
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1722	1722	1900	1900
Adj Flow Rate, veh/h	236	397	33	89	126	24
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	4	4	12	12	0	0
Cap, veh/h	322	542	225	485	166	32
Arrive On Green	0.52	0.52	0.52	0.52	0.12	0.12
Sat Flow, veh/h	617	1037	147	929	1377	262
Grp Volume(v), veh/h	0	633	122	0	151	0
Grp Sat Flow(s),veh/h/ln	0	1654	1077	0	1651	0
Q Serve(g_s), s	0.0	9.1	0.4	0.0	2.7	0.0
Cycle Q Clear(g_c), s	0.0	9.1	9.6	0.0	2.7	0.0
Prop In Lane		0.63	0.27		0.83	0.16
Lane Grp Cap(c), veh/h	0	863	711	0	199	0
V/C Ratio(X)	0.00	0.73	0.17	0.00	0.76	0.00
Avail Cap(c_a), veh/h	0	2121	1669	0	1581	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	5.7	4.1	0.0	13.1	0.0
Incr Delay (d2), s/veh	0.0	1.2	0.1	0.0	5.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.3	0.2	0.0	1.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.9	4.2	0.0	18.9	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	633			122	151	
Approach Delay, s/veh	6.9			4.2	18.9	
Approach LOS	A			A	B	

Timer - Assigned Phs		2		4			8
Phs Duration (G+Y+Rc), s		9.2		21.6			21.6
Change Period (Y+Rc), s		5.5		5.5			5.5
Max Green Setting (Gmax), s		29.5		39.5			39.5
Max Q Clear Time (g_c+I1), s		4.7		11.1			11.6
Green Ext Time (p_c), s		0.4		5.0			0.7

Intersection Summary	
HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	224	69	116	357	18
Future Vol, veh/h	13	224	69	116	357	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Stop	-	Yield
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	2	15	8	2	18
Mvmt Flow	14	249	77	129	397	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	77	0	-	0	230	77
Stage 1	-	-	-	-	77	-
Stage 2	-	-	-	-	153	-
Critical Hdwy	4.1	-	-	-	6.63	6.47
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.2	-	-	-	3.519	3.471
Pot Cap-1 Maneuver	1535	-	-	-	748	937
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	860	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1535	-	-	-	740	937
Mov Cap-2 Maneuver	-	-	-	-	740	-
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	860	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1535	-	-	-	767
HCM Lane V/C Ratio	0.009	-	-	-	0.543
HCM Control Delay (s)	7.4	0	-	-	15.1
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	210	354	30	79	113	21
Future Volume (veh/h)	210	354	30	79	113	21
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1722	1722	1900	1900
Adj Flow Rate, veh/h	241	407	34	91	130	24
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	4	4	12	12	0	0
Cap, veh/h	325	549	221	475	172	32
Arrive On Green	0.53	0.53	0.53	0.53	0.12	0.12
Sat Flow, veh/h	615	1039	144	899	1385	256
Grp Volume(v), veh/h	0	648	125	0	155	0
Grp Sat Flow(s),veh/h/ln	0	1654	1043	0	1651	0
Q Serve(g_s), s	0.0	9.6	0.5	0.0	2.9	0.0
Cycle Q Clear(g_c), s	0.0	9.6	10.1	0.0	2.9	0.0
Prop In Lane		0.63	0.27		0.84	0.15
Lane Grp Cap(c), veh/h	0	874	696	0	205	0
V/C Ratio(X)	0.00	0.74	0.18	0.00	0.76	0.00
Avail Cap(c_a), veh/h	0	2064	1595	0	1539	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	5.8	4.2	0.0	13.4	0.0
Incr Delay (d2), s/veh	0.0	1.3	0.1	0.0	5.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.4	0.2	0.0	1.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	7.1	4.3	0.0	19.0	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	648			125	155	
Approach Delay, s/veh	7.1			4.3	19.0	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	9.4	22.2	22.2
Change Period (Y+Rc), s	5.5	5.5	5.5
Max Green Setting (Gmax), s	29.5	39.5	39.5
Max Q Clear Time (g_c+I1), s	4.9	11.6	12.1
Green Ext Time (p_c), s	0.4	5.1	0.8

Intersection Summary	
HCM 6th Ctrl Delay	8.7
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	229	71	119	366	18
Future Vol, veh/h	14	229	71	119	366	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Stop	-	Yield
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	2	15	8	2	18
Mvmt Flow	16	254	79	132	407	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	79	0	-	0	238	79
Stage 1	-	-	-	-	79	-
Stage 2	-	-	-	-	159	-
Critical Hdwy	4.1	-	-	-	6.63	6.47
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.2	-	-	-	3.519	3.471
Pot Cap-1 Maneuver	1532	-	-	-	740	935
Stage 1	-	-	-	-	944	-
Stage 2	-	-	-	-	854	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1532	-	-	-	731	935
Mov Cap-2 Maneuver	-	-	-	-	731	-
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	854	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1532	-	-	-	758
HCM Lane V/C Ratio	0.01	-	-	-	0.563
HCM Control Delay (s)	7.4	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	216	363	30	81	115	22
Future Volume (veh/h)	216	363	30	81	115	22
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1722	1722	1900	1900
Adj Flow Rate, veh/h	248	417	34	93	132	25
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	4	4	12	12	0	0
Cap, veh/h	330	555	215	474	175	33
Arrive On Green	0.54	0.54	0.54	0.54	0.13	0.13
Sat Flow, veh/h	617	1037	139	885	1379	261
Grp Volume(v), veh/h	0	665	127	0	158	0
Grp Sat Flow(s),veh/h/ln	0	1654	1024	0	1651	0
Q Serve(g_s), s	0.0	10.2	0.6	0.0	3.0	0.0
Cycle Q Clear(g_c), s	0.0	10.2	10.7	0.0	3.0	0.0
Prop In Lane		0.63	0.27		0.84	0.16
Lane Grp Cap(c), veh/h	0	886	688	0	209	0
V/C Ratio(X)	0.00	0.75	0.18	0.00	0.75	0.00
Avail Cap(c_a), veh/h	0	2006	1532	0	1495	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	5.9	4.2	0.0	13.7	0.0
Incr Delay (d2), s/veh	0.0	1.3	0.1	0.0	5.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.5	0.2	0.0	1.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	7.2	4.4	0.0	19.2	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	665			127	158	
Approach Delay, s/veh	7.2			4.4	19.2	
Approach LOS	A			A	B	

Timer - Assigned Phs		2		4			8
Phs Duration (G+Y+Rc), s		9.6		22.9			22.9
Change Period (Y+Rc), s		5.5		5.5			5.5
Max Green Setting (Gmax), s		29.5		39.5			39.5
Max Q Clear Time (g_c+I1), s		5.0		12.2			12.7
Green Ext Time (p_c), s		0.4		5.3			0.8

