Glens Falls, Queensbury, and Kingsbury Dix Avenue Corridor Study Update

THE CHAZEN Companies JUNE 2016 Adirondack/ Glens Falls Transportation Council



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1 INTRODUCTION & SUMMARY



This report provides an update to the Dix Avenue Corridor Study that was prepared in 2000 ("2000 study"). Similar to the 2000 study, this report is intended to "provide short, intermediate and long-term mobility recommendations along the Dix Avenue corridor in Warren and Washington Counties." The 2000 study was drafted in response to significant traffic growth that had occurred along Dix Avenue over the previous 20 years. The 2000 study noted that increases

in population, particularly within the Towns of Queensbury and Kingsbury, coupled with growth (employment and tourism related) along NYS Route 254 and around Lake George, would continue to increase traffic demand along the Dix Avenue corridor. In response, the 2000 study included a series of recommendations that were intended to address the anticipated decline in the level of service along the corridor.

Since 2000, the area's transportation network has experienced a series of changes. This includes several improvements to the Dix Avenue corridor, including recent signal time and phasing changes to the Quaker Road intersection. It also includes several sizable projects, including the construction of the Centennial Circle in downtown Glens Falls, reconstruction of key transportation corridors including Glens Falls' South, Warren, and Broad Streets as well as Hudson Avenue, and reconstruction of Queensbury's Main Street and Exit 18 intersections. While an analysis of these changes was not part of this update, it is understood that these improvements may have had an influence on the use of Dix Avenue corridor, as has commercial growth along NYS Route 254. Given these changes, the communities of Glens Falls, Queensbury, and Kingsbury sought to reexamine Dix Avenue with the intent of identifying needed improvements for current and future traffic volumes.

As part of the 2015 Dix Avenue Corridor Study Update, new traffic counts, intersection volumes, signal timing, queuing, and future growth projections were prepared. Additionally, updated accident data, transit service information, sidewalk locations, and pedestrian demands were also analyzed. The 2015 Dix Avenue Corridor Study Update observed lower traffic volumes along the Dix Avenue corridor than were anticipated in the 2000 study. The table below lists the 2000 study's proposed intersection capacity improvements. The table also indicates which projects have been completed (or will be completed in the near future) since 2000. However, based on this corridor study update, the growth forecasts in the 2000 study are not projected to

materialize. As such, for comparison purposes, the table illustrates whether the previously proposed projects are still needed based on current and projected traffic volumes.

2000 Study Improvement	Completed	2015-2030 Need
Segment 1		
Left-turn Lanes at Cooper Street	Ν	Ν
Signalize Cooper Street	Ν	Ν
Left-turn Lanes at Technical Park Drive	Ν	Ν
Segment 2		
Left-turn Lane at Highland Avenue	Ν	Ν
Left-turn Lanes at Queensbury Drive	Ν	Ν
Protected Signal Phases at Queensbury	Ν	Ν
Realign Highland Avenue to "T"	Y ¹	Y ¹
Segment 3		
Left-turn lane at BOCES	Ν	Ν
Left-turn Lanes at Feeder St/Dean Rd	Ν	Ν
Left-turn Lanes at Vaughn Road	N	Ν
Left-turn/Right-turn Lane at Route 4	N ¹	Y

Table 1-1 2000 Recommended Improvements, Project Status, and Future Needs

N = Not Needed; Y = Yes Needed; Y 1 = To be completed under NYSDOT 2016 project;

N¹: Modification to improve northbound turning radius to be completed under NYSDOT 2016 project

Furthermore, the updated analysis also projects low to moderate increases in demand by 2030. As such, recommended traffic improvements are relatively minor when compared to the 2000 study. Recommended improvements include the following:

- Additional signal timing modifications at Dix Avenue/Queensbury Avenue and Dix Avenue/Quaker Road
- Signal timing modification and one of three alternative geometric improvements at Dix Avenue/Burgoyne Avenue and NYS Route 4. The alternative geometric improvements include:
 - Alternative 1: Widening the eastbound approach for a left-turn lane
 - o Alternative 2: Widening the southbound approach for right-turn lane
 - Alternative 3: Reconstructing the intersection to a single lane roundabout

It is important to note that the curbed island in the northwest quadrant of the Dix Avenue/Burgoyne Avenue and NYS Route 4 intersection will be improved under a NYS Department of Transportation (NYSDOT) project to facilitate the eastbound to northbound traffic movement for larger vehicles. NYSDOT also plans to improve the intersection of Dix Avenue/Highland Avenue by restriping the Highland Avenue northbound approach into a conventional 'T' intersection to replace the 'Y' configuration. It is anticipated that both these projects will occur during 2016. Although the need for further traffic improvements is less significant than previously identified, it is important to note that the 2000 Study's multimodal, streetscape, and access management recommendations are still valid. Furthermore, some of the crash analysis included in this update suggests the need for further safety analysis at select intersections. It is also worth noting that the City of Glens Falls, Town of Queensbury, and A/GFTC have highlighted the need for improved bicycle and pedestrian infrastructure along Dix Avenue in the following studies:

- Queensbury South Brownfield Opportunity Area (BOA) Pre-Nomination Study
- <u>Glens Falls Community Challenge Report</u>
- A/GFTC Regional Bicycle/Pedestrian Plan

As such, it is recommended that these planning initiatives, as well as this update, be taken into consideration when undertaking needed improvements to the corridor.

While considerable effort has been applied to this study, a significant amount of work remains before any of the concepts proposed within this study can be advanced to the formal design and construction phases. The recommendations set forth in this report are conceptual in nature and do not commit the NYSDOT and/or A/GFTC, or any of the municipalities within the study area to funding any of the improvements. The concepts need to be investigated in greater detail before any financial commitment can be made.

2 EXISTING CONDITIONS

Dix Avenue runs east-west between Ridge Road (NYS Route 9L) to the west and US Route 4 to the east. The corridor, approximately four miles in length, spans the boundary between Warren and Washington counties and traverses three municipalities: the City of Glens Falls, the Town of Queensbury, and the Town of Kingsbury (see below for Dix Avenue Study Area map). Operational jurisdiction for Dix Avenue is divided between the City of Glens Falls (Ridge Road to city line), Warren County (Glens Falls city line to Highland Avenue, designated CR 42) and New York State (Highland Avenue to Route 4, designated NYS 32).



Other than at select intersections (to accommodate turning movements), Dix Avenue is a two-lane roadway with a single 11 to 12 foot travel lane in each direction and varying width paved shoulders. From Ridge Road to Highland Avenue, Dix Avenue is a minor arterial, with a posted speed limit of 30 mph within the City limits and 35 mph elsewhere. From Highland Avenue to US Route 4 it is a principal arterial. However, the

section between Highland Avenue and Quaker is pending reclassification as a principal arterial. Land uses vary along Dix Avenue and include residential, recreational, commercial, retail, light industrial, and educational (see below for Land Use map). Pavement surfaces and markings are generally in fair to good condition.

ROADWAYS

Based on traffic volumes, the Dix Avenue corridor is primarily accessed by the following roadways:

 <u>Ridge Road (NYS Route 9L)</u> runs north-south through the City of Glens Falls and continues north, crossing Route 254, providing commuter access to the City of Glens Falls as well as to the Northway (Interstate 87). Ridge Road is a two-lane roadway with a 30 mph posted speed limit within the City limits.



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Dix Avenue,	Town of Queensbury - Warren County, NY	,

1 inch = 600 feet

91518.00

NA

Figure



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Landscope Architects

Drawn:	
	RLB
Date:	
	07/21/2015
Scale:	
	1 inch = 600 feet
Project:	
	91518.00
Figure:	NA

- 2. <u>Quaker Road (NYS Route 254 and County Road 70 in the Dix Avenue area)</u> is a heavily traveled commuter and commercial roadway running primarily between the Northway and Route 4 in Hudson Falls. Quaker Road is a multi-lane facility with a posted speed limit of 40 mph.
- 3. <u>Route 4</u> runs north-south through Washington County at the eastern terminus of Dix Avenue. Route 4 is a two-lane roadway with a 40 mph posted speed limit in this area.

INTERSECTIONS

Similar to the 2000 study, the 2015 Dix Avenue Corridor Study Update evaluated the following intersections:

- <u>Dix Avenue at Ridge Road (NYS Route 9L)</u> is a three-way "T" intersection under threecolor traffic signal control. Each approach has two lanes providing for dedicated turning lanes. The traffic signal provides separate phasing for the southbound left-turn onto Dix Avenue. Pedestrian pushbuttons without pedestrian signal heads are provided at the intersection.
- 2. <u>Dix Avenue at Cooper Street</u> is a four-way intersection under Stop control for the northbound and southbound Cooper Street approaches. All approaches are one lane approaches.
- 3. <u>Dix Avenue at Haskell Avenue</u> is a three-way intersection under Stop control for the northbound approach. Leland Road is offset from Haskell Avenue approximately 50 feet to the west and is a short dead-end road.
- 4. <u>Dix Avenue at Quaker Road (NYS Route 254)</u> is a four-way intersection under three-color traffic signal control. Each approach contains at least two lanes, providing for dedicated turning movements. The southbound approach contains a dedicated left-turn lane and a shared through/right-turn lane. The northbound approach contains the same two-lane arrangement. The eastbound approach contains three lanes, with dedicated left-turn, through, and right-turn lanes. The westbound approach contains a dedicated right-turn lane and a shared through/left-turn lane. All dedicated turn lanes operate with separate phasing under the traffic signal operation. No pedestrian pushbuttons or pedestrian signal heads are provided at the intersection.
- 5. <u>Dix Avenue at Highland Avenue (NYS Route 32)</u> is a three-way "Y" configured intersection under Stop control for the Highland Avenue approach from the south. All approaches are single lane.

- 6. <u>Dix Avenue at Queensbury Avenue (CR 52)</u> is a four-way intersection under three-color traffic signal control. All approaches are single lane. No pedestrian pushbuttons or pedestrian signal heads are provided at the intersection.
- 7. <u>Dix Avenue at Feeder Street and Dean Road</u> is a four-way intersection under three-color traffic signal control. All approaches are single lane. No pedestrian pushbuttons or pedestrian signal heads are provided at the intersection.
- 8. <u>Dix Avenue at Vaughn Road (CR 35)</u> is a four-way intersection under three-color traffic signal control. All approaches are single lane. New pedestrian pushbuttons and pedestrian signal heads were recently installed at the intersection.
- 9. <u>Dix Avenue at Route 4 and Burgoyne Avenue</u> is a four-way intersection under threecolor traffic signal control. There is a slip lane under Yield control for southbound rightturns. All other approaches are single lane. No pedestrian pushbuttons or pedestrian signal heads are provided at the intersection.

TRAFFIC VOLUMES

Traffic counts were conducted along the corridor in September 2015 to determine the existing traffic volumes while local schools were in session. Intersection turning movement counts were conducted for the nine study intersections for the AM, PM, and Saturday peak periods. Daily traffic counts were conducted at three locations along the corridor, one in each municipality: east of Cooper Street, between Quaker Road and Highland Avenue, and east of Feeder Street. Figures 1-3 in Appendix A present the peak hour volumes.

The 2015 existing intersection volumes were compared to the 2000 volumes from the 2000 study, shown in Table 2-1 (next page). While intersection volumes have increased by several hundred vehicles for the AM peak period, they have remained very similar for the PM peak period. No comparison was made to Saturday conditions since the 2000 study did not include the Saturday period.

