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Technical Memorandum

TO:	Megan Costa, Syracuse-Onondaga County Planning Agency Mark Premo, Onondaga County Department of Transportation
FROM:	Meghan Vitale
DATE:	May 11, 2017 (revised September 26, 2017)
RE:	Route 57 build-out impact analysis Technical Memorandum #1: Existing and future (base) traffic conditions
CC:	James Fensken, Onondaga County Department of Transportation Mark Territo, Town of Clay Steve Procopio, Town of Salina

Introduction

The Syracuse Metropolitan Transportation Council's (SMTC) 2016-2017 Unified Planning Work Program (UPWP) includes a "Comprehensive Plan Assistance Block" to assist municipalities within our Metropolitan Planning Area (MPA) with transportation-related elements of their comprehensive planning, as requested by the Syracuse-Onondaga County Planning Agency (SOCPA). In September 2016, the SMTC agreed to provide technical assistance related to proposed and potential development of the Route 57 corridor between the New York State Thruway (I-90) and John Glenn Boulevard.

This Technical Memo summarizes the SMTC's work on the first two (out of three) tasks anticipated for this analysis: capacity analysis for existing conditions, and future traffic volumes and analysis of future conditions.

2016 traffic volumes

Table 1 lists the intersections that are included in this analysis. All of these intersections were included in a Synchro model that was developed in 2010 as part of the Onondaga County Traffic Signal Optimization Phase 1 project (completed by Creighton Manning Engineering for the SMTC). As noted in Table 1, recent turning movement counts were available for some of the study area intersections.

Intersection	Signalized?	Counted by	Count date
Route 57/John Glenn Boulevard	Y	SMTC	2015
Route 57/Long Branch Road/Belmont Drive	Y	SMTC	2010
Route 57/Glenn Crossing plaza	Y	SMTC	2010
Route 57/Old Cove Road	Ν	SMTC	2010
Route 57/Dunkin Donuts south driveway	N	GTS	2016
Route 57/Liverpool Bypass	Y	GTS	2016
Morgan Road/Liverpool Bypass/Crown Road	Y	SMTC	2016
Route 57/Thruway ramps	Y	SMTC	2016

Table 1: Study area intersections and most recent traffic count information

Note: Counts completed by GTS Consulting in 2016 were obtained from the Traffic Impact Assessment – Proposed CNG Fueling Station, August 2016.

To develop the 2016 Existing traffic volumes, SMTC used the current turning movement count data at the five intersections with recent counts, and updated the 2010 volumes for the through movements on Route 57 at the three remaining intersections to balance to the nearby intersections with current data. Side-street volumes on Old Cove Road, Glenn Crossing, and Long Branch Road/Belmont Drive were assumed to remain consistent with the 2010 volumes. Traffic volumes were then balanced, to the extent practical, between adjacent intersections (although some imbalances were allowed to remain where there were numerous driveways between intersections). The resulting 2016 Existing Traffic Volumes for the AM and PM peak hours are shown on Figure 1.

SMTC staff then updated the 2010 AM and PM peak hour Synchro models to reflect the 2016 Existing traffic volumes. Per guidance from OCDOT, signal timings from the 2010 existing conditions model were not altered. The existing levels of service and delay at each intersection, based on the updated 2016 Synchro model, are summarized in Table 5.

Future (2021 and 2030) traffic volumes

SMTC staff worked with staff from SOCPA, the Onondaga County Department of Transportation (OCDOT), the Town of Clay, and the Town of Salina to identify a list of anticipated projects for the study corridor. This list was divided into two categories: short-term "proposed" developments (i.e. a current proposal for the site has been presented to the town and/or county agencies and development is expected within 5 years) and long-term "anticipated" developments (i.e. the Working Group members anticipate that these properties will be developed by 2030, though no specific proposal has been presented at the current time).