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	235	73	122	376	19
Future Vol, veh/h	14	235	73	122	376	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Stop	-	Yield
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	2	15	8	2	18
Mvmt Flow	16	261	81	136	418	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	81	0	-	0	244	81
Stage 1	-	-	-	-	81	-
Stage 2	-	-	-	-	163	-
Critical Hdwy	4.1	-	-	-	6.63	6.47
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.2	-	-	-	3.519	3.471
Pot Cap-1 Maneuver	1529	-	-	-	734	932
Stage 1	-	-	-	-	942	-
Stage 2	-	-	-	-	850	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1529	-	-	-	725	932
Mov Cap-2 Maneuver	-	-	-	-	725	-
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	850	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1529	-	-	-	752
HCM Lane V/C Ratio	0.01	-	-	-	0.584
HCM Control Delay (s)	7.4	0	-	-	16.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	124	202	34	240	374	47
Future Volume (veh/h)	124	202	34	240	374	47
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	133	217	37	258	402	51
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	204	333	160	480	522	66
Arrive On Green	0.32	0.32	0.32	0.32	0.33	0.33
Sat Flow, veh/h	644	1051	94	1515	1580	201
Grp Volume(v), veh/h	0	350	295	0	454	0
Grp Sat Flow(s),veh/h/ln	0	1696	1609	0	1785	0
Q Serve(g_s), s	0.0	5.5	0.2	0.0	7.1	0.0
Cycle Q Clear(g_c), s	0.0	5.5	5.8	0.0	7.1	0.0
Prop In Lane		0.62	0.13		0.89	0.11
Lane Grp Cap(c), veh/h	0	538	640	0	590	0
V/C Ratio(X)	0.00	0.65	0.46	0.00	0.77	0.00
Avail Cap(c_a), veh/h	0	2146	2262	0	1687	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	9.2	8.7	0.0	9.4	0.0
Incr Delay (d2), s/veh	0.0	1.3	0.5	0.0	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.4	1.1	0.0	2.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	10.5	9.2	0.0	11.5	0.0
LnGrp LOS	A	B	A	A	B	A
Approach Vol, veh/h	350			295	454	
Approach Delay, s/veh	10.5			9.2	11.5	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	15.8	15.4	15.4
Change Period (Y+Rc), s	5.5	5.5	5.5
Max Green Setting (Gmax), s	29.5	39.5	39.5
Max Q Clear Time (g_c+I1), s	9.1	7.5	7.8
Green Ext Time (p_c), s	1.4	2.4	1.8

Intersection Summary	
HCM 6th Ctrl Delay	10.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	147	245	388	205	30
Future Vol, veh/h	25	147	245	388	205	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Stop	-	Yield
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	4	6	2	1	2	10
Mvmt Flow	28	165	275	436	230	34

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	275	0	-	0	414	275
Stage 1	-	-	-	-	275	-
Stage 2	-	-	-	-	139	-
Critical Hdwy	4.16	-	-	-	6.63	6.35
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.238	-	-	-	3.519	3.395
Pot Cap-1 Maneuver	1274	-	-	-	580	741
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	874	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1274	-	-	-	566	741
Mov Cap-2 Maneuver	-	-	-	-	566	-
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	874	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	14.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1274	-	-	-	649
HCM Lane V/C Ratio	0.022	-	-	-	0.407
HCM Control Delay (s)	7.9	0.1	-	-	14.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	124	202	34	240	375	47
Future Volume (veh/h)	124	202	34	240	375	47
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	133	217	37	258	403	51
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	204	333	160	480	524	66
Arrive On Green	0.32	0.32	0.32	0.32	0.33	0.33
Sat Flow, veh/h	644	1051	94	1514	1581	200
Grp Volume(v), veh/h	0	350	295	0	455	0
Grp Sat Flow(s),veh/h/ln	0	1696	1608	0	1785	0
Q Serve(g_s), s	0.0	5.6	0.2	0.0	7.2	0.0
Cycle Q Clear(g_c), s	0.0	5.6	5.8	0.0	7.2	0.0
Prop In Lane		0.62	0.13		0.89	0.11
Lane Grp Cap(c), veh/h	0	537	639	0	591	0
V/C Ratio(X)	0.00	0.65	0.46	0.00	0.77	0.00
Avail Cap(c_a), veh/h	0	2144	2259	0	1685	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	9.2	8.7	0.0	9.4	0.0
Incr Delay (d2), s/veh	0.0	1.3	0.5	0.0	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.4	1.1	0.0	2.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	10.5	9.2	0.0	11.5	0.0
LnGrp LOS	A	B	A	A	B	A
Approach Vol, veh/h	350			295	455	
Approach Delay, s/veh	10.5			9.2	11.5	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	15.8	15.4	15.4
Change Period (Y+Rc), s	5.5	5.5	5.5
Max Green Setting (Gmax), s	29.5	39.5	39.5
Max Q Clear Time (g_c+I1), s	9.2	7.6	7.8
Green Ext Time (p_c), s	1.4	2.4	1.8

Intersection Summary	
HCM 6th Ctrl Delay	10.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	147	245	389	205	30
Future Vol, veh/h	25	147	245	389	205	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Stop	-	Yield
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	4	6	2	1	2	10
Mvmt Flow	28	165	275	437	230	34

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	275	0	-	0	414	275
Stage 1	-	-	-	-	275	-
Stage 2	-	-	-	-	139	-
Critical Hdwy	4.16	-	-	-	6.63	6.35
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.238	-	-	-	3.519	3.395
Pot Cap-1 Maneuver	1274	-	-	-	580	741
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	874	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1274	-	-	-	566	741
Mov Cap-2 Maneuver	-	-	-	-	566	-
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	874	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	14.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1274	-	-	-	649
HCM Lane V/C Ratio	0.022	-	-	-	0.407
HCM Control Delay (s)	7.9	0.1	-	-	14.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	127	207	35	246	384	49
Future Volume (veh/h)	127	207	35	246	384	49
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	137	223	38	265	413	53
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	207	337	156	480	532	68
Arrive On Green	0.32	0.32	0.32	0.32	0.34	0.34
Sat Flow, veh/h	645	1051	92	1495	1578	203
Grp Volume(v), veh/h	0	360	303	0	467	0
Grp Sat Flow(s),veh/h/ln	0	1696	1587	0	1785	0
Q Serve(g_s), s	0.0	5.9	0.3	0.0	7.6	0.0
Cycle Q Clear(g_c), s	0.0	5.9	6.1	0.0	7.6	0.0
Prop In Lane		0.62	0.13		0.88	0.11
Lane Grp Cap(c), veh/h	0	544	635	0	601	0
V/C Ratio(X)	0.00	0.66	0.48	0.00	0.78	0.00
Avail Cap(c_a), veh/h	0	2085	2186	0	1638	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	9.4	8.9	0.0	9.6	0.0
Incr Delay (d2), s/veh	0.0	1.4	0.6	0.0	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.6	1.2	0.0	2.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	10.8	9.4	0.0	11.8	0.0
LnGrp LOS	A	B	A	A	B	A
Approach Vol, veh/h	360			303	467	
Approach Delay, s/veh	10.8			9.4	11.8	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	16.3	15.8	15.8
Change Period (Y+Rc), s	5.5	5.5	5.5
Max Green Setting (Gmax), s	29.5	39.5	39.5
Max Q Clear Time (g_c+I1), s	9.6	7.9	8.1
Green Ext Time (p_c), s	1.4	2.4	1.9

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	151	252	399	210	31
Future Vol, veh/h	26	151	252	399	210	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Stop	-	Yield
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	4	6	2	1	2	10
Mvmt Flow	29	170	283	448	236	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	283	0	-	0	426	283
Stage 1	-	-	-	-	283	-
Stage 2	-	-	-	-	143	-
Critical Hdwy	4.16	-	-	-	6.63	6.35
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.238	-	-	-	3.519	3.395
Pot Cap-1 Maneuver	1265	-	-	-	571	733
Stage 1	-	-	-	-	764	-
Stage 2	-	-	-	-	870	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1265	-	-	-	557	733
Mov Cap-2 Maneuver	-	-	-	-	557	-
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	870	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1265	-	-	-	639
HCM Lane V/C Ratio	0.023	-	-	-	0.424
HCM Control Delay (s)	7.9	0.1	-	-	14.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	131	212	36	253	394	50
Future Volume (veh/h)	131	212	36	253	394	50
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	141	228	39	272	424	54
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	210	340	152	478	541	69
Arrive On Green	0.32	0.32	0.32	0.32	0.34	0.34
Sat Flow, veh/h	648	1048	90	1476	1580	201
Grp Volume(v), veh/h	0	369	311	0	479	0
Grp Sat Flow(s),veh/h/ln	0	1696	1566	0	1785	0
Q Serve(g_s), s	0.0	6.2	0.3	0.0	8.0	0.0
Cycle Q Clear(g_c), s	0.0	6.2	6.5	0.0	8.0	0.0
Prop In Lane		0.62	0.13		0.89	0.11
Lane Grp Cap(c), veh/h	0	550	630	0	611	0
V/C Ratio(X)	0.00	0.67	0.49	0.00	0.78	0.00
Avail Cap(c_a), veh/h	0	2031	2118	0	1596	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	9.6	9.1	0.0	9.7	0.0
Incr Delay (d2), s/veh	0.0	1.4	0.6	0.0	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.7	1.2	0.0	2.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	11.1	9.7	0.0	12.0	0.0
LnGrp LOS	A	B	A	A	B	A
Approach Vol, veh/h	369			311	479	
Approach Delay, s/veh	11.1			9.7	12.0	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4		8
Phs Duration (G+Y+Rc), s		16.8		16.2		16.2
Change Period (Y+Rc), s		5.5		5.5		5.5
Max Green Setting (Gmax), s		29.5		39.5		39.5
Max Q Clear Time (g_c+I1), s		10.0		8.2		8.5
Green Ext Time (p_c), s		1.5		2.5		2.0