Vehicle classification counts were also conducted at the time of the 2015 intersection turning movement counts. For the AM peak hour, about 14% of vehicles are heavy vehicles in the eastbound direction and about 6% are heavy vehicles in the westbound direction. For the PM peak hour, about 2% of vehicles are heavy vehicles in the eastbound direction and about 4% are heavy vehicles in the westbound direction. On a daily basis, NYSDOT traffic count data indicates that about 7% of vehicles are heavy vehicles.

	AM					PM				
Intersection	2000 2015		Total % Change	Annual % Change	2000	2015	Total % Change	Annual % Change		
Ridge	1,069	1,249	16.8%	1.1%	1,482	1,519	2%	0.2%		
Cooper	695	813	17.0%	1.1%	946	1,060	12%	0.8%		
Haskell	669	776	16.0%	1.1%	941	1,040	11%	0.7%		
Quaker	1,230	1,735	41.1%	2.7%	2,009	2,221	11%	0.7%		
Highland	831	1,171	40.9%	2.7%	1,319	1,304	-1%	-0.1%		
Queensbury	935	1,289	37.9%	2.5%	1,412	1,445	2%	0.2%		
Feeder/Dean	771	1,062	37.7%	2.5%	1,241	1,228	-1%	-0.1%		
Vaughn	749	1,012	35.1%	2.3%	1,200	1,180	-2%	-0.1%		
US Route 4	924	1,143	23.7%	1.6%	1,609	1,500	-7%	-0.5%		

Table 2-1 Existing Intersection Volumes (vph)2000 Study vs. 2015 Update

For comparison purposes, Table 2-2 below depicts Dix Avenue's Average Daily Traffic (ADT) counts. The ADT counts show very minimal increases (since 2000) for the westerly (0.29% per year) and easterly (0.13% per year) segments, and a more robust growth rate for the central location (1.46% per year). However, this pattern is likely attributed to commercial growth along the NYS Route 254 and various regional transportation improvements (e.g., Glens Falls Roundabout, Warren Street, Main Street, etc.).

Table 2-2 Average Daily Traffic (Weekday)

Location	1999	2015	Change	% Change	Annual % Change
East of Cooper	10,567	11,030	+463	+4.38%	+0.29%
Between Quaker and Highland	12,279	14,966	+2,687	+21.88%	+1.46%
East of Feeder	13,071	13,333	+262	+2.00	+0.13%

1999 ADTs taken August 19th and 20th, 1999: Thursday and Friday

2015 ADTs taken September 14th thru 18th : Monday through Friday: Average Weekday shown

LEVELS OF SERVICE

Signalized and unsignalized intersections were analyzed using the procedures of the *2010 Highway Capacity Manual* through the software program Synchro 8. This analysis provided the "level of service" for each of the intersections. The Level of Service (LOS) is a grading system that identifies traffic flow and timing conditions using letters A through F. An A grade represents the best condition (free flowing traffic) and an F grade represents the worst condition (congestion causing traffic to stop). A D grade is acceptable during peak periods given that all approaches have a D grade or better. An E grade represents an operation at or near capacity. The overall Dix Avenue LOS for existing conditions are shown in Table 2-3 (next page). The table shows that all intersections are operating at good levels of service with little to moderate delays. The one exception is the Dix Avenue eastbound approach to Route 4. The intersection operates with long delays (overall LOS D), with level of service F conditions on the eastbound approach in the weekday PM peak hour. Appendix B provides the LOS for each approach.

	Intersection	Approach*	Control	Peak Hour			
intersection		Арргоасн	Control	AM	PM	SAT	
1	Dix Avenue/Ridge Road	Overall	S	B (14)	B (16)	B (14)	
2	Dix Avenue/Cooper Street	Cooper St SB	U	C (17)	D (28)	C (18)	
3	Dix Avenue/Haskell Avenue	Haskell Ave NB	U	A (10)	B (11)	A (9)	
4	Dix Avenue/Quaker Road	Overall	S	C (21)	C (24)	C (32)	
5	Dix Avenue/Highland Avenue	Highland Ave NB*	U	C (17)	C (20)	B (14)	
6	Dix Avenue/Queensbury Avenue	Overall	S	B (20)	B (19)	B (16)	
7	Dix Avenue/Feeder St/Dean Road	Overall	S	B (15)	B (14)	B (14)	
8	Dix Avenue/Vaughn Road	Overall	S	B (11)	B (11)	B (11)	
9	Dix Avenue/Burgoyne Ave/Route 4	Overall	S	C (23)	D (47)	C (30)	

Table	2-3	2015	Existing	Levels	of	Service

Control S = Signalized; Control U = Unsignalized

*For signalized intersections, the overall LOS is provided. The worst LOS is provided for unsignalized intersections. Appendix B provides the LOS for each approach.

QUEUES

Queuing is the stacking of vehicles waiting to be serviced by a traffic control device such as a traffic signal or stop sign, and the queue length is the length of all vehicles stopped or slowing at that traffic control device. The queue data can help to determine the efficiency of traffic signal operation and identify the length of turn lanes needed to adequately accommodate vehicles.

A field review at all signalized intersections during recognized peak periods of activity was conducted to determine actual queues of traffic. In general five signal cycles were observed, with number vehicles at stopped when the signal turned red, the number of vehicles that arrived while the signal was red, and finally the number of vehicles stopped at the signal when it turned red again. The field data was subsequently integrated into the analysis and incorporated into the final results.

Based on these observations, all queued vehicles cleared the intersections during the allotted green time. In most cases all vehicles arriving during the green time also cleared the intersection. The observed queues were compared to the 50% queues determined by the Synchro analysis of existing traffic volumes and the model queues are calibrated to match actual queues.

CRASH ANALYSIS

Crash data for the three-year reporting period of October 2011 to September 2014 was reviewed. The reported crashes were summarized by severity, type, and rate. Crash severity refers to the level of loss, injury, or fatalities resulting from a crash. Crash type identifies the vehicle's intended direction of travel when a collision occurs and the manner of the collision. Crash rate is a calculation which expresses the number of crashes per million vehicles traveling along a road segment or through an intersection.

In the study area, most of the personal injury crashes occurred at the Quaker Road intersection (see Appendix C). The severity of crashes at this location could be an indication of higher vehicle speed given the wide-open area of the intersection; however, additional analysis is needed to determine if the crash severity can be attributed to the physical conditions at the intersection. Rear-end crashes are by far the predominant crash type with 64% of all crashes at the studied intersections. Table 2-4 summarizes the intersection crash rates. Five intersections have crash rates above the statewide averages. This includes Cooper Street, Quaker Road, Queensbury Avenue, Highland Avenue, and Route 4. It is important to note that the "average" crash rate statistics are compiled only for NYS-owned highways, which tend to be higher-volume facilities and may have been designed to different standards than local facilities. The average rates may therefore not provide a direct comparison to other intersections in the region, but can represent a first step in identifying locations which warrant further analysis.

Intersection	Actual Crash Rate	NYS Avg. Crash Rate ¹		
Ridge Road	0.18	0.27		
Cooper Street	0.34	0.14		
Haskell Avenue	0	0.16		
Quaker Road	2.18	0.23		
Highland Avenue	0.42	0.16		
Queensbury Avenue	1.33	0.47		
Feeder Street/Dean Road	0.22	0.47		
Vaughn Road	0.39	0.47		
Route 4	1.10	0.47		

Fable 2-4 Intersection Crash Rates	(Crashes/	'MEV)	
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¹Average Crash Rate for State-owned Facilities at Similar Intersections

The crash patterns for the intersections with crash rates above the NYS average can be summarized as follows:

• At Cooper Street there are no discernible crash patterns among the 4 crashes, and at Highland Avenue the rear-end crashes do not occur on the same approach.

- Quaker Road 45 of the 53 crashes are rear-end crashes with 32 of the 45 occurring on Dix Avenue. The time of day of the crashes and the orientation of Dix Avenue on a northwest/southeast alignment do not suggest that sunrise or sunset (lower sun angle) is a contributing factor to the crashes. Road conditions also do not appear to be a contributing factor as only one crash occurred under snow/ice conditions, and Dix Avenue is flat and straight approaching the intersection.
- Queensbury Avenue Rear-end and right-angle are the predominant crash types at this
 intersection with 7 of the 9 rear-end crashes occurring on the Dix Avenue eastbound
 approach. Road conditions do not appear to be a contributing factor as only one crash
 occurred under snow/ice conditions, and Dix Avenue is flat and straight approaching the
 intersection. Sight distances do not appear to be restricted as to be a contributing factor
 for the right-angle crashes.
- Route 4 Rear-end crashes are also the predominant crash type at this intersection with 7 of the 8 crashes occurring on Dix Avenue. Three occurred on the eastbound approach which approaches Route 4 along a sharp horizontal curve.

Collision diagrams have been prepared for an illustrative review of the intersection crashes at Quaker Road, Queensbury Avenue, and Route 4 (see Appendix C). Non-intersection crash data was also reviewed as part of the analysis, but no discernible patterns were identified.

PAVEMENT SURFACE CONDITIONS

Pavement surface ratings for the corridor were obtained from A/GFTC for a three-year period of 2013 through 2015. During the pavement surface condition survey, two assessments are made: the condition rating and the dominant distress. The surface ratings are based on a NYSDOT scale of 1 to 10, with 1 being "impassable" and 10 representing a "new" pavement surface. The scale is shown below in Table 2-5.

Rating Condition	Description
9-10 Excellent	No surface distress
7-8 Good	Surface distress beginning to show
6 Fair	Surface distress is clearly visible
1-5 Poor	Distress is frequent and severe

Table 2-5 Score Descriptions

The pavement surface condition scores for Dix Avenue are shown in Table 2-6. The ratings show that the pavement surface throughout the corridor is in fair to good condition, with two segments (Ridge Street to Sagamore Street and Highland Avenue to the county line) showing distress.

Road Segment	Score
Ridge St. to Sagamore St.	6
Sagamore St. to Leland Dr./Haskell Ave.	7
Leland Dr./Haskell Ave. to Time Warner Cable	8
Time Warner Cable to Quaker Ave.	7
Quaker Ave. to Highland Ave.	8
Highland Ave. to County Line	6
County Line to Dean Rd./Feeder St.	7
Dean Rd./Feeder St. to Route 4	7

Table 2-6 Dix Avenue Pavement Scores

BICYCLE & PEDESTRIAN INFRASTRUCTURE

Bicycle and pedestrian access and opportunities throughout the corridor are limited. Dix Avenue intersects with the Warren County Bikeway between Cherry and Walnut streets, and with Route 4, which is designated as NYS Bike Route 9. However, bicycle opportunities within the corridor are not defined or are nonexistent. Sidewalks infrastructure is primarily limited to the western portion of the corridor within the City of Glens Falls, with select sidewalk segments found within the Town of Kingsbury. The open curb cuts throughout the commercial areas of Glens Falls contribute to significant gaps in connectivity. Furthermore, in select locations poor sidewalk conditions pose a limitation on pedestrian mobility. The 2000 study identified sitespecific sidewalk and crosswalk conditions along the entire corridor. As there have not been any major sidewalk construction projects since that time, this inventory is still valid.

PUBLIC TRANSIT

Dix Avenue is served by the Route No. 4 bus of the Greater Glens Falls Transit (GGFT) service, which travels to and from Glens Falls, Hudson Falls, and Fort Edward by way of Dix Avenue and nearby Warren, Lower Warren, and River streets. The GGFT Route No. 4 service map and schedule can be found at their website (<u>www.agftc.org</u>). Stops along this route include the Ridge Street terminal, Dix Avenue at Quaker Street, Boulevard at Feeder Street, Dix Avenue at Feeder Street, Main Street and Village Park (Hudson Falls), Main Street and County Center (Hudson Falls), Broadway and East Street (Fort Edward) and East Street and Amtrak Station (Fort Edward). However, given the existing sidewalk infrastructure, some these stops may be difficult to access. The Dix Avenue Study Area map includes the location of the Route No. 4 bus stops along Dix Avenue.