SMTC staff reviewed the traffic volumes available in the 2010 Synchro model for all of the study area intersections, along with the more recent traffic volume information where available. Table 2 compares the total entering volume in the 2010 Synchro model with current values, for applicable intersections. With the exception of the Morgan Road/Liverpool Bypass intersection, total entering volumes have decreased from 2010 to 2015/2016 (although some individual turning movement volumes did increase).

	2010	Current volume	Percent change,
Intersection	volume	(2015 or 2016)	2010 to current
Route 57/John Glenn Boulevard	5,687	4,366	-23.2%
Route 57/Liverpool Bypass	3,050	2,292	-24.9%
Morgan Road/Liverpool Bypass/Crown Road	1,736	1,922	10.7%
Route 57/Thruway ramps	2,695	2,337	-13.3%

Table 2: Comparison of PM Peak Hour total entering vehicles at intersections

Source: OCDOT Traffic Signal Optimization Project, Old Route 57, CME, 2010 (Synchro files); 2015/2016 counts completed by SMTC staff and/or consultants.

For the short-term future (2021) analysis, data from ITE's Trip Generation Manual were used to determine the additional trips created by known proposed developments. Since the comparison of traffic volumes, as shown in Table 2, indicated decreasing volumes, no background growth rate was used. The developments considered for the short-term analysis are shown on Figure 2 and listed in Table 3. In total, over 400 new residential units and over 100,000 SF of commercial development (primarily due to the Liverpool Sports Complex) are anticipated by 2021.

Мар		ITE Land		Total trip	s generated
location	Development	Use Code	Units/size	AM	PM
1	Apartments	220	150 units	77	93
2	Liverpool Sports Complex (aka Sharkey's expansion)	495	100,000 SF	58	77
3	Mavis Tire Store	941	6 service bays	18	31
4	Bank	912	7,000 SF	85	170
5	Meyer Manor apartments*	220	135 units	24	29
6	Apartments*	220	24 units	11	11
7	Townhouses	230	100 units	44	52
			TOTAL	317	463

Table 3: Trips generated by "short-term" future developments within study area

Source: Institute of Transportation Engineers, Trip Generation Manual, 9th Edition

*Some trips generated by this development do not travel through the current study area. (Some Meyer Manor trips are anticipated to travel to/from the south on Tulip Street, and some trips associated with the apartments at location #6 are anticipated to travel to/from the north on Morgan Road. These trips would not pass through the study area intersections so are not included in the totals shown here.)

Table 3 summarizes the trip generation for these developments. Trips to and from these developments were distributed throughout the study area based on existing travel patterns (for residential development) and the location of existing residential areas (for commercial developments). The resulting "short-term future" (year 2021) traffic volumes are shown on Figure 3. These volumes were entered into the Synchro model to determine the anticipated vehicle delay and level of service under this scenario, as shown in Table 5.

The SMTC's regional travel demand model was used for the long-term (year 2030) analysis of the corridor.² SMTC modified the 2030 travel demand model to include the household and job growth shown in Table 4, for analysis zones within the study area. A total of over 800 residential units and over 400,000 SF of commercial uses were added to the model within the study corridor to represent 2030 conditions (these totals include the "short term" development previously identified).

Мар		Residential	Commercial	
location	Development	units	use/size	New jobs
1	Apartments	150 units	na	0
2	Liverpool Sports Complex	na	100,000 SF	50
	(aka Sharkey's expansion)			
3	Mavis Tire Store	na	6 service bays	15
4	Bank	na	7,000 SF	23
5	Meyer Manor	135 units	na	0
	apartments			
6	Apartments	24 units	na	0
7	Townhouses	100 units	na	
8	Liverpool Golf Course	400 units	na	0
	redevelopment	(townhomes)		
9	Restaurant	na	7,000 SF	70
10	Kickball park	na	86,000 SF retail	508
	redevelopment		8,000 SF fast-food	
			2,000 SF coffee shop	
			4,000 SF bank	
			8,000 SF restaurant	
			100,000 SF hotel	
11	Restaurant	na	10,000 SF	100
12	Retail (reuse of existing	na	70,000 SF	175
	building)			
13	Restaurant	na	6,000	60
14	Industrial	na		100
	TOTAL	809 units	408,000 SF	1,101