Intersection Summary		
HCM 6th Ctrl Delay		11.1
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	155	258	409	216	32
Future Vol, veh/h	27	155	258	409	216	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Stop	-	Yield
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	4	6	2	1	2	10
Mvmt Flow	30	174	290	460	243	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	290	0	-	0	437	290
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	147	-
Critical Hdwy	4.16	-	-	-	6.63	6.35
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.238	-	-	-	3.519	3.395
Pot Cap-1 Maneuver	1257	-	-	-	562	727
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	866	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1257	-	-	-	547	727
Mov Cap-2 Maneuver	-	-	-	-	547	-
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	866	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1257	-	-	-	628
HCM Lane V/C Ratio	0.024	-	-	-	0.444
HCM Control Delay (s)	7.9	0.1	-	-	15.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	134	218	37	259	404	51
Future Volume (veh/h)	134	218	37	259	404	51
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	144	234	40	278	434	55
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	212	344	149	477	549	70
Arrive On Green	0.33	0.33	0.33	0.33	0.35	0.35
Sat Flow, veh/h	646	1050	88	1457	1581	200
Grp Volume(v), veh/h	0	378	318	0	490	0
Grp Sat Flow(s),veh/h/ln	0	1696	1545	0	1785	0
Q Serve(g_s), s	0.0	6.5	0.4	0.0	8.4	0.0
Cycle Q Clear(g_c), s	0.0	6.5	6.9	0.0	8.4	0.0
Prop In Lane		0.62	0.13		0.89	0.11
Lane Grp Cap(c), veh/h	0	556	626	0	620	0
V/C Ratio(X)	0.00	0.68	0.51	0.00	0.79	0.00
Avail Cap(c_a), veh/h	0	1979	2053	0	1555	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	9.8	9.2	0.0	9.9	0.0
Incr Delay (d2), s/veh	0.0	1.5	0.6	0.0	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.3	0.0	2.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	11.3	9.9	0.0	12.2	0.0
LnGrp LOS	A	B	A	A	B	A
Approach Vol, veh/h	378			318	490	
Approach Delay, s/veh	11.3			9.9	12.2	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4		8
Phs Duration (G+Y+Rc), s		17.3		16.6		16.6
Change Period (Y+Rc), s		5.5		5.5		5.5
Max Green Setting (Gmax), s		29.5		39.5		39.5
Max Q Clear Time (g_c+I1), s		10.4		8.5		8.9
Green Ext Time (p_c), s		1.5		2.6		2.0

Intersection Summary		
HCM 6th Ctrl Delay		11.3
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	159	265	419	221	33
Future Vol, veh/h	27	159	265	419	221	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Stop	-	Yield
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	4	6	2	1	2	10
Mvmt Flow	30	179	298	471	248	37

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	298	0	-	0	448	298
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	150	-
Critical Hdwy	4.16	-	-	-	6.63	6.35
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.238	-	-	-	3.519	3.395
Pot Cap-1 Maneuver	1249	-	-	-	554	719
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	863	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1249	-	-	-	539	719
Mov Cap-2 Maneuver	-	-	-	-	539	-
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	863	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1249	-	-	-	619
HCM Lane V/C Ratio	0.024	-	-	-	0.461
HCM Control Delay (s)	8	0.1	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2.4

Attachment B
Unsignalized, Signal, and Roundabout Level of Service Analyses

PIN 7780.09 – New York Route 12E over Black River Bridge Replacement
Town of Brownville and Town of Hounsfield, New York

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	196	225	112	76	62	57
Future Vol, veh/h	196	225	112	76	62	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	100	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	8	1	4	28	6	14
Mvmt Flow	225	259	129	87	71	66

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	484	0	570	225
Stage 1	-	-	-	-	225	-
Stage 2	-	-	-	-	345	-
Critical Hdwy	-	-	4.14	-	6.46	6.34
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.236	-	3.554	3.426
Pot Cap-1 Maneuver	-	-	1068	-	476	785
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	708	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1068	-	418	785
Mov Cap-2 Maneuver	-	-	-	-	418	-
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	622	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.3	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	418	785	-	-	1068	-
HCM Lane V/C Ratio	0.17	0.083	-	-	0.121	-
HCM Control Delay (s)	15.4	10	-	-	8.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.3	-	-	0.4	-

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	223	64	110	315	21
Future Vol, veh/h	8	223	64	110	315	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	13	2	21	8	2	0
Mvmt Flow	9	248	71	122	350	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	193	0	-	0	337	71
Stage 1	-	-	-	-	71	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	4.23	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.317	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	1317	-	-	-	658	997
Stage 1	-	-	-	-	952	-
Stage 2	-	-	-	-	779	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1317	-	-	-	653	997
Mov Cap-2 Maneuver	-	-	-	-	653	-
Stage 1	-	-	-	-	944	-
Stage 2	-	-	-	-	779	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	17
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1317	-	-	-	667
HCM Lane V/C Ratio	0.007	-	-	-	0.56
HCM Control Delay (s)	7.8	0	-	-	17
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	3.5

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	201	231	114	79	63	59
Future Vol, veh/h	201	231	114	79	63	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	100	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	8	1	4	28	6	14
Mvmt Flow	231	266	131	91	72	68

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	497	0	584	231
Stage 1	-	-	-	-	231	-
Stage 2	-	-	-	-	353	-
Critical Hdwy	-	-	4.14	-	6.46	6.34
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.236	-	3.554	3.426
Pot Cap-1 Maneuver	-	-	1057	-	467	779
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	702	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1057	-	409	779
Mov Cap-2 Maneuver	-	-	-	-	409	-
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	615	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.2	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	409	779	-	-	1057	-
HCM Lane V/C Ratio	0.177	0.087	-	-	0.124	-
HCM Control Delay (s)	15.7	10.1	-	-	8.9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.3	-	-	0.4	-

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	229	65	114	324	22
Future Vol, veh/h	8	229	65	114	324	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	13	2	21	8	2	0
Mvmt Flow	9	254	72	127	360	24

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	199	0	-	0	344	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	272	-
Critical Hdwy	4.23	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.317	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	1310	-	-	-	652	996
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1310	-	-	-	647	996
Mov Cap-2 Maneuver	-	-	-	-	647	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	774	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1310	-	-	-	662
HCM Lane V/C Ratio	0.007	-	-	-	0.581
HCM Control Delay (s)	7.8	0	-	-	17.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	3.8

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	206	237	117	80	65	60
Future Vol, veh/h	206	237	117	80	65	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	100	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	8	1	4	28	6	14
Mvmt Flow	237	272	134	92	75	69

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	509	0	597	237
Stage 1	-	-	-	-	237	-
Stage 2	-	-	-	-	360	-
Critical Hdwy	-	-	4.14	-	6.46	6.34
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.236	-	3.554	3.426
Pot Cap-1 Maneuver	-	-	1046	-	459	773
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	697	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1046	-	400	773
Mov Cap-2 Maneuver	-	-	-	-	400	-
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	608	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.3	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	400	773	-	-	1046	-
HCM Lane V/C Ratio	0.187	0.089	-	-	0.129	-
HCM Control Delay (s)	16.1	10.1	-	-	8.9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.3	-	-	0.4	-