Route No. 4 operates Monday through Saturday, with 20 daily trips during the weekdays and 9 trips on Saturday. Average weekday ridership totals 386 passengers per day and 19 passengers per trip. Saturday ridership is lower with an average of 112 passengers per day and 12.4



passengers per trip.

According to GGFT representatives, transit demand on the Dix Avenue corridor has increased over the past few years. However, the lack of pedestrian facilities serving the corridor presents some challenges for transit users in Queensbury and Kingsbury =. This is particularly acute during the winter months and when passengers with physical disabilities board and disembark.

RELATED STUDIES

Two previous transportation studies prepared for projects within the study area were reviewed to aid in establishing existing and future traffic conditions. The information collected from these sources included existing traffic volumes, projected traffic volume increases for proposed developments, and traffic operating conditions at the intersections. The previous studies are summarized as follows:

Quaker Road to Queensbury Avenue Connector Road Study, A/GFTC, March 2012

The purpose of this study was to evaluate the potential feasibility, benefits, and costs of a roadway that would connect Quaker Road and Queensbury Avenue in the Town of Queensbury. The study sought to identify existing deficiencies with the surface transportation system that serve an area bounded primarily by Quaker Road, Dix Avenue, and Queensbury Avenue, quantify the impacts to the system that result from future growth and development, and analyze various conceptual layouts of the proposed connector road.



The study looked at two growth phases of the Quaker Ridge Technology Park in the evaluation of the connector road. For Phase 1, the study found that the connector road was not necessary nor were other roadway improvements. For Phase 2 of the Technology Park, significant improvements, including the connector road, would be necessary. However, the Study demonstrated that the connector road and other improvements

would only benefit the Technology Park and therefore would be the responsibility of the Park's developer.

Transit Development Plan, Greater Glens Falls Transit (GGFT), September 2009

The objective of this study was to develop a five-year plan for service and system improvements throughout the GGFT's service area. Within the Dix Avenue corridor, Route No. 4 services the area between downtown Glens Falls and the villages of Hudson Falls and Fort Edward. The study found that the Route 4 weekday service is the most heavily utilized route among the GGFT regular fixed-routes, operating costs are well below the system average, and Saturday service is strong. Passengers on Route 4 comprise a large portion of GGFT's overall ridership, they are regular riders, and a relatively high portion transfer to another bus to reach their final destination.

3 FUTURE CONDITIONS ANALYSIS

PROJECTED GROWTH & TRAFFIC VOLUMES

In order to identify potential increase in traffic volumes, an inventory of approved or potential development was prepared. Site-specific development information from local planning and building departments was inventoried and mapped. This information was used to generate potential trip generation that was considered when preparing projected traffic volumes. Table 3-1 below provides a summary of the existing and proposed projects. The Corridor Related Development Project map below depicts the location of the projects.

Community	Project	Residential Units	Floor Area (SF)	Status
Glens Falls	Car Dealership	NA	840	Under Construction
Queensbury	Garvey Kia	NA	18,000	Approved
Queensbury	VMJR Properties	NA	323,914	Approved
Queensbury	Lia Nissan	NA	18,622	Under Construction
Queensbury	Former Ciba-Geigy	NA	260,000	Conceptual
Queensbury	Queensbury Business Park	NA	235,904	Approved
Kingsbury	Quarry, LLC (Phase II)	248	334,400	Approved
Kingsbury	Brookview Apartments (Phase II)	32	30,400	Conceptual
Kingsbury	Senior Housing	100	139,500	Conceptual

Table 3-1 Corridor Related Development

Following this inventory, short-term (2023) and long-range (2030) traffic volume projections were prepared. In preparing the projections, an analysis of historical traffic growth trends and other potential traffic generating projects in the area were reviewed. While a number of projects were identified, none of these were considered significant trip generators because of their use and/or they were too conceptual in nature. As such, the traffic projections were calculated using annual growth rates. Minor variation in growth rates were used as shown in Table 3-2 to account for the different land use and transportation patterns in the corridor. These annual growth rates were applied to the study area intersections to obtain the 2023 and 2030 traffic volumes. It should be noted that significant changes in the corridor which could increase traffic beyond these thresholds may warrant a traffic impact study. For example, the potential for sewer expansion and/or zoning changes in the Town of Kingsbury could affect the development patterns along the corridor.

Intersections	2015 to 2023	2023 to 2030					
Ridge St., Cooper St, Haskell Ave.	0.5%	1.0%					
Quaker Rd., Highland Ave., Queensbury Ave.	1.0%	1.0%					
Feeder St., Vaughn Rd., Route 4	0.75%	1.0%					

Table 3-2 Annual Growth Rates

	ector teno	4				Town of Kingsbuny
etta Aven Graa	Rocal Managan				52	K340
	r Core r core	Semford	street	Town Queens 1000	hof sbury Q-2	
Rido - Street	Tron	GF41		Warren County Santo Road Road	Q.3	
ID	Place Norgan Avenue Electronic State Norgan Avenue Electronic State Stat	Units	SaFt	Phase	42 Avcance 2 Avcance 2 Avc	Rivalo Lana 75 Boulevend Stra
GF-1	Car dealership	0	840	Under Construction	Bouleverd	
Q-1	Garvey Kia	0	18,000	Approved		
Q-2	VMJR Properties	0	323,914	Approved	Lower Warren	
Q-3	Lia Nissan	0	18,622	Under Construction	QA CALL	Rivera
Q-4	Former Ciba-Geigy	0	260,000	Proposed/Conceptual		
Q-5	Hacker Boat	0	130,000	Approved	the second	
Q-6	Queensbury Business Park	0	235,904	Approved		254
	Report Apartments (Phase II)	248	334,400	Approved Proposed /Concentual	Town of Seretage	
K-2	Senior Housing	52 100	139 500	Proposed/Conceptual	Moreau County	
		100	133,300			
THE	CHAZEN ENGINEERING, LAND	SURVEYIN	G & LANDSCA	PE ARCHITECTURE CO., D.P.C.	Development Projects	/
COMP	Dutchess County Office:	Capital I	District Office:	North Country Office:		Corridor Pela

Proposed/Conceptual

Dix Avenue City of Glens Falls & Town of Queensbury - Warren County, NY and Town of Kingsbury - Washington Couny

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ated Development Projects

Drawn:	
	RLB
Date:	08/12/2015
Scale:	1 inch = 1,200 feet
Project:	91518.00
Figure:	NA

Table 3-3 provides the forecasted AM and PM peak hour intersection volumes for 2023 and 2030. (The 2023 and 2030 detailed volumes are shown on Figures 1-3 in Appendix B.) While AM forecast are generally consistent with the original 2000 study, the PM peak hour forecasts are considerably lower. As such, the growth forecasts in the 2000 Study have not materialized; this justifies the use of less aggressive rates for this update. This is also supported by historical traffic data supplied by NYSDOT for the central and eastern segments of the corridor, which shows that volumes have decreased or remained flat since 2000.

Table 5 5 2025 & 2050 Tatale intersection volumes (vpn)							
Dix Avenue Intersection with:	2023 AM	2030 AM	2023 PM	2030 PM			
Ridge Road	1,302	1,414	1,584	1,719			
Cooper Street	852	928	1,107	1,204			
Haskell Avenue	810	880	1,086	1,179			
Quaker Road	1,885	2,047	2,410	2,615			
Highland Avenue	1,271	1,379	1,415	1,535			
Queensbury Avenue	1,402	1,523	1,571	1,708			
Feeder Street/Dean Road	1,133	1,232	1,304	1,424			
Vaughn Road	1,080	1,174	1,258	1,368			
Route 4	1.218	1.325	1.597	1.737			

Table 3-3 2023 & 2030 Future Intersection Volumes (vph)

PROJECTED OPERATIONAL ANALYSIS

To determine the likely future traffic conditions at the study area intersections, operational analyses were conducted for the 2023 and 2030 volume conditions. Tables 3-4(A) through (C) summarize the overall AM, PM, and Saturday peak hours levels of service, respectively. Appendix B provides the forecasted LOS for each approach.

Nic		A mana a a b *	Control	Forecast Year		
NO.	Intersection	Approach	Control	2023	2030	
1	Dix Avenue/Ridge Road	Overall	S	B (15)	B (16)	
2	Dix Avenue/Cooper Street	Cooper St NB	U	C (19)	C (21)	
3	Dix Avenue/Haskell Avenue	Haskell Ave NB	U	B (11)	B (11)	
4	Dix Avenue/Quaker Road	Overall	S	C (24)	C (30)	
5	Dix Avenue/Highland Avenue	Highland Ave NB	U	C (19)	C (24)	
6	Dix Avenue/Queensbury Avenue	Overall	S	C (33)	F (83)	
7	Dix Avenue/Feeder St/Dean Road	Overall	S	B (16)	B (17)	
8	Dix Avenue/Vaughn Road	Overall	S	B (11)	B (11)	
9	Dix Avenue/Burgoyne Ave/Route 4	Overall	S	C (24)	C (27)	

Table 3-4(A) Future Levels of Service AM Peak Hour

Control S = Signalized; Control U = Unsignalized

*For signalized intersections, the overall LOS is provided. The worst LOS is provided for unsignalized intersections. Appendix B provides the LOS for each approach.

Nie	Intersection	A un un a a la X	Construct	Forecast Year		
NO.	Intersection	Approacn*	Control	2023	2030	
1	Dix Avenue/Ridge Road	Overall	S	B (17)	B (18)	
2	Dix Avenue/Cooper Street	Cooper St SB*	U	D (32)	E (43)	
3	Dix Avenue/Haskell Avenue	Haskell Ave NB*	U	B (11)	B (11)	
4	Dix Avenue/Quaker Road	Overall	S	C (31)	D (46)	
5	Dix Avenue/Highland Avenue	Highland Ave NB*	U	C (24)	D (31)	
6	Dix Avenue/Queensbury Avenue	Overall	S	C (24)	D (36)	
7	Dix Avenue/Feeder St/Dean Road	Overall	S	B (15)	B (16)	
8	Dix Avenue/Vaughn Road	Overall	S	B (11)	B (11)	
9	Dix Avenue/Burgoyne Ave/Route 4	Overall	S	E (62)	F (87)	

Table 3-4(B)	Future	Levels	of S	ervice	PM	Peak	Hour
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Control S = Signalized; Control U = Unsignalized

*For signalized intersections, the overall LOS is provided. The worst LOS is provided for unsignalized intersections. Appendix B provides the LOS for each approach.

Table 3-4(C) Future Levels of Service Saturday Peak Hour

No	Intersection	Annroach*	Control	Forecast Year		
NO.	Intersection	Approach	Control	2023	2030	
1	Dix Avenue/Ridge Road	Overall	S	B (14)	B (14)	
2	Dix Avenue/Cooper Street	Cooper St SB*	U	C (19)	C (22)	
3	Dix Avenue/Haskell Avenue	Haskell Ave NB*	U	A (9)	A (10)	
4	Dix Avenue/Quaker Road	Overall	S	D (44)	E (63)	
5	Dix Avenue/Highland Avenue	Highland Ave NB*	U	C (16)	C (17)	
6	Dix Avenue/Queensbury Avenue	Overall	S	B (17)	B (18)	
7	Dix Avenue/Feeder St/Dean Road	Overall	S	B (14)	B (15)	
8	Dix Avenue/Vaughn Road	Overall	S	B (11)	B (11)	
9	Dix Avenue/Burgoyne Ave/Route 4	Overall	S	D (36)	D (53)	

Control S = Signalized; Control U = Unsignalized

*For signalized intersections, the overall LOS is provided. The worst LOS is provided for unsignalized intersections. Appendix B provides the LOS for each approach.