Table 4: Long-term future development data for travel demand model

² The SMTC previously used the travel demand model to examine a variety of future options for the configuration of the Onondaga Lake Parkway. This previous analysis showed that options that constrain capacity on the Parkway result in a slight reduction of traffic volumes on Route 57. Therefore, the existing conditions on the Parkway (four lanes, speed limit of 55 mph) were used for the current analysis because this provides for the "worst case" (i.e. highest traffic volumes) on Route 57.

The model provided 2014 (model base year) and 2030 traffic volumes for the AM and PM peak hours for segments of Route 57 from the Thruway ramps to John Glenn Boulevard, the Liverpool Bypass, and segments of John Glenn Boulevard and Morgan Road at the study area intersections. The annual growth rate on each segment was determined, and based on an examination of the average annual growth rate for various segments in the study area, SMTC staff concluded that, in general, 2016 turning movement volumes should be inflated by 13 percent (total) to represent the anticipated 2030 traffic volumes. (For intersection approaches serving a "short term" development, for which site-specific trip generation had already been determined, the 2021 volumes were used for the 2030 analysis as well, instead of the 13 percent growth.) The 2030 turning movement volumes are shown on Figure 4.

The 2030 turning movement volumes were then input to the Synchro model to determine future delay and level of service at each of the study area intersections. The results are summarized in Table 5.

Capacity analysis results

The study area intersections generally operate well under existing conditions during the morning and evening peak hours. Most individual movements at the signalized intersections operate at LOS C or better. The existing side-street approaches at Old Cove Road and the Dunkin Donuts southern driveway – which are both unsignalized – operate at LOS E during the morning peak hour.

The analysis shows that the addition of the short-term developments (by year 2021) will result in increases in average vehicle delay of less than five seconds on most signalized intersection approaches (and delay will be unchanged on many of these approaches). At the signalized intersections in the study area, the greatest increases in delay between 2016 and 2021 are expected to be at the Route 57/John Glenn Boulevard intersection, with most of the movements at this intersection operating at LOS D or E under 2021 conditions and the intersection operating at LOS D overall.

The analysis shows more significant increases in delay for the unsignalized side-street approaches at Old Cove Road and the Dunkin Donuts driveway. Under 2021 conditions, these unsignalized approaches are expected to operate at LOS E or F during the peak hours with average vehicle delay of up to 77 seconds. Delays are expected to continue increasing under the 2030 conditions, with substantial increases in delay for these approaches during the AM peak hour. Average vehicle delay on the Old Cove Road and Dunkin Donuts driveway approaches to Route 57 are expected to be over 120 seconds during the AM peak hour under 2030 conditions. Since the volumes on the side-street approaches are not expected to change significantly from the 2021 to the 2030 conditions, the increase in delay is likely due to the increase in traffic on Route 57. The AM delay is significantly greater than the PM delay because the volume of vehicles exiting from Old Cove Road and the Dunkin Donuts driveway onto Route 57 is much greater in the morning than the afternoon (commuters leaving the residential areas along Old Cove Road, and the morning rush at Dunkin Donuts).