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	235	67	117	332	22
Future Vol, veh/h	8	235	67	117	332	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	13	2	21	8	2	0
Mvmt Flow	9	261	74	130	369	24

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	204	0	-	0	353	74
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	279	-
Critical Hdwy	4.23	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.317	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	1305	-	-	-	645	993
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1305	-	-	-	640	993
Mov Cap-2 Maneuver	-	-	-	-	640	-
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	768	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1305	-	-	-	654
HCM Lane V/C Ratio	0.007	-	-	-	0.601
HCM Control Delay (s)	7.8	0	-	-	18.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	4

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	211	243	120	83	66	61
Future Vol, veh/h	211	243	120	83	66	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	100	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	8	1	4	28	6	14
Mvmt Flow	243	279	138	95	76	70

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	522	0	614	243
Stage 1	-	-	-	-	243	-
Stage 2	-	-	-	-	371	-
Critical Hdwy	-	-	4.14	-	6.46	6.34
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.236	-	3.554	3.426
Pot Cap-1 Maneuver	-	-	1034	-	449	767
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1034	-	389	767
Mov Cap-2 Maneuver	-	-	-	-	389	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	597	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.3	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	389	767	-	-	1034	-
HCM Lane V/C Ratio	0.195	0.091	-	-	0.133	-
HCM Control Delay (s)	16.5	10.2	-	-	9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.3	-	-	0.5	-

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	241	68	119	340	23
Future Vol, veh/h	8	241	68	119	340	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	13	2	21	8	2	0
Mvmt Flow	9	268	76	132	378	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	208	0	-	0	362	76
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	286	-
Critical Hdwy	4.23	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.317	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	1300	-	-	-	637	991
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	763	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1300	-	-	-	632	991
Mov Cap-2 Maneuver	-	-	-	-	632	-
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	763	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	19.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1300	-	-	-	647
HCM Lane V/C Ratio	0.007	-	-	-	0.623
HCM Control Delay (s)	7.8	0	-	-	19.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	4.3

Intersection	
Int Delay, s/veh	8.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	125	111	108	188	229	161
Future Vol, veh/h	125	111	108	188	229	161
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	100	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	4	0	4	0	1
Mvmt Flow	134	119	116	202	246	173

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	253	0	568	134
Stage 1	-	-	-	-	134	-
Stage 2	-	-	-	-	434	-
Critical Hdwy	-	-	4.1	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.309
Pot Cap-1 Maneuver	-	-	1324	-	488	918
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	658	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1324	-	445	918
Mov Cap-2 Maneuver	-	-	-	-	445	-
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	600	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	17.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	445	918	-	-	1324	-
HCM Lane V/C Ratio	0.553	0.189	-	-	0.088	-
HCM Control Delay (s)	22.7	9.8	-	-	8	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	3.3	0.7	-	-	0.3	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	147	260	365	205	14
Future Vol, veh/h	25	147	260	365	205	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	7	3	0	2	0
Mvmt Flow	28	165	292	410	230	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	702	0	-	0	513	292
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	221	-
Critical Hdwy	4.1	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	905	-	-	-	521	752
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	816	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	905	-	-	-	503	752
Mov Cap-2 Maneuver	-	-	-	-	503	-
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	816	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	18.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	905	-	-	-	514
HCM Lane V/C Ratio	0.031	-	-	-	0.479
HCM Control Delay (s)	9.1	0	-	-	18.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2.6

Intersection	
Int Delay, s/veh	8.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	129	114	112	195	235	167
Future Vol, veh/h	129	114	112	195	235	167
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	100	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	4	0	4	0	1
Mvmt Flow	139	123	120	210	253	180

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	262	0	589	139
Stage 1	-	-	-	-	139	-
Stage 2	-	-	-	-	450	-
Critical Hdwy	-	-	4.1	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.309
Pot Cap-1 Maneuver	-	-	1314	-	474	912
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	647	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1314	-	431	912
Mov Cap-2 Maneuver	-	-	-	-	431	-
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	588	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	18.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	431	912	-	-	1314	-
HCM Lane V/C Ratio	0.586	0.197	-	-	0.092	-
HCM Control Delay (s)	24.5	9.9	-	-	8	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	3.7	0.7	-	-	0.3	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	151	269	376	211	14
Future Vol, veh/h	26	151	269	376	211	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	7	3	0	2	0
Mvmt Flow	29	170	302	422	237	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	724	0	-	0	530	302
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	228	-
Critical Hdwy	4.1	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	888	-	-	-	510	742
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	810	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	888	-	-	-	492	742
Mov Cap-2 Maneuver	-	-	-	-	492	-
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	810	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	19.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	888	-	-	-	503
HCM Lane V/C Ratio	0.033	-	-	-	0.503
HCM Control Delay (s)	9.2	0	-	-	19.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2.8

Intersection	
Int Delay, s/veh	9.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	133	117	115	200	241	171
Future Vol, veh/h	133	117	115	200	241	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	100	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	4	0	4	0	1
Mvmt Flow	143	126	124	215	259	184

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	269	0	606	143
Stage 1	-	-	-	-	143	-
Stage 2	-	-	-	-	463	-
Critical Hdwy	-	-	4.1	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.309
Pot Cap-1 Maneuver	-	-	1306	-	463	907
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	638	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1306	-	419	907
Mov Cap-2 Maneuver	-	-	-	-	419	-
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	577	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	19.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	419	907	-	-	1306	-
HCM Lane V/C Ratio	0.618	0.203	-	-	0.095	-
HCM Control Delay (s)	26.5	10	-	-	8	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	4	0.8	-	-	0.3	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	155	275	385	217	15
Future Vol, veh/h	27	155	275	385	217	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	7	3	0	2	0
Mvmt Flow	30	174	309	433	244	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	742	0	-	0	543	309
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	234	-
Critical Hdwy	4.1	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	874	-	-	-	501	736
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	805	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	874	-	-	-	482	736
Mov Cap-2 Maneuver	-	-	-	-	482	-
Stage 1	-	-	-	-	717	-
Stage 2	-	-	-	-	805	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	20.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	874	-	-	-	493
HCM Lane V/C Ratio	0.035	-	-	-	0.529
HCM Control Delay (s)	9.3	0	-	-	20.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	3

Intersection	
Int Delay, s/veh	9.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	136	120	118	204	248	175
Future Vol, veh/h	136	120	118	204	248	175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	100	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	4	0	4	0	1
Mvmt Flow	146	129	127	219	267	188

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	275	0	619	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	473	-
Critical Hdwy	-	-	4.1	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.309
Pot Cap-1 Maneuver	-	-	1300	-	455	904
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1300	-	410	904
Mov Cap-2 Maneuver	-	-	-	-	410	-
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	569	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	21
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	410	904	-	-	1300	-
HCM Lane V/C Ratio	0.65	0.208	-	-	0.098	-
HCM Control Delay (s)	28.7	10	-	-	8.1	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	4.5	0.8	-	-	0.3	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	159	282	395	223	15
Future Vol, veh/h	27	159	282	395	223	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	7	3	0	2	0
Mvmt Flow	30	179	317	444	251	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	761	0	-	0	556	317
Stage 1	-	-	-	-	317	-
Stage 2	-	-	-	-	239	-
Critical Hdwy	4.1	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	860	-	-	-	492	728
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	801	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	860	-	-	-	473	728
Mov Cap-2 Maneuver	-	-	-	-	473	-
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	801	-