The projected operational analysis shows (by year) the following intersection approaches operating with long delays and levels of service E or F:

- 2023 E or F Project Levels of Service:
 - Dix Avenue/Quaker Road (Int. #4), Southbound approach, at 2023 Saturday peak hour
 - Dix Avenue/Queensbury Avenue (Int. # 6) , Eastbound approach, at 2023 AM peak hour

- Dix Avenue/Burgoyne Avenue/Route 4 (Int. #9), Eastbound approach*, at 2023
 PM and Saturday peak hours
- 2030 E or F Projected Levels of Service:
 - Dix Avenue/Cooper Street (Int. #2), Southbound approach, at 2030 PM peak hour
 - Dix Avenue/Quaker Road (Int. #4), Southbound approach*, at 2030 PM and Saturday peak hours
 - Dix Avenue/Queensbury Avenue (Int. # 6), Eastbound approach, at 2030 AM and PM peak hours
 - Dix Avenue/Burgoyne Avenue/Route 4 (Int. #9), Eastbound approach*, at 2030 PM and Saturday peak hours

* Both approach and overall intersection are LOS E or F

It is important to note that at Cooper Street, the only long delay occurs on the southbound approach in the 2030 PM peak hour. The level of service is an E and it is not an unusual condition for stop-controlled approaches to operate with longer delays along urban and suburban corridors during peak hours. As such, no improvements are proposed at this intersection.

4 RECOMMENDATIONS

INTERSECTION IMPROVEMENTS

As noted in the Project Operational Analysis (see Tables 3-4(A) through (C) in the above Future Conditions Analysis Section and Appendix B), three signalized intersections will operate with long delays and at poor levels of service (E or F) during one or more future peak hour conditions. Improvements will be needed to accommodate this growth. By adjusting signal timing parameters without geometric improvements (Timing Option 1), most of the long delays and poor levels of service are eliminated. The signal timing improvements were automated using the signal optimization feature of the analysis software program Synchro. The optimization feature adjusted the green durations and cycle lengths as needed to accommodate the traffic volumes for peak efficiency.

It should be noted that in 2012 the intersection of Dix Avenue at Quaker Road was studied for signal operation improvements. The findings of that study showed that changing the phasing order of the northbound and southbound left-turn movements would improve traffic conditions. Those recommendations were carried through in the analysis for this corridor study update. Further improvements in signal timings are recommended to increase the green time of about 15 seconds given to the Quaker Road northbound and southbound through movements. The levels of service with signal timing improvements for Quaker Road, as well as the other intersections, are shown in Table 4-1(A) through (C). Appendix B provides the forecasted LOS for each approach.

No	Interaction	America ch*	Control	Forecast Year	
NO.	Intersection	Approach.	Control	2023	2030
6	Dix Avenue/Queensbury Avenue	Overall	S	B (12)	B (15)
Control	S = Signalized				

Table 4-1(A) AM Peak Hour Levels of Service Timing Modifications Only

*For signalized intersections, the overall LOS is provided. Appendix B provides the LOS for each approach.

While timing modifications to the Dix Avenue/Burgoyne Avenue and Route 4 intersection will result in an overall level of service D in 2030 (see Table 4-1(B) below), it is important to note that the Dix Avenue eastbound and Route 4 southbound approaches are forecasted to have levels of service F in 2030.

No.	Intersection Approach*		Control	Foreca 2023	st Year 2030
4	Dix Avenue/Quaker Road	Overall	S	NA	C (26)
6	Dix Avenue/Queensbury Avenue	Overall	S	NA	C (25)
9	Dix Avenue/Burgoyne Ave/Route 4	Overall	S	C (31)	D (48)

Table 4-1(B) PM Peak Hour Levels of Service Timing Modifications Only

NA: Not Applicable, already operating at good levels of service; Control S = Signalized

*For signalized intersections, the overall LOS is provided. Appendix B provides the LOS for each approach.

Similar to PM peak hour 2030 forecasts, timing modifications to the Dix Avenue/Burgoyne Avenue and Route 4 intersection will result in an overall level of service D (see Table 4-1(c) below). The timing modifications will not alleviate level of service F at Dix Avenue eastbound and Route 4 southbound approaches.

Table 4-1(C) Saturday Peak Hour Levels of Service Timing Modifications Only

No	Interception	Approach*	Control	Foreca	ist Year
NO.	Intersection	Approach	Control	2023	2030
4	Dix Avenue/Quaker Road	Overall	S	C (29)	C (32)
9	Dix Avenue/Burgoyne Ave/Route 4	Overall	S	C (34)	D (50)
9	Dix Avenue/Burgoyne Ave/Route 4	Overall	2	C (34)	D (50

Control S = Signalized

*For signalized intersections, the overall LOS is provided. Appendix B provides the LOS for each approach.

Since the eastbound and southbound approaches of the Dix Avenue/Burgoyne Avenue/Route 4 intersection will continue to experience long delays by 2030 in the PM and Saturday Peak Hour conditions (even with timing modifications), three geometric improvements were evaluated to reduce these delays further:

- 1. Widening Dix Avenue eastbound to accommodate a left-turn lane (Improvement Option 2)
- 2. Widening Route 4 southbound to accommodate a right-turn lane (Improvement Option 3)
- 3. Reconstructing the intersection to a single lane roundabout (Improvement Option 4)

Figures depicting these improvements can be found in Appendix D.

The resulting overall levels of service with these geometric improvements are shown in Tables 4-2(A), and 4-2(B). Appendix B provides the LOS for each approach.

Table 4-2(A) 2030 PM Peak Hour Levels of Service Geometric Improvements

		Improvement Option					
No.	Intersection	Approach*	Control	Timing	G	ieometri	c
				1	2	3	4
9	Dix Avenue/Burgoyne Ave/Route 4	Overall	S	D (48)	C (27)	D (41)	A (10)

Control S = Signalized (with the exception of Option 4)

*For signalized intersections, the overall LOS is provided. Appendix B provides the LOS for each approach. Geometric Improvement Option:

- 2 Dix Avenue EB Left-turn lane (includes Improvement 1)
- 3 Route 4 SB Right-turn lane (includes Improvement 1, but not 2)
- 4 Single-lane Roundabout

Table 4-2(B) 2030 Saturday Peak Hour Levels of Service Geometric Improvements

				Improvement Option			
No.	Intersection	Approach*	Control	Timing	g Geometric		с
				1	2	3	4
9	Dix Avenue/Burgoyne Ave/Route 4	Overall	S	D (50)	D (39)	D (38)	A (10)

Control S = Signalized (with the exception of Option 4)

*For signalized intersections, the overall LOS is provided. Appendix B provides the LOS for each approach. Geometric Improvement Option:

2 Dix Avenue EB Left-turn lane (includes Improvement 1)

3 Route 4 SB Right-turn lane (includes Improvement 1, but not 2)

4 Single-lane Roundabout

Adding a left-turn lane to the eastbound approach under Option 2 eliminates levels of service E and F for the intersection. The planning-level cost estimate for this improvement is \$900,000, excluding right-of-way (ROW) property acquisition cost (see Appendix E for preliminary cost estimates).

The southbound right-turn lane of Option 3 also reduces delay, but it is important to note that level of service E remains for the southbound approach in the PM peak hour (see Appendix B). However, the average approach delay of 55 seconds is at the borderline of level of service D and E such that it could be considered an acceptable condition as it occurs for one peak hour and only for the long-range forecast year of 2030. The planning-level cost estimate for this improvement is \$100,000, excluding ROW costs.

Replacing the existing signal with a roundabout significantly improves the intersection operations on all approaches to levels of service A and B. The planning-level cost estimate for this improvement is \$2,000,000, excluding ROW costs.

It is noted that the curbed island in the northwest quadrant of the intersection will be improved under a NYSDOT project to facilitate the eastbound to northbound traffic movement for larger vehicles (see NYSDOT Pavement Maintenance Setaside Plans in Appendix F). It is anticipated that this curb work will occur during 2016.

PAVEMENT SURFACE IMPROVEMENTS

The pavement rating scores for the Dix Avenue corridor range from 6 to 8, which is considered fair to good. In conjunction with the abovementioned Dix Avenue/Burgoyne Ave and Route 4 and Highland Avenue intersection improvements, NYSDOT will be making paving between Highland Avenue and Route 4. Improvements will include a mill and fill and an overlay as part of their ongoing Pavement Preservation Program. The program is intended to prevent the deterioration of good to fair condition roadways, which is considered more cost-effective than major rehabilitation that may result from deferred maintenance.

Given the pavement rating scores from Ridge Street to Highland Avenue, Warren County and the City of Glens Falls should seek to prevent pavement deterioration beyond the levels at which pavement preservation is viable. The specific type of pavement treatment should be selected based on accepted engineering practices for the condition. As a reference, a planning-level estimate for a mill and fill and an overlay has been provided. Given an average 40' width, this improvement would cost approximately \$3,600,000. However, a lesser treatment may be effective in preserving pavement in an acceptable condition.

It is important to note that additional costs to improve Americans with Disabilities Act (ADA) related facilities (e.g., updated curb ramps, etc.) would likely be incurred when undertaking Pavement Preservation Program projects.¹ It is also worth noting that the Pavement Preservation Program's list of eligible activities precludes many of the locally desired improvements (e.g., streetscape and pedestrian enhancements, etc.); however, these could be integrated into future projects via a betterment agreement wherein the municipality pays for the associated costs.

VEHICLE SAFETY CONSIDERATIONS

The intersection of Dix Avenue/Highland Avenue will be improved under a project by NYSDOT to restripe the Highland Avenue northbound approach into a conventional 'T' intersection to replace the 'Y' configuration (see NYSDOT Pavement Maintenance Setaside Plans in Appendix E). It is anticipated that this restriping will occur during 2016.

¹ See Department of Justice/Department of Transpiration Joint Technical Assistance on the Title II of the Americans with Disabilities Act Requirements Memorandum (July 8, 2013)

Previous versions of the State Transportation Improvement Program (STIP) included improvements to the Dix and Highland Avenue intersection (including a left-turn lane on the Dix Avenue westbound approach). It is not clear why this improvement has been eliminated from the STIP. Crashes at this intersection should be monitored upon completion of the NYSDOT striping project to determine if the restriping has reduced the crash rate, or if additional improvements such as the westbound left-turn are needed.

For the three intersections of Dix Avenue with Quaker Road, Queensbury Avenue, and Route 4, a separate safety analysis of the crashes and causes should be undertaken to determine potential solutions. More information about each crash may be available on the actual police report logged at the time of the crash.

TRAFFIC IMPROVEMENT COMPARISON TO 2000 CORRIDOR STUDY

The 2000 Corridor Study recommended a number of capacity improvements to address projected deficiencies. Table 4-3 lists those improvements and notes whether or not they are needed now based on the updated traffic volumes and projections from this 2015 Study. As the table shows there are two improvements that remain recommended; the dedicated turn lane at the Dix Avenue/Burgoyne Avenue at Route 4 intersection as well as the realignment of Highland Avenue, which will be completed through a NYSDOT preservation project in 2016.