		Level of Service (delay, in seconds)					
Intersection		AM Peak Hour PM Peak Hour			our		
Approach	Movement	Existing	2021	2030	Existing	2021	2030
CR 57/John Glenn Blvd (signalized)							
Eastbound	Left	D(46)	D(45)	D(44)	D(55)	D(55)	<mark>E(70)</mark>
	Through/right	D(47)	D(47)	<mark>E (66)</mark>	D(40)	D(40)	D(44)
Westbound	Left	D(52)	D(53)	D(53)	D(45)	D(47)	D(49)
	Through/right	C(35)	C(34)	D (36)	D(43)	D(43)	D(47)
Northbound	Left	D(45)	D(45)	D(45)	E(60)	E(63)	<mark>E(72)</mark>
	Through	C(27)	C(28)	C(29)	E(66)	<mark>E(75)</mark>	<mark>F(179)</mark>
	Right	A(8)	A(8)	A(8)	A(9)	A(9)	B(10)
Southbound	Left	D(45)	D(45)	D(45)	D(45)	D(45)	D(46)
	Through	D(38)	D(42)	E(56)	D(48)	E(60)	<mark>E(77)</mark>
	Right	B(17)	B(17)	B(18)	C(21)	C(21)	C(24)
OVERALL		D(37)	D(38)	D(47)	D(48)	D(53)	<mark>F(84)</mark>
CR 57/Longbr	anch Rd/Belmont Dr	(signalized)				
Eastbound	Left	C(30)	C(29)	C(30)	C(29)	C(32)	C(32)
	Through/right	B(19)	B(16)	B(16)	B(10)	A(9)	A(10)
Westbound	Left	C(25)	C(24)	C(25)	C(20)	B(20)	B(20)
	Through/right	B(18)	B(19)	B(19)	C(29)	D(39)	D(41)
Northbound	Left	D(41)	D(42)	D(42)	D(41)	D(43)	D(43)
	Through/right	B(15)	B(15)	B(16)	C(26)	C(28)	C(30)
Southbound	Left	D(41)	D(41)	D(41)	D(47)	D(47)	D(50)
	Through	C(22)	C(27)	C(32)	C(23)	C(28)	C(29)
	Right	A(0)	A(0)	A(0)	A(0)	A(0)	A(0)
OVERALL		C(21)	C(24)	C(27)	C(25)	C(28)	C(29)
CR 57/Glenn (Crossing Plaza (signali	ized)					
Eastbound	Left/through	C(28)	C(28)	C(28)	C(32)	C(32)	C(33)
	Right	A(4)	A(4)	A(5)	A(5)	A(5)	A(5)
Westbound	Left/through/right	C(26)	C(26)	C(26)	C(22)	C(22)	C(21)
Northbound	Left	A(2)	A(2)	A(2)	A(5)	A(5)	A(5)
	Through/right	A(1)	A(1)	A(1)	A(5)	A(5)	A(6)
Southbound	Left/through/right	A(6)	A(6)	A(7)	B(11)	B(12)	B(12)
OVERALL		A(5)	A(5)	A(6)	A(8)	A(9)	A(9)
CR 57/Old Cov	ve Rd (unsignalized)						
Eastbound	Left/right	E(40)	<mark>F(59)</mark>	<mark>F(131)</mark>	C(21)	D(32)	E(46)
Westbound	Left/right		E (36)	<mark>F(73)</mark>		E(44)	<mark>F(58)</mark>
Northbound	Left	C(15)	C(16)	C(18)	B(11)	B(11)	B(12)
Southbound	Left		A(9)	A(9)		B(12)	B(13)

Table 5: Level of Service and delay at study area intersections, AM and PM peak hours