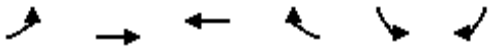
Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	21.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	860	-	-	-	484
HCM Lane V/C Ratio	0.035	-	-	-	0.553
HCM Control Delay (s)	9.3	0	-	-	21.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	196	225	112	76	62	57
Future Volume (veh/h)	196	225	112	76	62	57
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1885	1841	1485	1811	1693
Adj Flow Rate, veh/h	225	259	129	87	71	66
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	8	1	4	28	6	14
Cap, veh/h	773	693	632	644	219	183
Arrive On Green	0.43	0.43	0.43	0.43	0.13	0.13
Sat Flow, veh/h	1781	1598	897	1485	1725	1434
Grp Volume(v), veh/h	225	259	129	87	71	66
Grp Sat Flow(s),veh/h/ln	1781	1598	897	1485	1725	1434
Q Serve(g_s), s	1.9	2.5	2.5	0.8	0.9	1.0
Cycle Q Clear(g_c), s	1.9	2.5	4.3	0.8	0.9	1.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	773	693	632	644	219	183
V/C Ratio(X)	0.29	0.37	0.20	0.14	0.32	0.36
Avail Cap(c_a), veh/h	2737	2455	1621	2282	1893	1574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.2	4.4	5.6	3.9	9.0	9.1
Incr Delay (d2), s/veh	0.2	0.3	0.2	0.1	0.8	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	0.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.4	4.7	5.7	4.0	9.9	10.3
LnGrp LOS	A	A	A	A	A	B
Approach Vol, veh/h	484			216	137	
Approach Delay, s/veh	4.6			5.0	10.1	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	7.9	14.9	14.9
Change Period (Y+Rc), s	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	35.0	35.0
Max Q Clear Time (g_c+I1), s	3.0	4.5	6.3
Green Ext Time (p_c), s	0.4	2.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	5.6
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	223	64	110	315	21
Future Volume (veh/h)	8	223	64	110	315	21
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1589	1781	1900	1900
Adj Flow Rate, veh/h	9	248	71	122	350	23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	21	8	0	0
Cap, veh/h	143	644	558	530	473	31
Arrive On Green	0.35	0.35	0.35	0.35	0.29	0.29
Sat Flow, veh/h	23	1835	1589	1510	1655	109
Grp Volume(v), veh/h	257	0	71	122	374	0
Grp Sat Flow(s),veh/h/ln	1857	0	1589	1510	1768	0
Q Serve(g_s), s	0.0	0.0	0.8	1.6	5.3	0.0
Cycle Q Clear(g_c), s	2.8	0.0	0.8	1.6	5.3	0.0
Prop In Lane	0.04			1.00	0.94	0.06
Lane Grp Cap(c), veh/h	787	0	558	530	506	0
V/C Ratio(X)	0.33	0.00	0.13	0.23	0.74	0.00
Avail Cap(c_a), veh/h	2471	0	2017	1916	1603	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.7	0.0	6.1	6.3	8.9	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.1	0.2	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.1	1.6	1.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.0	0.0	6.2	6.5	11.0	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		257	193		374	
Approach Delay, s/veh		7.0	6.4		11.0	
Approach LOS		A	A		B	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			14.7		12.9	14.7
Change Period (Y+Rc), s			5.0		5.0	5.0
Max Green Setting (Gmax), s			35.0		25.0	35.0
Max Q Clear Time (g_c+I1), s			4.8		7.3	3.6
Green Ext Time (p_c), s			1.3		1.1	0.7

Intersection Summary		
HCM 6th Ctrl Delay	8.7	
HCM 6th LOS	A	

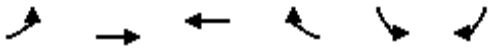
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	201	231	114	79	63	59
Future Volume (veh/h)	201	231	114	79	63	59
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1885	1841	1485	1811	1693
Adj Flow Rate, veh/h	231	266	131	91	72	68
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	8	1	4	28	6	14
Cap, veh/h	772	692	624	643	222	185
Arrive On Green	0.43	0.43	0.43	0.43	0.13	0.13
Sat Flow, veh/h	1781	1598	886	1485	1725	1434
Grp Volume(v), veh/h	231	266	131	91	72	68
Grp Sat Flow(s),veh/h/ln	1781	1598	886	1485	1725	1434
Q Serve(g_s), s	1.9	2.6	2.6	0.8	0.9	1.0
Cycle Q Clear(g_c), s	1.9	2.6	4.5	0.8	0.9	1.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	772	692	624	643	222	185
V/C Ratio(X)	0.30	0.38	0.21	0.14	0.32	0.37
Avail Cap(c_a), veh/h	2730	2448	1599	2276	1888	1570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.2	4.4	5.7	3.9	9.0	9.1
Incr Delay (d2), s/veh	0.2	0.4	0.2	0.1	0.8	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	0.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.4	4.8	5.8	4.0	9.9	10.3
LnGrp LOS	A	A	A	A	A	B
Approach Vol, veh/h	497			222	140	
Approach Delay, s/veh	4.6			5.1	10.1	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	7.9	14.9	14.9
Change Period (Y+Rc), s	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	35.0	35.0
Max Q Clear Time (g_c+I1), s	3.0	4.6	6.5
Green Ext Time (p_c), s	0.4	2.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	5.6
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	229	65	114	324	22
Future Volume (veh/h)	8	229	65	114	324	22
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1589	1781	1900	1900
Adj Flow Rate, veh/h	9	254	72	127	360	24
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	21	8	0	0
Cap, veh/h	141	639	554	526	485	32
Arrive On Green	0.35	0.35	0.35	0.35	0.29	0.29
Sat Flow, veh/h	22	1835	1589	1510	1653	110
Grp Volume(v), veh/h	263	0	72	127	385	0
Grp Sat Flow(s),veh/h/ln	1857	0	1589	1510	1768	0
Q Serve(g_s), s	0.0	0.0	0.9	1.7	5.5	0.0
Cycle Q Clear(g_c), s	3.0	0.0	0.9	1.7	5.5	0.0
Prop In Lane	0.03			1.00	0.94	0.06
Lane Grp Cap(c), veh/h	781	0	554	526	518	0
V/C Ratio(X)	0.34	0.00	0.13	0.24	0.74	0.00
Avail Cap(c_a), veh/h	2442	0	1993	1894	1584	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.9	0.0	6.2	6.5	8.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.1	0.2	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.1	1.7	1.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.1	0.0	6.3	6.7	11.0	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		263	199		385	
Approach Delay, s/veh		7.1	6.6		11.0	
Approach LOS		A	A		B	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			14.7		13.2	14.7
Change Period (Y+Rc), s			5.0		5.0	5.0
Max Green Setting (Gmax), s			35.0		25.0	35.0
Max Q Clear Time (g_c+I1), s			5.0		7.5	3.7
Green Ext Time (p_c), s			1.3		1.1	0.7

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

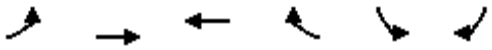
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	206	237	117	80	65	60
Future Volume (veh/h)	206	237	117	80	65	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1885	1841	1485	1811	1693
Adj Flow Rate, veh/h	237	272	134	92	75	69
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	8	1	4	28	6	14
Cap, veh/h	770	691	617	642	226	188
Arrive On Green	0.43	0.43	0.43	0.43	0.13	0.13
Sat Flow, veh/h	1781	1598	877	1485	1725	1434
Grp Volume(v), veh/h	237	272	134	92	75	69
Grp Sat Flow(s),veh/h/ln	1781	1598	877	1485	1725	1434
Q Serve(g_s), s	2.0	2.7	2.7	0.9	0.9	1.0
Cycle Q Clear(g_c), s	2.0	2.7	4.7	0.9	0.9	1.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	770	691	617	642	226	188
V/C Ratio(X)	0.31	0.39	0.22	0.14	0.33	0.37
Avail Cap(c_a), veh/h	2722	2441	1577	2269	1882	1565
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.3	4.4	5.8	3.9	9.0	9.1
Incr Delay (d2), s/veh	0.2	0.4	0.2	0.1	0.9	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.0	0.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.5	4.8	6.0	4.0	9.9	10.3
LnGrp LOS	A	A	A	A	A	B
Approach Vol, veh/h	509			226	144	
Approach Delay, s/veh	4.7			5.2	10.1	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	8.0	14.9	14.9
Change Period (Y+Rc), s	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	35.0	35.0
Max Q Clear Time (g_c+I1), s	3.0	4.7	6.7
Green Ext Time (p_c), s	0.4	2.1	1.2