2000 Study Improvement	2015 Need	2023 Need	2030 Need
Segment 1			
Left-turn Lanes at Cooper Street	Ν	N	N
Signalize Cooper Street	Ν	N	N
Left-turn Lanes at Technical Park Drive	N	N	N
Segment 2			
Left-turn Lane at Highland Avenue	Ν	N	N
Left-turn Lanes at Queensbury Drive	Ν	N	N
Protected Signal Phases at Queensbury	Ν	N	N
Realign Highland Avenue to "T"	Y 1	Y ¹	Y 1
Segment 3			
Left-turn lane at BOCES	N	N	Ν
Left-turn Lanes at Feeder St/Dean Rd	N	N	N
Left-turn Lanes at Vaughn Road	N	N	Ν
Left-turn/Right-turn Lane at Route 4	N	N	Y

Table 4-3 Capacity Improvements from the 2000 Corridor Study

N: Not Needed

Y: Yes Needed

Y¹: To be completed under NYSDOT striping project

BICYCLE, PEDESTRIAN, AND TRANSIT IMPROVEMENTS

Bicycle Accommodations

There have been a number of studies that have recommended improvements for bicycle accommodations in the study area. The bicycle recommendations put forth by the City of Glens Falls, Town of Queensbury, and A/GFTC in the following documents are still valid and should be implemented:

- Queensbury South Brownfield Opportunity Area (BOA) Pre-Nomination Study
- Glens Falls Community Challenge Report
- A/GFTC Regional Bicycle/Pedestrian Plan



To improve conditions for cyclists, informational signage and pavement markers should be incorporated into future roadway improvements. Bicycling needs should be taken into consideration when undertaking roadway maintenance and improvements (e.g., catch basin designs, shoulder widths, striping, parking configuration, etc.). Finally, improvements to the Warren County Bikeway

intersection should be explored (see Warren County Bikeway Consideration below). However, when developing bicycle accommodations, effort should be made to employ consistent design features between the Dix Avenue communities. More specifically, a mix of bike lanes, shoulders, and sharrows along the corridor is not desirable (or permitted in some instances), particularly if transitions between these varying accommodations occur over short spans or do not end at logical termini.

Pedestrian Enhancements

While the 2000 *Dix Avenue Study* provided detailed sidewalk enhancements for the entire corridor, this update utilized a similar GIS model as the *A/GFTC Regional Bicycle/Pedestrian Plan* to evaluate pedestrian generation and demand.

Pedestrian generating factors, including bus stops, trails, retail locations, educational facilities, existing roadway infrastructure, and population density were entered into a site suitability model in order to identify concentrations of pedestrian generators. Areas that had moderate to high concentrations indicate land uses with dense residential development, i.e. areas of pedestrian generation. The employment centers, retail locations, and educational facilities constitute pedestrian destinations. Field observations (such as herd paths/desire lines) and

anecdotal data from GGFT indicate that the entire corridor is used by pedestrians. Given that the corridor contains destinations such as grocery stores, pharmacies, educational facilities, and employment centers, it is recommended that pedestrians be accommodated for the entire length of the corridor.

The specific type of pedestrian facility should balance the need to provide safe, accessible accommodation within the context of surrounding land uses. Within the high and medium population density areas, and for those stretches of roadway with curbs, sidewalks are the most desirable option. However, in those areas without curbs, and/or with primarily commercial land uses, asphalt or concrete walkways could provide an acceptable substitute if the roadway cannot be reconstructed to include curbs. Walkways can also be constructed on a parcel-by-parcel basis as properties are developed or redeveloped, as part of the site plan review process. As a short-term measure, efforts should be made to widen the shoulders wherever possible and include crosswalks and pedestrian signals as appropriate.

In addition, the existing sidewalk network along Dix Avenue was mapped in GIS to identify gaps. There is approximately 8,800 feet of existing sidewalk within the Dix Avenue corridor, including 5,300' in the City of Glens Falls and the 3,500' in the Town of Kingsbury. There are no sidewalks in the Town of Queensbury. An additional 20,200 feet of new sidewalks would be needed to provide sidewalk accommodations throughout the high- and medium-density population areas. Approximately 4,300 feet of new sidewalk would be in the City of Glens Falls, 6,000 feet in the Town of Queensbury, and 9,900 feet in the Town of Kingsbury. The planning-level cost estimate for this improvement is \$1,010,000. However, as previous noted, existing sidewalk conditions vary greatly. Many sections are in need of repair or replacement. The planning-level cost estimate for replacement of existing sidewalks is \$528,000.

As previously noted, the provision of ADA facilities will need to be included as part of any improvements. In addition to ADA compliance, each of the participating communities should utilize the NYSDOT Highway Design Manual's Capital Project Complete Streets Checklist when considering pedestrian (and bicycle) facility enhancements (see Chapter 18.5). According to the Highway Design Manual, the Complete Streets Checklist is intended to help identify the potential for complete street design features "based upon a review of planning impartment, analysis of adjacent land uses, existing modal operational issues and comparison of these conditions with existing infrastructure."

While enhancing Dix Avenue pedestrian facilities, improvements to the streetscape from a beautification and revitalization perspective should be considered as well. For example, the Town of Queensbury has identified a series of streetscape improvements as part of its *Queensbury South Brownfield Opportunity Area (BOA) Pre-Nomination Study*. The City of Glens Falls has established an attractive streetscape design approach with reconstruction to nearby



About This Map

The design of pedestrian facilities should balance the need to provide safe, accessible accommodation The design of pedestrian facilities should balance the need to provide safe, accessible accommodation within the context of surrounding land uses and existing infrastructure. Within the high and medium population density areas, and for those stretches of roadway with curbs, sidewalks are the most desirable option. However, in those areas without curbs, and/or with primarily commercial land uses, asphalt or concrete walkways could provide an acceptable substitute if the roadway cannot be reconstructed to include curbs. Walkways can also be constructed on a parcel by parcel basis as properties are developed or redeveloped, as part of the site plan review process. As a short term measure, efforts should be made to widen the shoulders wherever possible and include crosswalks and pedestrian signals as appropriate







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AGFTC Dix Avenue Study Update

Pedestrian/Multimodal **Characteristics and Needs**

Dix Avenue Warren & Washington Counties

Drawn:	
	PWC
Date:	
	05/02/2016
Scale:	
	1 " equals 300 '
Project:	
	91518.00
Figure:	
	NA



Queensbury South BOA identified its eastern portion of Dix Ave. as an important pedestrian corridor

Bay Road and throughout downtown. The common theme is period lighting, wayfinding signage, and attractive landscaping.

Site-specific pedestrian, bicycle, and streetscapes enhancements for Warren County Bikeway's Dix Avenue intersection were conceptualized by A/GFTC and City of Glens Falls in 2012. Given the existing configuration of the Warren County Bikeway coupled with the types of nearby land uses (e.g., local restaurants, neighborhood grocery store, nearby residential neighborhoods, etc.), the evaluation recommended several traffic calming, pedestrian, and bicycle related improvements. This included the following:

- Narrowing of the Dix Avenue approaches by the installation of curbing
- Relocation of the Dix Avenue pedestrian/bike crossing closer to the intersection
- Marked pedestrian crosswalks on the other three intersection approaches,
- Upgraded signing and pavement markings, including stop bars and centerlines

5 IMPLEMENTATION & FUNDING

A/GFTC manages the financial planning process for the region's transportation related capital improvements and develops a Transportation Improvement Plan (TIP). State and federal funding sources are limited and focused mainly on system preservation. Therefore, competition for funding for projects other than pavement preservation is challenging.

The A/GFTC Long Range Plan Update 2015 notes:

"Most municipalities do not have the requisite funding to keep pace with growing infrastructure maintenance needs even with the availability of federal funding assistance, and merely increasing the share of the existing federal transportation program will not solve this issue. Not only is new funding required, but also new mechanisms and formulas for funding."

Funding for recommended improvements will require a combination of public, private and grant related sources. Because of the involvement of multiple jurisdictions, coordination is crucial; some projects will be advanced by individual municipal sponsors while others may be advanced collaboratively. Consistency and continuity will be crucial considerations, especially for bicycle facility improvements. The NYSDOT, Warren County, and A/GFTC should work with the communities to coordinate these efforts. Should joint funding applications be pursued, an equitable and feasible cost-sharing strategy should be put in place. For example, for a design effort, project sponsors may elect to split costs based on geographic extent of the roadway, while with a construction projects, these costs may be split according to the actual improvements to be built within each municipality. When pursuing specific improvements and developing a funding strategy, the following planning-level cost estimates should be considered:

- Dix Avenue at Route 4 and Burgoyne Avenue Alternatives (Town of Kingsbury)
 - 1. Widening Dix Avenue for an eastbound left-turn lane: \$900,000*
 - 2. Widening Route 4 for a southbound right-turn lane: \$100,000*
 - 3. Reconstructing the intersection to a single lane roundabout: \$2,000,000*
- Resurfacing (mill and fill with overlay) from Ridge Road to Highland Avenue (City of Glens and Town of Queensbury): \$3,600,000**
- New sidewalks within high/medium density areas (all communities): \$1,010,000
- Existing sidewalk replacements (City of Glens Falls and Town of Kingsbury): \$528,000 *excluding right-of-way acquisition costs

** The specific type of pavement treatment should be selected based on accepted engineering practices for the condition. A lesser treatment may be effective in preserving pavement in an acceptable condition.

Recommendations contained in this report may be eligible for the following funding sources:

Project	Segment/ Jurisdiction	Possible Funding Source
Additional Safety Analysis of Corridor	A/GFTC or Joint project of all municipalities	NYSDOT Regional Staff, A/GFTC Safety Planning, A/GFTC Local Transportation and Engineering Assistance Program
Dix Avenue/Cooper Street Bike Crossing Improvement	City of Glens Falls, Warren County	Transportation Alternatives Program (TAP) Funds
Highland Avenue Realignment	Queensbury	Completed by NYSDOT
Dix Avenue/Route 4 Intersection Improvements	Kingsbury & NYSDOT	A/GFTC TIP – Surface Transportation Program (STP), National Highway System Performance Program (NHPP)
Signal Timing Modifications	Individually or joint project of Glens Falls, Queensbury, Kingsbury, Warren & Washington Counties	NYSDOT Regional Staff and Local (Town, City) sources
Sidewalk, Lighting & Streetscape Improvements	Glens Falls, Queensbury, Kingsbury, Washington County	TAP Funds
Bicycle and pedestrian facilities		A/GFTC TIP, TAP Funds

Because of limited financial resources, alternative funding programs should be explored. Key programs are summarized below.

Description of Potential Funding Sources

• **EFC Green Innovation Grant Program** NYS Environmental Facilities Corporation (EFC) Provides grants on a competitive basis to projects that improve water quality and demonstrate green stormwater infrastructure in New York. Eligible activities include permeable pavement, bio retention, green roofs and green walls, stormwater street trees / urban forestry programs designed to manage stormwater, construction or restoration of wetlands, floodplains, or riparian buffers, stream daylighting, downspout disconnection, and Stormwater harvesting and reuse, *e.g.* rain barrel and cistern projects. Grants typically provide for up to 90% of the total eligible project costs set forth in the application. A minimum 10% match from state or local sources is required.