		Level of Service (delay, in seconds)					
Intersection		AM Peak Hour PM Peak Hour			our		
Approach	Movement	Existing	2021	2030	Existing	2021	2030
CR 57/Dunkin	Donuts (unsignalized	d)					
Eastbound	Left/right	E(35)	F(77)	<mark>F(124)</mark>	B(14)	B(15)	C(15)
Northbound	Left	C(16)	C(17)	C(19)	A(10)	B(11)	B(11)
CR 57/Liverpo	ool Bypass (signalized)					
Eastbound	Left/through/right	*	*	*	C(26)	C(25)	C(25)
Westbound	Left/through	D(47)	D(47)	D(48)	D(48)	D(48)	D(50)
	Right	B(17)	B(17)	B(16)	C(21)	C(22)	C(21)
Northbound	Left	B(17)	B(18)	B(18)	*	*	*
	Through/right	B(15)	B(16)	B(17)	B(20)	C(22)	C(24)
Southbound	Left	A(9)	A(10)	B(11)	A(9)	B(16)	B(18)
	Through/right	A(8)	A(9)	A(10)	A(7)	A(7)	A(8)
OVERALL		B(12)	B(13)	B(14)	B(17)	B(19)	C(20)
Morgan Rd/Li	iverpool Bypass/Crow	vn Rd (sign	alized)				
Eastbound	Left/through	C(34)	C(33)	D(35)	D(46)	D(48)	D(48)
	Right	A(8)	A(7)	A(7)	B(12)	B(12)	B(12)
Westbound	Left/through/right	D(36)	D(37)	D(38)	C(33)	C(33)	C(34)
Northbound	Left	B(11)	B(12)	B(14)	A(9)	A(10)	B(10)
	Through/right	B(16)	B(17)	C(20)	C(23)	C(24)	C(35)
Southbound	Left	A(10)	B(10)	B(11)	A(8)	A(8)	A(8)
	Through/right	C(22)	C(24)	C(29)	B(19)	B(20)	C(21)
OVERALL		B(20)	C(21)	C(24)	C(21)	C(22)	C(27)
CR 57/Thruwa	ay exit 38 (signalized)						
Eastbound	Left	D(50)	D(50)	D(50)	D(48)	D(51)	D(53)
	Right	A(0)	A(0)	A(0)	A(0)	A(0)	A(0)
Northbound	Left	A(5)	A(6)	B(12)	A(7)	A(7)	A(8)
	Through	A(3)	A(3)	A(3)	A(7)	A(8)	A(8)
Southbound	Through	B(18)	C(21)	C(25)	B(19)	C(20)	C(21)
	Right	A(1)	A(1)	A(1)	A(0)	A(0)	A(0)
OVERALL		B(12)	B(14)	B(16)	B(19)	C(20)	C(21)

*No volume for this movement during the time period

Summary and next steps

This Tech Memo summarized the existing traffic operations along Route 57 between the New York State Thruway (I-90) and John Glenn Boulevard. Future operations with additional proposed and anticipated development were also examined for horizon years 2021 and 2030. Over 400 residential units and 100,000 SF of commercial development were assumed for the "short-term" growth (year 2021), with another 400 residential units and over 300,000 additional square feet of commercial development in the "long term" (year 2030). Future traffic volumes for the 2021 and 2030 conditions were developed using a combination of ITE trip generation data and outputs from SMTC's travel demand model, and Synchro software was used to analyze future operations. The future conditions analysis maintained the existing lane configuration and traffic control at the study area intersections. The analysis results indicate that existing operations are generally good within the corridor, with individual approaches operating mostly at LOS B or C. The exception is the intersection at John Glenn Boulevard, which currently operates at LOS D overall.

With the addition of development anticipated for year 2021 as well as for the year 2030, most approaches at the signalized intersections in the study area will experience only minor increases in delay (less than five seconds), although the John Glenn Boulevard intersection will likely experience greater increases in delay. Some movements at the John Glenn Boulevard intersection are expected to operate at LOS E or F under 2030 conditions during the PM peak hour. Significant increases in delay are also expected for the unsignalized side-street approaches of Old Cove Road and the Dunkin Donuts driveway, particularly between the 2021 and 2030 conditions in the AM peak hour.

The final task in this analysis (Task 3) is to assess future alternatives. This work will be summarized in a second Tech Memo once potential alternatives have been identified. Possible alternatives may include both changes to the transportation system, such modification of the signal timing and coordination factors at John Glenn Boulevard and Long Branch Road (as previously suggested during the 2010 Traffic Signal Optimization Phase 1 project) and/or the addition of a signal at Old Cove Road and consolidation of access at this location, or changes to the future development assumed for the corridor.