Intersection Summary	
HCM 6th Ctrl Delay	5.7
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	235	67	117	332	22
Future Volume (veh/h)	8	235	67	117	332	22
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1589	1781	1900	1900
Adj Flow Rate, veh/h	9	261	74	130	369	24
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	21	8	0	0
Cap, veh/h	140	636	550	523	495	32
Arrive On Green	0.35	0.35	0.35	0.35	0.30	0.30
Sat Flow, veh/h	22	1836	1589	1510	1656	108
Grp Volume(v), veh/h	270	0	74	130	394	0
Grp Sat Flow(s),veh/h/ln	1858	0	1589	1510	1768	0
Q Serve(g_s), s	0.0	0.0	0.9	1.7	5.7	0.0
Cycle Q Clear(g_c), s	3.1	0.0	0.9	1.7	5.7	0.0
Prop In Lane	0.03			1.00	0.94	0.06
Lane Grp Cap(c), veh/h	775	0	550	523	528	0
V/C Ratio(X)	0.35	0.00	0.13	0.25	0.75	0.00
Avail Cap(c_a), veh/h	2420	0	1974	1876	1569	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.0	0.0	6.3	6.6	8.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.1	0.2	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.1	1.7	1.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.3	0.0	6.4	6.8	11.0	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		270	204		394	
Approach Delay, s/veh		7.3	6.7		11.0	
Approach LOS		A	A		B	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			14.8		13.4	14.8
Change Period (Y+Rc), s			5.0		5.0	5.0
Max Green Setting (Gmax), s			35.0		25.0	35.0
Max Q Clear Time (g_c+I1), s			5.1		7.7	3.7
Green Ext Time (p_c), s			1.3		1.2	0.7

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

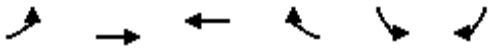
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	211	243	120	83	66	61
Future Volume (veh/h)	211	243	120	83	66	61
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1781	1885	1841	1485	1811	1693
Adj Flow Rate, veh/h	243	279	138	95	76	70
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	8	1	4	28	6	14
Cap, veh/h	770	691	610	642	228	189
Arrive On Green	0.43	0.43	0.43	0.43	0.13	0.13
Sat Flow, veh/h	1781	1598	866	1485	1725	1434
Grp Volume(v), veh/h	243	279	138	95	76	70
Grp Sat Flow(s),veh/h/ln	1781	1598	866	1485	1725	1434
Q Serve(g_s), s	2.1	2.8	2.9	0.9	0.9	1.0
Cycle Q Clear(g_c), s	2.1	2.8	4.9	0.9	0.9	1.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	770	691	610	642	228	189
V/C Ratio(X)	0.32	0.40	0.23	0.15	0.33	0.37
Avail Cap(c_a), veh/h	2717	2437	1557	2265	1879	1563
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.3	4.5	5.9	4.0	9.0	9.1
Incr Delay (d2), s/veh	0.2	0.4	0.2	0.1	0.9	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.0	0.3	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.5	4.9	6.1	4.1	9.9	10.3
LnGrp LOS	A	A	A	A	A	B
Approach Vol, veh/h	522			233	146	
Approach Delay, s/veh	4.7			5.3	10.1	
Approach LOS	A			A	B	

Timer - Assigned Phs		2		4			8
Phs Duration (G+Y+Rc), s		8.0		14.9			14.9
Change Period (Y+Rc), s		5.0		5.0			5.0
Max Green Setting (Gmax), s		25.0		35.0			35.0
Max Q Clear Time (g_c+I1), s		3.0		4.8			6.9
Green Ext Time (p_c), s		0.4		2.1			1.2

Intersection Summary	
HCM 6th Ctrl Delay	5.7
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	241	68	119	340	23
Future Volume (veh/h)	8	241	68	119	340	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1589	1781	1900	1900
Adj Flow Rate, veh/h	9	268	76	132	378	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	21	8	0	0
Cap, veh/h	138	631	546	519	504	35
Arrive On Green	0.34	0.34	0.34	0.34	0.31	0.31
Sat Flow, veh/h	21	1837	1589	1510	1650	113
Grp Volume(v), veh/h	277	0	76	132	405	0
Grp Sat Flow(s),veh/h/ln	1858	0	1589	1510	1767	0
Q Serve(g_s), s	0.0	0.0	0.9	1.8	5.9	0.0
Cycle Q Clear(g_c), s	3.3	0.0	0.9	1.8	5.9	0.0
Prop In Lane	0.03			1.00	0.93	0.06
Lane Grp Cap(c), veh/h	769	0	546	519	540	0
V/C Ratio(X)	0.36	0.00	0.14	0.25	0.75	0.00
Avail Cap(c_a), veh/h	2393	0	1952	1855	1551	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.2	0.0	6.4	6.7	8.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.1	0.3	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.1	1.8	1.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.5	0.0	6.6	7.0	11.0	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		277	208		405	
Approach Delay, s/veh		7.5	6.8		11.0	
Approach LOS		A	A		B	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		14.8		13.7	14.8
Change Period (Y+Rc), s		5.0		5.0	5.0
Max Green Setting (Gmax), s		35.0		25.0	35.0
Max Q Clear Time (g_c+I1), s		5.3		7.9	3.8
Green Ext Time (p_c), s		1.4		1.2	0.7

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

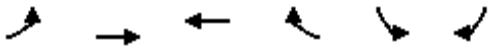
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	125	112	109	189	230	162
Future Volume (veh/h)	125	112	109	189	230	162
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1841	1900	1841	1900	1885
Adj Flow Rate, veh/h	134	120	117	203	247	174
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	4	0	4	0	1
Cap, veh/h	715	592	657	698	425	376
Arrive On Green	0.38	0.38	0.38	0.38	0.24	0.24
Sat Flow, veh/h	1885	1560	1143	1841	1810	1598
Grp Volume(v), veh/h	134	120	117	203	247	174
Grp Sat Flow(s),veh/h/ln	1885	1560	1143	1841	1810	1598
Q Serve(g_s), s	1.2	1.3	2.0	2.0	3.1	2.4
Cycle Q Clear(g_c), s	1.2	1.3	3.2	2.0	3.1	2.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	715	592	657	698	425	376
V/C Ratio(X)	0.19	0.20	0.18	0.29	0.58	0.46
Avail Cap(c_a), veh/h	2544	2105	1766	2484	1744	1540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.4	5.4	6.4	5.6	8.8	8.5
Incr Delay (d2), s/veh	0.1	0.2	0.1	0.2	1.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.1	0.1	0.9	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.5	5.6	6.6	5.8	10.0	9.4
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	254			320	421	
Approach Delay, s/veh	5.5			6.1	9.8	
Approach LOS	A			A	A	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	11.1	14.8	14.8
Change Period (Y+Rc), s	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	35.0	35.0
Max Q Clear Time (g_c+I1), s	5.1	3.3	5.2
Green Ext Time (p_c), s	1.3	1.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	148	262	366	206	14
Future Volume (veh/h)	25	148	262	366	206	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1796	1796	1856	1900	1900	1900
Adj Flow Rate, veh/h	28	166	294	411	231	16
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	7	7	3	0	0	0
Cap, veh/h	205	623	747	648	323	22
Arrive On Green	0.40	0.40	0.40	0.40	0.20	0.20
Sat Flow, veh/h	99	1548	1856	1610	1646	114
Grp Volume(v), veh/h	194	0	294	411	248	0
Grp Sat Flow(s),veh/h/ln	1647	0	1856	1610	1768	0
Q Serve(g_s), s	0.0	0.0	2.8	5.1	3.3	0.0
Cycle Q Clear(g_c), s	1.8	0.0	2.8	5.1	3.3	0.0
Prop In Lane	0.14			1.00	0.93	0.06
Lane Grp Cap(c), veh/h	828	0	747	648	346	0
V/C Ratio(X)	0.23	0.00	0.39	0.63	0.72	0.00
Avail Cap(c_a), veh/h	2307	0	2609	2264	1775	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.0	0.0	5.3	6.0	9.4	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.3	1.0	2.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	4.7	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.1	0.0	5.6	7.0	12.1	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		194	705		248	
Approach Delay, s/veh		5.1	6.4		12.1	
Approach LOS		A	A		B	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			15.0		9.9	15.0
Change Period (Y+Rc), s			5.0		5.0	5.0
Max Green Setting (Gmax), s			35.0		25.0	35.0
Max Q Clear Time (g_c+I1), s			3.8		5.3	7.1
Green Ext Time (p_c), s			1.1		0.7	2.9