- Cleaner, Greener Communities Program, Implementation Grants The NYS Research and Energy Development Authority (NYSERDA) (in 2015) provided funds for Community-Scale Sustainability Projects that are innovative and transformational in their contributions to advancing sustainable development; thereby creating direct community benefit and reduction of carbon emissions. Project types include showcase or anchor construction projects, as well as innovative projects or programs that stimulate market transformation. Projects must be ready to commence within 3 months of NYSERDA contract execution and should be completed within 3 years of contract execution. Applicants may not commence work on any portion of the project until there is a fully executed contract with NYSERDA. Awards will range from \$500,000 to \$5.0 million per project with a 25% cost share requirement.
- NYS OHCR Community Development Block Grant Program The City of Glens Falls is an Entitlement Community and annual receives Community Development Block Grant (CDBG) funds from the US Housing and Urban Development (HUS) program via NYS. The City routinely programs a portion of its CDBG funds for sidewalk replacement and could choose to utilize the funds for the Dix Avenue Segment. The balance of the communities could participate in the open/competitive solicitation of the CDBG program. The CDBG Public Infrastructure program consists of two funding activities: drinking water, clean water, and stormwater and public works. Eligible projects for NYS CDBG Public Infrastructure may include the repair or replacement of existing systems, construction of new systems, or expansion of existing systems into areas previously un-served that are in compliance with the NYS Smart Growth Public Infrastructure Act (Chapter 433 of the Laws of 2010) and principally benefit low- and moderate-income persons.
- A/GFTC Make the Connection Program is intended to assist with small-scale projects that "will improve the region's bicycle and pedestrian travel network." Announced on annual basis, the Make the Connection Program requires a 20 percent local match and can be used for a variety of small projects. However, it is important to note that funding is limited and project administration can be technically difficult in relation to award amount due to administrative guidelines and/or requirements.
- NYSDOT Transportation Alternative Program (TAP) provides funding for transportation alternatives including "on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation." Because the proposed improvements are primarily focused on transportation alternatives, several aspects of the project may be eligible for funding through TAP program. It is also important to note that certain improvements proximate to Washington-Saratoga-

Warren-Hamilton-Essex BOCES (Dix Avenue) and the Hudson Falls School campus (Burgoyne Avenue) may be eligible for TAP funding, specifically the Safe Routes to School funding category.

- New York State Department of State (NYSDOS) Local Waterfront Revitalization Program (LWRP) funds are available through the State's Consolidated Funding Application (CFA) process. Portions of the project study area fall within the recently completed South Queensbury Brownfield Opportunity area (BOA) and the Regional Waterfront Plan, monies from the State's Environmental Protection Fund (EPF) may be used to prepare a wide variety of community planning initiatives and projects. The improvements to Quaker Road/Dix Avenue are called out in the BOA study and there is a greater likelihood of being awarded funding support. LWRP Grant requirements include a 50 percent local match.
- NYSDEC Urban and Community Forestry Grants Funding seeks to encourage and assist municipalities as they develop and implement sustainable local urban forestry programs. Grants are designed to encourage communities to actively enhance tree cover along their streets and in their parks, to properly care for and maintain their community trees, to develop tree inventories and management plans, and to inform their residents of the value and benefits of urban trees. The project sponsors could consider pursuing this funding for street trees along Dix Avenue.

APPENDIX A: EXISTING & PROJECTED TRAFFIC FIGURES



FALLS, TOWNS OF QUEENSBURY & KINGSBURY	
ASHINGTON COUNTY, NEW YORK	

designed checked RMA scale 12/2015 N/A roject r 91518.00 Fig. 1

2015(2023)[2030] PEAK HOUR TRAFFIC VOLUMES





APPENDIX B:

EXISTING & PROJECTED TRAFFIC TABLES

No.	Intersection	Control		Peak Hour			
			AM	PM	SAT		
1	Dix Avenue/Ridge Road	S					
_	Div Ave WB	Ū	C(28)	C (27)	C (27)		
			C(20)	C(27)	C(27)		
	Ridge Rd NB		B (11)	B (13)	A (9)		
	Ridge Rd SB		A (6)	A (7)	A (5)		
	Overall		B (14)	B (16)	B (14)		
2	Dix Avenue/Cooper Street	U					
	Dix Ave EB Lefts		A (8)	A (8)	A (8)		
	Dix Ave WB Lefts		A (8)	A (8)	A (8)		
	Cooper St NR		C(17)	C(21)	C(16)		
	Cooper St NB		C(17)	C(21)	C(10)		
-	Cooper St SB		C (17)	D (28)	C (18)		
3	Dix Avenue/Haskell Avenue	U					
	Dix Ave WB Lefts		A (8)	A (9)	A (8)		
	Haskell Ave NB		A (10)	B (11)	A (9)		
4	Dix Avenue/Quaker Road	S					
•	Dix Ave FB		B (14)	B (16)	B (15)		
	Dix Ave WB		C(20)	C(21)	C(25)		
	Ouskor Bd NB		C (20)	C(21)	C (20)		
			C(27)	C(27)	D (39)		
	Quaker Rd SB		B (18)	C (29)	D (42)		
	Overall		C (21)	C (24)	C (32)		
5	Dix Avenue/Highland Avenue	U					
	Dix Ave WB Lefts		A (9)	A (10)	A (9)		
	Highland Ave NB		C (17)	C (20)	B (14)		
6	Dix Avenue/Queensbury Avenue	S					
	Dix Ave FB		C (22)	C (24)	B (15)		
			B (10)	B (12)	B (16)		
			D(10)	D (12)	D (10)		
	Queensbury Ave NB		В (18)	В (17)	В (13)		
	Queensbury Ave SB		C (21)	C (21)	B (14)		
	Overall		B (20)	B (19)	B (16)		
7	Dix Avenue/Feeder St/Dean Road	S					
	Dix Ave EB		B (11)	B (15)	B (14)		
	Dix Ave WB		B (17)	B (12)	B (13)		
	Feeder St NB		B (16)	B (14)	B (13)		
	Dean Rd SB		B (14)	B (13)	B (12)		
	Overall		B (15)	B (14)	B(11)		
0	Div Avenue (Veughan Beed	C C	D (13)	D (14)	D (14)		
ð	Dix Avenue/ vaugnnn Road	5	. (0)	5 (44)			
	Dix Ave EB		A (9)	B (11)	B (11)		
	Dix Ave WB		B (11)	A (10)	B (11)		
	Vaughan Rd NB		B (12)	B (13)	B (11)		
	Vaughan Rd SB		B (12)	B (12)	B (11)		
	Overall		B (11)	B (11)	B (11)		
9	Dix Avenue/Burgovne Ave/Route 4	S	. /	. ,	、 <i>,</i>		
	Div Ave ER	3	(28)	F (96)	D (40)		
			C(20)	C(21)	(+0)		
	Burgoyne AVE WB		C (28)	C(21)	C (22)		
	Route 4 NB		В (14)	B (18)	B (18)		
	Route SB		B (17)	C (21)	C (33)		
	Overall		C (23)	D (47)	C (30)		

Existing Levels of Service

No.	Intersection Control		Foreca	st Year
			2023	2030
1	Dix Avenue/Ridge Road	S	- ()	- />
	Dix Ave WB		C (29)	C (30)
	Ridge Rd NB		B (12)	B (13)
	Ridge Rd SB		A (7)	A (7)
	Overall		B (15)	B (16)
2	Dix Avenue/Cooper Street	U		
	Dix Ave EB Lefts		A (8)	A (8)
	Dix Ave WB Letts		A (8)	A (8)
	Cooper St NB		C (19)	C (21)
	Cooper St SB		C (18)	C (21)
3	Dix Avenue/Haskell Avenue	U	. (0)	. (0)
	Dix Ave WB Lefts		A (8)	A (9)
	Haskell Ave NB	C	B (11)	B (11)
4	Dix Avenue/Quaker Road	5	D(4,4)	
	Dix Ave EB		B (14)	B (14)
	Dix Ave WB		C(21)	C (22)
	Quaker Rd NB		C (34)	D (49)
	Quaker Rd SB		C(21)	C (25)
	Overall		C (24)	C (30)
5	Dix Avenue/Highland Avenue	U		
	Dix Ave WB Lefts		A (9)	A (9)
	Highland Ave NB		C (19)	C (24)
6	Dix Avenue/Queensbury Avenue	S	= (= 0)	5 (202)
	Dix Ave EB		F (58)	F (203)
	Dix Ave WB		C (23)	C (31)
	Queensbury Ave NB		B (19)	B (19)
	Queensbury Ave SB		C (21)	C (22)
	Overall		C (33)	F (83)
/	Dix Avenue/Feeder St/Dean Road	5	$\mathcal{D}(11)$	
	Dix Ave EB		B (11)	B (11)
	DIX AVE WB		B (18)	C (20)
	Feeder St NB		B(17)	B (19)
	Dean Rd SB		B (15)	B (16)
	Overall		B (10)	B(17)
8	Dix Avenue/Vaughan Road	S	. (0)	. (0)
	Dix Ave EB		A (9)	A (9)
	Dix Ave WB		B (11)	B (11)
	Vaughan Rd NB		B (13)	B (14)
	Vaughan Rd SB		B (13)	B (14)
	Overall	-	в (11)	в (11)
9	Dix Avenue/Burgoyne Ave/Route 4	S	0 (00)	
	Dix Ave EB		C (29)	C (32)
	Burgoyne Ave WB		C (28)	C (29)
	Route 4 NB		B (15)	B (16)
	Route SB		B (20)	C (23)
	Overall		C (24)	C (27)

Projected Levels of Service AM Peak Hour

No.	Intersection	Control	Foreca	st Year
			2023	2030
1	Dix Avenue/Ridge Road	S		
	Dix Ave WB		C (28)	C (29)
	Ridge Rd NB		B (14)	B (16)
	Ridge Rd SB		A (7)	A (8)
	Overall		B (17)	B (18)
2	Dix Avenue/Cooper Street	U		
	Dix Ave EB Lefts		A (9)	A (9)
	Dix Ave WB Lefts		A (8)	A (9)
	Cooper St NB		C (24)	D (30)
	Cooper St SB		D (32)	E (43)
3	Dix Avenue/Haskell Avenue	U		
	Dix Ave WB Lefts		A (9)	A (9)
	Haskell Ave NB		B (11)	B (11)
4	Dix Avenue/Quaker Road	S		
	Dix Ave EB		B (16)	B (16)
	Dix Ave WB		C (21)	C (22)
	Quaker Rd NB		C (30)	D (36)
	Quaker Rd SB		D (47)	F (84)
	Overall		C (31)	D (46)
5	Dix Avenue/Highland Avenue	U	- ()	- ()
	Dix Ave WB Lefts		B (11)	B (11)
	Highland Ave NB	6	C (24)	D (31)
6	Dix Avenue/Queensbury Avenue	5	C(22)	
	DIX AVE EB		C (32)	F (56)
			B (12) B (10)	B (13) P (10)
	Queensbury Ave NB		D (19)	D (19)
	Queensbury Ave 3B		C (24)	C(25)
7	Div Avenue (Feeder St/Deen Beed	C C	C (24)	D (30)
/	Dix Avenue/Feeder St/Dean Road	5	D(1C)	D (10)
			B (10) D (12)	B (18) D (12)
	DIX AVE VVB		D (12) P (15)	B (12) B (16)
	Doop Pd SP		B (13) B (14)	B (10) B (15)
	Overall		B (15)	B (15) B (16)
0	Div Avenue (Vaughan Road	C	D (13)	D (10)
0	Dix Avenue/ vaugnan Koau	3	D (11)	D (12)
			$\Delta (10)$	$\Delta (12)$
	Vaughan Rd NB		R (10)	R (10)
	Vaughan Rd SB		B (13)	B (15)
	Overall		B (11)	B (11)
٥	Dix Avenue/Burgovne Ave/Poute 4	c	2 (11)	2 (11)
9	Dix Avenue/ Buigoyne Ave/ Route 4	5	E (125)	E (200)
			C (22)	C (23)
	Route / NR		B (18)	B (19)
	Route SR		C(23)	C(27)
	Overall		F (62)	F (87)
	Overall		- (0-)	. (37)

