

Route 9 Active Transportation Plan: Appendix E
Projected Traffic Analysis Under Conceptual Design Conditions

November 2018

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Introduction

This memorandum describes the methodology and findings of the traffic analysis for the future conditions of the Route 9 Active Transportation Corridor project with proposed bicycle facilities in place. The analysis was developed based on modification to the Synchro 9 (Trafficware) model created of existing study area intersections and roadways to determine vehicle level of service (LOS) and delay during typical peak-hour weekday and midday weekend conditions. This method was chosen to anticipate the New York State Department of Transportation comments with respect to the Active Transportation Corridor's impact on operations.

Study Intersections

As with the existing analysis, the future conditions analysis were based upon morning and afternoon weekend and weekday peak hour turning movements and signal timing information that were collected in the fall of 2017 for 16 signalized study intersections:

- | | |
|----------------------------------|------------------------------|
| 1. Pierson Avenue/Old Broadway | 9. Fieldpoint Drive |
| 2. Pocantico Street/Old Broadway | 10. Harriman Road |
| 3. Bedford Road | 11. West/East Clinton Avenue |
| 4. Beekman Avenue | 12. Ashford Avenue |
| 5. Depeyster Street | 13. Cedar Street |
| 6. Neperan Road | 14. Livingston Avenue |
| 7. Route 119 | 15. Villard Avenue |
| 8. Interstate 87 (I-87) | 16. Farragut Avenue |

Method

The existing Synchro model was modified to account for the bicycle facilities proposed as a part of the project and as described in the Route 9 Active Transportation Conceptual Design Plan documents. As with the existing condition model, the future Synchro model with the bicycle facilities was used to estimate intersection LOS during the peak hours. Intersection LOS is based on the observed "peak hour" which is typically defined as the one continuous hour of peak traffic flow counted within the two-hour period in the morning and afternoon. Existing lane configurations, intersection controls, and vehicle turning movement counts are included in the traffic analysis.¹ Generally, LOS A through E are considered acceptable during peak hour, and any intersection that operates at LOS F is considered over capacity during the same period (Figure 126).

Consistent with the existing analysis, two analyses were conducted using Synchro and SimTraffic. The Synchro analysis provided overall LOS for all approaches at the intersection level. SimTraffic is a microscopic simulation component of Synchro, and five runs were conducted to determine any potential improvements in LOS. The 5th run of the SimTraffic analysis was used to determine overall LOS for all approaches at the intersection level.

¹ Synchro 9 Trafficware is used to model and calculate intersection LOS according to HCM 2000 methodology.

Figure 1 Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F ¹	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

Results With Bicycle Facilities

During the weekday AM Peak, the intersections that experienced LOS E or F in the Synchro analysis include Main Street/Fieldpoint Drive (Irvington) and Ashford Avenue (Dobbs Ferry). The worst approaches for each intersection are listed below:

1. The southbound through movement of Main Street/Fieldpoint Drive experienced the most delay, operating at LOS F.
2. The eastbound left turn movement of Ashford Avenue experienced the most delay, operating at LOS F.

During the weekday PM Peak, the intersections that experienced LOS E or F in the Synchro analysis include Beekman Avenue (Sleepy Hollow) and Ashford Avenue (Dobbs Ferry). The worst approaches for each intersection are listed below:

1. The eastbound through movement of Beekman Avenue experienced the most delay, operating at LOS F.
2. The eastbound left turn movement of Ashford Avenue experienced the most delay, operating at LOS F.

No intersections operated at LOS E or F during the Saturday Midday Peak.

All intersections were further modeled for five runs using SimTraffic, the microsimulation component of Synchro. Results of the 5th iteration show that each intersection that experienced LOS E or F in the Synchro analysis improved to LOS D or better. Intersection operations are summarized in Figure 173.

Appendix E: Projected Traffic Conditions Under Conceptual Design Conditions
Route 9 Active Transportation Conceptual Design Plan

Figure 2 Weekday AM Peak, Weekday PM Peak, and Saturday Midday Level of Service

Intersection	Village	Peak Hour	Synchro 9 Analysis		SimTraffic Analysis	
			Delay (sec)	LOS	Delay (sec)	LOS
Pierson Avenue/Gordon Avenue	Sleepy Hollow	AM	-	-	-	-
		PM	19.0	B	7.8	A
		Saturday (PM)	11.7	B	4.5	A
Pocantico Street/Old Broadway	Sleepy Hollow	AM	-	-	-	-
		PM	26.1	C	27.4	C
		Saturday (PM)	18.1	B	12.5	B
Bedford Road	Sleepy Hollow	AM	35.0	C	19.0	B
		PM	40.7	D	20.2	C
		Saturday (Midday)	31.3	C	11.1	B
Beekman Avenue	Sleepy Hollow	AM	47.1	D	12.8	B
		PM	85.9	F	12.8	B
		Saturday (Midday)	44.0	D	8.0	A
Depeyster Street	Sleepy Hollow	AM	21.4	C	11.6	B
		PM	11.4	B	10.8	B
		Saturday (Midday)	5.9	A	6.7	A
Main Street/Neperan Road	Tarrytown	AM	19.4	B	14.1	B
		PM	23.6	C	18.1	B
		Saturday (Midday)	24.4	C	22.3	C
Route 119	Tarrytown	AM	26.6	C	28.1	C
		PM	35.6	D	22.5	C
		Saturday (Midday)	26.5	C	19.4	B
I-87 (WB)	Tarrytown	AM	49.4	D	25.1	C
		PM	49.8	D	23.5	C
		Saturday (Midday)	26.2	C	23.4	C
Main Street/Fieldpoint Drive	Irvington	AM	103.1	F	32.4	C
		PM	53.1	D	30.3	C
		Saturday (Midday)	27.3	C	19.7	B
Harriman Road	Irvington	AM	4.2	A	4.8	A

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Route 9 Active Transportation Conceptual Design Plan

Intersection	Village	Peak Hour	Synchro 9 Analysis		SimTraffic Analysis	
			Delay (sec)	LOS	Delay (sec)	LOS
		PM	28.8	C	11.7	B
		Saturday (Midday)	31.6	C	9.2	A
West/East Clinton Avenue	Irvington	AM	10.5	B	8.4	A
		PM	25.1	C	13.0	B
		Saturday (Midday)	9.3	A	7.3	A
Ashford Avenue	Dobbs Ferry	AM	105.6	F	22.7	C
		PM	62.4	E	19.3	B
		Saturday (Midday)	14.3	B	13.6	B
Cedar Street	Dobbs Ferry	AM	12.0	B	14.6	B
		PM	15.0	B	13.5	B
		Saturday (Midday)	13.1	B	12.5	B
Livingston Avenue	Dobbs Ferry	AM	9.0	A	6.2	A
		PM	9.3	A	5.9	A
		Saturday (Midday)	8.0	A	10.4	B
Villard Avenue	Hastings-on-Hudson	AM	8.4	A	8.4	A
		PM	9.4	A	6.8	A
		Saturday (Midday)	7.7	A	8.3	A
Farragut Avenue	Hastings-on-Hudson	AM	Intersection Converted to Roundabout (Condition Not Studied)			
		PM				
		Saturday (Midday)				

Source: Nelson\Nygaard, 2017.

Note 1. **BOLD** indicates intersections that experienced LOS F under the Synchro 9 Analysis.

Note 2. AM and PM peak conditions were analyzed for a typical weekday. Midday conditions were analyzed on a typical weekend.

Note 3. Pierson Avenue/Gordon Avenue and Pocantico Street/Old Broadway evaluated for the midday Saturday and weekday PM periods only due to lack of weekday AM data.