Intersection Summary	
HCM 6th Ctrl Delay	7.4
HCM 6th LOS	A

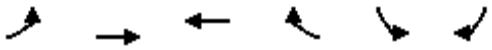
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	129	114	112	195	235	167
Future Volume (veh/h)	129	114	112	195	235	167
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1841	1900	1841	1900	1885
Adj Flow Rate, veh/h	139	123	120	210	253	180
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	4	0	4	0	1
Cap, veh/h	712	589	648	695	433	383
Arrive On Green	0.38	0.38	0.38	0.38	0.24	0.24
Sat Flow, veh/h	1885	1560	1135	1841	1810	1598
Grp Volume(v), veh/h	139	123	120	210	253	180
Grp Sat Flow(s),veh/h/ln	1885	1560	1135	1841	1810	1598
Q Serve(g_s), s	1.3	1.4	2.1	2.1	3.2	2.5
Cycle Q Clear(g_c), s	1.3	1.4	3.4	2.1	3.2	2.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	712	589	648	695	433	383
V/C Ratio(X)	0.20	0.21	0.19	0.30	0.58	0.47
Avail Cap(c_a), veh/h	2526	2090	1740	2467	1732	1529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.5	5.5	6.6	5.7	8.8	8.5
Incr Delay (d2), s/veh	0.1	0.2	0.1	0.2	1.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.1	0.2	0.9	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.6	5.7	6.7	6.0	10.0	9.4
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	262			330	433	
Approach Delay, s/veh	5.6			6.2	9.8	
Approach LOS	A			A	A	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	11.3	14.9	14.9
Change Period (Y+Rc), s	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	35.0	35.0
Max Q Clear Time (g_c+I1), s	5.2	3.4	5.4
Green Ext Time (p_c), s	1.3	1.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	151	269	376	211	14
Future Volume (veh/h)	26	151	269	376	211	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1796	1796	1856	1900	1900	1900
Adj Flow Rate, veh/h	29	170	302	422	237	16
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	7	7	3	0	0	0
Cap, veh/h	202	628	756	656	330	22
Arrive On Green	0.41	0.41	0.41	0.41	0.20	0.20
Sat Flow, veh/h	99	1542	1856	1610	1650	111
Grp Volume(v), veh/h	199	0	302	422	254	0
Grp Sat Flow(s),veh/h/ln	1641	0	1856	1610	1768	0
Q Serve(g_s), s	0.0	0.0	2.9	5.4	3.4	0.0
Cycle Q Clear(g_c), s	1.9	0.0	2.9	5.4	3.4	0.0
Prop In Lane	0.15			1.00	0.93	0.06
Lane Grp Cap(c), veh/h	830	0	756	656	354	0
V/C Ratio(X)	0.24	0.00	0.40	0.64	0.72	0.00
Avail Cap(c_a), veh/h	2244	0	2548	2211	1734	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.0	0.0	5.3	6.1	9.5	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.3	1.1	2.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	4.9	1.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.2	0.0	5.7	7.1	12.2	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		199	724		254	
Approach Delay, s/veh		5.2	6.5		12.2	
Approach LOS		A	A		B	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			15.4		10.1	15.4
Change Period (Y+Rc), s			5.0		5.0	5.0
Max Green Setting (Gmax), s			35.0		25.0	35.0
Max Q Clear Time (g_c+I1), s			3.9		5.4	7.4
Green Ext Time (p_c), s			1.1		0.7	3.0

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

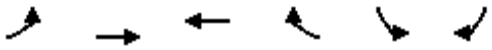
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	133	117	115	200	241	171
Future Volume (veh/h)	133	117	115	200	241	171
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1841	1900	1841	1900	1885
Adj Flow Rate, veh/h	143	126	124	215	259	184
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	4	0	4	0	1
Cap, veh/h	709	586	640	692	441	389
Arrive On Green	0.38	0.38	0.38	0.38	0.24	0.24
Sat Flow, veh/h	1885	1560	1128	1841	1810	1598
Grp Volume(v), veh/h	143	126	124	215	259	184
Grp Sat Flow(s),veh/h/ln	1885	1560	1128	1841	1810	1598
Q Serve(g_s), s	1.3	1.4	2.2	2.2	3.3	2.6
Cycle Q Clear(g_c), s	1.3	1.4	3.5	2.2	3.3	2.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	709	586	640	692	441	389
V/C Ratio(X)	0.20	0.21	0.19	0.31	0.59	0.47
Avail Cap(c_a), veh/h	2510	2077	1718	2451	1721	1520
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.5	5.6	6.7	5.8	8.8	8.5
Incr Delay (d2), s/veh	0.1	0.2	0.1	0.3	1.2	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.2	0.2	0.9	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.7	5.7	6.9	6.0	10.0	9.4
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	269			339	443	
Approach Delay, s/veh	5.7			6.4	9.8	
Approach LOS	A			A	A	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	11.4	14.9	14.9
Change Period (Y+Rc), s	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	35.0	35.0
Max Q Clear Time (g_c+I1), s	5.3	3.4	5.5
Green Ext Time (p_c), s	1.3	1.1	1.5

Intersection Summary	
HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	155	275	385	217	15
Future Volume (veh/h)	27	155	275	385	217	15
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1796	1796	1856	1900	1900	1900
Adj Flow Rate, veh/h	30	174	309	433	244	17
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	7	7	3	0	0	0
Cap, veh/h	199	632	764	663	339	24
Arrive On Green	0.41	0.41	0.41	0.41	0.21	0.21
Sat Flow, veh/h	100	1536	1856	1610	1646	115
Grp Volume(v), veh/h	204	0	309	433	262	0
Grp Sat Flow(s),veh/h/ln	1636	0	1856	1610	1767	0
Q Serve(g_s), s	0.0	0.0	3.1	5.7	3.6	0.0
Cycle Q Clear(g_c), s	2.0	0.0	3.1	5.7	3.6	0.0
Prop In Lane	0.15			1.00	0.93	0.06
Lane Grp Cap(c), veh/h	831	0	764	663	364	0
V/C Ratio(X)	0.25	0.00	0.40	0.65	0.72	0.00
Avail Cap(c_a), veh/h	2177	0	2482	2154	1689	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.1	0.0	5.4	6.2	9.7	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.3	1.1	2.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.2	5.2	1.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.3	0.0	5.8	7.3	12.4	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		204	742		262	
Approach Delay, s/veh		5.3	6.7		12.4	
Approach LOS		A	A		B	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			15.8		10.4	15.8
Change Period (Y+Rc), s			5.0		5.0	5.0
Max Green Setting (Gmax), s			35.0		25.0	35.0
Max Q Clear Time (g_c+I1), s			4.0		5.6	7.7
Green Ext Time (p_c), s			1.1		0.7	3.1