Projected Levels of Service PM Peak Hour

No.	Intersection		Control	Forecast Year	
				2023	2030
1	Dix Avenue/Ridge Road		S		
		Dix Ave WB		C (27)	C (27)
		Ridge Rd NB		A (9)	B (11)
		Ridge Rd SB		A (5)	A (5)
		Overall		B (14)	B (14)
2	Dix Avenue/Cooper Street		U		
		Dix Ave EB Lefts		A (8)	A (8)
		Dix Ave WB Lefts		A (8)	A (8)
		Cooper St NB		C (17)	C (19)
		Cooper St SB		C (19)	C (22)
3	Dix Avenue/Haskell Avenue		U		
		Dix Ave WB Lefts		A (8)	A (8)
		Haskell Ave NB		A (9)	A (10)
4	Dix Avenue/Quaker Road		S		
		Dix Ave EB		B (15)	B (15)
		Dix Ave WB		C (28)	D (36)
		Quaker Rd NB		D (47)	E (62)
		Quaker Rd SB		F (67)	F (107)
		Overall		D (44)	E (63)
5	Dix Avenue/Highland Avenue		U	. ,	. ,
5		Dix Ave WB Lefts	Ũ	A (9)	A (9)
		Highland Ave NB		C(16)	C(17)
6	Dix Avenue/Queensbury Avenue	inginaria / te ite	S	0 (10)	0(17)
Ŭ		Dix Ave FB	0	B (16)	B (19)
		Dix Ave WB		B (17)	B (19)
		Queenshury Ave NB		B (14)	B (15)
		Queensbury Ave SB		B (16)	B (17)
		Overall		B (17)	B (18)
7	Dix Avenue/Feeder St/Dean Boad	o verain	S	5 (17)	5 (10)
1	Dix Avenue/Teeder St/Deart Road	Div Ave FR	5	B (15)	B (16)
				B (17)	B (10) B (14)
		Ecodor St NB		D (14)	D (14) D (15)
		Dean Rd SB		B (13)	B (17)
		Overall		B (17)	B (15)
0	Div Avenue (Veusban Dood	Overall	C	D (14)	B (13)
õ	Dix Avenue/vaugnan Road		5	D (11)	D (11)
		DIX AVE EB		B (11)	B (11)
		DIX AVE WB		B (11) D (12)	B (11) D (14)
		Vaughan Ru NB		B (12)	B (14)
		vaugnan ko SB		B (12)	B (14)
_		Overall	_	в (11)	в (11)
9	Dix Avenue/Burgoyne Ave/Route	. 4	S	- /	
		Dix Ave EB		E (56)	F (94)
		Burgoyne Ave WB		C (24)	C (26)
		Route 4 NB		B (18)	B (19)
		Route SB		D (40)	E (58)
		Overall		D (36)	D (53)

Projected Levels of Service Saturday Peak Hour

No	Intersection	Control	Forecast Year		
INU.	intersection	Control	2023	2030	
6	Dix Avenue/Queensbury Avenue	S			
	Dix Ave EB		A (9)	B (12)	
	Dix Ave WB		B (11)	B (12)	
	Queensbury Ave NB		B (19)	C (22)	
	Queensbury Ave SB		C (23)	C (28)	
	Overall		B (12)	B (15)	

Projected AM Peak Hour Levels of Service Timing Modifications Only

PM Peak Hour Levels of Service Timing Modifications Only

No	Intersection	Control	Forecast Year	
NO.	intersection	Control	2023	2030
4	Dix Avenue/Quaker Road	S	NA	
	Dix Ave EB			C (22)
	Dix Ave WB			C (25)
	Quaker Rd NB			C (31)
	Quaker Rd SB			C (26)
	Overall			C (26)
6	Dix Avenue/Queensbury Avenue	S	NA	
	Dix Ave EB			C (31)
	Dix Ave WB			B (11)
	Queensbury Ave NB			C (26)
	Queensbury Ave SB			C (34)
	Overall			C (25)
9	Dix Avenue/Burgoyne Ave/Route 4	S		
	Dix Ave EB		D (39)	F (67)
	Burgoyne Ave WB		B (12)	B (12)
	Route 4 NB		C (22)	C (23)
	Route 4 SB		D (46)	F (76)
	Overall		C (31)	D (48)

NA: Not Applicable, already operating at good levels of service

No	Intersection	Control	Forecast Year		
NO.	Intersection	Control	2023	2030	
4	Dix Avenue/Quaker Road	S			
	Dix Ave EB		B (19)	C (24)	
	Dix Ave WB		C (29)	C (33)	
	Quaker Rd NB		D (41)	C (29)	
	Quaker Rd SB		C (26)	D (42)	
	Overall		C (29)	C (32)	
9	Dix Avenue/Burgoyne Ave/Route 4	S			
	Dix Ave EB		D (45)	F (79)	
	Burgoyne Ave WB		C (21)	C (23)	
	Route 4 NB		B (17)	B (18)	
	Route 4 SB		D (44)	F (66)	
	Overall		C (34)	D (50)	

Projected Saturday Peak Hour Levels of Service Timing Modifications Only

2030 PM Peak Hour Levels of Service Geometric Improvements

			Improvement Option			
No.	Intersection	Control	Timing		Geometric	
				2	3	4
9	Dix Avenue/Burgoyne Ave/Route 4	S				R
	Dix Ave EB		F (67)	B (17)	D (49)	A (10)
	Burgoyne Ave WB		B (12)	D (36)	B (20)	A (9)
	Route 4 NB		C (23)	B (19)	D (35)	B (14)
	Route 4 SB		F (76)	D (37)	E (55)	A (8)
	Overall		D (48)	C (27)	D (41)	A (10)

Improvement Option:

2 Dix Avenue EB Left-turn lane (includes Improvement 1)

3 Route 4 SB Right-turn lane (includes Improvement 1, but not 2)

4 Single-lane Roundabout

	Geometric improvements						
				Improvement Option			
No.	Intersection	Control	Timing		Geometric		
				2	3	4	
9	Dix Avenue/Burgoyne Ave/Route 4	S				R	
	Dix Ave EB		F (79)	C (24)	D (52)	A (10)	
	Burgoyne Ave WB		C (23)	D (52)	C (31)	A (9)	
	Route 4 NB		B (18)	B (18)	C (25)	B (11)	
	Route 4 SB		F (66)	D (52)	D (39)	B (11)	
	Overall		D (50)	D (39)	D (38)	A (10)	

Table 4-2(B) 2030 Saturday Peak Hour Levels of Service Geometric Improvements

Improvement Option:

2 Dix Avenue EB Left-turn lane (includes Improvement 1)

3 Route 4 SB Right-turn lane (includes Improvement 1, but not 2)

4 Single-lane Roundabout

APPENDIX C: COLLISION DIAGRAMS

Dix Avenue at:	Personal Injury	Property Damage Only	Non-Reportable	Total
Ridge Road	1	1	1	3
Cooper Street	0	3	1	4
Haskell Avenue	0	0	0	0
Quaker Road	13	11	29	53
Highland Avenue	3	2	1	6
Queensbury Avenue	5	7	9	21
Feeder Street/Dean Road	0	2	1	3
Vaughan Road	0	3	2	5
Route 4	1	10	7	18
Total	23	40	51	114

Existing Intersection Crash Severity¹

¹No Fatalities in the 3-year Reporting Period (October 2011 – September 2014)

Existing Intersection Crash Types¹

Dix Avenue at:	Rear-end	Right Angle	Left-Turn	Unknown/ Other	Total
Ridge Road	2	0	0	1	3
Cooper Street	1	1	0	2	4
Haskell Avenue	0	0	0	0	0
Quaker Road	45	1	4	3	53
Highland Avenue	4	0	0	2	6
Queensbury Avenue	9	7	2	3	21
Feeder Street/Dean Road	1	1	0	1	3
Vaughan Road	3	1	0	1	5
Route 4	8	3	1	6	18
Total	73	16	7	18	114

¹No Bike/Ped Crashes in the 3-year Reporting Period (October 2011 – September 2014)

COLLISION DIAGRAM

Key Number =



COLLISION DIAGRAM

Key Number =



COLLISION DIAGRAM

Key Number =



APPENDIX D:

PROPOSED GEOMETRIC IMPROVEMENT FIGURES



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AVENUE AT ROUTE 4 IDABOUT SCHEMATIC

FALLS, TOWNS OF QUEENSBURY & KINGSBURY /ASHINGTON COUNTY, NEW YORK

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date 01/2015	scale N/A
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SF	2-3

APPENDIX E:

PRELIMINARY COST ESTIMATES

THE		North Country Office				
C	Chazen COMPANIES Engineera/Surveyors Plannere Environmental Scientists Landscape Architects		37 P: WV Du Ca	5 Bay Road, Queensl (518) 812-0513 F: (ww.chazencompanie Itches County Office (845) pital District Office (518) :	bury, NY 12804 518) 812-2205 s.com 454-3980 273-0055	
Dix Aven	ue Cooridor Study Update					
Dix Aven	ue at Route 4					
Enginee	er's Opinion of Probable Cost for Planning Phase					
	Eastbound Left-turn La	ne				
Item No.	Description	Quanity	Units	Unit Cost	Cost	
1	CLEARING AND GRUBBING	0.10	AC	\$15,000.00	\$1,500.00	
2	UNCLASSIFIED EXCAVATION AND DISPOSAL	250	CY	\$20.00	\$5,000.00	
3	EMBANKMENT IN PLACE	50	CY	\$20.00	\$1,000.00	
4	PAVEMENT	40,000	SF	\$8.00	\$320,000.00	
5	TOPSOIL AND TURF	1	LS	\$20,000.00	\$20,000.00	
6	SMOOTH INTERIOR CORR. POLY. PIPE, 600 mm DIA	200	LF	\$80.00	\$16,000.00	
7	TYPE F DRAINAGE STRUCTURE FOR TYPE F1 FRAME AND GRATE	2	EA	\$5,000.00	\$10,000.00	
8	BOX BEAM GUIDE RAIL	0	0 LF \$60.00			
9	BOX BEAM END ASSEMBLY - TYPE 1	0	EA	\$2,285.00	\$0.00	
10	CAST-IN-PLACE CONCRETE CURB, TYPE VF150	1,000	LF	\$35.00	\$35,000.00	
11	SIDEWALK	30	CY	\$600.00	\$18,000.00	
12	RETAINING WALLS	0	SY	\$500.00	\$0.00	
13	TRAFFIC SIGNAL MODIFICATIONS	1	EA	\$50,000.00	\$50,000.00	
14	LIGHTING	0	EA	\$5,000.00	\$0.00	
15	SIGNING AND PAVEMENT MARKINGS	1	LS	\$15,000.00	\$15,000.00	
16	UTILITY RELOCATION	1	LS	\$50,000.00	\$50,000.00	
17	WETLAND MITIGATION - \$75,000 acre (2:1 replacement)	0	AC	\$75,000.00	\$0.00	
18	STORMWATER MANAGEMENT (\$50,000 /acre)	0.25	AC	\$50,000.00	\$12,500.00	
				SUBTOTALS	\$554,000.00	
			ŀ	PROJECT SUBTOTAL	\$554,000	
			C	ONTINGENCY (20%)	\$110,800	
		MAINT	AND PRC	T. OF TRAFFIC (3%)	\$16,700	
			SURVEY A	ND STAKEOUT (4%)	\$22,200	
			PEF	RMITS/SWPP (1.5%)	\$8,400	
				LEGAL/ADMIN (2%)	\$11,100	
	4% MOBILIZATION (4%	OF PROJECT	SUBTOTA	L + CONTINGENCY)	\$26,600	
			CON	ISTRUCTION TOTAL	\$750.000	
	FNG		ESIGN-DF	TAILED PHASE (8%)	\$60,000	
			RACT AD		\$75,000	
					<i></i>	
				PROJECT ΤΟΤΔΙ	\$890.000	
		1		. HOPEOT TOTAL	<i>4030,000</i>	

THE		North Country Office			
Chazen Engineers/Surveyors Planners Environmental Scientists Landscape Architects		375 Bay Road, Queensbury, NY 12804 P: (518) 812-0513 F: (518) 812-2205 www.chazencompanies.com			
CO	MPANIES		Di	utches County Office (845 poital District Office (518)) 454-3980 273-0055
Dix Aver	nue Cooridor Study Update			,	
Dix Aver	nue at Route 4				
Engine	er's Opinion of Probable Cost for Planning Phase				
	Southbound Right-turn	Lane			
Item No.	Description	Quanity	Units	Unit Cost	Cost
1	CLEARING AND GRUBBING	0.10	AC	\$15,000.00	\$1,500.00
2	UNCLASSIFIED EXCAVATION AND DISPOSAL	250	CY	\$20.00	\$5,000.00
3	EMBANKMENT IN PLACE	50	CY	\$20.00	\$1,000.00
4	PAVEMENT	3,500	SF	\$8.00	\$28,000.00
5	TOPSOIL AND TURF	1	LS	\$10,000.00	\$10,000.00
6	SMOOTH INTERIOR CORR. POLY. PIPE, 600 mm DIA	0	LF	\$80.00	\$0.00
7	TYPE F DRAINAGE STRUCTURE FOR TYPE F1 FRAME AND GRATE	0	EA	\$5,000.00	\$0.00
8	BOX BEAM GUIDE RAIL	0	LF	\$60.00	\$0.00
9	BOX BEAM END ASSEMBLY - TYPE 1	0	EA	\$2,285.00	\$0.00
10	CAST-IN-PLACE CONCRETE CURB, TYPE VF150	0	LF	\$35.00	\$0.00
11	RETAINING WALLS	0	SY	\$500.00	\$0.00
12	TRAFFIC SIGNALS	0	EA	\$150,000.00	\$0.00
13	LIGHTING	0	EA	\$5,000.00	\$0.00
14	SIGNING AND PAVEMENT MARKINGS	1	LS	\$5,000.00	\$5,000.00
15	UTILITY RELOCATION (GUY POLE)	1	LS	\$5,000.00	\$5,000.00
16	WETLAND MITIGATION - \$75,000 acre (2:1 replacement)	0	AC	\$75,000.00	\$0.00
17	STORMWATER MANAGEMENT (\$50,000 /acre)	0	AC	\$50,000.00	\$0.00
				SUBTOTALS	\$55,500.00
				PROJECT SUBTOTAL	\$56,000
			C	ONTINGENCY (20%)	\$11,200
		MAINT	AND PRO	DT. OF TRAFFIC (3%)	\$1,700
			SURVEY A	ND STAKEOUT (4%)	\$2,300
			PE	RMITS/SWPP (1.5%)	\$900
				LEGAL/ADMIN (2%)	\$1,200
	4% MOBILIZATION (4%	OF PROJECT	SUBTOT	AL + CONTINGENCY)	\$2,700
			CON	ISTRUCTION TOTAL	\$76,000
	ENG	GINEERING D	ESIGN-DE	TAILED PHASE (8%)	\$6,100
	INSPECTIC	N AND CONT	RACT AD	MINISTRATION (10%)	\$7,600
				PROJECT TOTAL	\$90,000

APPENDIX F: NYSDOT PAVEMENT MAINTENANCE SETASIDE PLANS (SELECT DIX AVE. SHEETS)



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ALL WORK CONTEMPLATED UNDER THIS CONTRACT IS TO BE COVERED BY AND IN CONFORMITY WITH THE STANDARD SPECIFICATIONS WE CUSTOMARY UNITS OF MAY 1, 2008, EXCEPT AS MODIFIED ON THESE PLANS AND IN THE ITEMAZED PROPOSAL.

CONTRACT PLANS HAVE BEEN DESIGNED IN ACCORDANCE WITH NYSDOT POLICIES AND CUIDE LINES AND THE FINAL DESIGN REPORT APPROVED ON 02/03/2015

2015 P/	AVEMENT	MAINTENANCE	SETASIDE	
		· · · · · · · · · · · · · · · · · · ·		
COUNTY	VARIOUS			
FED. ROAD) REG. NO.	STATE	SHEP	TNO
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CAPITAL PR IDENTIFICA	ióject Tíón no, 1809	.47	· · · ·	<u>يەر جارالىيە قالىل</u>
INDEX ON S	IKEET NO. 2			





ANE	RM 1007+450 TO RM 1009-75
ANE	RM 1007+150 TO RM 1007+450
ANE	RM 1005+200 TO RM 1007+150
	RM 1003+XXX TO RN 1006+200

PLICABLE	
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	NOTES:	······		
1.	EXISTING SUPERCLEVATION RATES, LANE WIDTHS AND STRIF UNLESS OTHERWISE ROTED.	ING LAYOUT TO BE R	ETAINED	
2,	TACK COAT SHALL BE APPLIED TO EXISTING PAVEMENT ANI NEW ASPHALT.	D BETWEEN ALL LAYER	₹5 ØF	
3. 3	ITEN 490.15 REQUIRES THAT A MOVING SKI BE USED. SEE DWG: NO INST-00 FOR LOCATIONS OF HELL CAD TO			
5,	MILLING & PAVING, THE TOP OF EXISTING DRAINAGE STRUC CONTROL TO ESTABLISH. THE PAVENENT PROFILE AND PROV	TURES SHALL BE USE	D AS	
Б.	PAYEMENT REPAIR AREAS ARE TO BE IDENTIFIED BY THE E IN CONJUNCTION WITH THE REGIONAL MATERIALS ENGINEER	NGINEER AND THE CO ALL REPAIRS SHALL	NTRACTOR, L BE	
7a	COMPLETED AFTER PRODUCTION MULLING IMPERE APPLICABL SHOADER BACKAP SHALL BE PLACED A.O.B.E. MHENEVER SI AFTER FINAL PAYING.	E) AND PRIOR TO FIN HOLLDER DROPOFF EXI	al Paving. Eeds 2"	
-	ALL DIMENSIONS IN TO UNLESS OTADRAISE HOTED	CONTRACT NUMBER		
	TYPICAL SECTIONS 6	D262914		
۰.	ROUTE 50. SCHENECTADY CO	DRAWING NO. TYP-05		
	BUTE 32, BASHINGTON CO.	SHEET NO. 12		
	NEW YORK STATE DEPARTMENT OF TRANSPORTATION REGION OF			
	BDCLMENT NAMEA 180947_CPH_TYP_OB			



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lea see	DWG. NO. MSD-3 FOR REQUIRED SEQUENCING AND PAVING LIMITS OF THESE TWO SITES	
	NOTES;	
1.	EXISTING SUPERFLEVATION RATES, LANE WIDTHS AND STRIPING LAYOUT TO BE RETAINED UNLESS OPHERNISE NOTED.	
х. Э.	THEN AGAN STALL DE AFFAILED IN LAISTING FARENENI AND BETALEN ALL LAIRNS OF NEW ASPHALT. TELY AND AS REPUMBES THAT A ADVING SEN DE DECH.	
4. 5.	SEE DWG. NO. MST-01 FOR LOCATIONS OF THEM 649.11 MILLING & PAVING THE TOP OF EXISTING DRAINAGE STRUCTURES SHALL BE USED AS	ŀ
Б.	CONTROL TO ESTABLISH THE PAVEMENT PROFILE AND PROVIDE FOR POSITIVE DRAMAGE. PAVEMENT REPAIR AREAS ARE TO BE IDENTIFIED BY THE ENGINEER AND THE CONTRACTOR.	ľ
	IN CONJUNCTION WITH THE REGIONAL MATERIALS ENGINEER. ALL REPAIRS SHALL BE COMPLETED AFTER PRODUCTION MULLING THERE APPLICABLED AND PRIOR TO FINAL PAVING.	
Ja	SNULLVEN BAUAUF SBALL DE FLADED ASUBLE. WHENEVER SHOULDER DROPOFF EXCEEDS 2° AFTER FUNAL PAVING.	
\$	ALL DIMENSIONS DI 17 JUNESS OFHERVISE NOTED CONTRACT MINIFER	
	TYPICAL SECTIONS 7 D262914	
	DRAWING NO. TYP-07	
. 1	ROUTE 9112/254, WARREN CO. SHEET NO. 13	
	NEW YORK STATE DEPARTMENT OF TRANSPORTATION REGION OF	
	DOCUMENT NAME: 180947_CPH_TYP_07	





5	ALL DIMENSIONS IN TH UNLESS OTHERWISE NOTED	CONTRACT NUMBER	
	PAVEMENT MARKING PLAN	D262914	
		DRAWING NO. PM	P-D1
<u> </u>		SHEET NO. 40	
	NEW YORK STATE DEPARTMENT	T OF TRANSPORTATION	region oi
	DOCUMENT MADE: 180947_cph	.pmp-01	

APPENDIX G:

PUBLIC MEETING SUMMARY

Adirondack / Glens Falls Transportation Council

 11 South Street, Suite 203

 Glens Falls, NY 12801

 p: (518) 223 - 0086
 f: (518) 223 - 0584

 info@agftc.org
 www.agftc.org

Public Meeting Summary

Date: May 4, 2016, 3:00 p.m.

Project: Dix Avenue Corridor Study Update

Location: Crandall Library Community Room

Summary: Paul Cummings from the Chazen Companies gave a slide presentation of the project, including the project purpose and need, existing conditions, and proposed recommendations. The meeting was then turned over for an open discussion with attendees. Items of discussion included:

- Several of the non-signalized intersections which were not included in the study are subject to high delays, including Quarry, Queen, and North. The vehicle queues can stack to the point where nearby intersections are blocked.
 - Response: The 2015 Update included an in-depth examination of certain intersections both to maintain consistency with the 2000 plan and to efficiently analyze traffic operations along the corridor. Transportation planning studies are often limited in terms of how much data can feasibly be collected/analyzed, so key intersections are used to extrapolate conditions for the corridor as a whole.
- Volume on Dix seems to warrant widening to three lanes, especially in areas with turning movement activity.
 - Response: Access management can be a key component to maintain roadway operation. Although the traffic volumes do not meet the threshold for roadway widening, poor access management can create or exacerbate delays between major intersections, reducing the quality of the user experience.
- The plan should address pedestrian access at intersections, especially at Quaker.
 - Pedestrian accommodations and access are included as part of the plan, either directly or by reference to the 2000 Study.
- There are several pedestrian destinations in the corridor, including Kmart, Price Chopper, and the Family Dollar.
- How does the plan account for unforeseen growth?
- Sewer expansion in Kingsbury may affect growth as well.