Intersection Summary	
HCM 6th Ctrl Delay	7.7
HCM 6th LOS	A

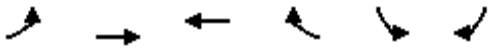
Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	136	120	118	204	248	175
Future Volume (veh/h)	136	120	118	204	248	175
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1841	1900	1841	1900	1885
Adj Flow Rate, veh/h	146	129	127	219	267	188
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	4	0	4	0	1
Cap, veh/h	704	583	632	688	450	397
Arrive On Green	0.37	0.37	0.37	0.37	0.25	0.25
Sat Flow, veh/h	1885	1560	1122	1841	1810	1598
Grp Volume(v), veh/h	146	129	127	219	267	188
Grp Sat Flow(s),veh/h/ln	1885	1560	1122	1841	1810	1598
Q Serve(g_s), s	1.4	1.5	2.3	2.2	3.4	2.7
Cycle Q Clear(g_c), s	1.4	1.5	3.7	2.2	3.4	2.7
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	704	583	632	688	450	397
V/C Ratio(X)	0.21	0.22	0.20	0.32	0.59	0.47
Avail Cap(c_a), veh/h	2491	2062	1695	2433	1708	1508
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.6	5.7	6.9	5.9	8.8	8.5
Incr Delay (d2), s/veh	0.1	0.2	0.2	0.3	1.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.2	0.2	1.0	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.8	5.9	7.0	6.2	10.0	9.3
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	275			346	455	
Approach Delay, s/veh	5.8			6.5	9.7	
Approach LOS	A			A	A	

Timer - Assigned Phs	2	4	8
Phs Duration (G+Y+Rc), s	11.6	14.9	14.9
Change Period (Y+Rc), s	5.0	5.0	5.0
Max Green Setting (Gmax), s	25.0	35.0	35.0
Max Q Clear Time (g_c+I1), s	5.4	3.5	5.7
Green Ext Time (p_c), s	1.4	1.1	1.5

Intersection Summary	
HCM 6th Ctrl Delay	7.7
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	159	282	395	223	15
Future Volume (veh/h)	27	159	282	395	223	15
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1796	1796	1856	1900	1900	1900
Adj Flow Rate, veh/h	30	179	317	444	251	17
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	7	7	3	0	0	0
Cap, veh/h	194	641	772	670	348	24
Arrive On Green	0.42	0.42	0.42	0.42	0.21	0.21
Sat Flow, veh/h	97	1540	1856	1610	1649	112
Grp Volume(v), veh/h	209	0	317	444	269	0
Grp Sat Flow(s),veh/h/ln	1636	0	1856	1610	1768	0
Q Serve(g_s), s	0.0	0.0	3.2	6.0	3.8	0.0
Cycle Q Clear(g_c), s	2.1	0.0	3.2	6.0	3.8	0.0
Prop In Lane	0.14			1.00	0.93	0.06
Lane Grp Cap(c), veh/h	835	0	772	670	373	0
V/C Ratio(X)	0.25	0.00	0.41	0.66	0.72	0.00
Avail Cap(c_a), veh/h	2124	0	2421	2101	1647	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.2	0.0	5.5	6.3	9.8	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.4	1.1	2.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.2	0.2	1.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.3	0.0	5.9	7.4	12.5	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		209	761		269	
Approach Delay, s/veh		5.3	6.8		12.5	
Approach LOS		A	A		B	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			16.2		10.7	16.2
Change Period (Y+Rc), s			5.0		5.0	5.0
Max Green Setting (Gmax), s			35.0		25.0	35.0
Max Q Clear Time (g_c+I1), s			4.1		5.8	8.0
Green Ext Time (p_c), s			1.2		0.7	3.2

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

LANE SUMMARY

Site: 1 [Route 12E-New Bridge- ETC (2021) - AM Peak]

Route 12E/New Bridge
ETC (2021)
AM Peak
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	50% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: New Bridge - NB													
Lane 1[d]	137	9.8	846	0.162	100	5.9	LOS A	0.4	9.5	Full	1460	0.0	0.0
Approach	137	9.8		0.162		5.9	LOS A	0.4	9.5				
East: Route 12E - WB													
Lane 1[d]	216	13.7	1049	0.206	100	5.4	LOS A	0.5	13.7	Full	1600	0.0	0.0
Approach	216	13.7		0.206		5.4	LOS A	0.5	13.7				
West: Route 12E - EB													
Lane 1[d]	484	4.3	1103	0.439	100	8.0	LOS A	1.3	33.1	Full	1600	0.0	0.0
Approach	484	4.3		0.439		8.0	LOS A	1.3	33.1				
Intersection	837	7.6		0.439		7.0	LOS A	1.3	33.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 1 [Route 12F-New Bridge- ETC (2021) - AM Peak]

Route 12F/New Bridge
ETC (2021)
AM Peak
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	50% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Route 12E - WB													
Lane 1[d]	193	12.8	1310	0.148	100	4.0	LOS A	0.4	9.9	Full	1600	0.0	0.0
Approach	193	12.8		0.148		4.0	LOS A	0.4	9.9				
North: New Bridge - SB													
Lane 1[d]	373	1.9	1096	0.341	100	6.7	LOS A	0.9	21.8	Full	1600	0.0	0.0
Approach	373	1.9		0.341		6.7	LOS A	0.9	21.8				
West: Route 12E - EB													
Lane 1[d]	257	2.4	839	0.306	100	7.7	LOS A	0.7	18.7	Full	1600	0.0	0.0
Approach	257	2.4		0.306		7.7	LOS A	0.7	18.7				
Intersection	823	4.6		0.341		6.4	LOS A	0.9	21.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 1 [Route 12E-New Bridge- ETC+10 (2031) - AM Peak]

Route 12E/New Bridge
ETC+10 (2031)
AM Peak
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	50% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: New Bridge - NB													
Lane 1[d]	140	9.9	840	0.167	100	6.0	LOS A	0.4	9.9	Full	1460	0.0	0.0
Approach	140	9.9		0.167		6.0	LOS A	0.4	9.9				
East: Route 12E - WB													
Lane 1[d]	222	13.8	1047	0.212	100	5.4	LOS A	0.5	14.2	Full	1600	0.0	0.0
Approach	222	13.8		0.212		5.4	LOS A	0.5	14.2				
West: Route 12E - EB													
Lane 1[d]	497	4.3	1101	0.451	100	8.2	LOS A	1.3	34.6	Full	1600	0.0	0.0
Approach	497	4.3		0.451		8.2	LOS A	1.3	34.6				
Intersection	859	7.6		0.451		7.1	LOS A	1.3	34.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 1 [Route 12F-New Bridge- ETC+10 (2031) - AM Peak]

Route 12F/New Bridge
ETC+10 (2031)
AM Peak
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	50% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Route 12E - WB													
Lane 1[d]	199	12.7	1313	0.152	100	4.0	LOS A	0.4	10.3	Full	1600	0.0	0.0
Approach	199	12.7		0.152		4.0	LOS A	0.4	10.3				
North: New Bridge - SB													
Lane 1[d]	384	1.9	1094	0.351	100	6.8	LOS A	0.9	22.8	Full	1600	0.0	0.0
Approach	384	1.9		0.351		6.8	LOS A	0.9	22.8				
West: Route 12E - EB													
Lane 1[d]	263	2.4	832	0.317	100	7.9	LOS A	0.8	19.5	Full	1600	0.0	0.0
Approach	263	2.4		0.317		7.9	LOS A	0.8	19.5				
Intersection	847	4.6		0.351		6.5	LOS A	0.9	22.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 1 [Route 12E-New Bridge- ETC+20 (2041) - AM Peak]

Route 12E/New Bridge
ETC+20 (2041)
AM Peak
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	50% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: New Bridge - NB													
Lane 1[d]	144	9.8	835	0.172	100	6.1	LOS A	0.4	10.2	Full	1460	0.0	0.0
Approach	144	9.8		0.172		6.1	LOS A	0.4	10.2				
East: Route 12E - WB													
Lane 1[d]	226	13.7	1044	0.217	100	5.5	LOS A	0.5	14.6	Full	1600	0.0	0.0
Approach	226	13.7		0.217		5.5	LOS A	0.5	14.6				
West: Route 12E - EB													
Lane 1[d]	509	4.3	1097	0.464	100	8.4	LOS A	1.4	36.2	Full	1600	0.0	0.0
Approach	509	4.3		0.464		8.4	LOS A	1.4	36.2				
Intersection	879	7.6		0.464		7.3	LOS A	1.4	36.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach