Capital District Transportation Authority

RIVER CORRIDOR SIMPLIFIED ALTERNATIVES ANALYSIS

REPORT
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APPENDICES

1. INTRODUCTION

The Capital District Transportation Authority (CDTA) operates a transit system that serves New York's Capital Region including Albany, Schenectady, Rensselaer, and Saratoga Counties. Responding to the need for faster, more efficient, and more competitive transit service in the region's busiest corridors, CDTA is working to implement 40 miles of Bus Rapid Transit along 3 corridors as outlined in CDTA's 2014 Transit Development Plan (TDP).

BusPlus, CDTA's concept for BRT service, consists of limited stop service with strategic transit priority treatments including transit signal priority (TSP) and queue jumpers, segments of bus-only travel lanes, a dedicated fleet of sleek, branded buses, large and comfortable stations, and enhanced customer information.

The first BRT line began operation in April 2011. This line serves one of the busiest commuter corridors in the region along NYS Route 5 connecting Albany and Schenectady. The Route 905 BusPlus, also known as the Red Line, has already resulted in a 20% increase in ridership along the corridor. CDTA now plans to expand the BRT network along two other high-volume corridors. The Purple Line is planned along the Washington/Western Corridor between Downtown Albany and Crossgates Mall, and the Blue Line is planned along the Hudson River Corridor connecting Albany, Troy, and other Hudson River communities. The complete 40-mile BRT network is expected to be operation by 2018 or later.

This report evaluates existing service, develops alternatives, and makes recommendations for a new Blue Line BRT service in the River Corridor.

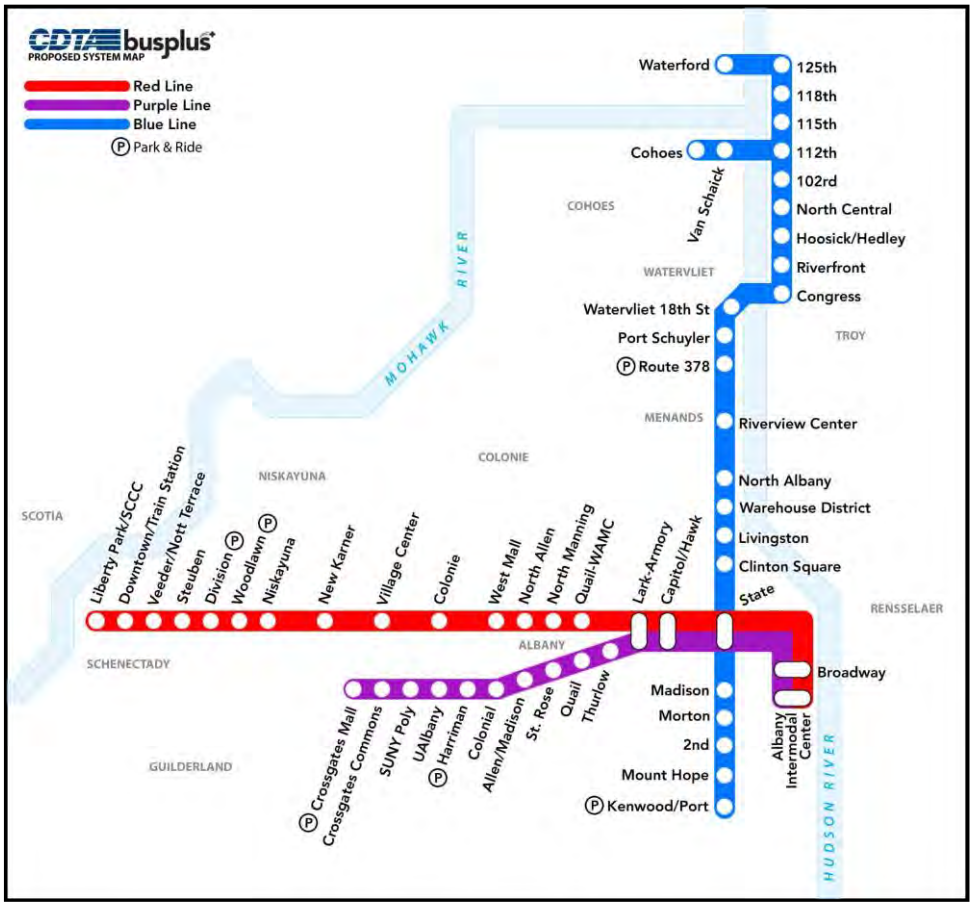


Figure 1: Proposed 40-Mile BRT Network

1.1 Overview

The Blue Line refers to the high volume transportation corridor along the Hudson River between the South End of Albany and the Village of Waterford and City of Cohoes. Being the third busiest transit corridor in the Capital Region with over 2.5 million boardings per year, it is considered an ideal corridor for expansion of BusPlus. At about 15 miles in length, the River Corridor runs primarily along New York State Route 32 and US Route 4.

The project will introduce arterial BRT service to the corridor using a fleet of 17 articulated buses stopping at 26 stations along the way. New transit signal priority (TSP) systems and queue jump lanes will be implemented at numerous locations. An enclosed transit center in Downtown Troy will serve as the centerpiece of the Blue Line, providing a consolidated location for transfers between nearly every bus route in the city. Service frequency will be increased to every 10 minutes throughout the majority of the day and every 15 to 20 minutes during the evening and on weekends.

The Blue Line will provide direct service starting from two branches, one from Cohoes and one from Waterford that meet in Lansingburgh and travel through downtown Troy to Watervliet, Menands, downtown Albany and end at the Port of Albany. This will be the first time that these high-density, transit-supportive communities are linked by a through, no-transfer transit service. It is expected that the enhanced characteristics of the BusPlus service will attract more riders and complement ongoing land development along the corridor. The BusPlus service will act as a catalyst for the revitalization of many neighborhoods within walking distance of stations.

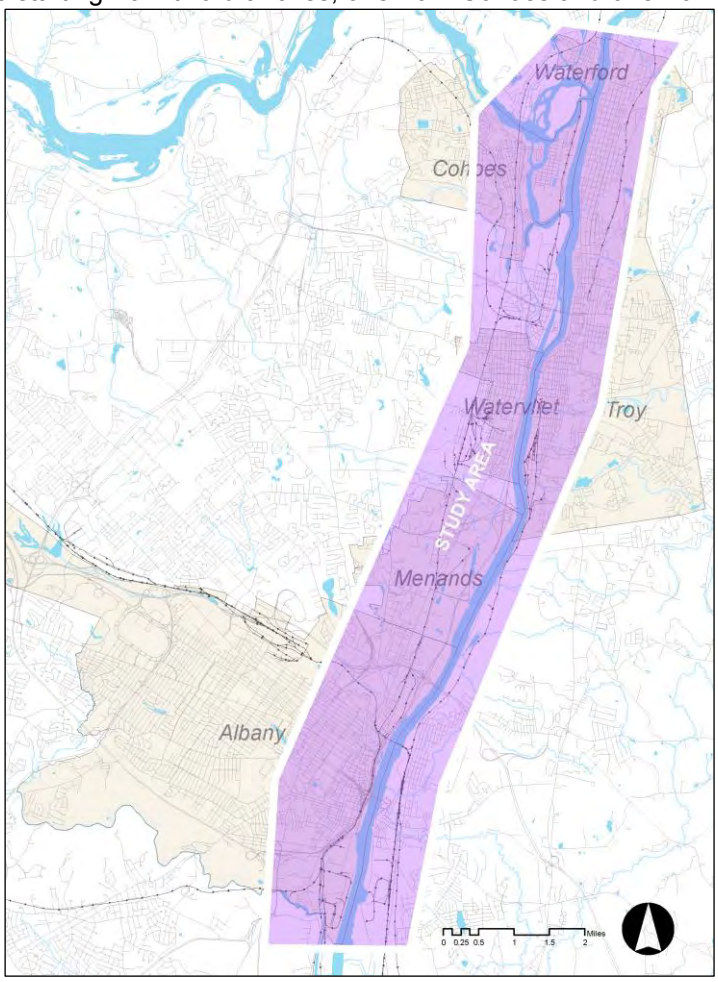


Figure 2: Project Study Area

This study identifies potential BRT capital requirements that are sizable enough to explore financing from the Federal Transit Administration's (FTA) Small Starts program. The first step in the process of pursuing FTA Small Starts funds is the adoption of the Locally Preferred Alternative (LPA) by CDTA and the Capital District Transportation Committee (CDTC). This report evaluates a range of alternatives and recommends an LPA that best meets the Purpose and Need of the project. Adoption of the LPA by CDTA, and amending the Region's Long Range Transportation Plan (LRTP) to include the LPA by CDTC will facilitate consideration of financing from the FTA, and project implementation.

1.2 Regional Plan and Previous Studies

The BRT Plan is based on the foundational planning efforts that have already been completed in the River Corridor. These plans are summarized here.

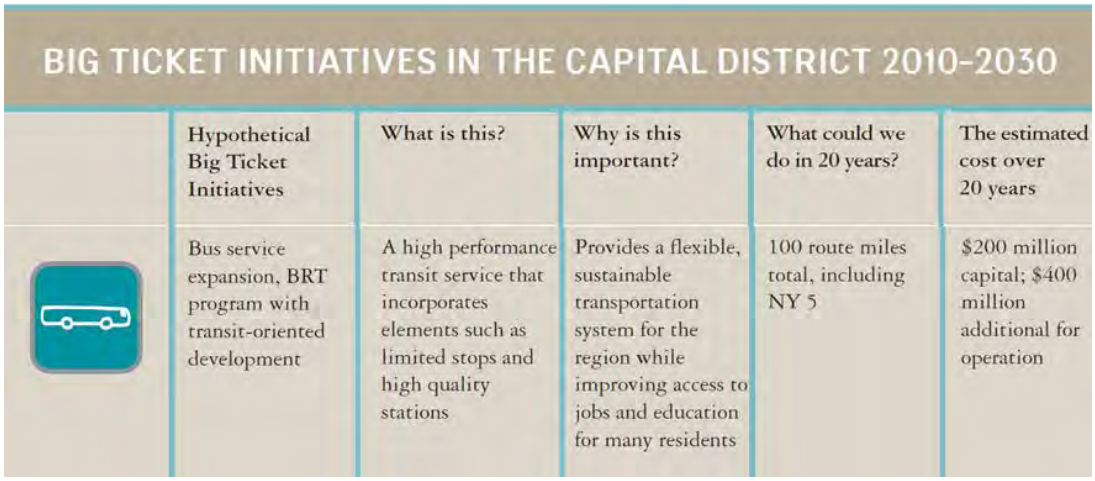
CDTC New Visions 2035 Plan Update

The New Visions 2035 Plan Update, the Regional Transportation Plan (RTP) for the Capital Region, was completed in 2011, the same year that the first BRT line in the region opened on Route 5. The plan continues its strong support for transit and BRT.

The plan lays out a set of 31 principles to guide transportation planning, funding, and implementation over the next 25 years. They incorporate many national best practices for maintaining and expanding an efficient and effective transportation system that responds to the goals of the community. The principles are grouped into four areas:

- Preserve and manage the existing investment in the region's transportation system.
- Develop the region's potential to grow into a uniquely attractive, vibrant, and diverse metropolitan area.
- Link transportation and land use planning to meet the Plan's goals for urban investment, concentrated development patterns, and smart economic growth.
- Plan and build for all modes of transportation, including pedestrian, bicycle, public transit, cars, and trucks.

The plan was developed through extensive outreach and consensus building with stakeholders and the public. New Visions includes a number of "Big Ticket Initiatives" including 100 miles of bus rapid transit for the region.



BIG TICKET INITIATIVES IN THE CAPITAL DISTRICT 2010-2030

	Hypothetical Big Ticket Initiatives	What is this?	Why is this important?	What could we do in 20 years?	The estimated cost over 20 years
	Bus service expansion, BRT program with transit-oriented development	A high performance transit service that incorporates elements such as limited stops and high quality stations	Provides a flexible, sustainable transportation system for the region while improving access to jobs and education for many residents	100 route miles total, including NY 5	$200 million capital; $400 million additional for operation

CDTA Plans & Studies

The 2014 CDTA Transit Development Plan (TDP) Update lays the foundation for the River Corridor BRT Conceptual Design Study. The adoption of the 2007 TDP resulted in the implementation of the first BRT corridor along NY Route 5 in 2011. Citing the success of this BRT project, the 2013 TDP envisions expansion of the BRT line into a 40-mile BRT network, comprised of the Washington/Western Avenue corridor and the River Corridor in addition to the initial Route 5 Corridor.

Two key recommendations in the TDP will guide the development of this study:

1) Transit Priority Network – this entails prioritizing transit corridors for increased transit investments and development, based on the following criteria: (a) Productivity; (b) Transit Demand; (c) Social Equity; (d) Geographical Equity. Prioritizing transit corridors will enable CDTA to optimize operational expenditures and resources while improving overall service quality for the greatest possible number of customers. It will also enable developing Transit Oriented Development (TOD)-based zoning codes, thus facilitating denser development and higher ridership. Infrastructure investments can also be prioritized where transit benefits can be accrued. Development can be concentrated along prioritized networks, encouraging sustainable travel behavior. The streets served by the existing bus routes along the River Corridor are all part of the Transit Priority Network.

2) Expansion of BusPlus – Three corridors have been envisioned for the immediate expansion of the BusPlus network. Figure 1 illustrates these corridors.

The River Corridor was proposed in the North-South Corridor Study[1], as one of the key recommendations to improve north-south connectivity through transit. A number of transit alternatives were evaluated along various corridors, including BRT, LRT, and Commuter Rail. BRT and LRT were considered for the River Corridor or what was called the US4/NY32 Corridor in that study. Other north-south corridors considered for BRT included:

- I-87 Northway Corridor: Saratoga Springs to Albany
- I-87 Northway Corridor: Saratoga Springs to Albany and SUNY-Harriman Campus
- US 9 Corridor: Saratoga Springs to Albany
- CPR Corridor: Mechanicville to Cohoes, Watervliet and Albany

These alternatives were evaluated in qualitative terms based on accessibility and connectivity, operational issues, right-of-way issues, constructability, institutional acceptability, and environmental issues. They were further evaluated based on costs in relation to growth benefits. The River Corridor – which included the US4/NY32 and the Canadian Pacific Railway corridors were found to offer the highest benefits.

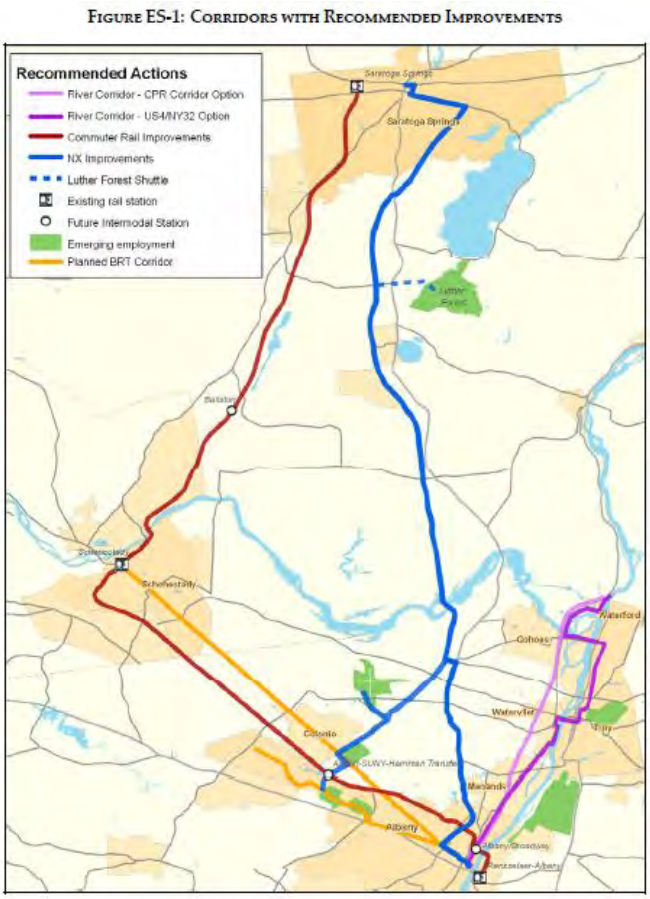


Figure 3: Recommended alternatives from the North-South Corridor Study

[1] Assessment of Capital Region North-South Corridors to Improve Access to Emerging Employment Centers, 2009 by Parsons Brinckerhoff

A number of other studies have been identified that are relevant to the River Corridor BRT Conceptual Design Study:

Municipal Plans and Studies

Albany

- Albany 2030, The City of Albany Comprehensive Plan (April 2012) presents a vision for the city of Albany, using a "systems" approach rather than the traditional structure of a comprehensive plan. One of the six major components of the vision is Albany's role as a multi-modal transportation hub connecting neighborhoods and the region through complete streets and mass transit. The plan calls for promoting mixed-use development and land investments along existing and proposed transit corridors (such as BRT routes) through Transit Oriented Development (TOD) overlay districts.

  The plan identifies the existing BRT line on Route 5, as well as planned lines on the Washington/Western and River corridors, and encourages exploration of expanded BRT service between Albany, Schenectady, and Troy. An Intermodal Transit Center is proposed downtown, with local/regional bus service and connections to the Rensselaer Amtrak Station and Albany International Airport. Improvements to the existing Route 5 BRT line programmed through the CDTC's Capital Improvement Program include new stations, vehicles, park and ride lots, transit signal priority, and possibly off-board fare collection.

- The Climate Action and Adaptation Plan serves as an appendix to the Albany 2030 Plan, and provides metrics and greenhouse gas reduction benefits for proposed transit improvement strategies, including the Intermodal Transit Center, Transit Oriented Development (TOD), and expanded transit network.
- The City of Albany Transit-Oriented Development Guidebook (December 2012) provides guidance for site selection along the River Corridor and development in accordance with TOD principles. The Guidebook provides general incentives for zoning, off-street parking, and project finance, as well as design standards, and applies them to three pilot TOD overlay zones in the downtown Albany area.

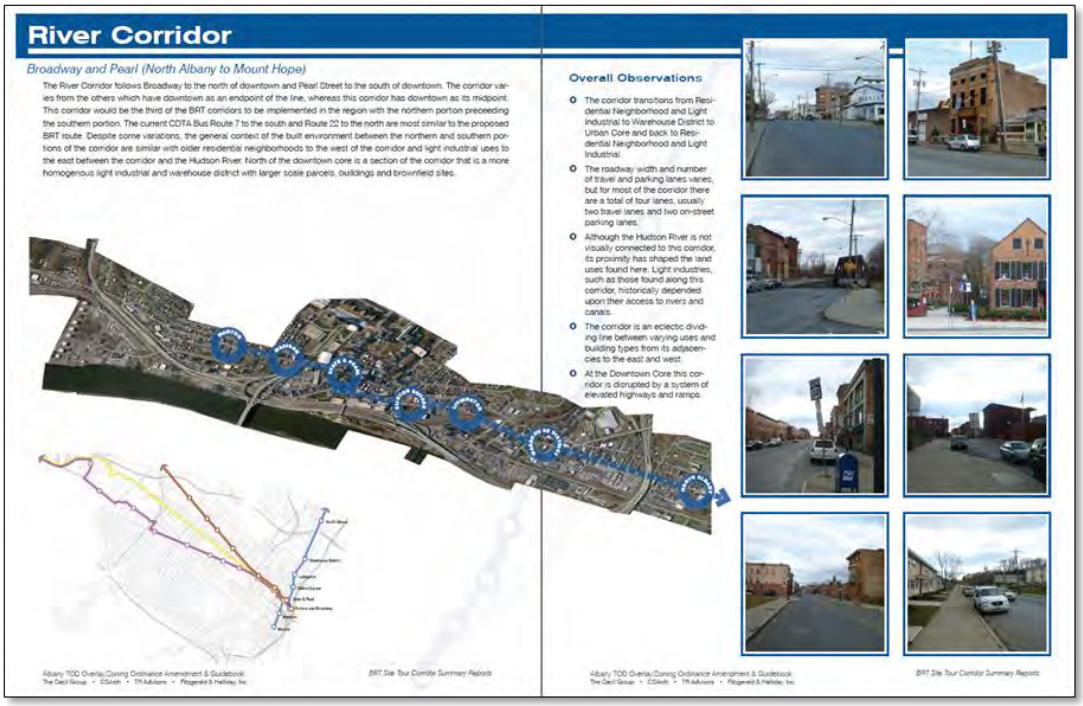


Figure 4: The River Corridor Station Inventory in the TOD Guidebook

Albany Bicycle Master Plan (2009) provides recommendations for improvement of the Albany bicycle network, including the existing NYS Bike Route 9 located on Broadway. This route overlaps with the proposed River Corridor, and hence the combined objectives of the Albany Bicycle Master Plan and the River Corridor would need to be considered while developing designs.

- Albany Bicycle Signage and Wayfinding Strategy (2013) has proposed approximately 15 wayfinding signs on Bicycle Route 9, located along Broadway, which lies in the River Corridor. Integration of these signs into the River Corridor BRT Plans will provide multimodal benefits.
- Capital South Plan: SEGway to the Future (2008) is a revitalization plan for Albany's South End. It prioritizes commercial development on South Pearl Street along the River Corridor alignment and near certain stations.
- Arbor Hill Neighborhood Plan (2003) provides a strategic framework of action items and development approaches to revitalize the community. Between 2003 and 2013, a number of community development and housing projects have already been implemented, as shown in the map below. The River Corridor borders the Arbor Hill neighborhood to the southeast, along Broadway and North Pearl Street.
- The Stakeholders, Inc.'s Sustainable Cities Project: The Future of I-787 and the Albany Waterfront (2011) is a study of the barrier effect of I-787 and the parallel rail line, and a vision for the reconnection of the city of Albany to its waterfront. The River Corridor can help mitigate traffic impacts caused by the potential removal or reconfiguration of the highway.

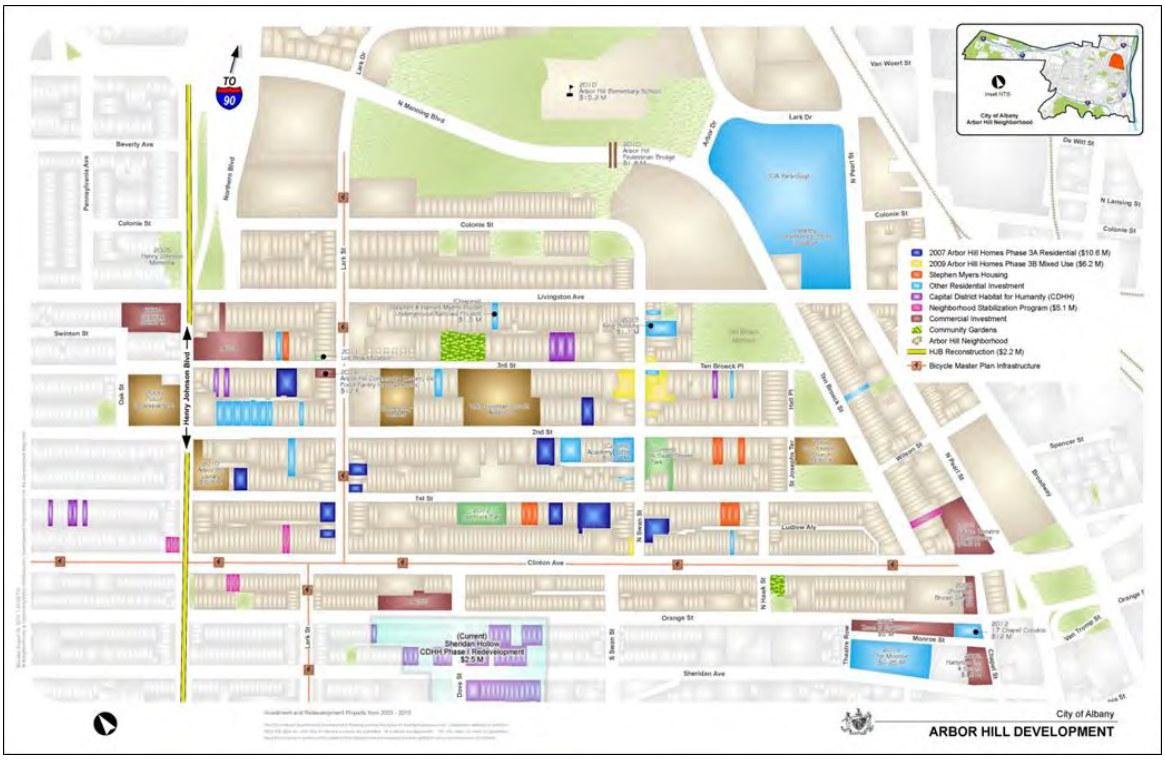


Figure 5: Arbor Hill Redevelopment Plan, 2003 - 2013

Watervliet

- City of Watervliet Comprehensive Plan (2010) presents a vision for Watervliet and reaffirms the need to upgrade the city's transportation system, including better public transportation, although it does not specifically include the River Corridor BRT alignment as an action item.
- Watervliet Bicycle Master Plan (2013) provides recommendations for bicycle infrastructure improvements in Watervliet. It recommends a bicycle boulevard running parallel along 3rd Ave while the Mohawk Hudson Bike Trail runs alongside Broadway. The integration with bikeways will have to be considered while designing the River Corridor BRT alignment.
- City of Watervliet Local Waterfront Revitalization Program (2006) provides a plan for reconnecting the city of Watervliet to the waterfront, enhancing the ecology of the waterfront, and supporting waterfront communities. The River Corridor alignment can help reduce this barrier effect through improvements to pedestrian and bicycle connections to the waterfront.

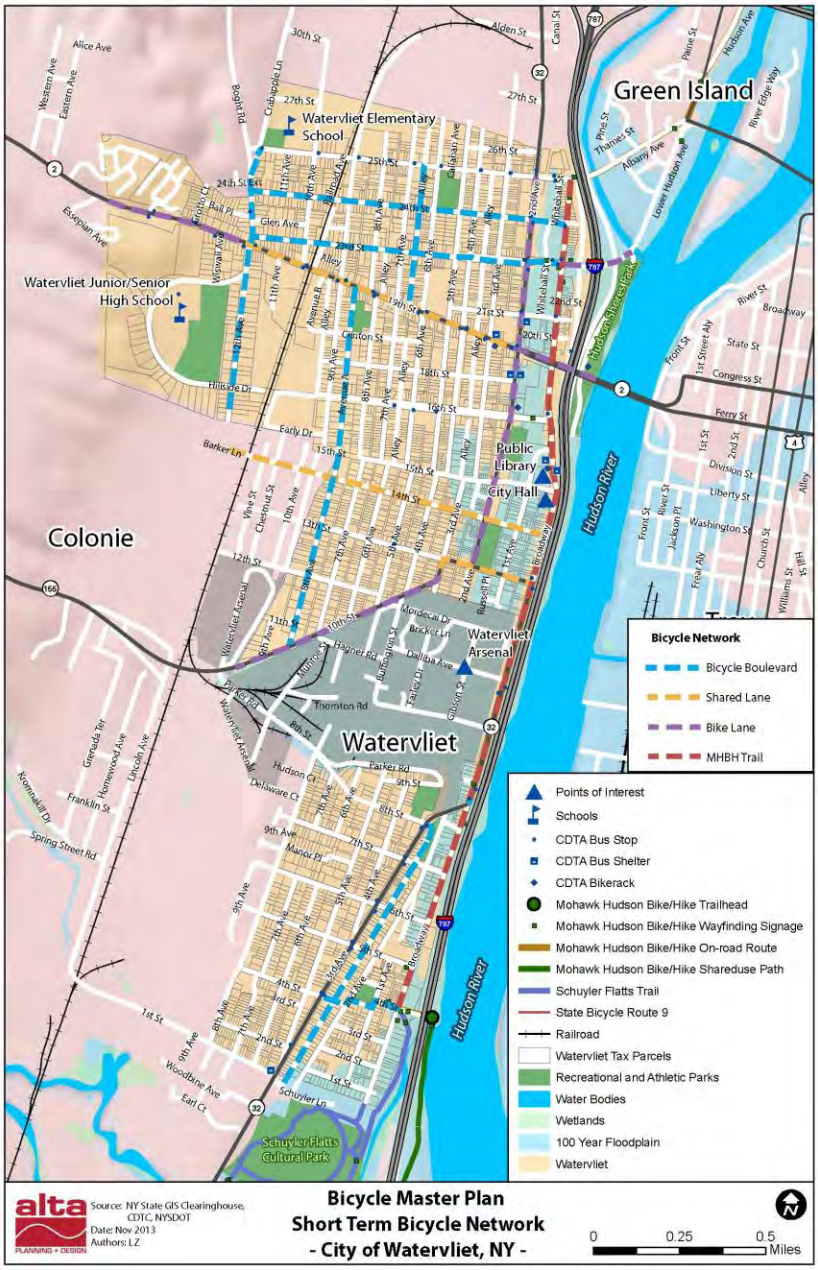


Figure 6: Short Term Bicycle Network - Watervliet Bicycle Master Plan

Cohoes

- Cohoes Van Schaick Island Transportation and Revitalization Plan (2008) suggests multiple land use alternatives and transportation improvement recommendations to revitalize Ontario Street, the key connection linking Lansingburgh to Van Schaick Island and downtown Cohoes.

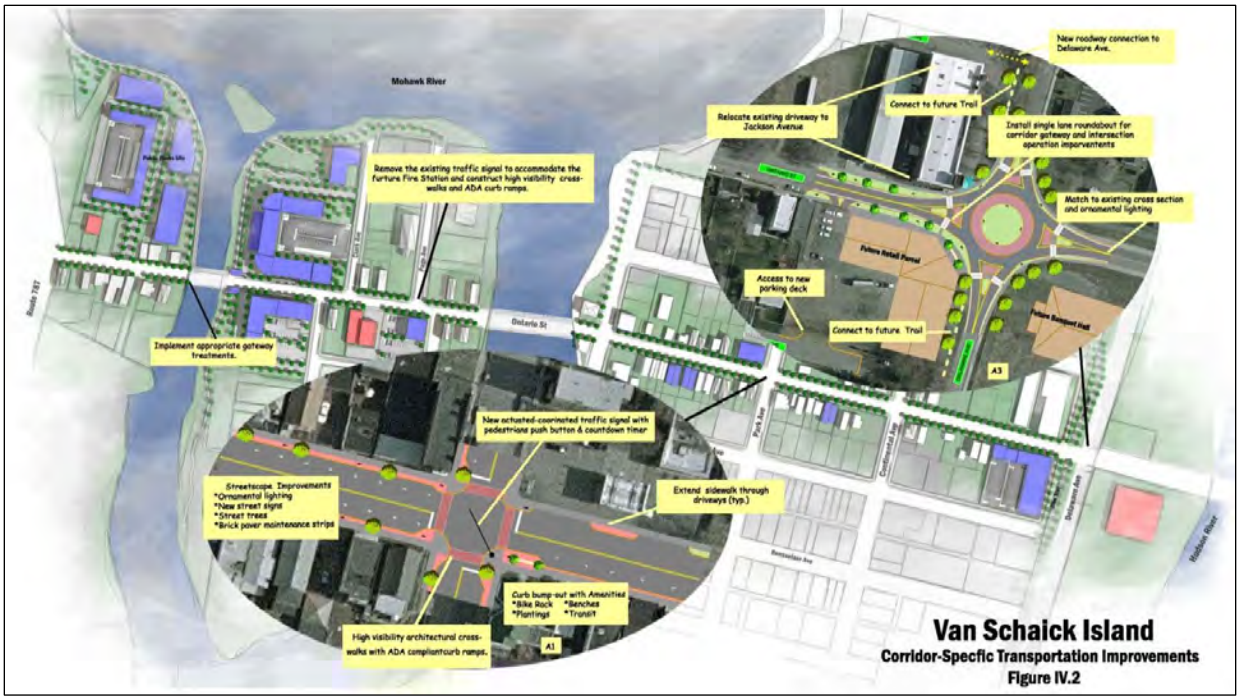


Figure 7: Recommended Transportation Improvements in the Van Schaick Island Transportation and Revitalization Plan

Troy

- Lansingburgh Village Study Master Plan (2004) provides a Vision and Action Plan for a livable, safe, functional Urban Village along 112th Street near the 112th Street station on the River Corridor.

Multiple Municipalities

- I-87 Multimodal Corridor Study (2004) is a study of a parallel North-South Corridor extending from New York City in the south to Montreal to the north.
- NYS Route 32 Corridor Linkage Study (Menands, Colonie & Watervliet) (2010) provides a common vision for future transportation and land use treatments along Route 32 in the Town of Colonie, City of Watervliet and Village of Menands. Classified as a minor urban arterial, Route 32 experiences average annual daily traffic (AADT) from 9,900 in Watervliet to 14,800 in Colonie and Menands. These numbers are projected to increase by a third in Colonie and Menands. The study proposes implementation of an inter-municipal zoning overlay district, which could standardize development norms, uniform commercial development guidelines, streetscape enhancements, bicycle trail connections, pedestrian and ADA enhancements, drainage improvements, traffic access management, and local safety awareness campaigns. The River Corridor alignment along Route 32 should dovetail with the proposed recommendations in this study.

2. CORRIDOR TRANSPORTATION CONDITIONS

The study corridor, existing bus service, and market conditions are quantified in this section as a baseline for conceptualization. Current data on service supply, utilization, and measures of service quality are included.

2.1 Corridor Characteristics

The River Corridor is over 15 miles long and includes communities between the Village of Waterford at the north and the southern boundary of the City of Albany at the Port of Albany. Some of the key municipalities and communities included are described below:

Port of Albany – The southern terminus of the corridor will serve trips to the Port of Albany, the Kenwood Industrial Park, and surrounding communities through a Park-and-Ride facility.

South End – The corridor runs along South Pearl Street in Albany's South End neighborhood. A number of stations will serve the South End, including Mount Hope, 2nd, and Morton. Mount Hope is a residential neighborhood and public housing site off South Pearl Street. Second Avenue is a dense residential neighborhood between Delaware Avenue and South Pearl Street. The portion of the neighborhood closer to South Pearl Street has become blighted in recent decades, and may be a favorable location to redevelop using TOD principles. Morton Avenue is near the northern edge of the South End neighborhood, and includes several institutional buildings near the South Pearl Street corner including the Giffen Memorial Elementary School, Albany City Court, Albany Office of NYSDMV, the Union Missionary Baptist Church, and the Albany Fire Department. The Capital South Campus Center, a mixed-use educational campus and community center, is currently under construction only blocks from Morton Station. Single story state offices and convenience stores flank South Pearl Street to the north of Morton Avenue.

There are several public housing sites in this area, including the Steamboat Square Homes complex, a block east of the proposed Morton Station. There is also Jared Holt Mews townhomes on Broad Street between the Second Ave and Morton Stations, as well as Nutgrove Garden Apartments (a mixture of market rate and subsidized units) and Ezra Prentice Homes within walking distance to the proposed Mount Hope Station.

Downtown Albany – This portion of the corridor runs through Downtown Albany, serving the region's prime employment district, and including interchange facilities to the other BusPlus and local bus lines. The stations that serve downtown Albany include Madison, State Street, and Clinton Square.

Madison Avenue is the southern node of downtown Albany and at the northern edge of the historic Mansion and Pastures neighborhoods. It is separated from the rest of Downtown by the I-787 highway viaducts to the northeast and includes a mix of commercial and residential uses.

The intersection of State Street and Pearl Street is the regional transit system's primary interchange node. At this point, the River Corridor will intersect the other two Bus Rapid Transit lines and almost all local bus routes serving the City of Albany. It is also at the center of the downtown core, surrounded by tall commercial buildings. Within walking distance to the State Street node are the New York State Capitol, the Corning City Preserve, and other downtown destinations such as the Times Union Center indoor arena which will be connected by bridge to the Albany Convention Center.

Clinton Square is at the intersection of North Pearl Street and Clinton Avenue and serves important destinations like the Palace Theatre, the historic Ten Broeck Triangle neighborhood, and tall

commercial buildings including the O'Brien Federal Office Building, NYS Department of Conservation Headquarters, and 677 Broadway, a private office tower.

Arbor Hill – Livingston Station is located along the eastern edge of the Arbor Hill neighborhood and is surrounded by residential apartment buildings and multifamily homes, some of which are experiencing blight. It is also the station for the Whitney Young Jr. Health Center and Ida Yarborough Homes.

North Albany – The River Corridor is proposed to run along Broadway in North Albany, and is served by two stations, Warehouse District and North Albany. The Warehouse District is a light industrial area, characterized by large parcel footprints, front parking lots, vacant lots, some ground floor conversions to restaurants, and proposed conversions of vacant buildings into apartments. It has been identified as a brownfield opportunity area in the Comprehensive Plan, and is a favorable location for a TOD transformation, which is already underway with new restaurants, bars, breweries, and residential developments opening in the last 2-5 years.

North Albany is the northernmost stop in the City of Albany, and serves the Shaker Park residential neighborhood to the west and a mix of residential and light industrial uses to the east. This neighborhood includes several important institutional buildings within close walking distance, including the Albany YMCA, North Albany Public Library, North Albany Academy public school, and Sacred Heart Church. North Albany Homes, a public housing site, lies several blocks to the west.

Village of Menands – The corridor continues to run along Broadway into the Village of Menands, which is served by two stations, Riverview Center, and Route 378. Riverview Center is an important 1 million square foot office building at the southern edge of the Village, mostly occupied by state government agencies. Route 378 is a planned park-and-ride station at the northern edge in proximity to the historic St. Agnes Cemetery, the Village One apartments, and a mid-sized retail plaza including a Price Chopper (grocery store). It is located directly adjacent to Exit 7 on Interstate 787, and is well-located to intercept commuters from the highway.

City of Watervliet – The corridor runs first along 3rd Avenue in the City of Watervliet until it meets Broadway and then finally moves to 2nd Avenue to take the Congress Street Bridge across the Hudson River. It is served by two stations – Port Schuyler, and Watervliet 18th Street. Port Schuyler is a dense residential neighborhood with single family homes and neighborhood amenities and institutions along 3rd Avenue. Watervliet 18th Street Station is the northernmost node on Rte. 32 before turning towards Troy. It serves numerous important destinations, including a Price Chopper supermarket and shopping plaza, as well as the 19th Street retail district, in the city's historic center. Most of the Watervliet Housing Authorities units including the Michael J. Day Apartments, Abram Hilton Apartments, the Eugene Henratta Senior Housing complex, and Daniel P. Quinn Senior Housing, are within easy walking distance of a River Corridor station, either Port Schuyler or 18th Street.

Downtown Troy – Crossing the Hudson River from Watervliet, the corridor travels through downtown Troy along Congress/Ferry and 3rd/4th Streets, and continues north along Route 4. It is served by three stations – Congress, Riverfront, and Hoosick/Hedley. Some important destinations in downtown Troy include Russell Sage College, the Rensselaer Polytechnic Institute (RPI), and the tourist destinations near Riverfront Park. There are also two public housing complexes located within downtown that would be served.

RPI, a private research university, is built on a 275 acre hillside campus just to the east of downtown Troy. It enrolls almost 7000 students, many of whom use CDTA services under a Universal Access program that provides fare-free rides. CDTA and RPI run a combination of shuttles and regular routes that travel between RPI and downtown Troy, providing connections at the Congress and Ferry Street intersection.

North Troy – Most of North Troy is dense and residential in nature and is spread in a linear pattern along the edge of Hudson River. The River Corridor will run on River Street and 2nd Avenue, serving almost all of North Troy's linear communities, including the North Central and Lansingburgh neighborhoods. It is provided with many stations, including North Central, 102nd, 112th, 115th, 118th, and 124th Street. Multiple public housing projects would also be served.

Cohoes – A branch of the River Corridor will terminate at Cohoes, with an intermediate stop at Van Schaick. Van Schaick Island is a residential neighborhood, connected to both sides of the Hudson River by Route 470 (Ontario/112th Street). The terminal at Cohoes is in the heart of that city's downtown, serving important destinations such as the Cohoes City Hall, McDonald Towers (senior housing), Post Office, banks, and other commercial enterprises.

Village of Waterford – Another branch of the River Corridor will terminate at Downtown Waterford, a commercial and residential node just across the Hudson River from North Troy in Saratoga County.

2.2 Existing Bus Routes and Services

There are seven (7) existing bus routes along the River Corridor, including five (5) trunk lines, one neighborhood route, and one express route.

Trunk Lines

Route 6 – Second / Whitehall – This is a trunk route running between St. Peter's Hospital and Downtown Albany, traveling mainly along Whitehall Road, Second Avenue, and South Pearl Street. It connects a number of South Albany communities and destinations to Downtown Albany.

Route 7 – Glenmont / South End – This is a trunk route running between Glenmont and Downtown Albany, traveling along Route 9W, River Road, and South Pearl Street. Glenmont is a suburb to the south of Albany, with several large shopping and employment centers. This route is the main connection between the communities close to the Port and Downtown Albany.

Route 22 – Albany / Troy / Watervliet – This is a trunk route running between Fulton and 4th Streets in Troy and Empire State Plaza in Albany. This route connects Downtown Albany to Downtown Troy via Watervliet, mainly along Broadway. Route 22 is the fourth-most-used route in CDTA transit system.

Route 80 – Troy / Fifth Avenue – This trunk route serves the City of Troy and runs between River and Front Streets and Northern Drive and 8th Street. It connects communities in northern Troy to Downtown Troy. It terminates at Corliss Park Apartments, a large public housing complex.

Route 85 – Waterford / Troy – This trunk route also serves the City of Troy, running between Broad and 6th Streets in Waterford, and Van Rensselaer Manor, just south of Troy, via Downtown Troy and Hudson Valley Community College (HVCC).

Neighborhood Route

Route 116 – Mount Hope / Albany South End – This is a neighborhood route and runs only on weekdays. It connects several communities to the south of Downtown Albany.

Express Route

Route 522 – Hudson River Express – This is an express route running between Downtown Albany and Cohoes via Troy and Watervliet along I-787. This is a weekday peak-hour service only.

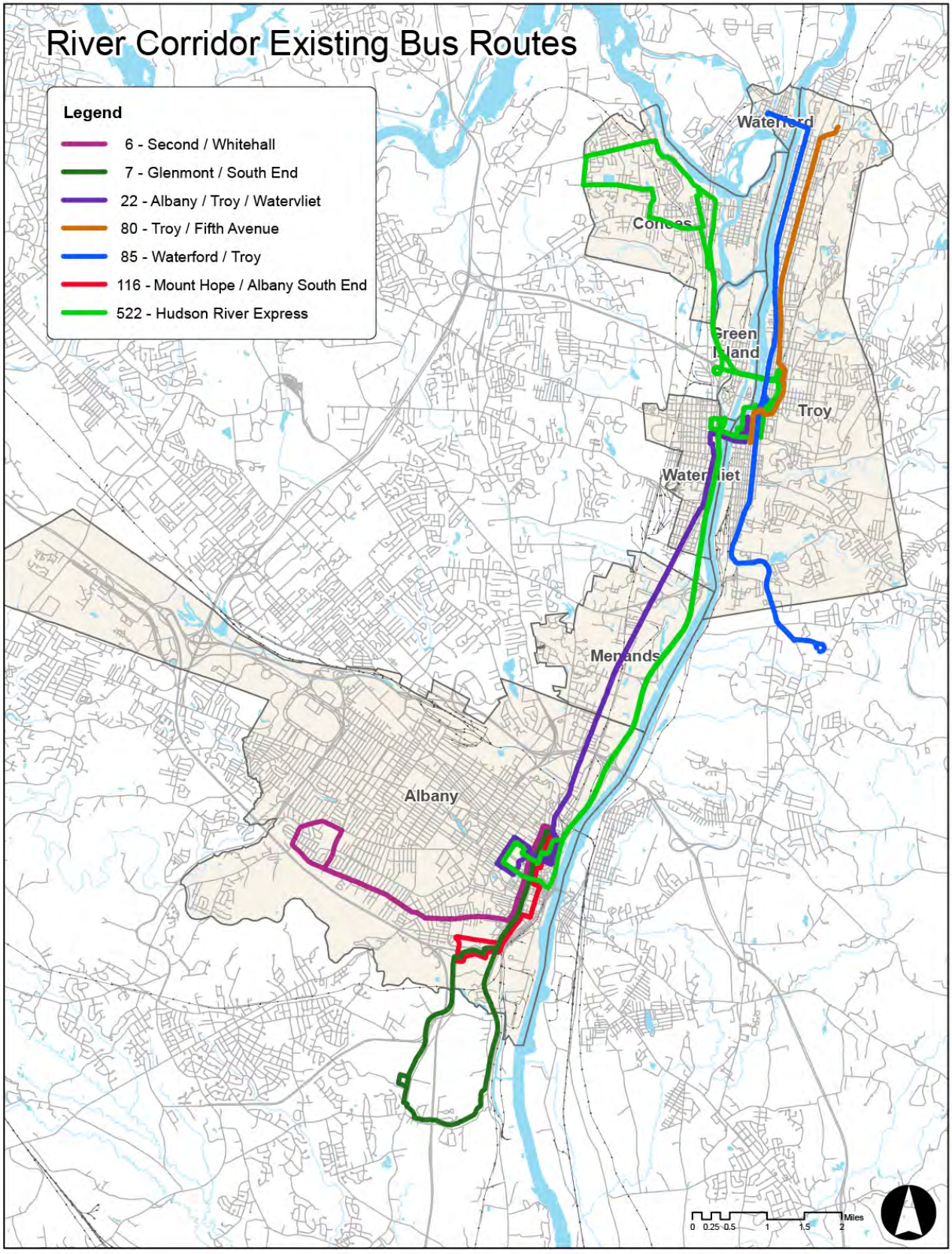


Figure 8: River Corridor Existing Bus Routes

2.3 Service Supplied

The following is a description of the service currently provided on the existing routes of the River Corridor as of November 2014. CDTA has and will likely make changes to spans and frequencies of routes in the coming years prior to the date the River Corridor begins service. For example, in late January of this year, CDTA slightly increased service on Saturdays for the #22, but is not included in this report as it was enacted after draft service plans were developed.

2.3.1 PEAK VEHICLES

The maximum peak fleet requirement for any single existing route is 8 buses on Route 22, as is seen in Table 1. The total fleet in operation for all the seven routes during peak hours is 27 during weekday peaks. The total fleet number on Saturday is 13, and 10 on Sundays.

Table 1: Peak Fleet Requirements

	Peak Hour					Maximum Weekday
Route	AM	Midday	PM	Saturday	Sunday	
6	4	4	4	2	2	4
7	3	3	3	2	2	3
22	8	4	8	4	3	8
80	4	2	4	2	1	4
85	5	5	5	3	2	5
116	1	1	1	0	0	1
522	2	0	2	0	0	2
Total	**27**	**19**	**27**	**13**	**10**	**27**

2.3.2 SERVICE MILES AND HOURS

The average daily revenue hours and miles of the existing bus routes are shown in Table 2. Route 22, between Albany, Watervliet and Troy, is the most heavily served route, with 106 daily hours and 1,271 miles on weekdays and between 50 – 65 hours and 600 – 800 miles on weekends. The rest of the trunk routes run between 400 – 600 miles on average weekdays.

Table 2: Service Miles and Hours

	Daily Revenue Hours			Daily Revenue Miles			Annual Figures	
Route	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday	Hours	Miles
6	64.1	34.1	22.9	574	369	249	19,410	179,819
7	44.9	28.1	21.0	416	257	196	14,123	130,637
22	102.7	64.9	51.3	1,293	800	588	32,516	404,862
80	39.6	28.2	11.0	394	272	105	12,175	120,437
85	71.8	48.6	22.8	822	575	272	22,090	254,770
116	13.4	0.0	0.0	105	0	0	3,409	26,653
522	8.7	0.0	0.0	149	0	0	2,210	37,946
Total	**345.1**	**203.8**	**129.0**	**3,753**	**2273**	**1409**	**105,932**	**1,155,124**

2.3.3 SERVICE SPANS AND HEADWAYS

Most of the trunk routes run between 5:30 am and 12:30 am on weekdays. Route 22 runs about 2 hours longer on weekdays. It also has the shortest headways - between 10 and 20 minutes Monday through Saturday. The rest of the trunk routes have headways ranging from 15 to 35 minutes Monday through Saturday. Sunday headways range from 30 to 60 minutes.

Table 3: Service Spans

	Weekday		Saturday		Sunday	
Route	Start	End	Start	End	Start	End
6	5:25 am	12:43 am	6:20 am	12:12 am	7:20 am	7:16 pm
7	5:55 am	12:17 am	6:25 am	11:10 pm	8:00 am	7:30 pm
22	5:00 am	1:52 am	6:00 am	1:43 am	6:30 am	1:13 am
80	5:45 am	12:35 am	7:00 am	12:35 am	6:30 am	5:30 pm
85	5:35 am	12:08 am	6:00 am	12:34 am	8:45 am	8:39 pm
116	6:25 am	7:06 pm	-	-	-	-
522	6:17 am	6:49 pm	-	-	-	-

Table 4: Service Headways (in minutes)

Route	AM Peak	Midday	PM Peak	Night	Saturday	Sunday
6	20	20	20	30	30	30
7	25	25	25	35	35-70	35
22	10	15	10	20	20-30	30
80	15	30	15	60	30-60	60
85	20	20	20	45	30-45	45
116	45	45	45	-	-	-
522	30	-	30	-	-	-

**Some routes' Saturday frequencies shown as a range as frequency reduced in early AM and late night*

2.3.4 FINDINGS

Route 22 emerges as the most heavily served route, with the maximum bus frequency, highest fleet requirement, maximum revenue hours, and longest span of service on weekdays and weekends. Other routes provide good all-day coverage of the entire corridor. Frequencies are moderate, mostly between 10 and 30 minutes during much of the day. Service spans are generally long, from 6 am to midnight on most routes Monday through Saturday with Sunday service between 8 am and 8 pm and sometimes longer.

The route structure is set up to serve historic neighborhoods and downtown trip patterns. Routes in Albany converge in downtown Albany, and routes in Troy converge in downtown Troy, except for Route 22 Albany–Troy via Watervliet and Route 522 Hudson River Express, which connect both hubs. This leads to a large number of shorter routes that require one or more transfers to reach many important destinations, especially now that many large commercial and employment centers are not located in one of the downtowns.

2.4 Service Utilized

2.4.1 DAILY RIDERSHIP

Using data from CDTA's fare collection system, average daily ridership by weekday, Saturday, and Sunday was calculated for the key routes currently operating in the study corridor. Route 22 – Albany to Troy via Watervliet was the most heavily traveled route by a large margin, followed by Route 85 Troy/Waterford via 2nd Avenue.

Table 5: Average Daily Ridership

Route	Weekday	Saturday	Sunday
6: Second/Whitehall	1,808	638	325
7: Glenmont	1,262	747	385
22: Albany/Troy	3,847	2,242	1,355
80: Fifth Avenue	1,067	529	202
85: Troy/Waterford	2,171	1,280	497
116: Mount Hope / Albany South End	195	-	-
522: Hudson River Express	341	-	-
Total	**10,691**	**5,437**	**2,763**

2.4.2 PASSENGER LOADING

Table 6 shows the AM and PM peak hour load factors in both directions for each of the bus routes in the corridor. Routes 6, 22, and 522 are well utilized, with load factors exceeding 60% in both directions. Route 7, serving South Albany, and Route 116, serving Mount Hope and Albany, are moderately utilized in both directions. The average daily ridership along Route 7, however, is reasonably high (over 1,200) compared to Route 116 (322). Route 7 does not follow a peaked ridership trend, due its focus on shopping and retail employment in Glenmont. Routes 80 and 85, serving Troy, are more highly peaked and have significantly higher southbound movement during the AM peak hours and northbound movement during the PM peak hours.

Table 6: Weekday Peak Hour Load Factors

Route	Direction	AM Peak			PM Peak		
		Riders Per Trip	Seats Per Trip	Load Factor	Riders Per Trip	Seats Per Trip	Load Factor
6	North	32	39	82%	24	39	62%
	South	31	39	79%	30	39	77%
7	North	19	39	48%	17	39	44%
	South	17	39	44%	20	39	50%
22	North	29	39	76%	39	39	99%
	South	36	39	93%	26	39	67%
80	North	11	39	28%	23	39	58%
	South	21	39	54%	15	39	38%
85	North	11	39	28%	30	39	78%
	South	26	39	67%	19	39	47%
116	North	15	39	38%	11	39	29%
	South	7	39	17%	18	39	46%
522	North	-	-	-	30	39	78%
	South	35	39	89%	-	-	-

2.4.3 FINDINGS

The Albany – Troy segment of the River Corridor is the most heavily utilized, especially during weekday peak hours. Travel demand appears to be more for long distance travel along this segment, rather than for shorter trips. While the peak movement of people in both directions over the entire corridor is largely uniform, travel within Troy is more significantly southbound during mornings and northbound in the evenings.

2.5 Origin Destination Survey

An origin-destination survey was completed for the routes in the River Corridor in the spring of 2014. An analysis of the data revealed the following information.

- The O-D matrix shows that a large proportion of riders, 95%, on Route 22, the most heavily traveled route in the corridor, travel to or from one of the downtowns (including Empire State Plaza as downtown Albany), with around 40% traveling through from Albany to Troy or vice versa.
- Ridership to Empire State Plaza (ESP) is significant, with about 39% of trips having one end or the other there. Some of these riders may be transferring from other routes at South Swan Street and Washington Avenue.
- 51% of riders on Route 22 transfer from another route, to another route, or both. Nearly 20% of transferring riders change to a bus to or from North Troy.

Conclusions that can be drawn from this analysis are:

- The ridership patterns on Route 22 fit a BRT service plan well, with a high proportion of ridership going end to end. These riders would benefit greatly from the faster travel time.
- The large number of riders who transfer to and from the 80 and 85 would benefit from the elimination of the transfer in downtown Troy.

- The reduction in service to ESP is a potential issue. The final configuration of Routes 22 and the 522 must maintain these essential connections to ESP.

2.6 Purpose and Need

2.6.1 PURPOSE

The purpose of the project is to provide faster, more direct, more frequent, and more reliable north-south transit service connecting the major activity centers along the River Corridor at a reasonable cost and schedule. High levels of existing ridership, significant clusters of transit-supportive demographics, and transit-oriented development patterns indicate a clear need for improved transit services. The major activity centers include:

- the Port of Albany
- the City of Albany neighborhoods of:
    - Kenwood
    - Krank Park
    - the South End
    - the Mansion District
    - the Pastures
    - Downtown Albany
    - Arbor Hill
    - the Warehouse District
    - North Albany
- the Village of Menands
- the Town of Colonie
- the City of Watervliet including:
    - Port Schuyler
    - 19th Street / Uptown
- the City of Troy neighborhoods of:
    - Downtown Troy
    - North Central
    - Lansingburgh
- the City of Cohoes neighborhoods of:
    - Downtown Cohoes
    - Van Schaick Island
- the Village of Waterford

Several educational institutions are located along or near the corridor, including:

- the Capital South Campus Center
- Schenectady County Community College - Albany Campus
- Russell Sage College
- the Rensselaer Polytechnic Institute (RPI)
- multiple elementary schools

In addition to the central business districts in downtown Albany and downtown Troy, major employment centers on the corridor include:

- the Broadway industrial district in North Albany

- the Watervliet Arsenal Business and Technology Partnership
- the Port of Albany

Many large public housing projects are located along the corridor, including:

- the Albany Housing Authority sites of:
  - Ezra Prentice Homes
  - Nutgrove Garden Apartments
  - Jared Holt Mews townhomes and Capital South Properties
  - Creighton Story Homes
  - Lincoln Square Homes
  - Steamboat Square Homes
  - Ida Yarbrough Homes
  - North Albany Homes

- the Watervliet Housing Authority sites of:
  - Abram Hilton Apartments
  - Michael J. Day Apartments
  - Eugene Hanratta Senior Housing
  - Daniel Quinn Senior Housing

- the Troy Housing Authority sites of:
  - John Taylor Apartments
  - Grand Street Apartments
  - Arnold Fallon Apartments
  - Martin Luther King Apartments
  - Edward Kane Apartments
  - Corliss Park Apartments.

- the Cohoes Housing Authority site of:
  - Jay McDonald Towers.

Several New York State Government buildings line the corridor, including:

- the Office of the State Comptroller (OSC) Building
- the Department of Environmental Conservation (DEC) headquarters
- Various offices on State Street, Pearl Street, and Broadway in Albany
- NYS offices in Menands and Troy.

A key intercity transportation connection is made at the Greyhound-Trailways intercity bus station in downtown Albany. The project purpose is consistent with CDTA's Transit Development Plan (TDP), the City of Albany's 2030 Comprehensive Plan, and the Capital District Transportation Committee's (CDTC) Regional Transportation Plan (RTP), *New Visions*.

2.6.2 NEED

Fast, efficient, and environmentally sound connections between major activity centers are needed in the study corridor. A key success factor for the River Corridor will be increasing ridership to, from, and between the existing and emerging centers along the route including downtown Albany, downtown Troy, downtown Cohoes, and neighborhoods undergoing urban revitalization. The new BRT service will directly link many centers along the corridor that have never been linked by a continuous route before, resulting in significant reductions in overall trip time and transfer inconvenience. Improved access between the urban economic and cultural centers of Albany and Troy will support revitalization efforts and development of efficient land use patterns.

Improved mobility for the transit dependent populations throughout the study corridor is needed. The River Corridor has a significant percentage of its population that does not own an automobile. Some sections of the study area, particularly those in proximity to transit stations, exceed 50% without a car, in contrast to 8% for the Albany-Schenectady-Troy metropolitan area. These individuals and households would find improved access to jobs, shopping, schools and universities, and other key destinations throughout the corridor. The corridor is also home to many people with disabilities, who depend on transit for many of their travel needs. Twenty-eight percent of all CDTA bus boardings with a wheelchair or other mobility device occur on routes within the River Corridor. Faster, more direct, and more reliable transit service would improve their mobility and access to essential services.

There is a need to encourage redevelopment and revitalization that is transit supportive. In some parts of the corridor, properties and parcels are underutilized. High quality transit service will improve the regional accessibility of these sites, making them more economically viable and encouraging development. It will provide improved access to jobs, education, shopping, and service for local residents, leading to increased investment in residential areas. In other parts of the corridor, development patterns are currently auto-centric and inefficient. Access to high quality transit will support redevelopment in a more compact, pedestrian-oriented form and will encourage revisions to existing land use regulations to reinforce these patterns of development. The proposed transit center in Downtown Troy will improve the waiting experience for passengers of the River Corridor BRT and other local routes, and project a modern, attractive image of transit that will encourage redevelopment of the surrounding parcels.

There is a need to alleviate parking problems and the costs associated with the provision of parking. Parking is a long standing and continuous problem in the study corridor both in historic neighborhoods and in the major downtowns and commercial districts. Parking is also a concern at major institutions, particularly universities and colleges. Surface parking in particular requires large areas of land that are costly to purchase, require on-going maintenance, and create a variety of environmental problems. Structured parking reduces the amount of land required, but construction costs can be very high. Encouraging greater transit use by providing high quality service will reduce the need for parking, encourage more productive land uses, reduce costs for institutions, and improve air quality.

3. ALTERNATIVES DEVELOPMENT

The alternatives under consideration for the River Corridor BRT service are introduced in this chapter.

3.1 Description and Initial Screening of Alternatives

The geography and development patterns in the River Corridor are unique. Steep hillsides closely line both sides of the Hudson River and extensive wetlands further constrain developable land into narrow bands along both banks. Existing development tends to be older trolley car and industrial suburbs at relatively high densities, with narrow streets and little remaining undeveloped land. Main arterial streets were defined during the streetcar era and helped define the patterns of development that surround them. This results in a situation where most, if not all, reasonable alternatives in terms of serving existing development, directness of travel, appropriateness of road infrastructure and geometry, operational efficiency, travel time, and transit oriented development are already existing transit routes.

The *Assessment of Capital Region North-South Corridors to Improve Access to Emerging Employment Centers,* conducted in 2009, looked at BRT, LRT and commuter rail alternatives in the River Corridor. The study identified three routing alternatives for the BRT/LRT options. These included US 4/NY 32, US 9, and the Canadian Pacific Railroad (CPR) Corridor, shown in Figure 9.

Further analysis and new research into transportation needs and opportunities led to the creation of three preliminary alternatives: BRT via surface arterials NY Route 32 and US Route 4, LRT via the existing Canadian Pacific rail alignment, and BRT via the I-787 expressway.

Light Rail Transit (LRT) was considered in the alternatives development stage of the study but not advanced further. It is not considered feasible at this time due to high capital cost, lack of a viable local funding source of sufficient means, and the long lead time for development. In addition, regional transportation plans do not call for LRT in the Capital District during the current planning horizon. This does not mean that LRT might not be revisited in the future as conditions change, funding becomes available, and travel patterns evolve. Furthermore, the high service levels and infrastructure improvements established through implementation of BRT are anticipated to make the corridor more viable for LRT in the coming decades.

This study discusses only those alternatives that are considered reasonable and that meet the project's purpose and need. Alternatives that are not included in this study are presented in Appendix C.

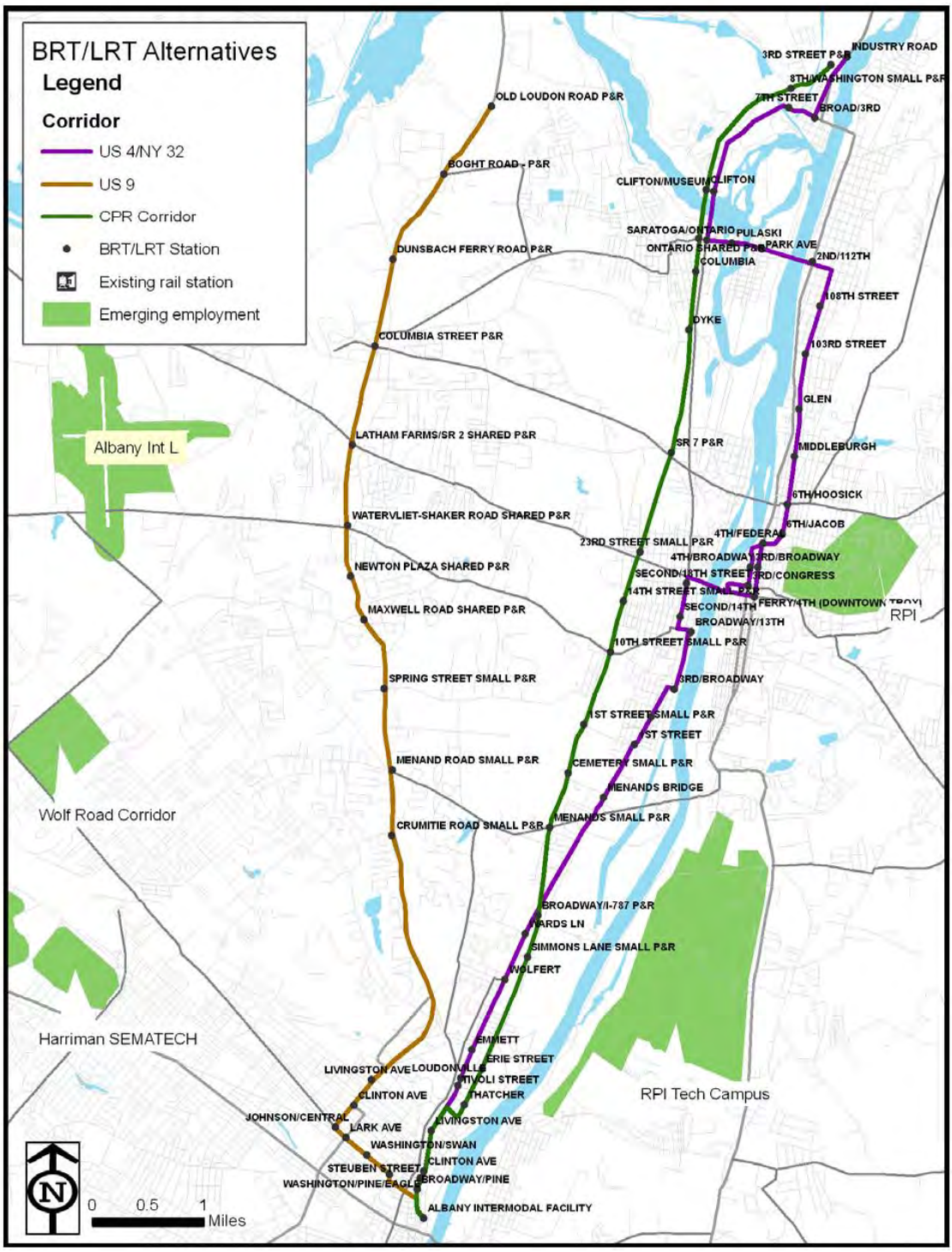


Figure 9: Refined LRT/BRT Alternatives proposed in the North-South Corridor Study

3.1.1 ALTERNATIVE 1: BRT VIA PEARL IN NORTH ALBANY

This alternative begins at Kenwood/Port of Albany in South Albany, running along South Pearl Street (also US Route 32), with stations at Mount Hope, 2nd, and Morton. In Downtown Albany, this alternative continues along US Route 32, with stations at Madison, State Street (intersecting the BusPlus Red and Purple Lines), and Clinton Square.

After Clinton Square, this alternative continues along Pearl Street, with stations at the intersections with Livingston Avenue, Pleasant Street (Warehouse District) and North 2nd Street (North Albany). The corridor turns at Wolfert Avenue to run along Broadway through the Village of Menands. This alignment will provide connectivity to important residential and commercial destinations.

North Pearl Street is, however, susceptible to delays due to the narrow right-of-way, double parking, and residential uses. This would adversely impact the travel time and reliability of the BRT service. The traffic signals along North Pearl Street would need to be upgraded, increasing the capital cost. Also, the narrow right-of-way reduces the feasibility of bus lanes in more fully built-out iterations of the corridor in the future.

The route continues further along US Route 32, with stations at Riverview Center and the intersection with Route 378, which would also serve as a park and ride station, in Menands, and Port Schuyler and 18th Street in Watervliet. From Watervliet, it crosses the Hudson River to downtown Troy and generally follows US Route 4 (2nd and River) up to 112th Street. This route runs closer to the riverfront, where there are larger parcels available in premium locations, increasing the potential for TOD. Greater concentration of existing commercial and institutional uses along this route would also provide placemaking opportunities and good pedestrian access. One branch to Waterford (Route 923) continues on 2nd Ave up to 125th Street, leading to Waterford. The other branch to Cohoes (Route 922) follows 112th and Ontario Streets.

The 20 common stations for this alternative are located at Kenwood/Port, Mount Hope, 2nd Ave, Morton, Madison, State, Clinton Square, Livingston, Warehouse District, North Albany, Riverview Center, Route 378, Port Schuyler, Watervliet 18th Street, Congress, Riverfront, Hoosick/Hedley, North Central, 102nd Street and 112th Street. The Cohoes branch (Route 922) has 2 additional stations at Van Schaick and Cohoes. The Waterford branch (Route 923) has 4 additional stations at 115th, 118th, 124th, and Waterford.

A similar alternative is included in the *North-South Corridors study*, and a review of the data indicates that this alternative can meet the purpose of the project at a reasonable cost and implementation schedule.

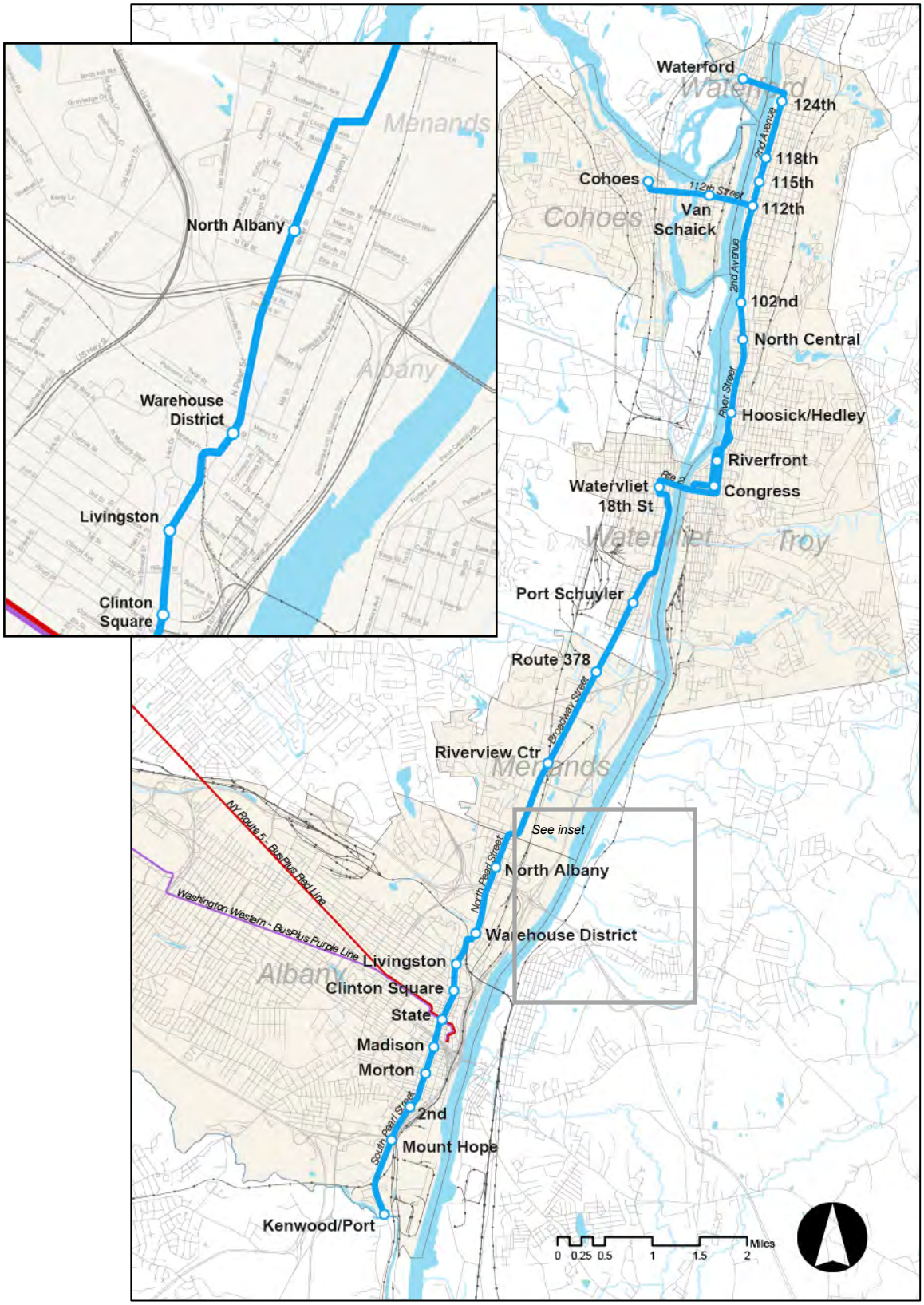


Figure 10: BusPlus Blue Line Alternative 1

3.1.2 ALTERNATIVE 2: BRT VIA BROADWAY IN NORTH ALBANY

This alternative begins at Kenwood/Port of Albany in South Albany, running along South Pearl Street (NY Route 32), with stations at Mount Hope, 2nd, and Morton. In Downtown Albany, this alternative continues along NY Route 32, with stations at Madison, State Street (intersecting the BusPlus Red and Purple Lines), and Clinton Square.

After Clinton Square, this alternative turns east on Clinton Avenue and then turns north on Broadway. This "zig-zag" from Pearl to Broadway includes two traffic signals, which will likely increase travel time somewhat. The route continues north along Broadway, with stations at the Warehouse District and North 2nd Street.

Broadway is largely commercial, with some light industrial uses. There is great potential for transit oriented development (TOD) around stations on this option. The width of Broadway allows the possibility of future bus lanes in this section of the route.

The route continues along NY Route 32, with stations at Riverview Center and the intersection with Route 378, which would also serves as a park-and-ride station, in Menands, Port Schuyler, and 18th Street in Watervliet. From Watervliet, it crosses the Hudson River to downtown Troy, and generally follows US Route 4 (2nd and River) up to 112th Street. This route runs closer to the riverfront, where there are larger parcels available in premium locations, increasing the potential for TOD. Greater concentration of existing commercial and institutional uses along this route would also provide placemaking opportunities and good pedestrian access. One branch to Waterford (Route 923) continues on 2nd Avenue up to 125th Street leading to Waterford. The other branch to Cohoes (Route 922) follows 112th and Ontario Streets.

The 20 common stations for this alternative are located at Kenwood/Port, Mount Hope, 2nd Avenue, Morton, Madison, State, Clinton Square, Livingston, Warehouse District, North Albany, Riverview Center, Route 378, Port Schuyler, Watervliet 18th Street, Congress, Riverfront, Hoosick/Hedley, North Central, 102nd and 112th. The Cohoes branch (Route 922) has 2 additional stations at Van Schaick and Cohoes. The Waterford branch (Route 923) has 4 additional stations at 115th, 118th, 124th and Waterford.

A similar alternative is included in the *North-South Corridors* study, and a review of the data indicates that this alternative can meet the purpose of the project at a reasonable cost and implementation schedule.

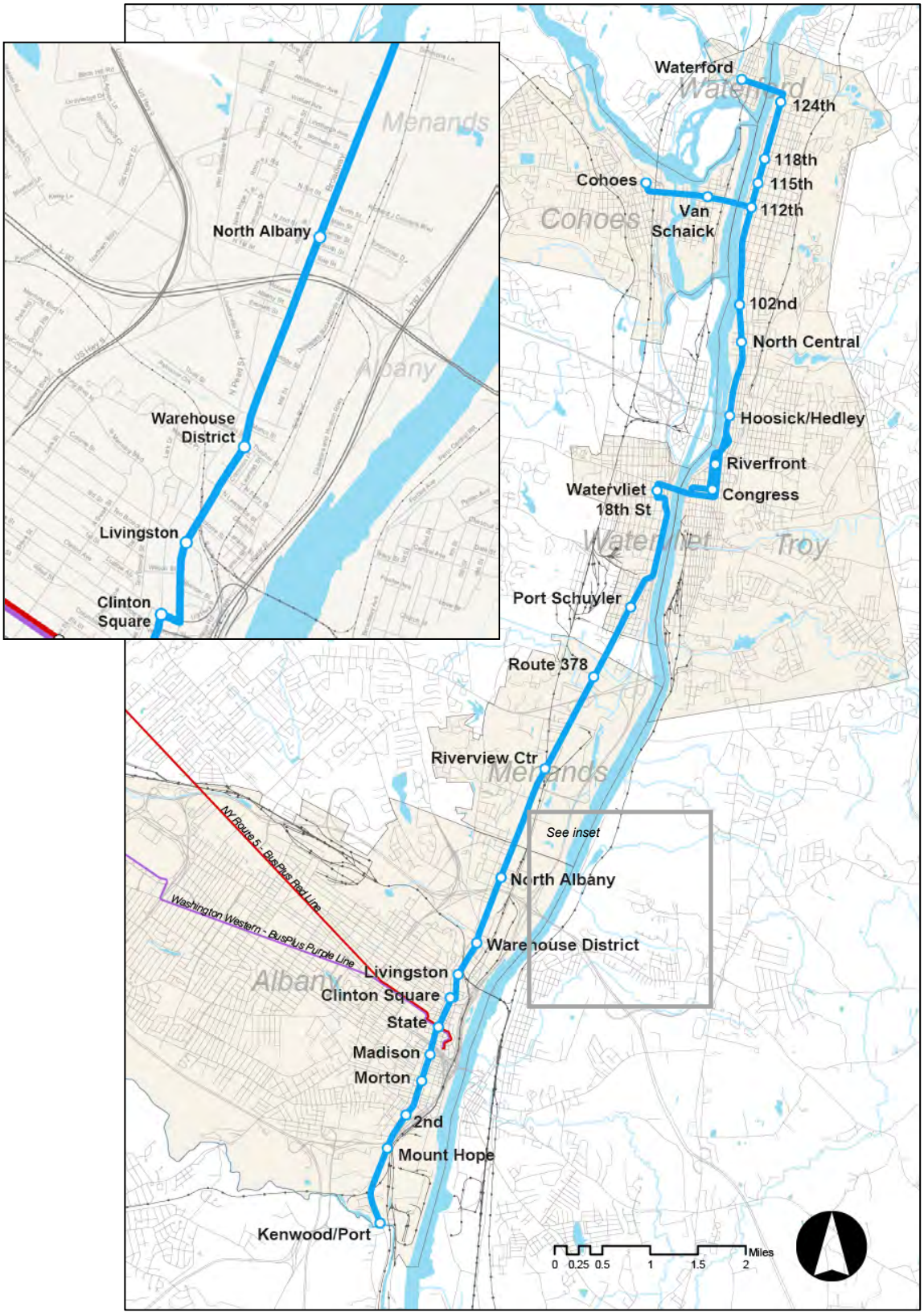


Figure 11: BusPlus Blue Line Alternative 2

3.1.3 ALTERNATIVE 3: BRT VIA I-787

This alternative between Waterford and Cohoes and the Port of Albany generally follows US Route 4 (2nd and River) to downtown Troy where it crosses the Hudson River to Watervliet and then follows I-787 to NY Route 32 (South Pearl) at Clinton Square in downtown Albany to the Port of Albany. A branch from Cohoes follows Ontario and 112th Street. This alternative provides travel time advantages between downtown Albany and downtown Troy, but avoids a number of important activity centers, transfer points, and institutions along the most heavily used segment of the existing transit network.

This alternative begins at Kenwood/Port of Albany in South Albany running along South Pearl Street (NY Route 32), with stations at Mount Hope, 2nd, and Morton Avenue. In Downtown Albany, this alternative continues along NY Route 32, with stations at Madison, State Street (connecting with the BusPlus Red and Purple Lines), and Clinton Square.

After Clinton Square, this alternative turns onto I-787, traveling directly to Watervliet, from where it crosses the Hudson River to downtown Troy. From downtown Troy the route generally follows US Route 4 (2nd Avenue and River Street) up to 112th Street. The main branch to Waterford (Route 923) continues on 2nd Ave up to 125th Street to Waterford. A branch to Cohoes (Route 922) follows 112th and Ontario Streets.

The 14 common stations for this alternative are located at Kenwood/Port, Mount Hope, 2nd Ave, Morton, Madison, State, Clinton Square, Watervliet, Congress, Riverfront, Hoosick/ Hedley, North Central, 102nd and 112th. The Cohoes branch (922) has 2 additional stations at Van Schaick and Cohoes. The Waterford branch (923) has 4 additional stations at 115th, 118th, 124th and Waterford.

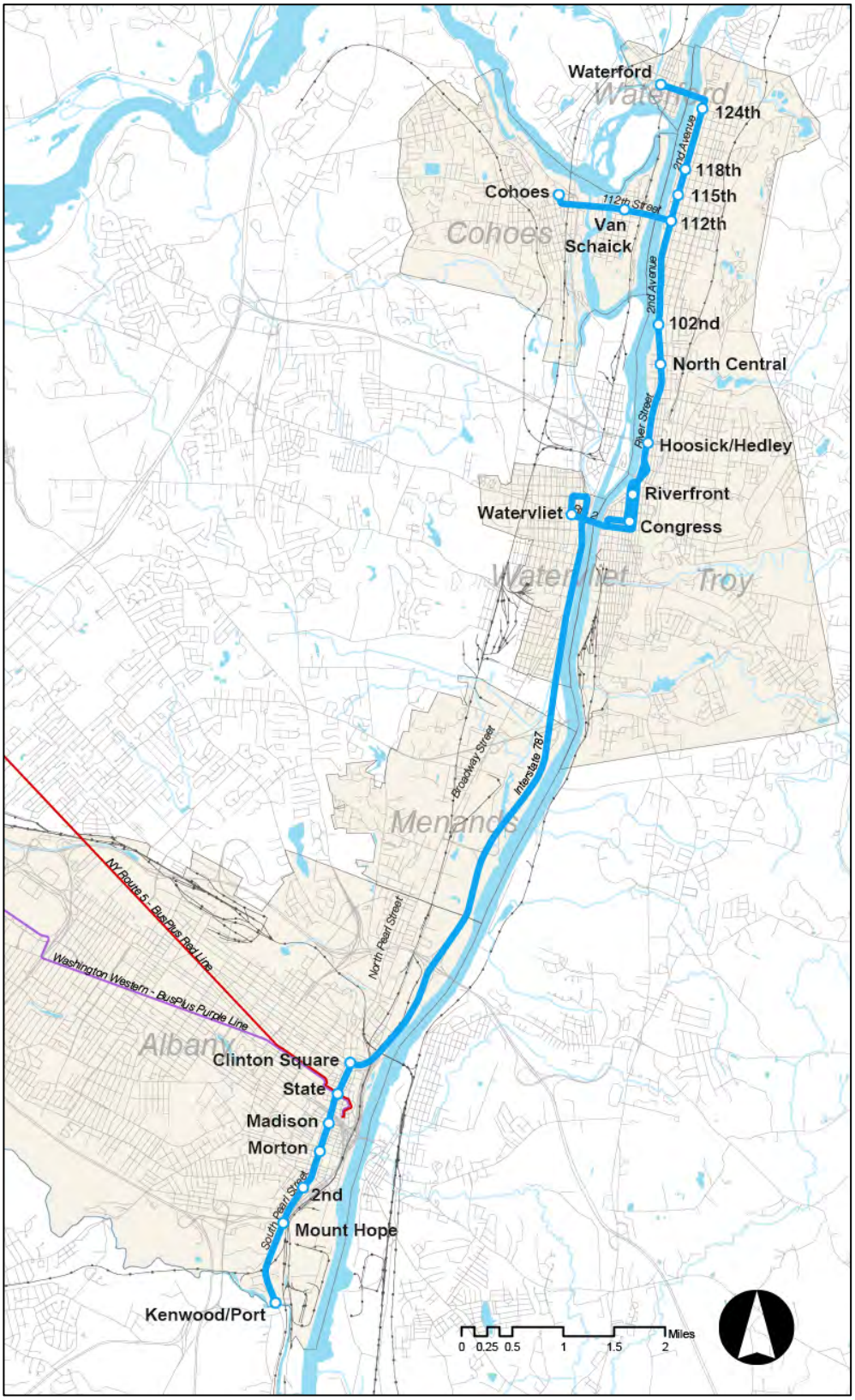


Figure 12: BusPlus Blue Line Alternative 3

3.1.4 DELAWARE AVENUE VIA SECOND AVENUE BRANCH

The possibility of a branch line is being held open at the southern end of the route, connecting South Pearl Street with Delaware Avenue via Second Avenue. Every other trip could operate southbound from downtown Albany via Pearl Street to Second Avenue Station and then turn right on Second to Hoffman, left on Hoffman, right on Southern Boulevard, right on Delaware, and then back to Second. Stations could be located at 2nd and Grandview Terrace, 2nd and Hoffman, and 2nd and Delaware. This branch would serve the densely populated neighborhoods along Second that are home to a high proportion of transit dependent residents. A final determination of whether or not this branch is worth including will be completed in the Project Development phase.

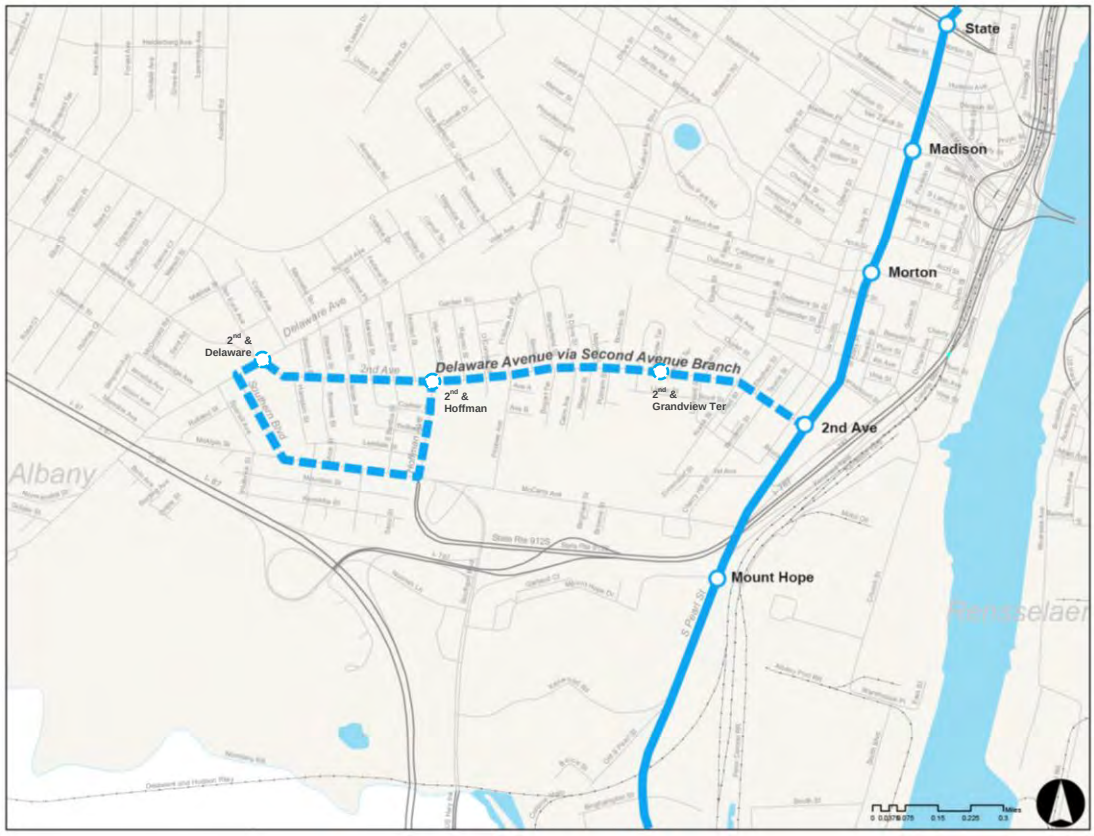


Figure 13: Possible Second Avenue Branch

3.2 Routes and Service Concepts

Operating plans were developed for new BRT service in the River Corridor. The three alternatives are as follows:

- Alternative 1 – via North Pearl Street
- Alternative 2 – via Broadway
- Alternative 3 – via I-787

The operating plans for these alternatives reflect annual hours and miles of service for the proposed BRT service and local routes 6, 7, 22, 80, 85, 116, and 522. Proposed headways for the local routes 6, 7, 22, 80, 85, 116, and 522 have been revised to achieve operating efficiency for each of the alternatives. Cost estimates are provided along with incremental cost increases of the proposed corridor network relative to current services.

3.2.1 METHODOLOGY

To create the operating plans, several service characteristics were identified:

- BRT service is designed to feature a peak and midday weekday headway of 10 minutes.
- Primary BRT service span is 22 hours per day on weekdays.
- Layover time is designed based on a percentage of running times, actual on-time performance of existing services, and experience with Route 905 operating performance.

Operating scenarios were calculated based on mileage, anticipated travel speeds, actual running times, and costs for the alternatives under consideration. A detailed spreadsheet model supports the findings.

3.2.2 OPERATING PLANS

Table 9 compares the three BRT alternatives with the baseline service to show changes in frequency and span along with net changes in operating hours, miles, and costs. Table 7 shows a summary of each alternative's operating costs.

Table 7: Summary of Service Plan Alternatives

Alternative	Peak Vehicles	Annual Revenue Hours	Net Change in Hours	Percent Change in Hours	Annual Operating Cost	Net Change in Operating Cost	% Change in Net Operating Cost
Existing/ No Build	27	105,932	-	-	$8,139,592	-	-
Alternative 1:N. Pearl	32	157,553	+ 51,621	49%	$11,919,100	$3,779,508	46%
Alternative 2: Broadway	32	154,413	+ 48,481	46%	$11,765,100	$3,625,508	45%
Alternative 3: via I-787	31	150,277	+44,345	42%	$11,824,400	$3,684,808	45%

Includes Routes 22, 80, modified routes 6 and 7, and proposed neighborhood routes.

The comparison of travel time savings between current service and the alternatives (Table 8) shows significant travel time savings, especially for trips that formerly required a transfer.

Table 8: Travel Time Savings (min and percent change)

Origin-Destination	Current	Alternative 1		Alternative 2		Alternative 3	
Port of Albany to Cohoes	94	58	-38%	57	-39%	52	-45%
Port of Albany to Waterford	74	59	-20%	56	-24%	50	-32%
South End to Downtown Troy	42	32	-24%	29	-31%	23	-45%
Downtown Albany to Waterford	58	45	-22%	42	-28%	36	-38%
Downtown Albany to Downtown Troy	31	26	-16%	23	-26%	17	-45%
Downtown Albany to Riverview Center	15	13	-13%	11	-27%	15 (Not possible by BRT)	0%

**"Current" does not include time spent while transferring, which would further reduce travel times by an additional 5%-15%, depending on time of day and origin/destination.*

Table 9: Operating Characteristics

Route	Description	Span of Service			Headways													Annual Revenue Hours	Annual Revenue Miles	Peak Buses	Annual Operating Cost
					Weekday							Saturday			Sunday						
		Weekday	Saturday	Sunday	Early AM	AM Peak	Mid-Day	PM Peak	Evening	Late Night	Early AM	Day	Evening	Late Night	Day	Evening	Late Night				
Existing / No-build June 2014 Baseline Conditions																					
6	Second/Whitehall	5:25 am – 12:43 am	6:20 am – 12:12 am	7:20 am – 7:16 pm	20	20	20	20	30	30		30	30	30	30			19,410	179,819	4	$1,410,157
7	Glenmont	5:55 am – 12:17 am	6:25 am – 11:10 pm	8:00 am – 7:30 pm		25	25	25	35	35		35	70	70	35			14,123	130,637	3	$1,025,561
22	Albany/Troy	5:00 am - 1:52 am	6:00 am – 1:43 am	6:30 am – 1:13 am	20	10	15	10	20	30		20	20	30	30	30	30	32,516	404,862	8	$2,626,820
80	Fifth Avenue	5:45 am - 12:35 am	7:00 am – 12:35 am	6:30 am – 5:30 pm		15	30	15	60	60	60	30	60	60	60			12,175	120,437	4	$904,038
85	Troy/Waterford	5:35 am – 12:08 am	6:00 am – 12:34 am	8:45 am – 8:39 pm		20	20	20	45	45		30	30	45	45	45		22,090	254,770	5	$1,732,795
116	Mount Hope/Albany South End	6:25 am – 7:06 pm	-	-		45	45	45	-	-		-			-			3,409	26,653	1	$235,066
522	Hudson River Express	6:17 am – 6:49 am	-	-		30	-	30	-	-		-			-			2,210	37,946	2	$205,155
																	TOTAL	105,932	1,155,124	27	$8,139,592
Alternative 1: N Pearl St																					
22	Albany / Troy Local	5:00 am - 1:00 am	6:00 am - 1:00 am	7:00 am - 1:00 am	30	20	20	20	30	30	-	30	30	30	30	30	30	25,986	285,326	5	$2,001,600
80	Fifth Avenue / HVCC	5:30 am - 12:30 am	7:00 am - 12:30 am	6:30 am - 5:30 pm	-	20	20	20	45	45	-	30	45	45	40	40	60	24,229	165,279	5	$1,609,300
106	Second / Whitehall	5:30 am - 12:30 am	6:30 am - 11:30 pm	7:30 am - 7:30 pm	30	20	30	20	30	30	-	30	30	60	30	30	60	15,722	143,339	4	$1,136,200
107	Glenmont	6:00 am - 12:00 am	7:00 am - 11:00 pm	8:30 am - 7:30 pm	-	30	30	30	60	60	-	30	60	60	60	60	60	9,999	104,910	2	$758,000
522	Hudson River Express	TBD	-	-	-	3 trips	-	3 trips	-	-	-	-	-	-	-	-	-	1,667	28,346	-	$154,000
716	McCarty / Green	6:30 am - 6:00 pm	-	-	-	45	-	45	-	-	-	-	-	-	-	-	-	1,403	10,079	1	$94,400
922	Blue Line Cohoes	4:30 am - 2:30 am	5:00 am - 2:00 am	6:00 am - 1:00 am	30	10	10	10	15	30	30	15	20	30	20	20	30	39,042	442,665	7	$3,062,500
923	Blue Line Waterford																	37,472	458,439	7	$3,103,100
																	TOTAL	157,553	1,638,383	32	$11,919,100
Alternative 2: Broadway St																					
22	Albany / Troy Local	5:00 am - 1:00 am	6:00 am - 1:00 am	7:00 am - 1:00 am	30	20	20	20	30	30	-	30	30	30	30	30	30	25,986	285,326	5	$2,001,600
80	Fifth Avenue / HVCC	5:30 am - 12:30 am	7:00 am - 12:30 am	6:30 am - 5:30 pm	-	20	20	20	45	45	-	30	45	45	40	40	60	24,229	165,279	5	$1,609,300
106	Second / Whitehall	5:30 am - 12:30 am	6:30 am - 11:30 pm	7:30 am - 7:30 pm	30	20	30	20	30	30	-	30	30	60	30	30	60	15,722	143,339	4	$1,136,200
107	Glenmont	6:00 am - 12:00 am	7:00 am - 11:00 pm	8:30 am - 7:30 pm	-	30	30	30	60	60	-	30	60	60	60	60	60	9,999	104,910	2	$758,000
522	Hudson River Express	TBD	-	-	-	3 trips	-	3 trips	-	-	-	-	-	-	-	-	-	1,667	28,346	-	$154,000
716	McCarty / Green	6:30 am - 6:00 pm	-	-	-	45	-	45	-	-	-	-	-	-	-	-	-	1,403	10,079	1	$94,400
922	Blue Line Cohoes	4:30 am - 2:30 am	5:00 am - 2:00 am	6:00 am - 1:00 am	30	10	10	10	15	30	30	15	20	30	20	20	30	37,472	442,665	7	$2,985,400
923	Blue Line Waterford																	37,472	458,439	7	$3,026,200
																	TOTAL	152,282	1,638,383	32	$11,765,100
Alternative 3: I-787																					
22	Albany / Troy Local	5:00 am - 1:00 am	6:00 am - 1:00 am	7:00 am - 1:00 am	20	15	15	15	20	30	-	20	20	30	30	30	30	31,200	346,002	6	$2,482,100
80	Fifth Avenue / HVCC	5:30 am - 12:30 am	7:00 am - 12:30 am	6:30 am - 5:30 pm	-	20	20	20	45	45	-	30	45	45	40	40	60	24,229	165,279	5	$1,609,300
106	Second / Whitehall	5:30 am - 12:30 am	6:30 am - 11:30 pm	7:30 am - 7:30 pm	30	20	30	20	30	30	-	30	30	60	30	30	60	15,722	143,339	4	$1,136,200
107	Glenmont	6:00 am - 12:00 am	7:00 am - 11:00 pm	8:30 am - 7:30 pm	-	30	30	30	60	60	-	30	60	60	60	60	60	9,999	104,910	2	$758,000
716	McCarty / Green	6:30 am - 6:00 pm	-	-	-	45	-	45	-	-	-	-	-	-	-	-	-	1,403	10,079	1	$94,400
782	Manor / Vliet	6:30 am - 7:00 pm	-	-	-	30	-	30	-	-	-	-	-	-	-	-	-	765	7,436	1	$56,400
922	Blue Line Cohoes	4:30 am - 2:30 am	5:00 am - 2:00 am	6:00 am - 1:00 am	30	10	10	10	15	30	30	15	20	30	20	20	30	34,081	484,973	6	$2,823,700
923	Blue Line Waterford																	38,690	475,430	7	$2,864,300
																	TOTAL	156,088	1,737,448	32	$11,824,400

3.3 Transit Center and Station Concepts

3.3.1 UNCLE SAM TRANSIT CENTER

A key recommendation of CDTA's 2014 Transit Development Plan calls for a transit center to be located in Downtown Troy. CDTA has determined that the optimal location for such a facility is directly alongside the Uncle Sam Parking Garage on Fulton Street. This location is adjacent to the geographic center of all transit services in the City of Troy, as well as the economic and cultural center of the city.

The transit center would consist of the following basic elements:

- 1,000 to 1,500 square feet
- Fully enclosed, climate-controlled waiting area
- Exclusive bus access
- Enhanced rider information/real time display
- Sales / customer service outlet
- Level boarding
- BRT branding
- Bathrooms for drivers and possibly for the public

In addition to the above elements, the transit center will be sized to accommodate the proposed BRT and other existing transit service currently at the on-street stops that would be relocated to the new facility.

Conceptual Rendering from Transit Center Boarding Area.

Conceptual Rendering from Corner of 3rd St & Fulton St.

A conceptual cost estimate was developed for the concept and is shown below. The total project cost was estimated at between $2.5 million and $3.0 million.

Description	**Cost**
Stations - Site Work	$340,200
Stations – Transit Center, Canopy, and Amenities	$1,120,000
Construction Sub-Total	**$1,460,200**
Unallocated Contingency (30%)	$438,060
Mobilization (4%)	$75,930
Sub-Total	**$1,974,190**
Professional Services (30%)	$592,257
CONCEPTUAL TOTAL	**$2.5M TO $3.0M**

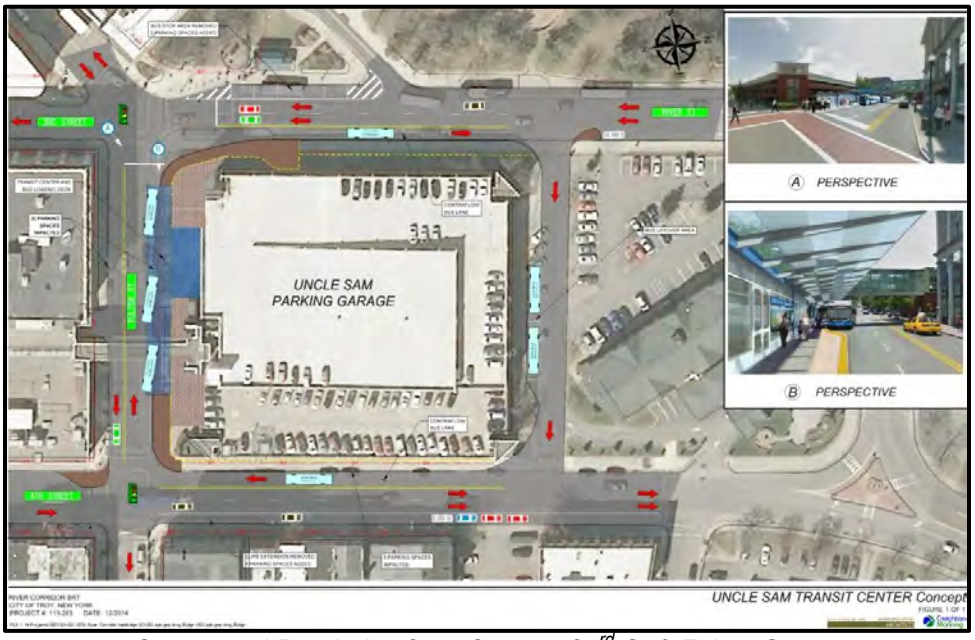
In order for the transit center to effectively serve passengers, the doors of CDTA buses must face the indoor waiting area, so that passengers can walk outside and immediately board the bus without having to cross the street. Within the current one-way street network surrounding the Uncle Sam Garage, the left sides of buses would face the transit center.

To orient transit traffic in the correct direction, this project necessitates a single contra-flow bus lane along the frontages of the garage and transit center on 4th Street, Fulton Street, and River Street, along with changes to the traffic signal infrastructure at the corresponding intersections.

Traffic on Fulton Street will be maintained in the eastbound direction; therefore, significant traffic related impacts are not anticipated. Creating the contraflow bus lanes will require removal of some

parking and minor lane striping adjustments (narrowing); however, impacts to traffic capacity are not anticipated.

As a result of implementing contraflow bus lanes and providing space on Fulton Street for buses, there is a net loss of approximately 15 parking spaces in the area. There are also parking impacts to the Uncle Sam Parking Garage property where the transit center has been located along with the bus layover area to the north of the garage. Parallel parking has been restored in the concept adjacent to the existing bus stop locations as well as the existing bus layover area on River Street along Riverfront Park.



Conceptual Rendering from Corner of 3rd St & Fulton St.

3.3.2 DOWNTOWN ALBANY INTERMODAL CENTER

An intermodal center or transit center in Downtown Albany is not part of this project. However, this facility is being considered as a separate project that the River Corridor BRT would service. This project is described here for information only. The Downtown Albany Intermodal Center will provide a central station for all CDTA BRT, express, and local buses, as well as intercity bus lines and taxis, bicycles, and shuttles. It is being planned to include:

- Central climate controlled waiting room
- Restrooms
- Bus bays for local and intercity buses
- Ticket offices
- Food and sundries
- Attractive architecture
- Parking
- Real time info
- Bicycle parking
- Taxi stand and auto drop off

The center will serve as the primary hub for public transportation services in the Capital Region. Passengers can transfer between BRT, express, and local routes, shuttle service to the Rensselaer Amtrak station, and intercity bus services to locations throughout the Northeast. The center will have at least 12 intercity bays and 12 local bays, making it one of the largest intermodal stations in the state. The facilities provided will make taking transit to, from, or via downtown Albany a comfortable and pleasant experience.

The primary proposed location for the center is the current site of the Greyhound bus terminal at the corner of Hamilton and Dallius Streets. Several other locations are possible and a final decision has not been made. Wherever it is located, the center would form a key element in the revitalization of downtown.

3.3.3 KENWOOD/PORT PARK AND RIDE

The southern terminus of the River Corridor at Kenwood/Port station will be a park-and-ride facility at the intersection of South Pearl Street (NY Route 144) and South Port Road. It will provide a place for buses to turn around, a passenger waiting area and shelter, and parking for approximately 50 vehicles. The station will provide a convenient place to park for commuters from the south and southwest of downtown Albany in the Town of Bethlehem and beyond.

The station is also accessible to certain areas of the Port of Albany, although pedestrian infrastructure on roadways is limited. A potential shuttle provided by the Port of Albany or other entity could connect employees directly to major destinations within the Port.

3.3.4 ROUTE 378 PARK-AND-RIDE

NY Route 378 crosses the River Corridor approximately halfway between Albany and Troy, providing easy access to communities to the east and west, including Loudonville, South Troy, Colonie, and Menands. A park-and-ride station is planned here that will include up to 100 spaces, passenger waiting areas in both directions with full BRT shelters and amenities, and an improved crosswalk across Broadway.

3.3.5 TYPICAL STATION DESIGN AND LOCATION

Station locations were determined based on ridership, station spacing, location of major destinations, and the layout of local street patterns, which vary by alternative, as described in section 3.1.

Route 905 BusPlus Station

Typical station design will provide safe, attractive, and accessible waiting environments and pedestrian connections for all transit users. The style of shelters and amenities will be similar to those used on the Red Line. Utilizing the existing station design will create consistency across the BusPlus system while minimizing infrastructure design and maintenance costs.

Branding for the River Corridor BRT will be consistent with the Route 905 BusPlus in the NY5 Corridor, except using blue in place of red to identify the River Corridor. Consistent branding and design will project the BRT image to riders and identify BRT as a unique part of CDTA system. In

certain locations, unique elements that fit local neighborhood character while maintaining basic branding elements may be included.

Stations will include the following:

- Partially enclosed bus shelters, providing riders with a well-lit waiting area and protection from the elements
- Signage clearly displaying the name of the station, BRT and local route information, a map of the local area, and other important information for new and regular riders
- Real time passenger displays that provide accurate bus arrival times with push-button activation for audio for visually impaired riders
- A pylon sign that exhibits the branding and station name
- Security cameras providing surveillance of the station and surrounding area
- Bicycle racks to encourage bicycle transfers
- Benches and trash cans

3.4 Street and Signal Concepts

Roadway Priority Measures include Transit Signal Priority (TSP) and Queue Jump Lanes, and can improve bus travel times and reliability, and ultimately make transit a more competitive and attractive alternative to the personal automobile. This section documents the methodology for determining where TSP and Queue Jump Lanes are being considered along the River Corridor.

3.4.1 TRANSIT SIGNAL PRIORITY

TSP is an operational improvement designed to reduce traffic related delays for approaching buses. It is accomplished through improved hardware and detection systems that allow communications between an approaching bus and a traffic signal. The signal may then adjust green time (conditionally or unconditionally) to minimize delay to the approaching transit vehicle. Conditional TSP only assigns priority if the bus is behind schedule; for example, whereas unconditional TSP assigns priority every time a bus is present. Conditional TSP minimizes disruption to general traffic and is the recommended implementation strategy, and is proposed when buses are running more than 2 minutes late. Conditional TSP is also the strategy that CDTA currently uses on the Route 905 BRT corridor.

Guidance

Research shows that TSP is typically applied where there is significant traffic congestion, but not over-saturation along a roadway. Although specific agencies have slightly different delay criteria, there is general agreement that TSP is not needed at intersections where there is little or no recurring delay, nor excessive delay.

In addition to congestion, turning movement locations can be a good location for consideration of TSP, because of the increased potential for delay typically experienced by turning vehicles, especially left turns. CDTA's Route 905 BRT project also considered traffic volumes and intersection and traffic signal characteristics as part of the TSP assessment (i.e. complex/high volume intersections). TSP has been found to be most effective with transit stops located on the far side of signalized intersections.

Methodology

Based on the above guidance, a peak hour travel time study was completed along the corridor, including three trips in each direction. Average stopped delays were reviewed as summarized in the Appendix G. The delay data showed that average delays are typically in the LOS C or better range, and that very few intersections experienced LOS D. As a result, LOS C locations (20 to 35 seconds of delay) were identified initially as potential candidates for TSP.

Intersection LOS information was researched from available studies and was considered, along with overall operating speeds (including stopped delay), traffic signal cycle length, and side street splits (the potential red time that a bus would be subject to if it arrived at the beginning of red).

Peak hour traffic volumes were reviewed from the Capital District Transportation Committee's (CDTC) Systematic Traffic Evaluation Program (STEP) Model, since low volume side streets would not justify TSP. Roadways not coded in CDTC's Model and side streets with traffic volumes less than 90 vehicles per hour were classified as Low (L) volume. This equates to less than two vehicles per an average 60 to 80 second traffic signal cycle (typical along the corridor), and a resulting short side street signal phase. Finally, approximate age of the traffic signal was also considered as an indication of the need to upgrade the signal to meet current standards and accommodate TSP.

It should be noted that there are 13 traffic signals located within the City of Troy that were not included in the volume assessment due to the existing traffic signal coordination plan, and minimum required pedestrian crossing times in the City's grid system that TSP would negatively impact.

Based on the above criteria and corridor drives with the project Team, TSP and signal upgrades are being considered at 38 locations as documented in the memorandum in Appendix G. The overall goal is to save time at congested intersections and improve on-time performance.

3.4.2 QUEUE JUMP

Queue Jumps are bus lanes combined with signal phasing that provide preference to approaching buses typically at congested intersections. The queue jump lane enables a bus to proceed through an intersection at the start of green ahead of other vehicles, thus decreasing overall bus delay. Queue jump lanes can be accomplished through either shared or exclusive lanes. CDTA currently operates bus service through queue jump lanes located at the intersection of Nott Terrace/Veeder Avenue with State Street in Schenectady, the intersections of Wolf Road and New Karner Road with Central Avenue in Colonie, and at the Federal Avenue and River Street intersection in Troy.

Queue jump intersections are identified in a similar fashion to TSP locations. Queue jump intersections should experience high traffic volumes and high levels of delay. They should be able to accommodate a shared queue jump lane via an existing lane, or have the physical space available to add an additional lane. Near side stops generally make more sense for queue jump lanes.

The purpose of this assessment is to document the impact and benefit of including queue jumps at the following three intersections:

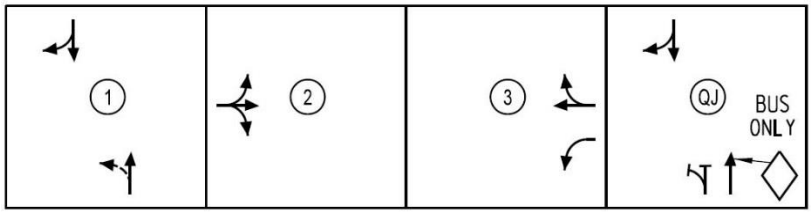
- South Pearl Street/1st Street/Green Street
- Broadway/I-787 Connector Road
- Federal Street/4th Street/King Street

Traffic volumes were obtained from peak hour traffic counts conducted during February 2014 specifically for this analysis and other studies where data was available, and adjusted to represent

2014 conditions. Traffic simulation models were then developed to show operations at each of the intersections with and without the queue jump phase and/or lane as shown in Table 10.

3.4.2.1 South Pearl Street/1st Street/Green Street (City of Albany)

This queue jump includes construction of a separate northbound queue jump lane as shown on the attached concept plan. The queue jump was modeled as a six-second northbound South Pearl Street through phase that will run in combination with the typical southbound phase, since there are no southbound left-turn movements that would conflict with queue jump operations at this intersection. This phase would be called after the westbound Green Street phase and before the northbound/southbound through phase on South Pearl Street.

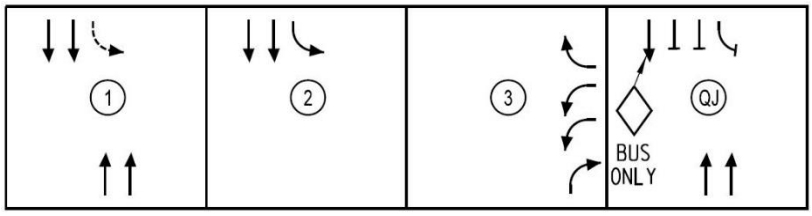


South Pearl Street/1st Street/Green Street Signal Phase Sequence

Table 10 shows that the intersection will experience a negligible increase in overall delay from the proposed queue jump phase. One lane group level of service degradation is shown in the table and is considered inconsequential. Buses would bypass the northbound traffic queue during the AM and PM peak hours.

3.4.2.2 Broadway/I-787 Connector Road (Village of Menands)

The proposed queue jump at this intersection would involve the conversion of the existing southbound curbside through lane into a "Bus Only" queue jump lane that would also provide a dedicated area for a bus stop as shown on the concept plan. The proposal would involve the relocation of the existing transit stops on Broadway to the northwest and northeast corners of the Broadway/I-787 Connector Road intersection and the installation of a crosswalk on the north leg of the intersection. A six-second southbound Broadway through phase was modeled to replicate the queue jump which allows buses to advance past through vehicles immediately prior to the southbound phase. The queue jump phase will run in combination with the typical northbound phase since there are no northbound left-turn movements that would impact queue jump operations at this intersection. This phase would be called after the westbound I-787 Connector Road phase and before the northbound/southbound through phase on Broadway as shown below.

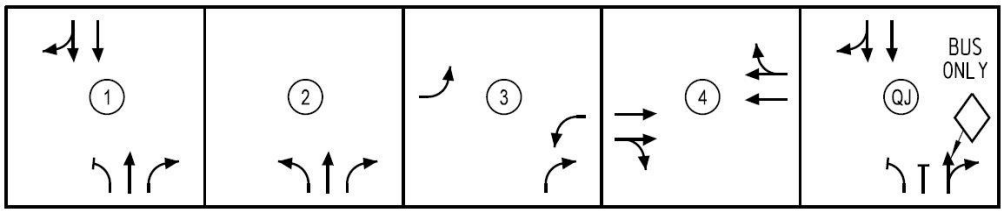


Broadway/I-787 Connector Road Signal Phase Sequence

Table 10 summarizes the results of the analysis and shows that the intersection will experience negligible increases in overall delay and levels of service will remain unchanged. The benefit to buses is that they would have the opportunity to enter the intersection ahead of southbound queued traffic and more easily change lanes to continue south on Broadway.

3.4.2.3 Federal Street/4th Street/King Street (City of Troy)

The proposed queue jump at this intersection would occur from the existing northbound right-turn lane making it a shared queue jump/right-turn lane as shown on the concept plan. The queue jump was modeled as a six-second northbound 4th Street right-turn phase that will run in combination with the typical southbound phase since there are no southbound left-turn movements that would impact queue jump operations at this intersection. This phase would be called after the eastbound/ westbound Federal Street phase and before the northbound/southbound through phase on 4th Street as shown below.



Federal Street/4th Street/King Street Signal Phase Sequence

Table 10 summarizes the results of the analysis and shows that the intersection will potentially experience some changes in levels of service, notably the northbound right-turn lane from LOS A to LOS B, and the overall intersection from LOS C to LOS D. Overall delays at the intersection would increase by less than a second. The projected LOS change is largely because the intersection is currently operating near the LOS C/D threshold. The benefit to buses is that they would save approximately ten (10) to twenty (20) seconds at the intersection from the opportunity to bypass approximately 130 to 235-feet of queued northbound traffic during the AM and PM peak hours.

Table 10: Level of Service Summary

Intersection		AM Peak Hour				PM Peak Hour			
		Existing		With Queue Jump*		Existing		With Queue Jump*	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
S Pearl St / 1st St/Green St									
1st St EB	LR	C	22.2	C	23.6	D	36.0	D	36.0
Green St WB	L	B	12.4	B	13.7	B	20.0	C	20.1
	TR	A	9.0	A	9.8	B	10.5	B	10.5
S Pearl St NB	LT	B	15.5	B	16.6	C	20.0	C	21.5
S Pearl St SB	TR	B	15.5	B	15.1	C	25.6	C	25.5
	Overall	B	13.8	B	14.7	C	21.0	C	21.2
Broadway/I-787 Connector									
I-787 Connector WB	L,L	B	11.9	B	11.9	B	15.5	B	16.1
	R	A	9.8	A	9.8	B	14.5	B	15.0
Broadway NB	T,T	C	21.1	C	21.1	B	14.4	B	14.9
	R	A	0.3	A	0.3	A	1.3	A	1.3
Broadway SB	L	B	14.3	B	16.3	B	12.0	B	14.2
	T,T,T	B	13.2	B	15.4	A	5.1	A	6.3
	Overall	B	11.3	B	11.8	A	8.2	A	9.0
Federal St/4th St/King St									
Federal St EB	L	D	41.5	D	41.5	D	40.1	D	40.1
	T,TR	D	37.7	D	37.7	C	33.9	C	33.9
Federal St WB	L	D	44.0	D	43.9	D	37.8	D	37.9
	T,TR	C	24.3	C	24.3	C	33.0	C	33.0
4th St NB	L	D	41.8	D	41.9	E	73.1	E	72.9
	T	C	23.5	C	24.9	C	24.7	C	27.8
	R	A	6.9	B	10.7	A	7.3	B	10.4
4th St SB	T,TR	D	38.9	D	36.4	D	36.2	D	36.2
	Overall	C	34.9	D	35.3	C	34.4	D	35.2

Key: NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound intersection approaches
L, T, R = Left-turn, Through, and/or Right-turn movements
LOS = Level of Service
Delay = Average delay in seconds per vehicle
* Delay is a weighted average of Null volume conditions with the queue jump cycle.

This traffic assessment finds that the queue jump operations and signal improvements are feasible at three areas with small changes in delay to general traffic, while providing travel time benefits to buses.

3.4.3 BUS LANES

The feasibility of including exclusive bus lanes along the River Corridor was explored, particularly for the section of Broadway (Route 32) from Clinton Avenue in the City of Albany to the Watervliet City line. The idea for bus lanes in this section was also identified in the 2009 *Assessment of Capital Region North/South Corridors to Improve Access to Emerging Employment Centers,* known as the "North-South Corridor Study". Bus lanes in this area are generally not needed to get around traffic congestion, but rather to influence land development and as a building block toward LRT. Bus lanes also ensure that travel times will remain consistent as traffic volumes grow along with increased economic development.

A detailed assessment for feasibility of bus lanes along the River Corridor was carried out, included here as Appendix H. The assessment showed that although Broadway (Route 32) is perceived as having excess pavement width, bus lanes cannot be provided within the existing curbs for the majority of the corridor. Some sections of bus lanes are more physically feasible than others, and

require further study and buy-in from users, agencies and the public. Potential impacts/constraints to be addressed include loss of parking, three (3) bridge structures, roadway widening including potential modifications to the Route 378 interchange, changes to bicycle accommodations, traffic operations, and right-of-way impacts, among others. Although bus lanes are not being pursued at this time, the potential for bus lanes should be retained for future consideration.

3.5 Cost Estimates

Cost estimates were developed for each alternative for an anticipated build year. The costs outlined in Table 11 are the total costs according to FTA cost categories, which include construction, ROW, vehicle costs, professional services, and contingencies. Operating and maintenance costs are accounted for separately. Table 11 shows that the total project costs range from approximately $28.0M to $36.5M, depending on the Alternative. More detailed information about the cost estimates is included in Appendix D.

Table 11: Summary of Probable Costs (Millions of dollars)

Cost Category	Alternative			
	Null	1	2	3
10 Guideway & Track Elements (route miles)	$0.00	$0.00	$0.00	$0.00
20 Stations, Stops, Terminals, Intermodal (number)	$0.00	$4.70	$4.70	$3.92
30 Support, Facilities: Yards, Shops, Admin Bldgs	$0.00	$0.00	$0.00	$0.00
40 Sitework & Special Conditions	$0.00	$7.70	$7.40	$5.37
50 Systems	$0.00	$1.79	$1.04	$0.71
Construction Subtotal (10 - 50)	**$0.00**	**$14.19**	**$13.13**	**$10.00**
60 ROW, Land, Existing Improvements	$0.00	$0.03	$0.03	$0.02
70 Vehicles (9)	$0.00	$12.75	$12.75	$11.25
80 Professional Services (applies to Cats. 10-50)	$0.00	$5.47	$5.06	$3.86
Subtotal (10 - 80)	**$0.00**	**$32.44**	**$30.98**	**$25.12**
90 Unallocated Contingency	$0.00	$4.05	$3.75	$2.85
Subtotal (10 - 90)	**$0.00**	**$36.48**	**$34.72**	**$27.98**
100 Finance Charges	$0.00	$0.00	$0.00	$0.00
Total Project Cost (10 - 100)	**$0.00**	**$36.48**	**$34.72**	**$27.98**
Local Match (20%)	**$0.00**	**$7.30**	**$6.94**	**$5.60**

4. ALTERNATIVES EVALUATION

This section summarizes the analysis of the alternatives and the initial environmental screenings. The analysis shows that the proposed BRT alternatives have minimal impacts and substantial benefits by addressing the project's purpose and need.

4.1 Meeting FTA Guidelines and Purpose and Need

The River Corridor BRT Project will be pursuing FTA Small Starts program funding. This plan will form the main part of an application to enter the Project Development phase. The Small Starts program is highly competitive, and CDTA is confident that this project will score highly on all Small Starts selection criteria, including mobility improvements, environmental benefits, congestion relief, cost-effectiveness, economic development, land use, current financial condition, commitment of future funds, and financial capacity. Some of these criteria may be the subject of warrants, but all of them will be the subject of more detailed development. This plan forms a foundation for further planning and analysis in the Project Development phase.

The three BRT alignment alternatives focus on connectivity between Waterford, Cohoes, Troy, Watervliet, and Albany. Through the creation of new, limited-stop services with enhanced stations, frequent and consistent service throughout the day and evening, the alternatives provide a blueprint for improved travel time and reliability, support for local and regional economic development initiatives, and increased mobility options for residents, workers, students, and visitors in the corridor. The BRT program builds on CDTA's vision for 40 miles of BRT in the Capital Region, as outlined in Chapter 1.

Stated project needs include improved mobility for transit dependent populations, improved travel time and reliability between major activity centers, reduced parking demand and associated costs of expanding limited parking capacity in downtowns, and support for redevelopment and revitalization that is transit-supportive. The BRT alternatives developed in this study provide improved connectivity within a critical activity corridor, with a view to future development and integration of transit as a vital means of mobility in the region, and do so at an affordable cost to the region and in a reasonable timeframe.

4.2 Environmental Impact Information Regarding the Proposed Action

The project will be required to follow the requirements of the National Environmental Policy Act (NEPA) and the State Environmental Quality Review Act (SEQR). The anticipated project classification is a NEPA Class II Categorical Exclusion (CE) per Code of Federal Regulations (CFR) Title 23 Section 771.118(c) and a SEQR Type II Action. The preliminary analysis of environmental impacts is summarized in Table 12. More details about the Initial Environmental Screening are included with this report in Appendix E. Based on the results of the environmental review it is anticipated that the proposed project will have no adverse effect on cultural/historic resources, but may affect endangered species, pending correspondence with review agencies.

Table 12: Summary of Environmental Impacts

Environmental Impact	Anticipated Finding
Land Use and Zoning	Easements or acquisitions required.
Traffic	No adverse effect
Aesthetics	No adverse effect
Air Quality	Regulate during construction. Positive impact upon completion.
Coastal Zone	No effect
Environmental Justice	No adverse effect
Floodplains	No adverse effect
Hazardous Materials	Potential effect.
Noise and Vibration	No effect
Navigable Waterways	No effect
Resources: Endangered Species	May affect; concurrence may be required by FTA
Resources: Archeological	No adverse effect
Resources: Historic Properties and Parklands (Section 106)	No adverse effect
Water Quality	No adverse effect; SPDES permit required
Wetlands	No effect
Construction Impacts	No adverse effect
Cumulative or Indirect Impacts	Not anticipated
Property Acquisition	No adverse effect

It is anticipated that the project will qualify as a “C” List Categorical Exclusion. As project development progresses, further assessment of environmental issues and properties may be necessary, as required by FTA.

4.3 Public Involvement

An extensive program of public outreach was conducted, including five (5) public meetings throughout the corridor and over 20 meetings with neighborhood groups, elected officials, and stakeholders. The public meetings were held in the South End of Albany, North Albany, Watervliet, downtown Troy, and Lansingburgh.

Attendees were asked to fill out a short survey expressing their preferences related to the alternatives. The majority (nearly 70%) supported **Alternative 2**. CDTA also adjusted the service plan to keep Route #522 between Cohoes and Albany, which had previously been proposed for elimination.

Table 13 provides a summary of the comments and questions that were received from the public at the five public meetings:

Table 13: Public Comments Summary

Comment Excerpt	Comment Category
South End (held on June 24, 2014)	
Impact on fare structure	
Change in service of Route 22	Reduced frequency on current routes
Connectivity to Empire State Plaza	BRT routing
Watervliet (held on June 30, 2014)	
Proposed bump-out on 2nd is a major concern	Safety concerns
Time savings for proposed BRT	BRT benefits
Concern about cutting local services	Reduced frequency on current routes
Connectivity to Rensselaer Rail Station	BRT routing
Lansingburgh (held on July 1, 2014)	
Space for bikes on buses	BRT features
BRT shelter sizes could be reduced	BRT features
Stop at 112th not preferred	BRT routing
Congress/3rd area is a congested stop, Will BRT provide relief?	BRT benefits
Downtown Troy (held on July 8, 2014)	
Express Route 522 should not be cut	Reduced frequency on current routes
Service for #85 should not be reduced	Reduced frequency on current routes
Need more stops in Waterford	BRT routing
Need shelters at existing bus stops	BRT features
Use articulated buses for local service.	BRT features
Impact on para-transit service	Reduced frequency on current routes
Concerned about use of space dedicated to bike facilities for BRT	BRT routing
Connectivity to Saratoga	BRT routing
Use hybrid approach– connect rural routes to BRT	BRT routing
Bigger buses may not fit in many areas	BRT features
North Albany (held on July 10, 2014)	
Happy with Alternative 2	BRT routing
Impact on fare structure	
Concerned about service cutbacks on current routes	Reduced frequency on current routes
Impact on para-transit service	

4.4 Screening Criteria

Evaluation criteria are used to rank the alternatives based on their ability to meet the goals of the project. The following criteria were used:

- Potential for Transit Oriented Development (TOD)
- Impact on Local Services
- Capital Cost
- Operating Cost
- Connection to Major Destinations
- Ridership Growth Potential
- Reduced Travel Time
- Improved Reliability
- Placemaking and Pedestrian Access
- Adaptability of Roadway for BRT Features

The alternatives were described in Chapter 3, including individual components that would help determine the performance of each alternative in the criteria above. Evaluation of the three alternatives based on the screening criteria is described below.

4.5 Recommended Locally Preferred Alternative (LPA)

While the three alternatives developed achieved similar results in broad terms, each presents advantages and disadvantages. The differences between the three alternatives related primarily to the impact on local bus services within the corridor, potential for economic development, improved access between communities along the corridor, the level of access between major activity centers, and future potential for bus lanes.

<u>Alternative 1: via North Pearl Street</u>

This alternative provides good connectivity along the River Corridor, travelling through several transit-dependent communities, including the South End, downtown Albany, North Albany, Watervliet, downtown Troy, and North Troy. There is very little undeveloped land along this corridor, and consequently very little scope for new TOD. Travelling along North Pearl Street allows maximum access to North Albany destinations, but may adversely impact travel time and reliability. North Pearl is a narrow two-lane roadway, used by most of the traffic in the area. The narrow right-of-way makes the possibility of adding bus lanes in future iterations of this project fairly remote. There are also multiple aging traffic signals that would need to be completely replaced to allow for TSP, increasing capital costs.

The frequency of Route 22 would be reduced to 20 to 30 minute headways and Route 80 would be reduced to 20 to 45 minute headways throughout the day. Routes 6 and 7 would be restructured as neighborhood feeder routes, providing last mile connectivity to the south and west of Albany. Frequency on these routes would be reduced to 20 to 30 minutes. Services along the Express Route 522 would be reduced to about 3 trips per day per direction. Route 116 will be restructured as Commuter Route 716, with mid-day service eliminated. Peak service on this route will be relatively unchanged.

Alternative 2: via Broadway

The difference between Alternative 1 and 2 is the routing in North Albany. This alternative travels along Broadway in North Albany, providing good connectivity within the River Corridor, while traveling on streets more conducive to large vehicles and higher speeds. There is substantial land available along Broadway, which has the potential to transform into transit oriented communities, improving the chances for ridership growth in the future. There is also the potential to introduce bus lanes along Broadway in the future, which can reduce travel time considerably through this section and improve reliability.

Similar to Alternative 1, in this alternative, the frequency of Route 22 would be reduced to 20 to 30 minute headways and Route 80 would be reduced to 20 to 45 minute headways throughout the day. Routes 6 and 7 would be restructured as neighborhood feeder routes, providing last mile connectivity to the south and west of Albany. Frequency on these routes would be reduced to 20 to 30 minutes. Services along the Express Route 522 would be reduced to about 3 trips per day per direction. Route 116 will be restructured as Commuter Route 716, with mid-day service eliminated. Peak service on this route will be relatively unchanged.

Alternative 3: via I-787

Alternative 3 combines the features of Express Route 522 with the proposed BRT corridor. It uses I-787 to travel between downtown Albany and downtown Troy. This provides major travel time benefits for the Albany-Troy sector. However, it fails to connect a large proportion of the transit dependent populations in North Albany, Menands, and Watervliet, as it completely bypasses most of these communities by traveling on a limited-access highway. The communities it travels through, in Albany and Troy, are fairly dense, leaving little scope for TOD.

In this alternative, the Express Route 522 would be discontinued or rather replaced with the BRT. The frequency of Route 22 would be reduced marginally to 15 to 30 minute headways and Route 80 would be reduced to 20 to 45 minute headways throughout the day. Routes 6 and 7 would be restructured as neighborhood feeder routes, providing last mile connectivity to the south and west of Albany. Frequency on these routes would be reduced to 20 to 30 minutes. Route 116 would be restructured as Commuter Route 716, with mid-day service eliminated. Peak service on this route would be relatively unchanged. An additional Commuter Route would be introduced (Route 782) to provide connectivity to northern and western Cohoes, running at 30 minute headways during peak periods.

4.5.1 RECOMMENDED LOCALLY PREFERRED ALTERNATIVE

Based on a comparative evaluation, Alternative 2 - Broadway is identified as the Locally Preferred Alternative (LPA) for the following reasons:

- Best potential to support economic development and transit oriented development.
- Best integration of existing local services without vast increases in resources required for the overall system.
- Best integration of transit priority infrastructure and connectivity to important transit dependent neighborhoods and destinations.
- Best combination of travel time savings and connectivity.

Table 14 below summarizes the relative rating of each alternative. A high score of 3 indicates the best performance; a score of 2 indicates satisfactory performance; and 1 indicates poor performance on that specific parameter. A score of zero (0) indicates the worst performance on the parameter. Overall, Alternative 2 compares favorably, with the highest possible rating for 4 measures, and satisfactory ratings for the rest. Notably, this alternative offers the best balance between the needs to improve travel times and the need to connect to maximum destinations.

Table 14: Alternative Comparison

Screening Criteria	Alternative 1 – N. Pearl	Alternative 2 – Broadway	Alternative 3 – I-787
Potential for TOD	1	3	0
Impact on Local Services	2	2	2
Capital Cost	1	2	3
Operating Cost	2	2	1
Connection to Major Destinations	3	2	0
Ridership Growth Potential	2	3	1
Reduced Travel Time	1	2	3
Improved Reliability	1	3	3
Placemaking & Pedestrian Access	3	2	1
Adaptability of Roadway to BRT Features	1	3	3
Cumulative Score	**17**	**24**	**17**

5. IMPLEMENTATION AND FINANCE PLANS

5.1 Construction Phasing and Service Rollout

Capital investments are needed for the roadway priority measures, stations, and new buses to begin operating the recommended LPA, which is planned for 2018 or later. These investments will require time to coordinate project development, design, and community input that may prolong the schedule for service rollout. Implementing an effective base BRT service is possible by staging the improvements as part of a building block approach. This approach proposes to purchase buses, build key stations (including branding elements at all locations), and begin implementing roadway priority measures while BRT service is introduced, then complete remaining stations and roadway priority measures while BRT is running. Phase I would include smaller scale stations, including shelters, amenities and TSP on capable signals. More significant priority measures or stations that require right-of-way would be completed during Phase II.

5.2 Land Acquisitions and Relocations Required

Construction of BRT station improvements outside of the highway boundary is a potential. It is understood that satisfactory continuing control of the asset is required. The preferential order in which land acquisition will be sought for proposed BRT stations is: use of easements; lease of property; market rate purchase, and eminent domain with the latter being used only as a last resort. Any takings will follow the procedures set out in the federal “Uniform Relocation Assistance and Real Property Acquisition Policies Act.”

There are no displacements and relocations anticipated as part of the proposed project. The areas adjacent to the proposed stations range from commercial to residential land use. Sensitive land use impacts are not anticipated. A table of anticipated right-of-way acquisitions is included in Appendix E.

5.3 Financial Plan

This section describes the financial plan and feasibility of affording the capital and operating costs of the LPA, as well as the sources of funds and the cash flow requirements of the project.

5.3.1 EXPECTED FINANCING

The estimated capital cost by project element is shown in Section 3.5 and indicates that the overall estimated project cost for the LPA is $34.73 million. Partnerships are being explored with corridor stakeholders to share in the local funding.

The anticipated financing would be from three sources. These are the Federal Transit Administration, State government, and CDTA and its partners. CDTA anticipates that federal financing through the Small Starts (Section 5309) program would cover 80% of the project cost. The NYSDOT manages a State Dedicated Fund for transit capital projects. The NYSDOT share of costs for this project would be 10% of the total project cost. CDTA and local stakeholders would cover the remaining 10% of the cost.

CDTA was awarded $2.05 million in October 2014 under the Transportation Alternatives Program (TAP) created by Moving Ahead for Progress in the 21st Century (MAP-21). The funding goes towards improvements in pedestrian infrastructure listed below at key intersections and station locations:

- Replacing or adding sidewalks to facilitate pedestrian mobility;
- Installing protected street crossings, high visibility crosswalks, pavement markings and signs;
- Use of traffic calming techniques for the benefit of pedestrians and bicyclists;
- Providing sidewalk modifications related to transit stations; e.g. curb extensions; and
- Installing or upgrading pedestrian signal accommodations to latest standards (e.g. countdown timers).

This funding was identified to serve an independent utility for existing transit service, but would supplement future BRT implementation.

5.3.2 TRANSIT OPERATIONS

Section 3.2 describes the operating cost of the three alternatives. Each of these was compared to the baseline level of operating cost as illustrated in that section. Annual operating cost increases for the LPA were shown to be $3,625,508. This estimated operating cost increase is within 4.6% of CDTA system-wide operating budget of $78.4 million in the fiscal year between April 1, 2014 and March 31, 2015. There is a presumption in the Small Starts federal financing criteria that increases in operating cost of less than 5% are sustainable.

Increases in operating cost will be partially offset by increases in passenger revenue. Other sources of operating funds will be CDTA's regular funding streams and stakeholders in the corridor.

5.4 Summary and Next Steps

BRT will bring much improved transit service to the River Corridor, connecting downtowns, residential neighborhoods, shopping districts, educational institutions, and other key destinations. BRT will improve reliability, reduce travel times, and shorten wait times, while expanding the network of transit service for transit dependent riders.

From here, this document will be submitted to the FTA with an application to enter the Small Starts program. CDTA intends to seek Section 5309 funds from the FTA to help pay for the capital cost of the project. The next phase of work will develop plans for the LPA to the level of detail necessary to be evaluated and rated on the required criteria. After this is completed, the FTA will make a decision on the level of funding that they will provide.

APPENDIX A: ADOPTED RESOLUTIONS OF LOCALLY PREFERRED ALTERNATIVE

CAPITAL DISTRICT TRANSPORTATION AUTHORITY
RESOLUTION NO. 32 - 2014

Approval of Locally Preferred Alternative for River Corridor BRT

WHEREAS, the Capital District Transportation Authority (the "Authority") is charged by Public Authorities Law section 1304 with the development and improvement of services within the Capital District, and

WHEREAS, the Authority has completed and endorsed the results of a River Corridor Bus Rapid Transit (BRT) Conceptual Design Study, and has conducted an Alternatives Analysis, and

WHEREAS, the Authority has worked with the FTA and local stakeholders to evaluate the potential alternatives for the corridor, and

WHEREAS, the evaluation process has resulted in the designation of a Locally Preferred Alternative for the River Corridor BRT route, which includes a specific route, service plan and station locations, and

WHEREAS, the Authority now desires to endorse the Locally Preferred Alternative, which shall be submitted to the Capital District Transportation Committee and included in the Long Range Regional Transportation Plan.

NOW, THEREFORE, IT IS RESOLVED AS FOLLOWS:

1. The Authority hereby endorses the Locally Preferred Alternative, and authorizes its submission to the Capital District Transportation Committee for inclusion in the Long Range Regional Transportation Plan.
2. The Authority hereby authorizes the Locally Preferred Alternative to be submitted to the FTA for entrance into the Project Development phase of the Small Starts funding program.
3. The Chief Executive Officer is hereby authorized to execute the required documents.
4. This Resolution shall take effect immediately.

CERTIFICATION

The undersigned, duly elected and acting as Secretary of the Capital District Transportation Authority, certifies that the foregoing is a true and correct copy of a resolution adopted at a legally convened meeting of the Capital District Transportation Authority held on the 24th day of September, 2014.

Dated: September 24, 2014

Joseph M. Spairana, Jr., Secretary

Memorandum

September 18, 2014

To: Chairman, Planning and Stakeholder Relations Committee
Members, Planning and Stakeholder Relations Committee

From: Christopher Desany, Vice President of Planning and Infrastructure

Subject: Approval of Locally Preferred Alternative for River Corridor BRT

Overview:
The Capital District Transportation Authority (CDTA) is committed to providing cost effective transit service across the Capital Region. The implementation of a 40-mile Bus Rapid Transit (BRT) network along three high ridership corridors is the centerpiece of these efforts. The BusPlus Red Line runs along NY Route 5 connecting Albany and Schenectady and resulted in a ridership increase above 20% since its April 2011 implementation. CDTA has developed plans to expand BRT services along the Washington/Western Corridor (Purple Line) between Downtown Albany, the University at Albany, and Crossgates Mall; and the River Corridor (Blue Line), between Albany, Troy, and a number of Hudson River communities.

The designation of the River Corridor BRT Locally Preferred Alternative (LPA) follows a federally prescribed Alternatives Analysis (AA) process. CDTA engaged in the AA process by working closely with the Federal Transit Administration and local stakeholders. This process evaluated alternatives to improve transit service along the corridor for existing businesses, residences, and community institutions. It considered engineering constraints, costs, ridership, operational concerns, environmental impacts, and public acceptance of the project.

This process identified Alternative 2: BRT via Broadway as the Locally Preferred Alternative, with a specific route, service plan, and station locations. CDTA engaged in a public feedback program with customers and stakeholders, in which this alternative was overwhelmingly preferred over others. Alternative 1 was via North Pearl Street, and Alternative 3 would use I-787.

This authorization will designate the LPA for submission to the FTA. The Capital District Transportation Committee (CDTC), the federally-designated Metropolitan Planning Organization for the Capital District, has endorsed the LPA and included it in their regional transportation plan pending CDTA approval. This step is necessary for the project to be eligible for federal funding.

Committee Action:
Staff recommends that the Locally Preferred Alternative for River Corridor BRT be endorsed by the Board. Staff also recommends authorization to submit the LPA to the FTA for entrance into the Project Development phase of the Small Starts funding program.

Copy: Chief Executive Officer
Director of Planning
Senior Planner

ADOPTED RESOLUTION 14-4
REGARDING RIVER CORRIDOR BUS RAPID TRANSIT
LOCALLY PREFERRED ALTERNATIVE

WHEREAS, the Capital District Transportation Committee (CDTC) is the designated metropolitan planning organization (MPO) for transportation planning and programming in the Albany-Schenectady and Saratoga Springs metropolitan areas; and,

WHEREAS, the Capital District Transportation Authority (CDTA) has completed the transit alternatives analysis for the River Corridor Bus Rapid Transit, known as the *River Corridor Simplified Alternatives Analysis*; and,

WHEREAS, the CDTC has been involved in the study and advised as to its progress and findings along with CDTA, the City of Albany, the City of Cohoes, the City of Watervliet, the City of Troy, the Village of Menands, the Village of Waterford, and several other study area stakeholders; and,

WHEREAS, the study process has offered several opportunities for public comment through direct stakeholder meetings, neighborhood association meetings, and public meetings throughout the corridor; and,

WHEREAS, the Alternatives Analysis has identified Alternative 2: Bus Rapid Transit via Broadway as the Locally Preferred Alternative; and,

THEREFORE BE IT RESOLVED that the Capital District Transportation Committee adopts Alternative 2: Bus Rapid Transit via Broadway from the *River Corridor Simplified Alternatives Analysis* as the Locally Preferred Alternative.

BE IT FURTHER RESOLVED that CDTC will integrate the Locally Preferred Alternative into its adopted long range regional transportation plan known as *New Visions 2035*.

BE IT FURTHER RESOLVED that CDTC will pursue with CDTA and its municipal, transportation agency, business and residential neighborhood partners the implementation of Locally Preferred Alternative.

Sam Stout for Kathy Sheehan

Kathy Sheehan, Mayor, City of Albany
Chair, Capital District Transportation Committee

9/4/14

Date

APPENDIX B: EXISTING CONDITIONS REPORT

Method of Fare Payment by Route

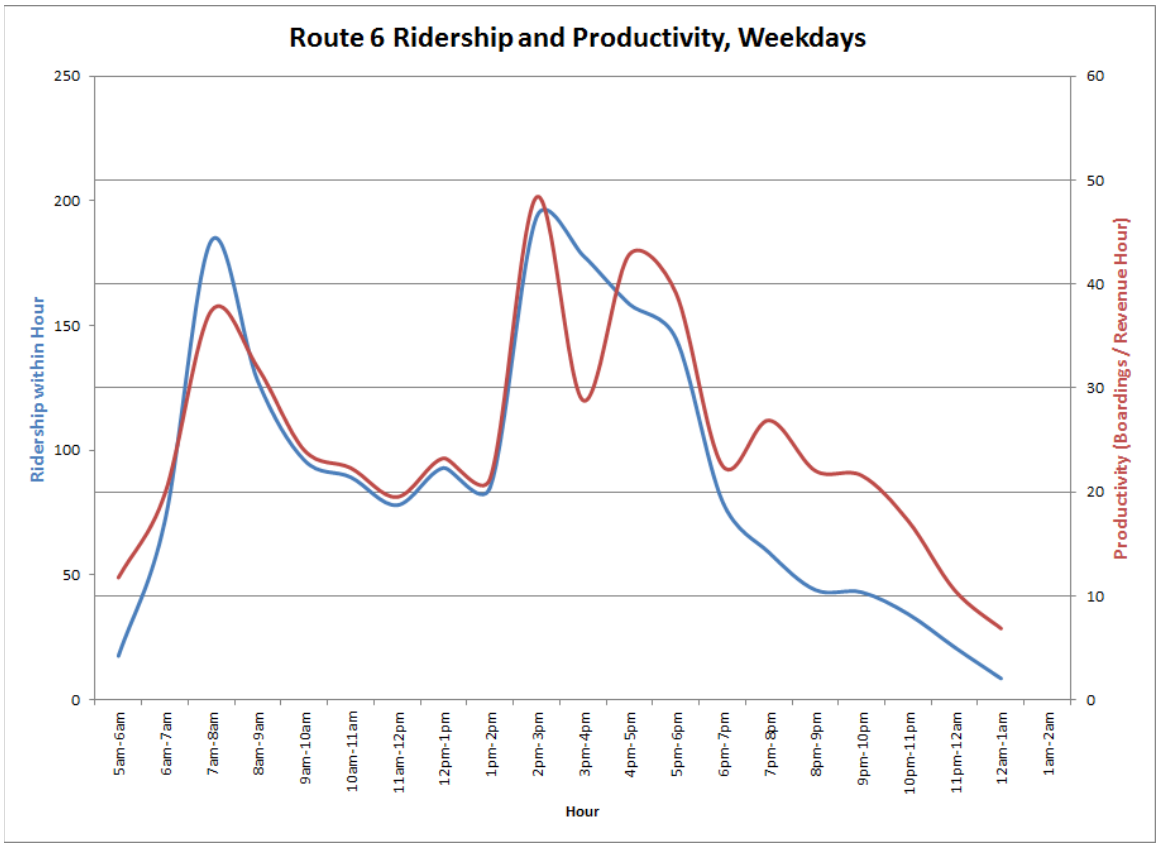
Fare Type	Total	6	7	22	80	85	116	522
Cash	22%	17%	21%	20%	27%	28%	17%	22%
Pass	62%	57%	63%	66%	66%	58%	70%	71%
Contracts	16%	26%	16%	14%	7%	14%	13%	6%
Other	0%	0%	0%	0%	0%	0%	0%	1%
Total	100%	100%	100%	100%	100%	100%	100%	100%

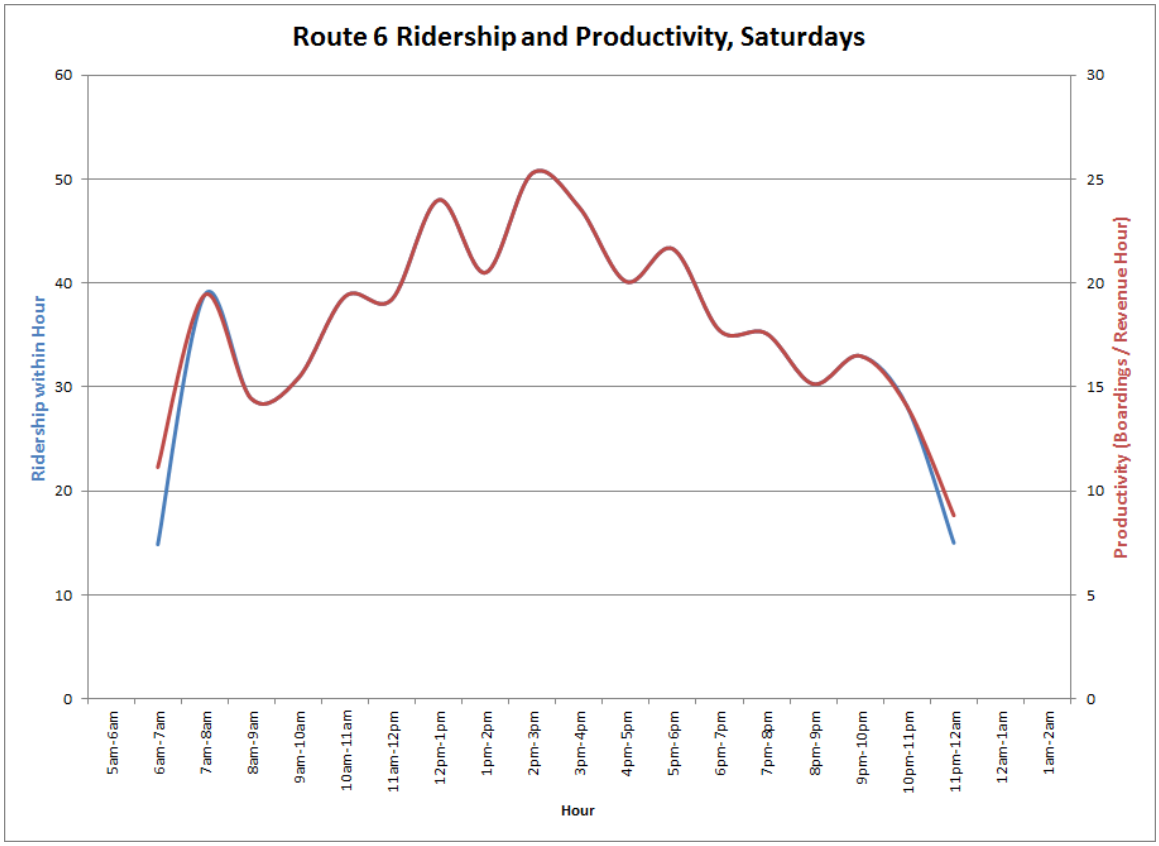
Cost Allocation Model

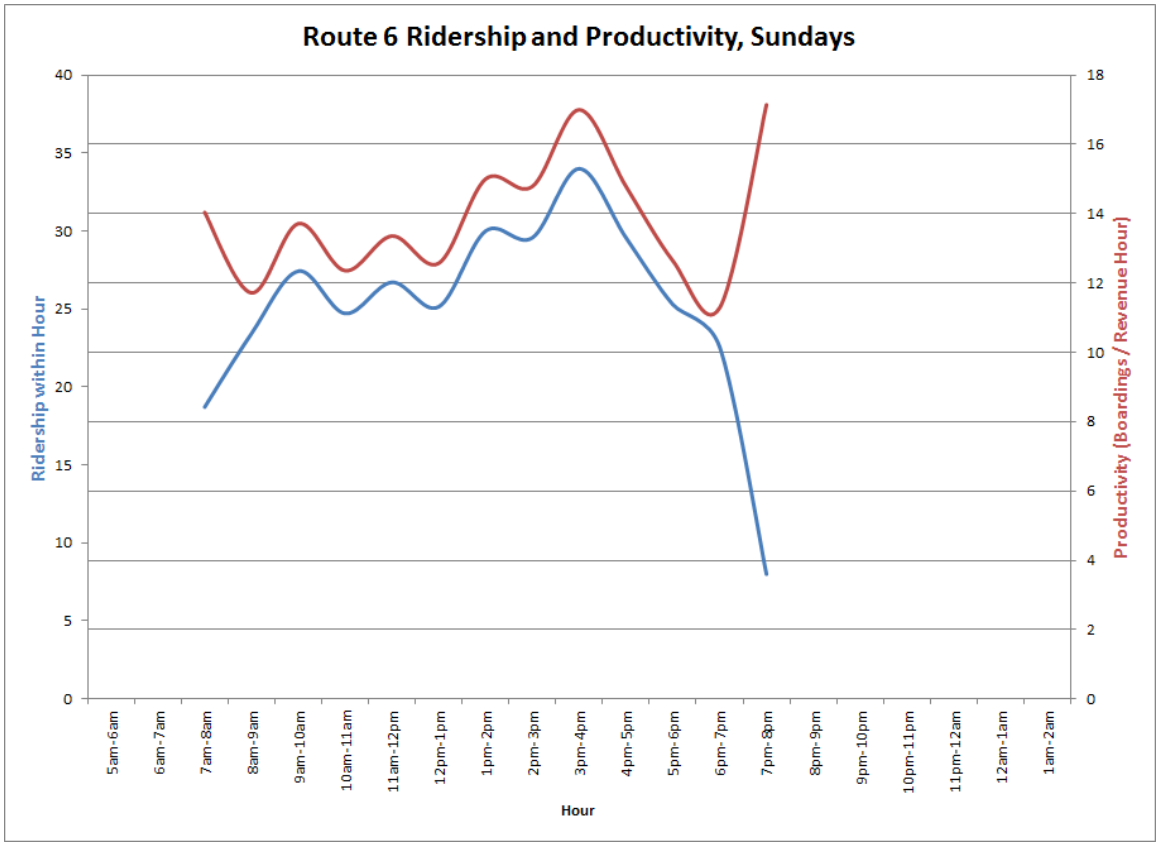
Cost Element	Function	Amount	Basis	Fixed Cost	Mileage Related Cost	Hourly Related Cost
Operator Wages	Operation	$15,238,671	Hourly	$0	$0	$15,238,671
Other Wages	Operations	$2,246,823	Hourly	$0	$0	$2,246,823
	Vehicle Maintenance	$5,414,464	Mileage	$0	$5,414,464	$0
	Facility Maintenance	$656,748	Fixed	$656,748	$0	$0
	Administration	$2,595,738	Fixed	$2,595,738	$0	$0
Fringe Benefits	Operations	$10,703,535	Hourly	$0	$0	$10,703,535
	Vehicle Maintenance	$3,314,388	Mileage	$0	$3,314,388	$0
	Facility Maintenance	$402,019	Fixed	$402,019	$0	$0
	Administration	$1,588,945	Fixed	$1,588,945	$0	$0
Services	Operations	$93,734	Hourly	$0	$0	$93,734
	Vehicle Maintenance	$459,170	Mileage	$0	$459,170	$0
	Facility Maintenance	$834,170	Fixed	$834,170	$0	$0
	Administration	$3,023,352	Fixed	$3,023,352	$0	$0
Fuels	Operations	$4,428,139	Mileage	$0	$4,428,139	$0
	Vehicle Maintenance	$148,042	Mileage	$0	$148,042	$0
Tires and Tubes	Operations	$364,522	Mileage	$0	$364,522	$0
	Vehicle Maintenance	$2,016	Mileage	$0	$2,016	$0
Materials and Supplies	Operations	$180,291	Hourly	$0	$0	$180,291
	Vehicle Maintenance	$3,054,778	Mileage	$0	$3,054,778	$0
	Facility Maintenance	$314,299	Fixed	$314,299	$0	$0
	Administration	$392,710	Fixed	$392,710	$0	$0
Utilities	Administration	$625,490	Fixed	$625,490	$0	$0
Casualty	Administration	$768,011	Fixed	$768,011	$0	$0
Misc.	Operations	$9,358	Mileage	$0	$9,358	$0
	Vehicle Maintenance	$2,963	Mileage	$0	$2,963	$0
	Facility Maintenance	$4,467	Fixed	$4,467	$0	$0
	Administration	$413,792	Fixed	$413,792	$0	$0
Totals		**$57,280,635**		**$11,619,741**	**$17,197,840**	**$28,463,054**

Vehicles	**183**		
Revenue Miles		**6,738,085**	
Revenue Hours			**580,804**
Coefficients	**$63,496**	**$2.55**	**$49.01**

Boardings and Productivity by Time of Day






Route 6 Ridership and Productivity, Sundays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
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12am-1am
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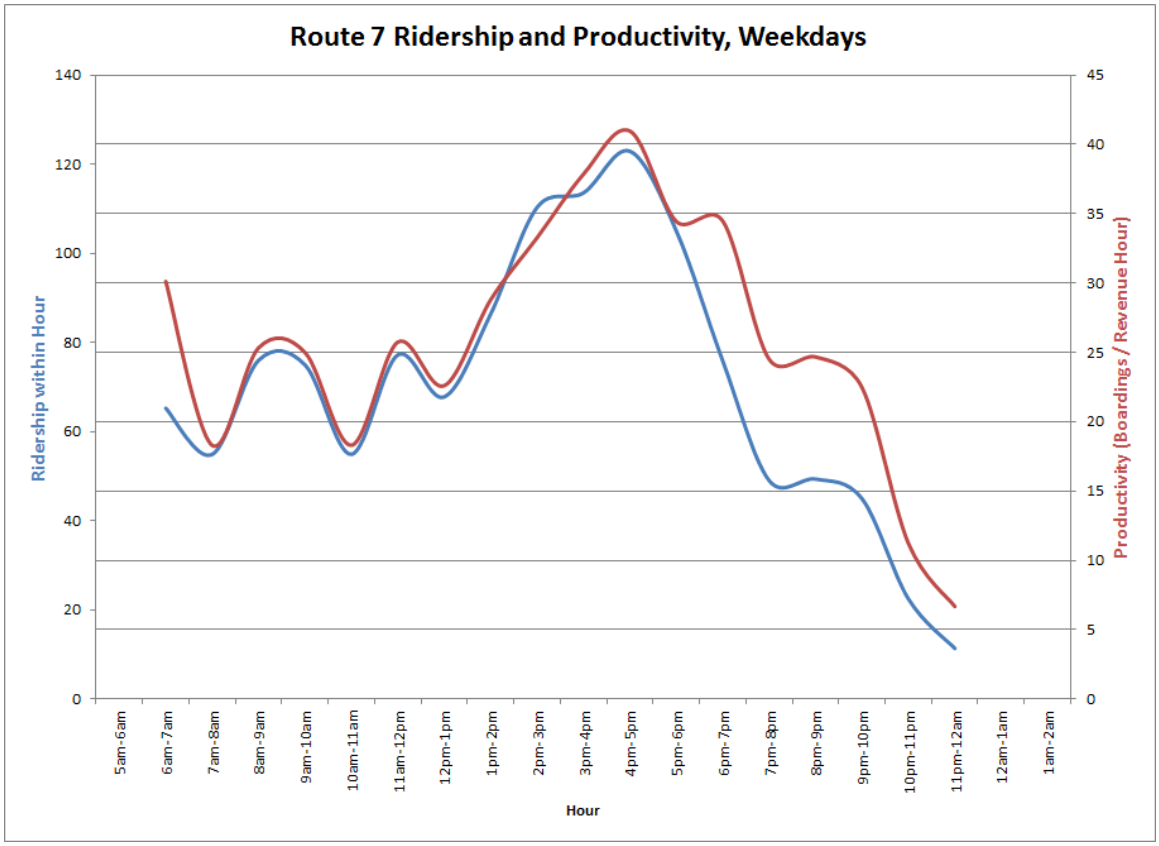
Route 7 Ridership and Productivity, Weekdays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
20
40
60
80
100
120
140
0
5
10
15
20
25
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40
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5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
3pm-4pm
4pm-5pm
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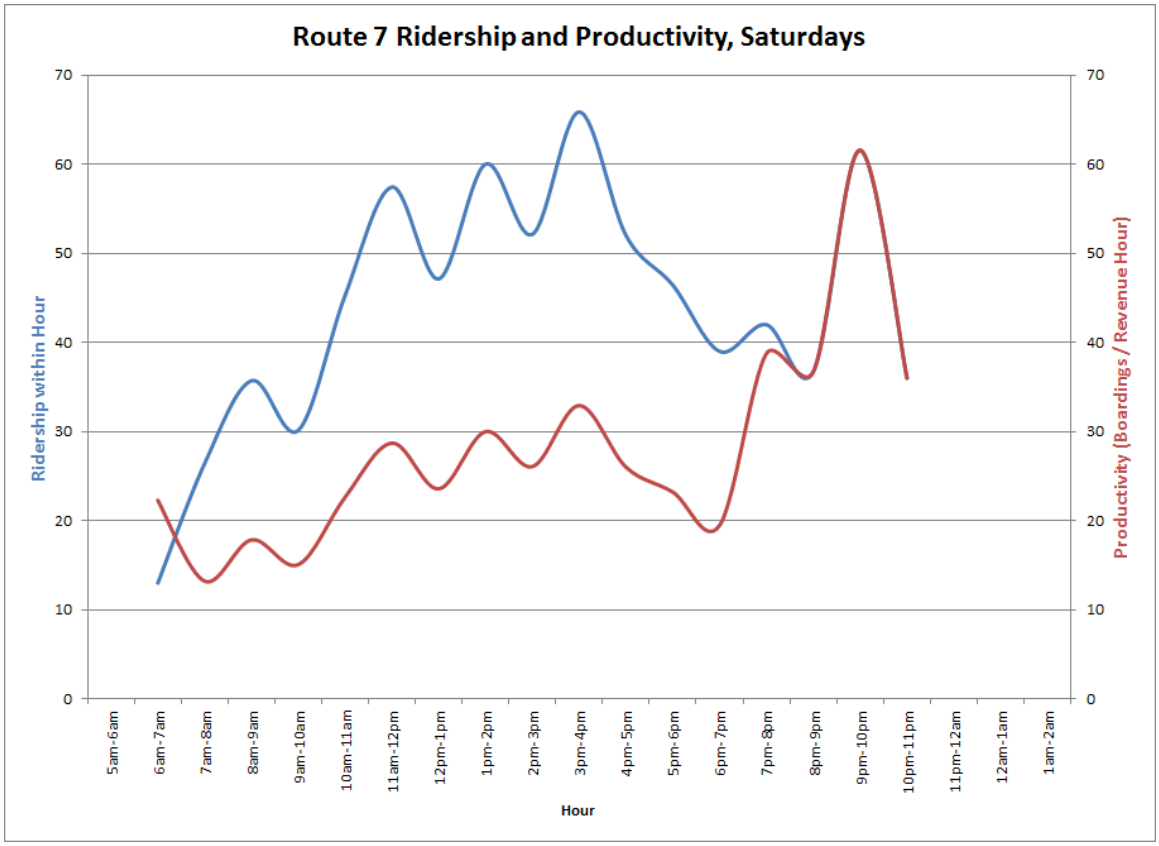
12am-1am
1am-2am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Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
10
20
30
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70
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
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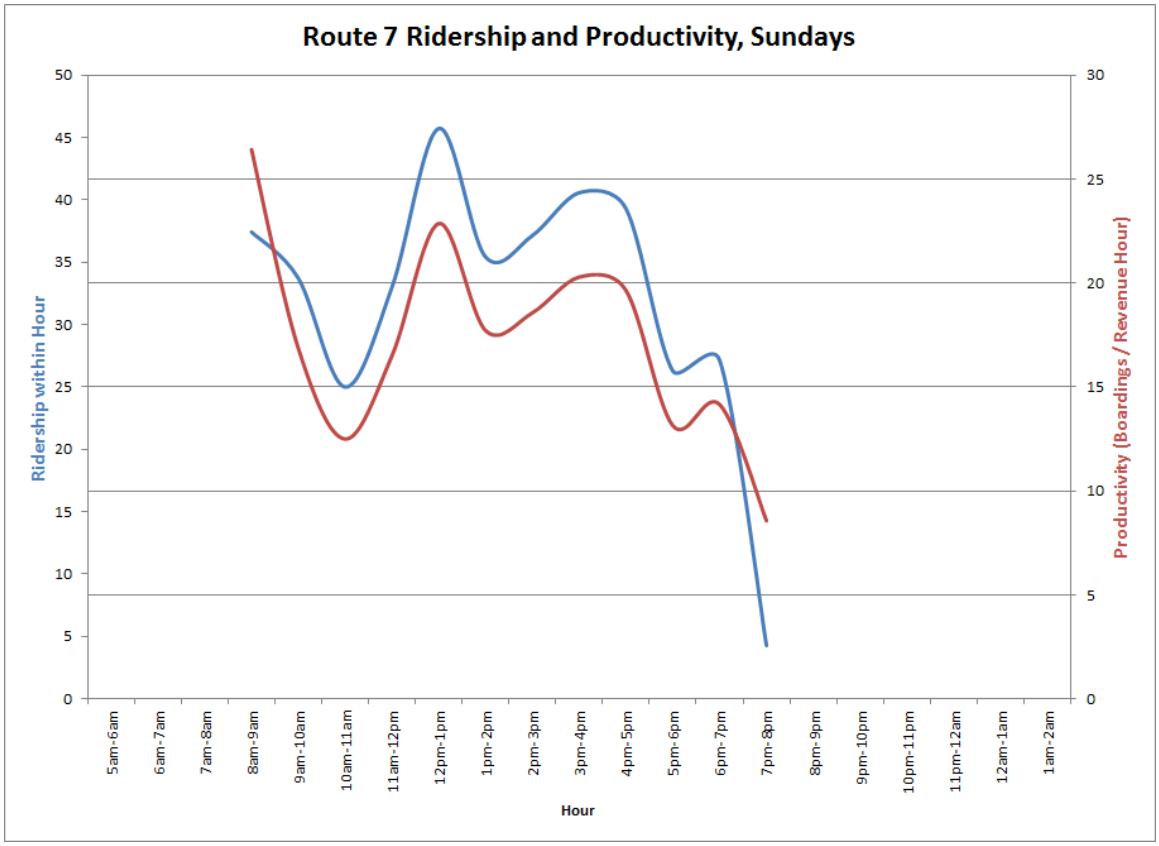
1am-2am


Route 7 Ridership and Productivity, Sundays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
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45
50
0
5
10
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25
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5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
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4pm-5pm
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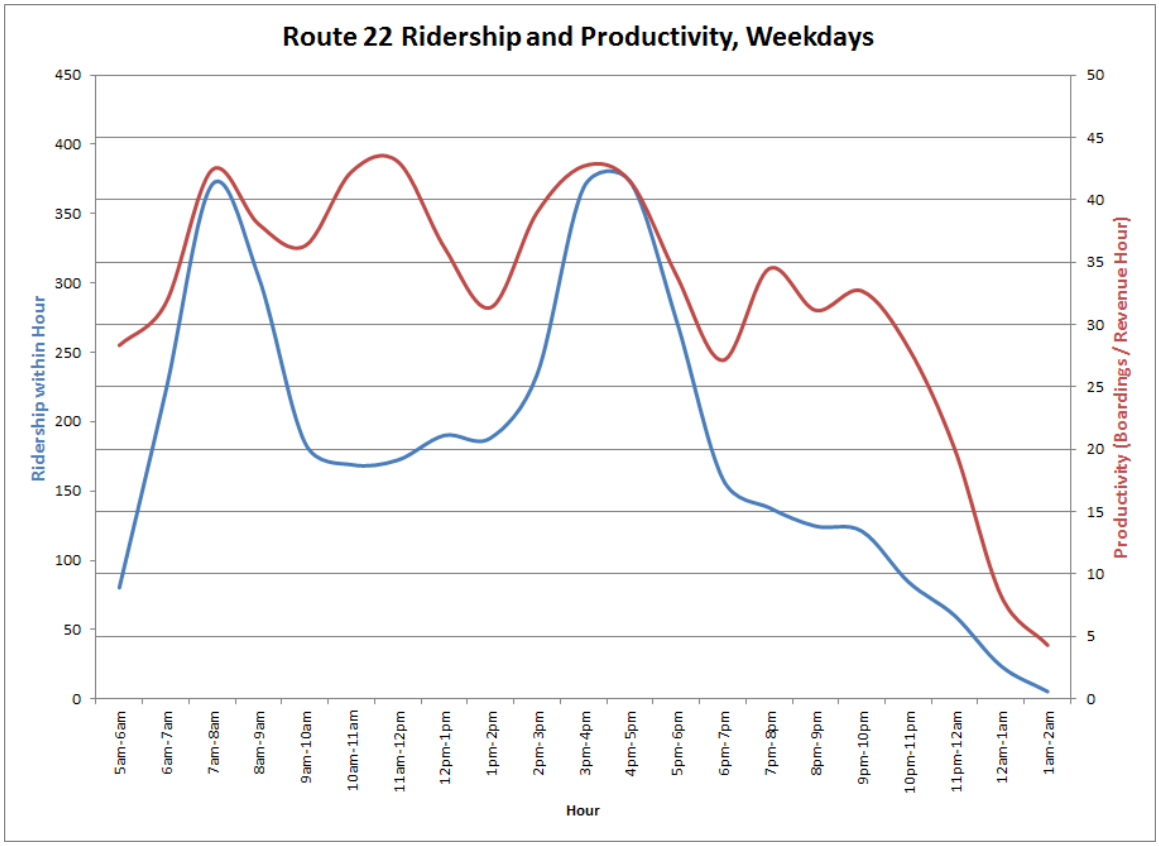
1am-2am


Route 22 Ridership and Productivity, Weekdays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
50
100
150
200
250
300
350
400
450
0
5
10
15
20
25
30
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40
45
50
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
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12am-1am
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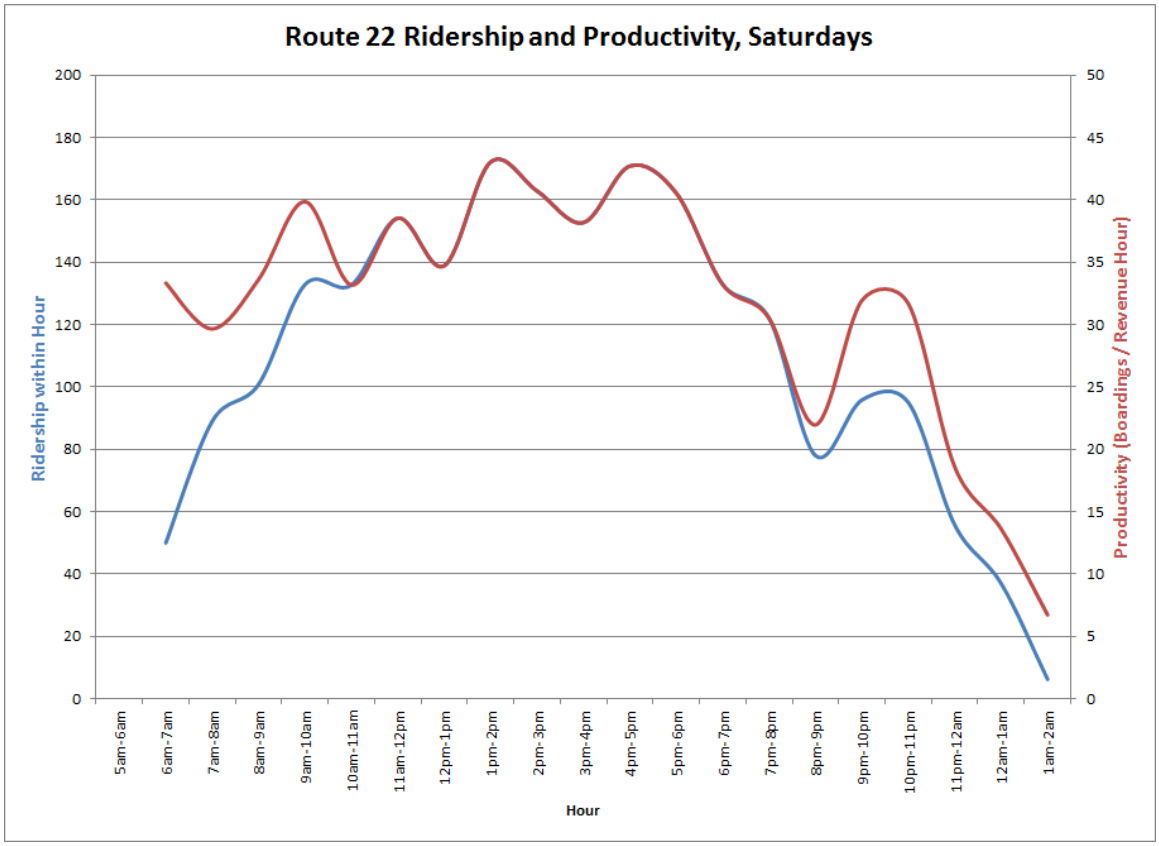
Route 22 Ridership and Productivity, Saturdays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
20
40
60
80
100
120
140
160
180
200
0
5
10
15
20
25
30
35
40
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50
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
3pm-4pm
4pm-5pm
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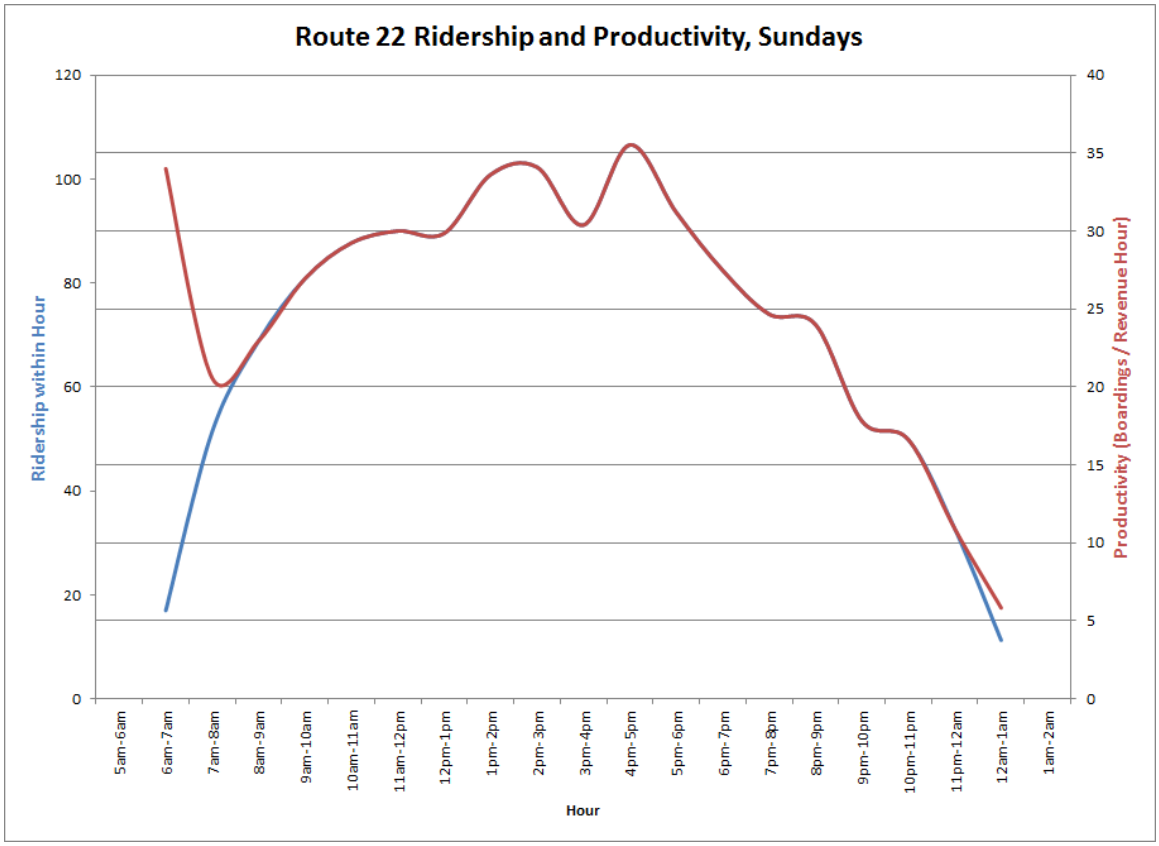
Route 22 Ridership and Productivity, Sundays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
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40
60
80
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120
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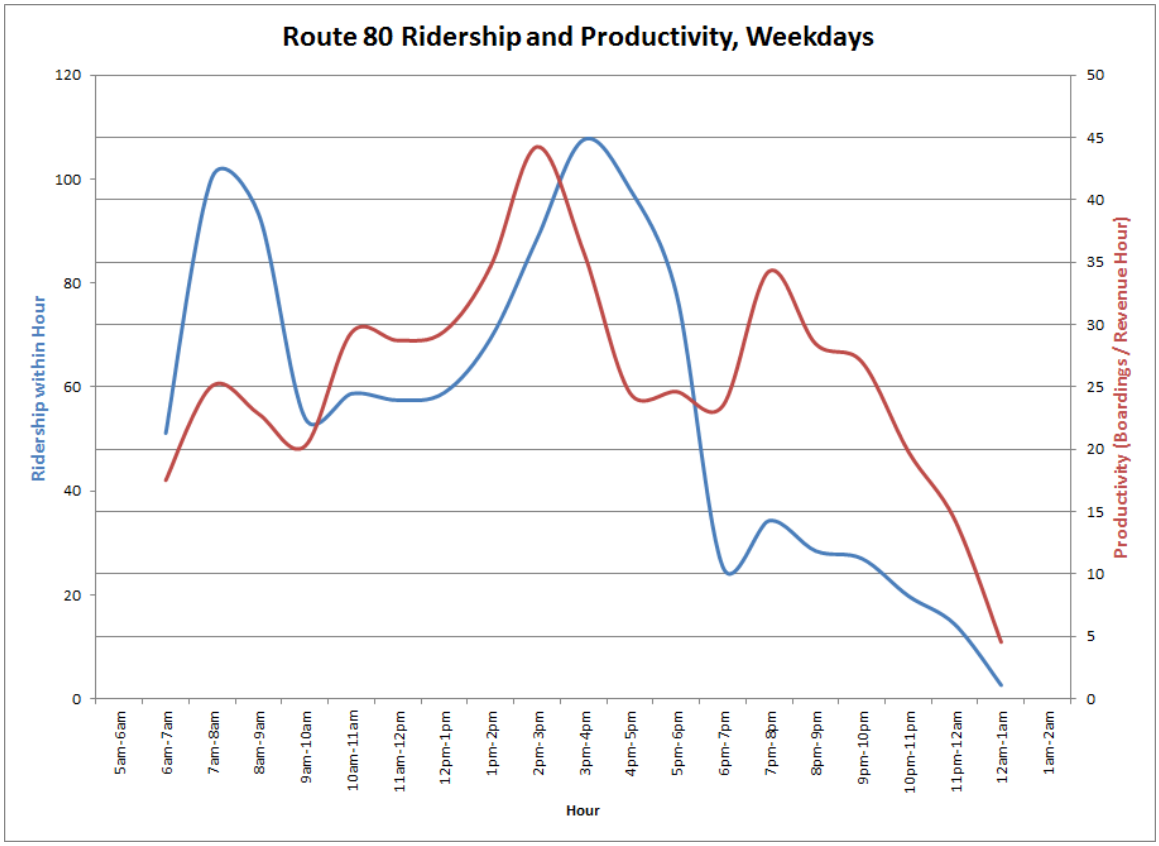
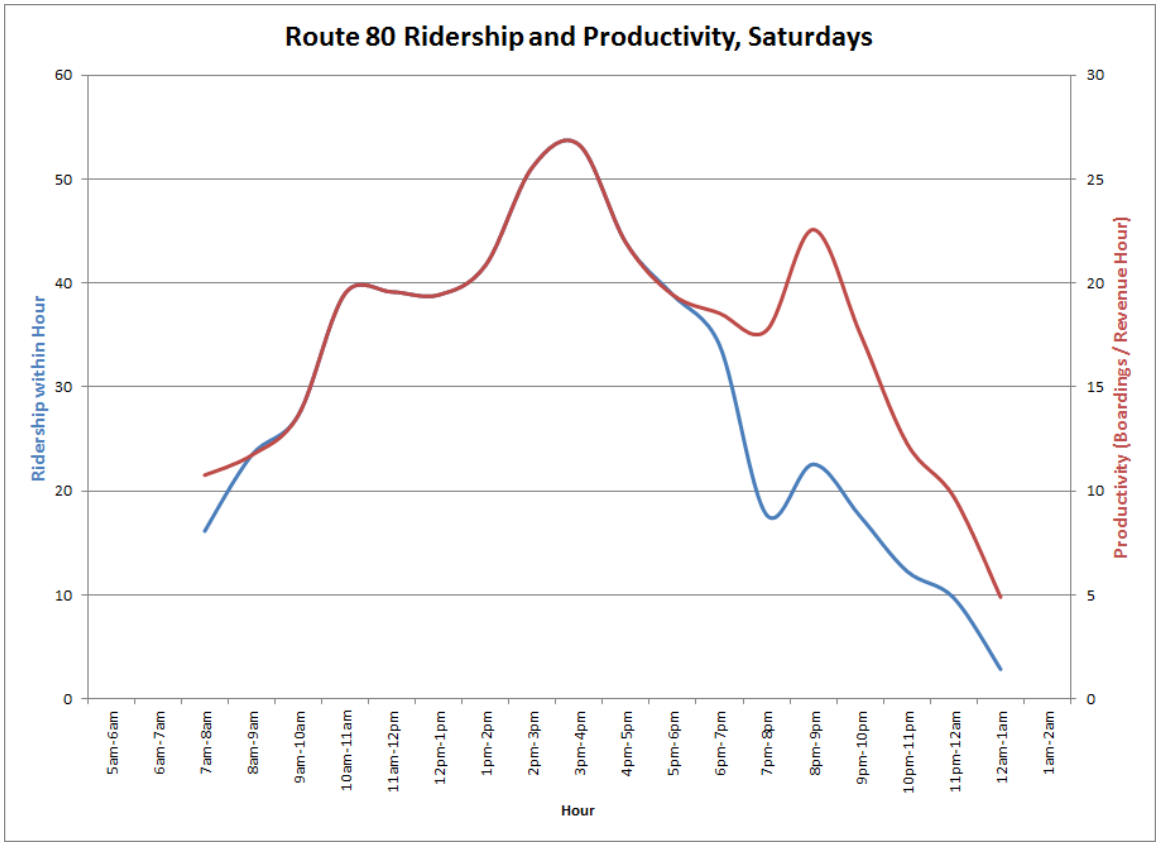
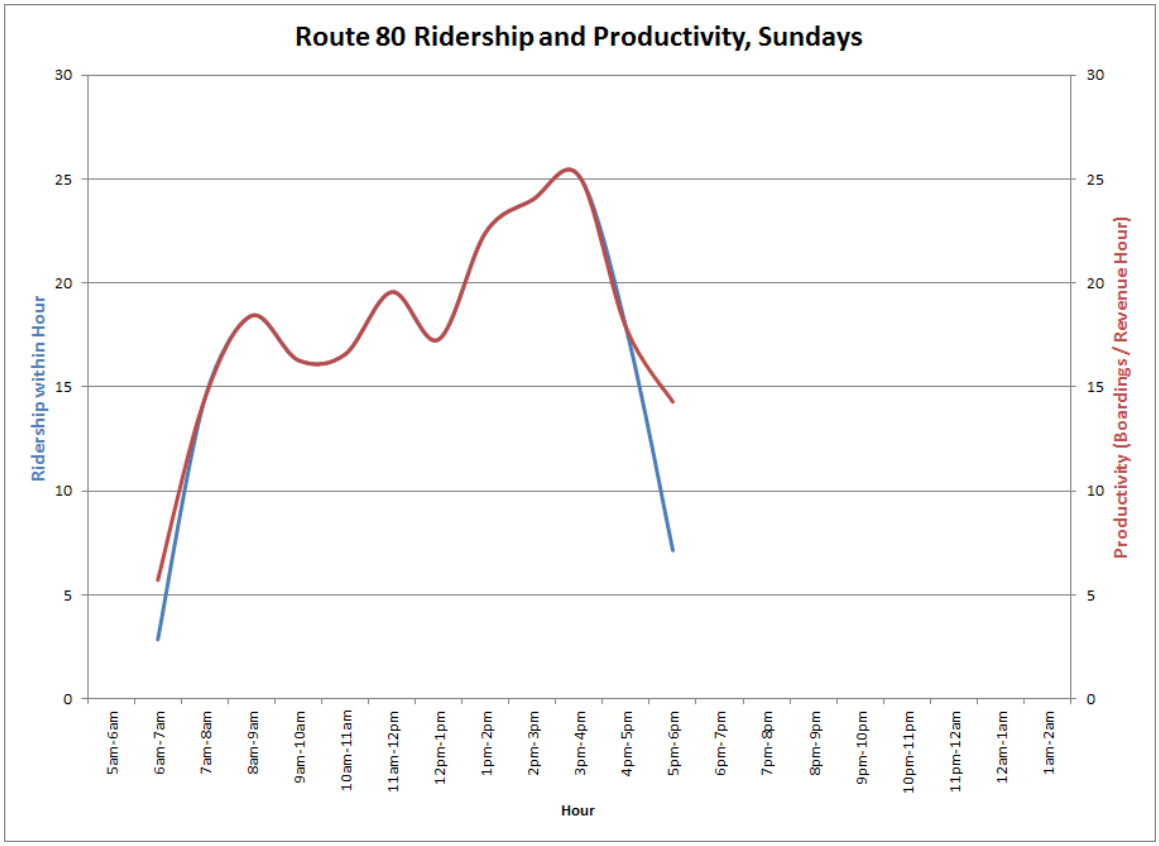
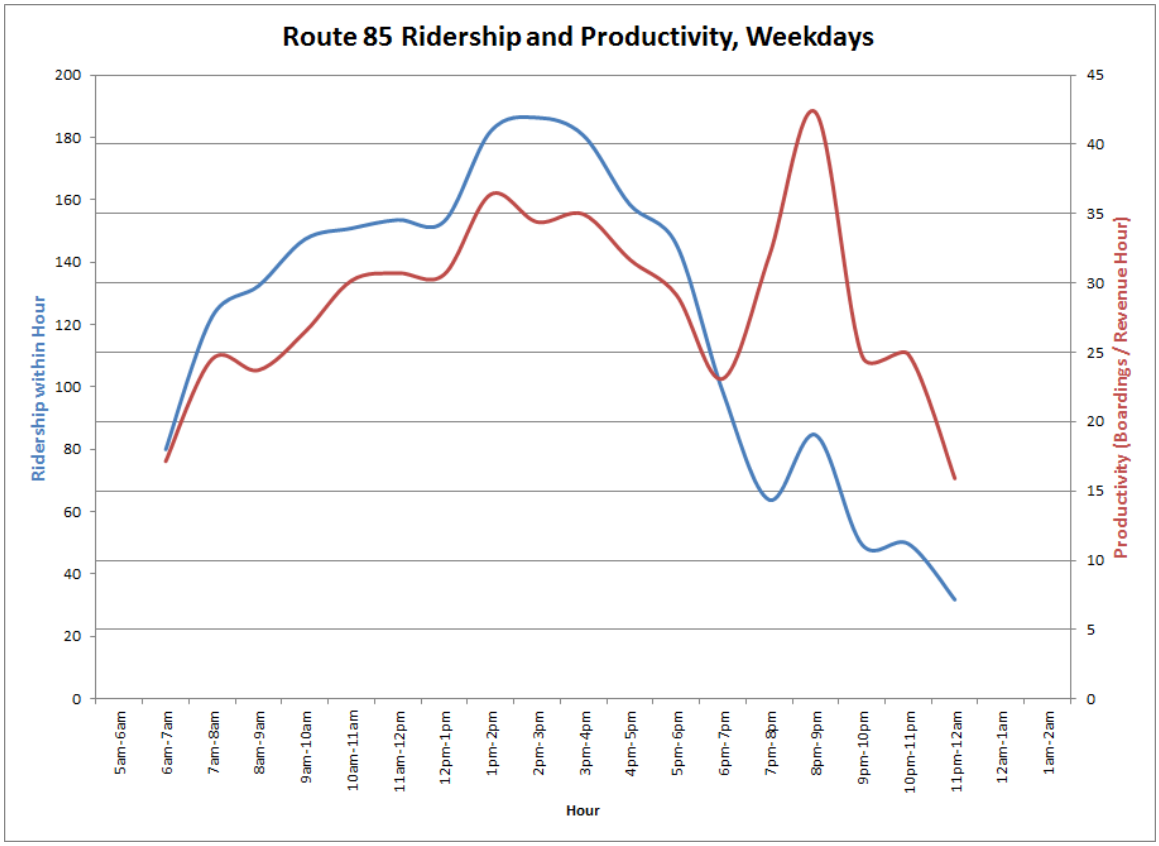
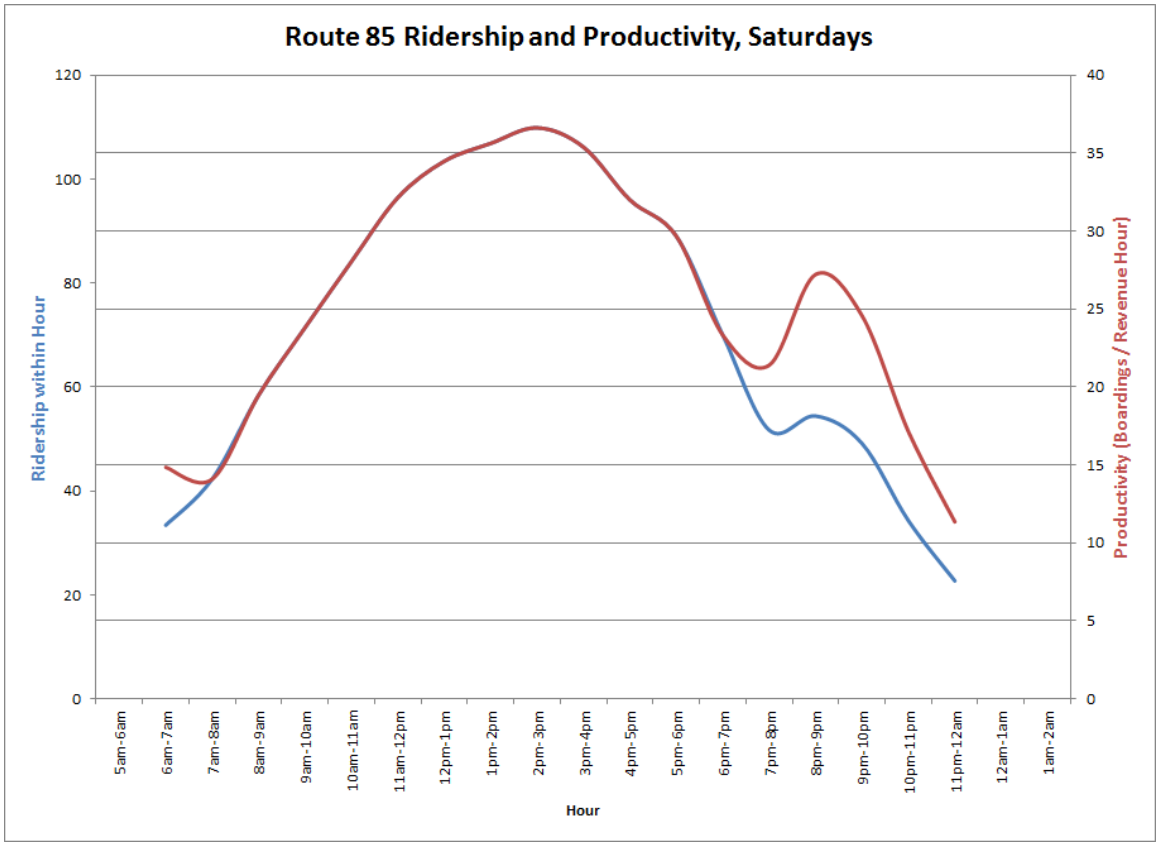
35
40
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
3pm-4pm
4pm-5pm
5pm-6pm
6pm-7pm
7pm-8pm
8pm-9pm
9pm-10pm
10pm-11pm
11pm-12am
12am-1am
1am-2am


Route 80 Ridership and Productivity, Weekdays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
20
40
60
80
100
120
0
5
10
15
20
25
30
35
40
45
50
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
3pm-4pm
4pm-5pm
5pm-6pm
6pm-7pm
7pm-8pm
8pm-9pm
9pm-10pm
10pm-11pm
11pm-12am
12am-1am
1am-2am


Route 80 Ridership and Productivity, Saturdays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
10
20
30
40
50
60
0
5
10
15
20
25
30
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
3pm-4pm
4pm-5pm
5pm-6pm
6pm-7pm
7pm-8pm
8pm-9pm
9pm-10pm
10pm-11pm
11pm-12am
12am-1am
1am-2am


Route 80 Ridership and Productivity, Sundays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
5
10
15
20
25
30
0
5
10
15
20
25
30
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
3pm-4pm
4pm-5pm
5pm-6pm
6pm-7pm
7pm-8pm
8pm-9pm
9pm-10pm
10pm-11pm
11pm-12am
12am-1am
1am-2am


Route 85 Ridership and Productivity, Weekdays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
20
40
60
80
100
120
140
160
180
200
0
5
10
15
20
25
30
35
40
45
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
3pm-4pm
4pm-5pm
5pm-6pm
6pm-7pm
7pm-8pm
8pm-9pm
9pm-10pm
10pm-11pm
11pm-12am
12am-1am
1am-2am


Route 85 Ridership and Productivity, Saturdays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
20
40
60
80
100
120
0
5
10
15
20
25
30
35
40
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
3pm-4pm
4pm-5pm
5pm-6pm
6pm-7pm
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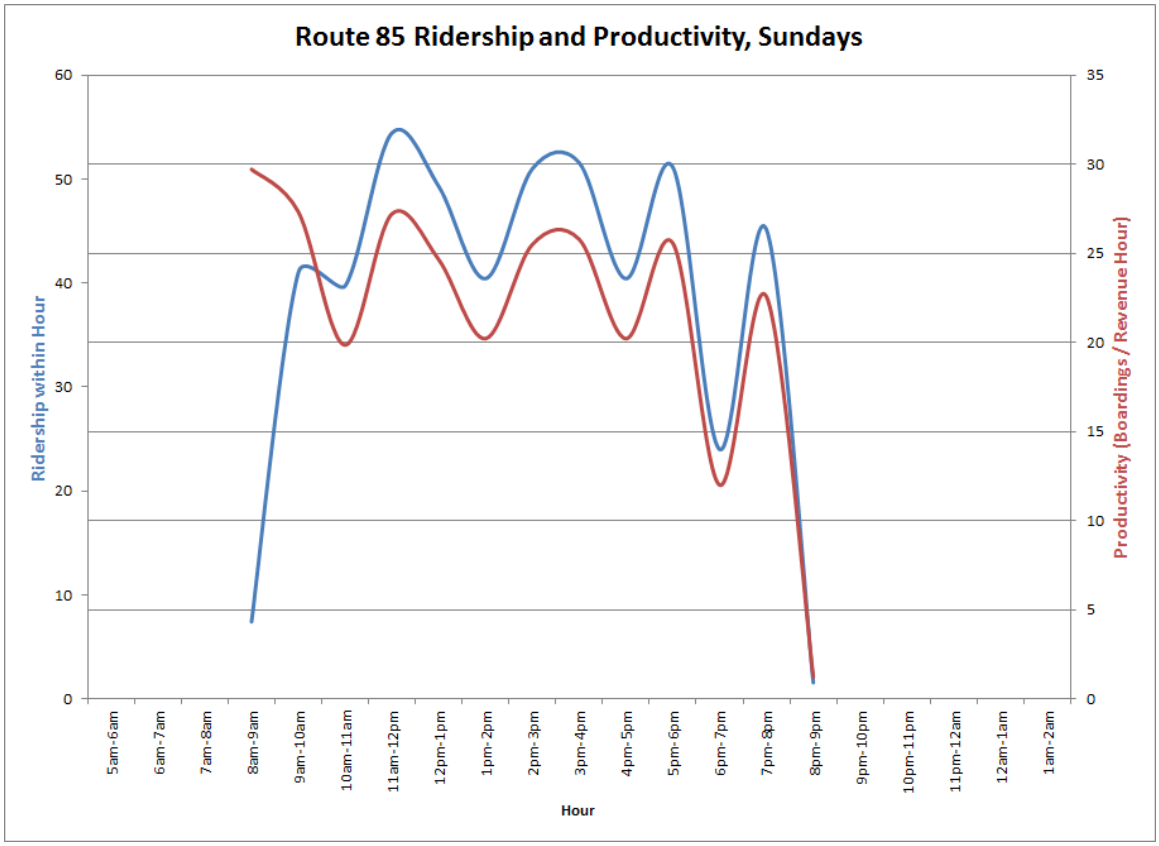
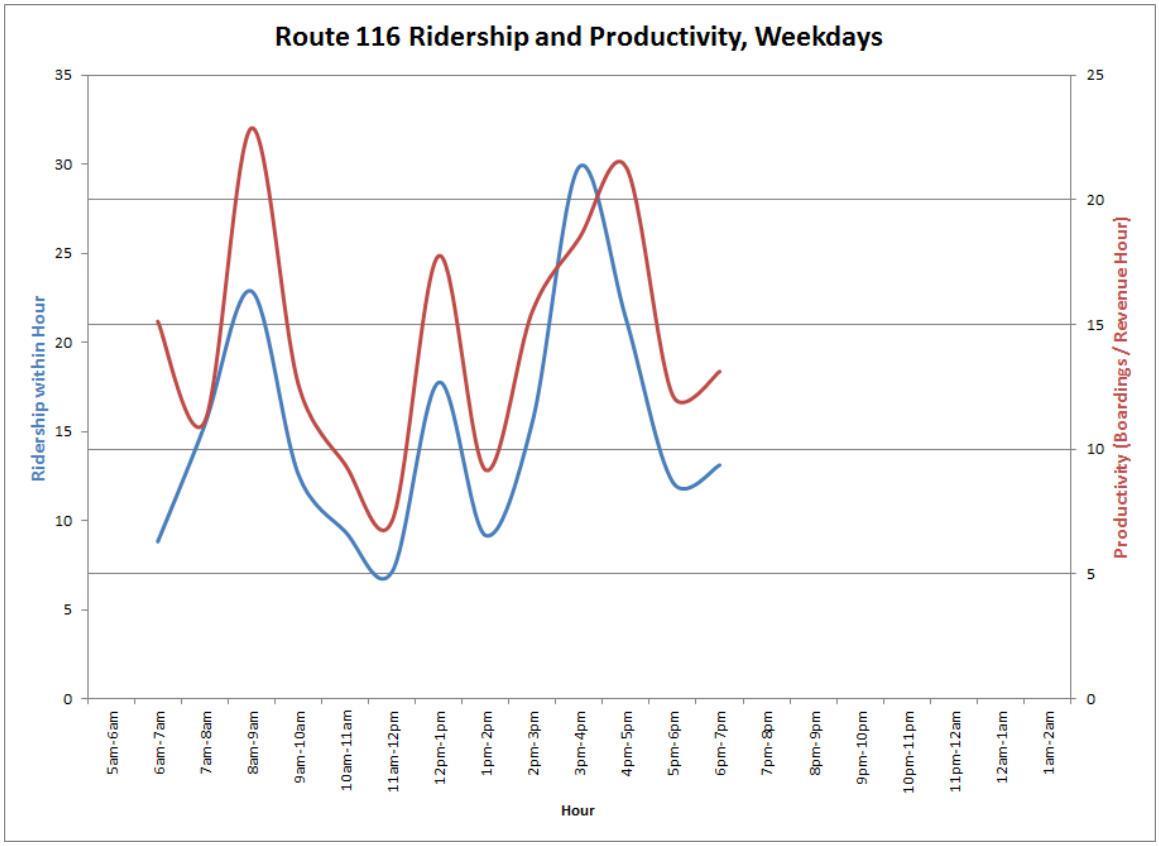
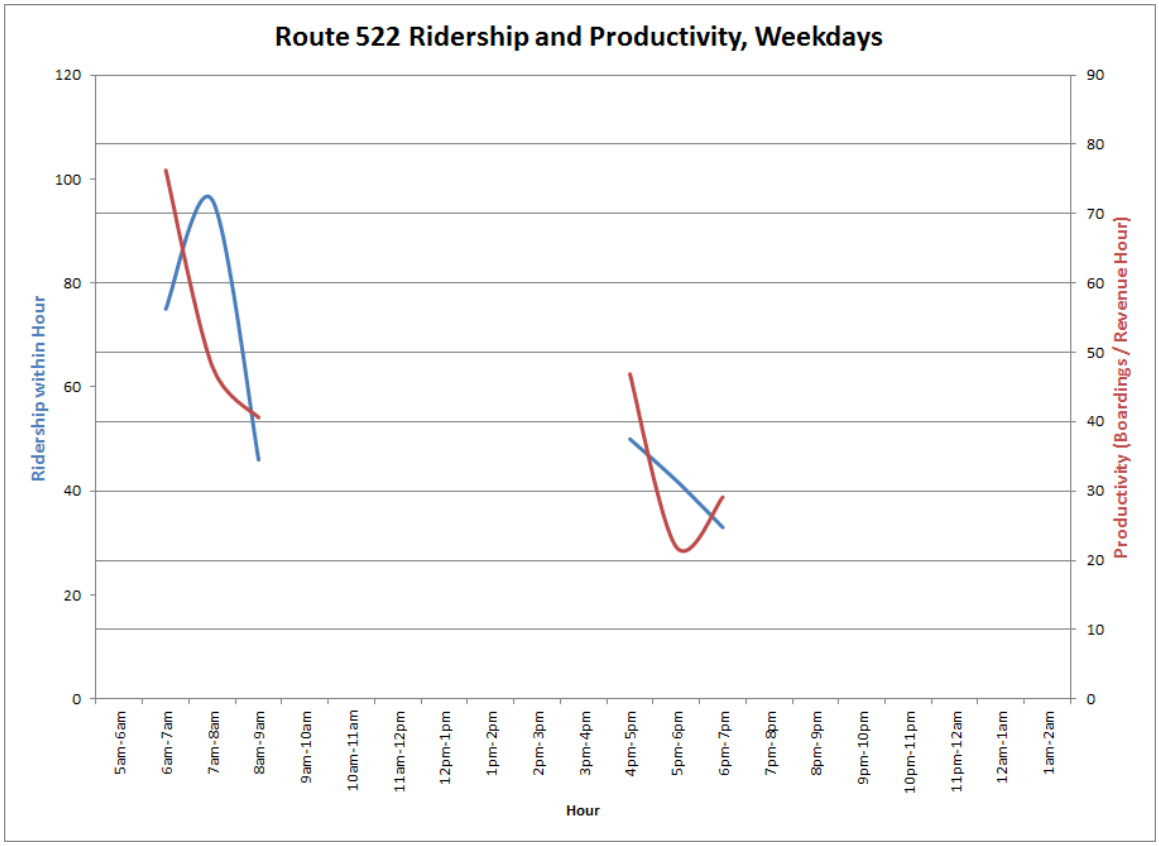
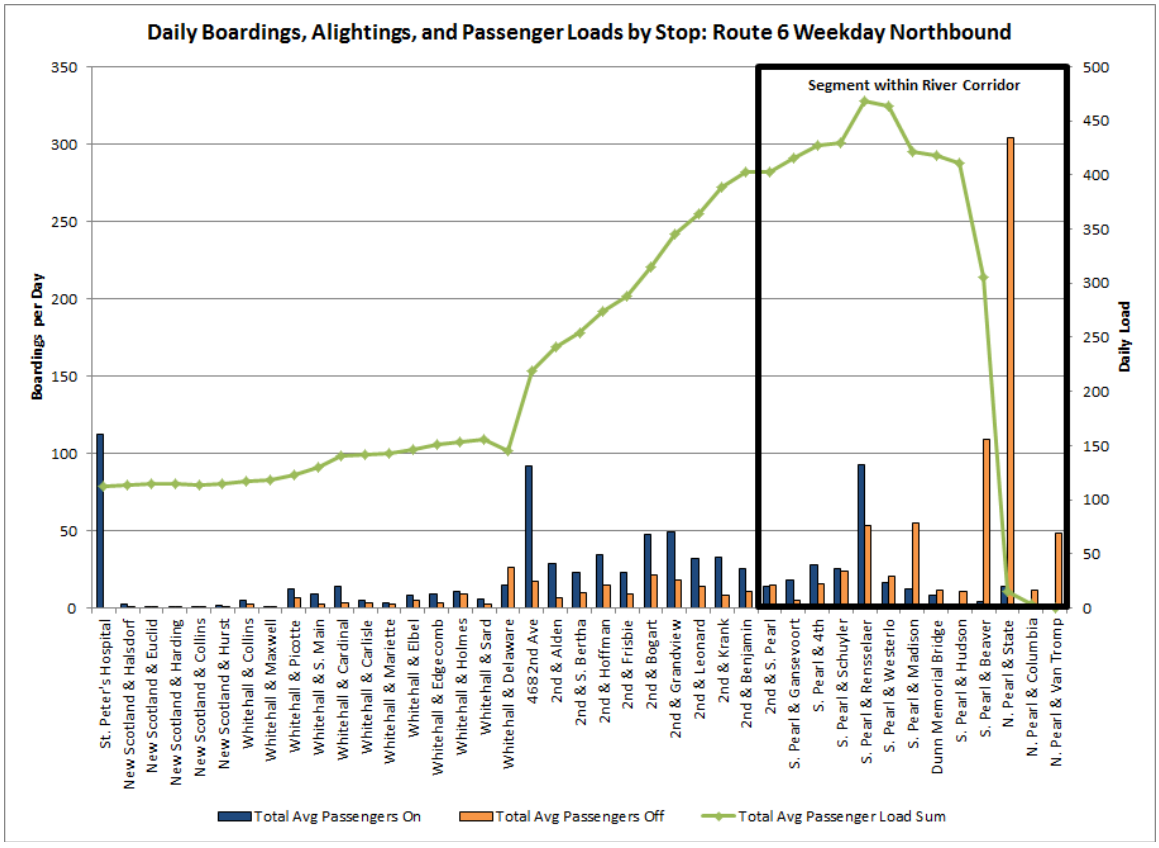
8pm-9pm
9pm-10pm
10pm-11pm
11pm-12am
12am-1am
1am-2am

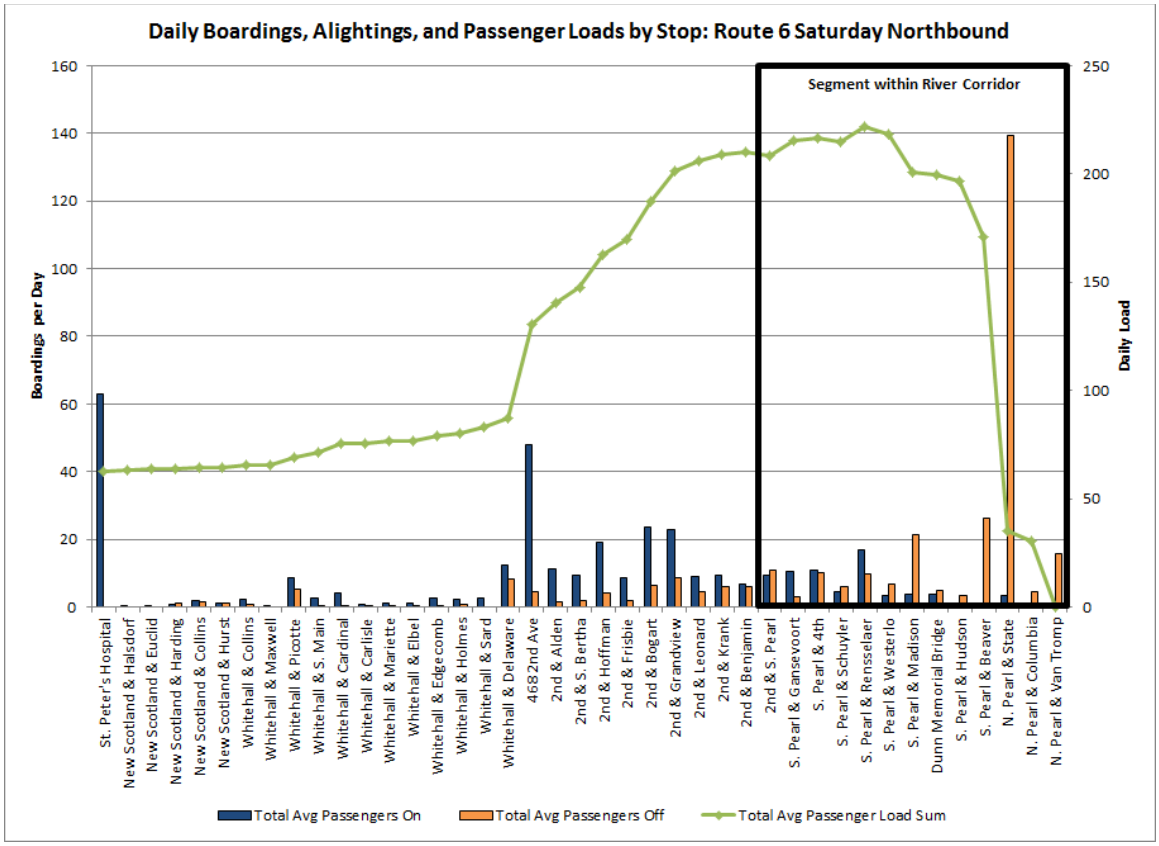

Route 85 Ridership and Productivity, Sundays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
10
20
30
40
50
60
0
5
10
15
20
25
30
35
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
3pm-4pm
4pm-5pm
5pm-6pm
6pm-7pm
7pm-8pm
8pm-9pm
9pm-10pm
10pm-11pm
11pm-12am
12am-1am
1am-2am

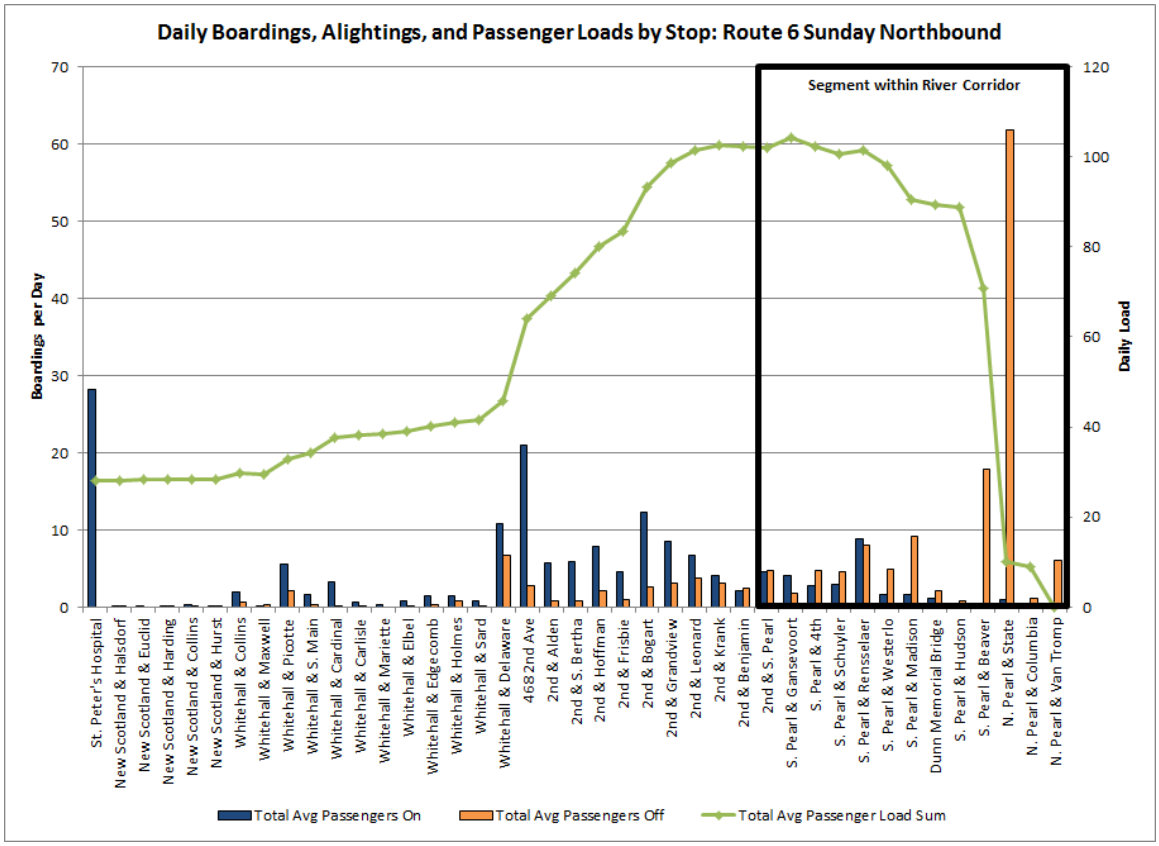

Route 116 Ridership and Productivity, Weekdays
Ridership within Hour
Productivity (Boardings / Revenue Hour)
Hour
0
5
10
15
20
25
30
35
0
5
10
15
20
25
5am-6am
6am-7am
7am-8am
8am-9am
9am-10am
10am-11am
11am-12pm
12pm-1pm
1pm-2pm
2pm-3pm
3pm-4pm
4pm-5pm
5pm-6pm
6pm-7pm
7pm-8pm
8pm-9pm
9pm-10pm
10pm-11pm
11pm-12am
12am-1am
1am-2am

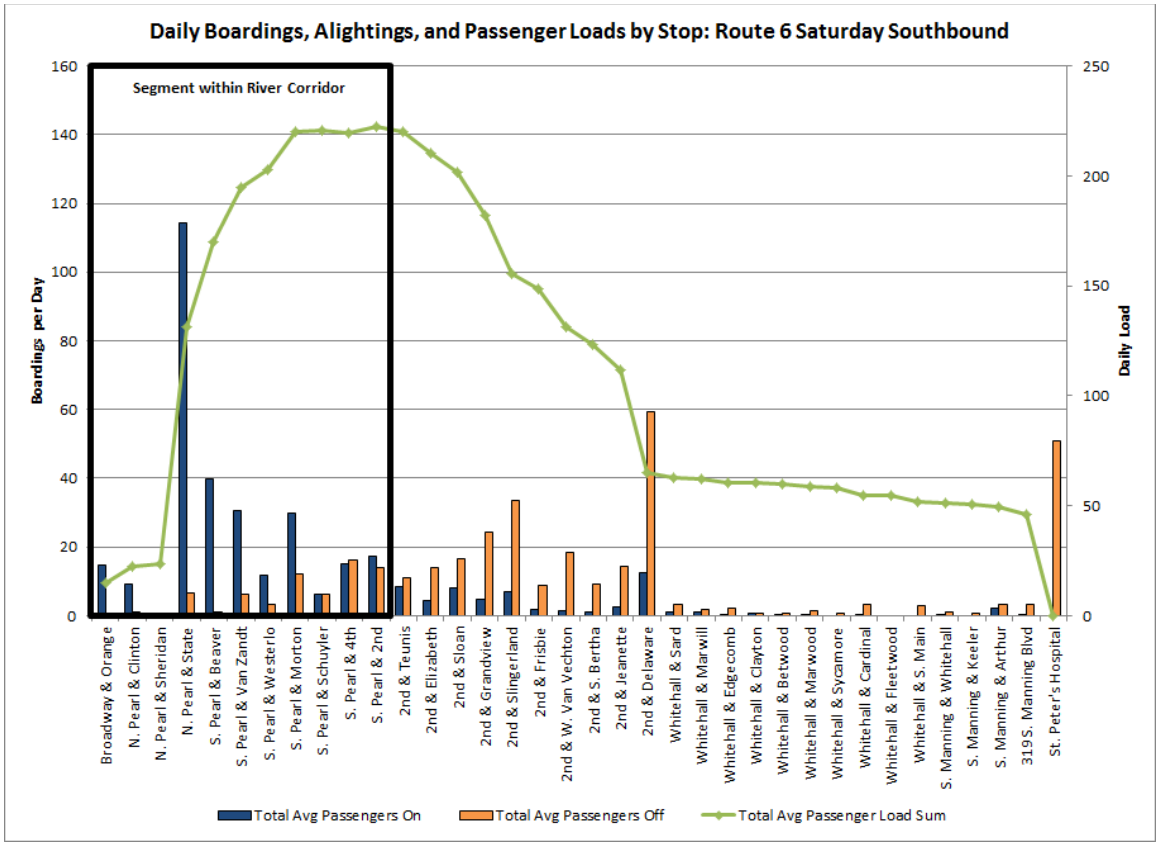


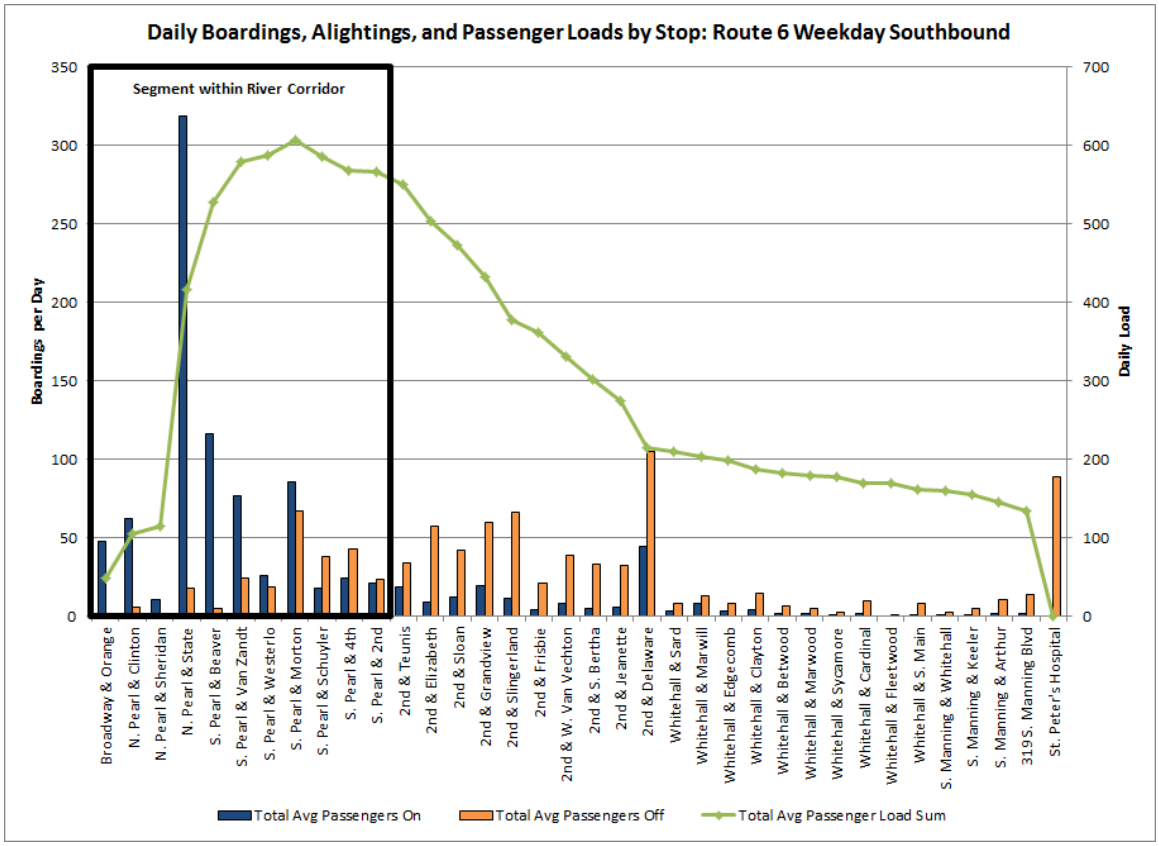
Ridership and Load by Stop

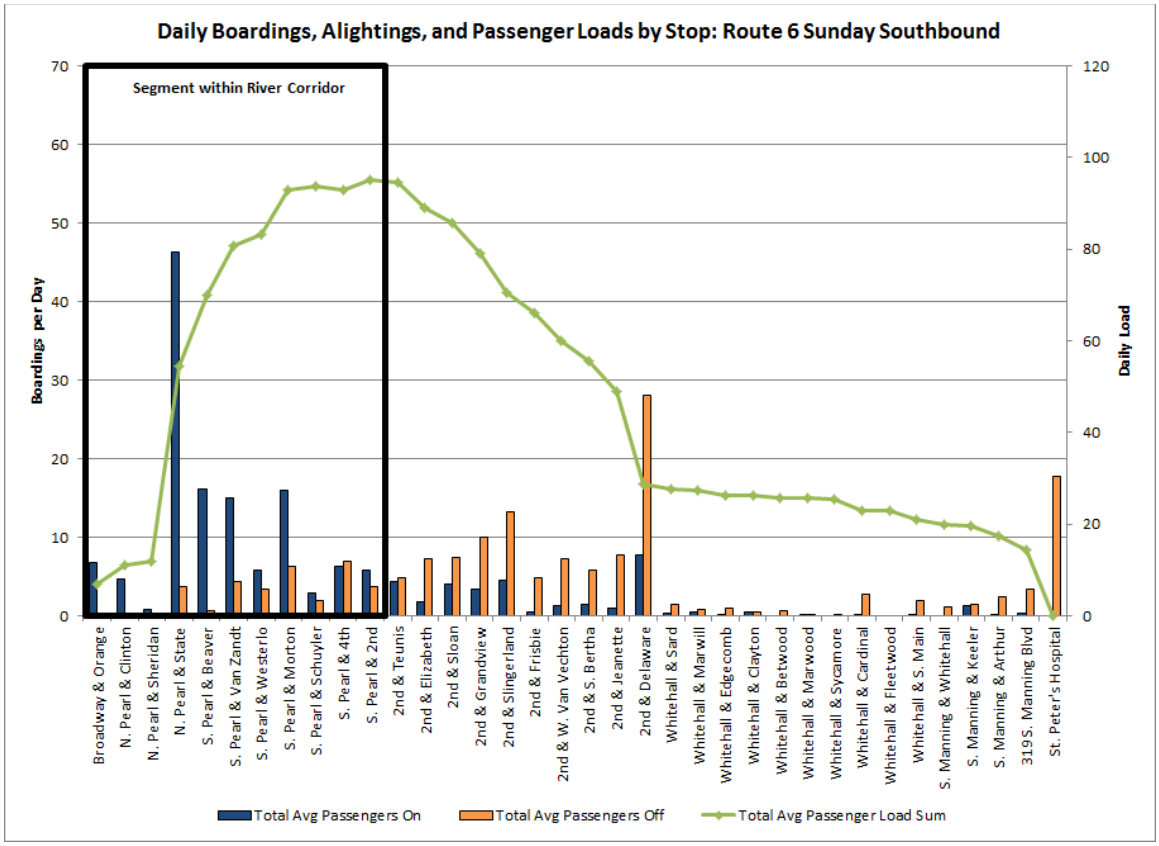


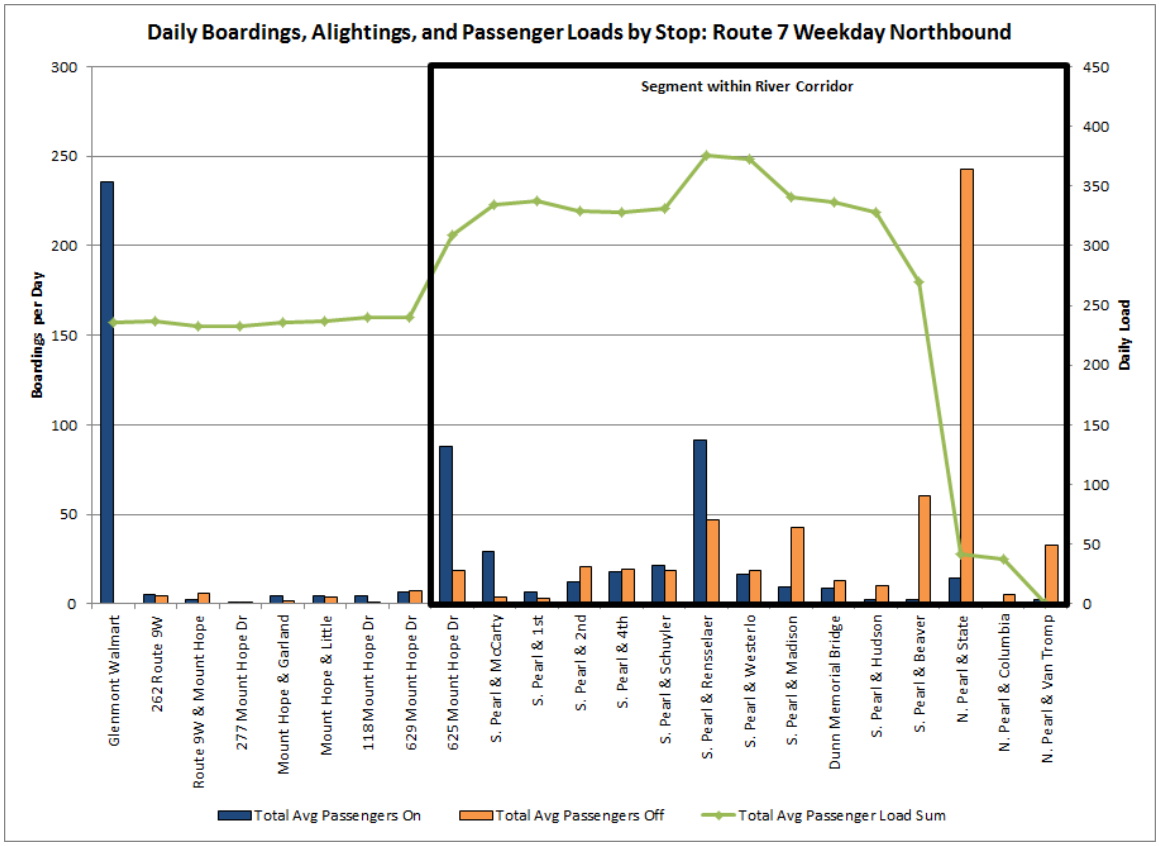

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 6 Saturday Northbound
Segment within River Corridor
Boardings per Day
Daily Load
0
20
40
60
80
100
120
140
160
0
50
100
150
200
250
St. Peter's Hospital
New Scotland & Halsdorf
New Scotland & Euclid
New Scotland & Harding
New Scotland & Collins
New Scotland & Hurst
Whitehall & Collins
Whitehall & Maxwell
Whitehall & Picotte
Whitehall & S. Main
Whitehall & Cardinal
Whitehall & Carlisle
Whitehall & Mariette
Whitehall & Elbel
Whitehall & Edgecomb
Whitehall & Holmes
Whitehall & Sard
Whitehall & Delaware
468 2nd Ave
2nd & Alden
2nd & S. Bertha
2nd & Hoffman
2nd & Frisbie
2nd & Bogart
2nd & Grandview
2nd & Leonard
2nd & Krank
2nd & Benjamin
2nd & S. Pearl
S. Pearl & Gansevoort
S. Pearl & 4th
S. Pearl & Schuyler
S. Pearl & Rensselaer
S. Pearl & Westerlo
S. Pearl & Madison
Dunn Memorial Bridge
S. Pearl & Hudson
S. Pearl & Beaver
N. Pearl & State
N. Pearl & Columbia
N. Pearl & Van Tromp
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

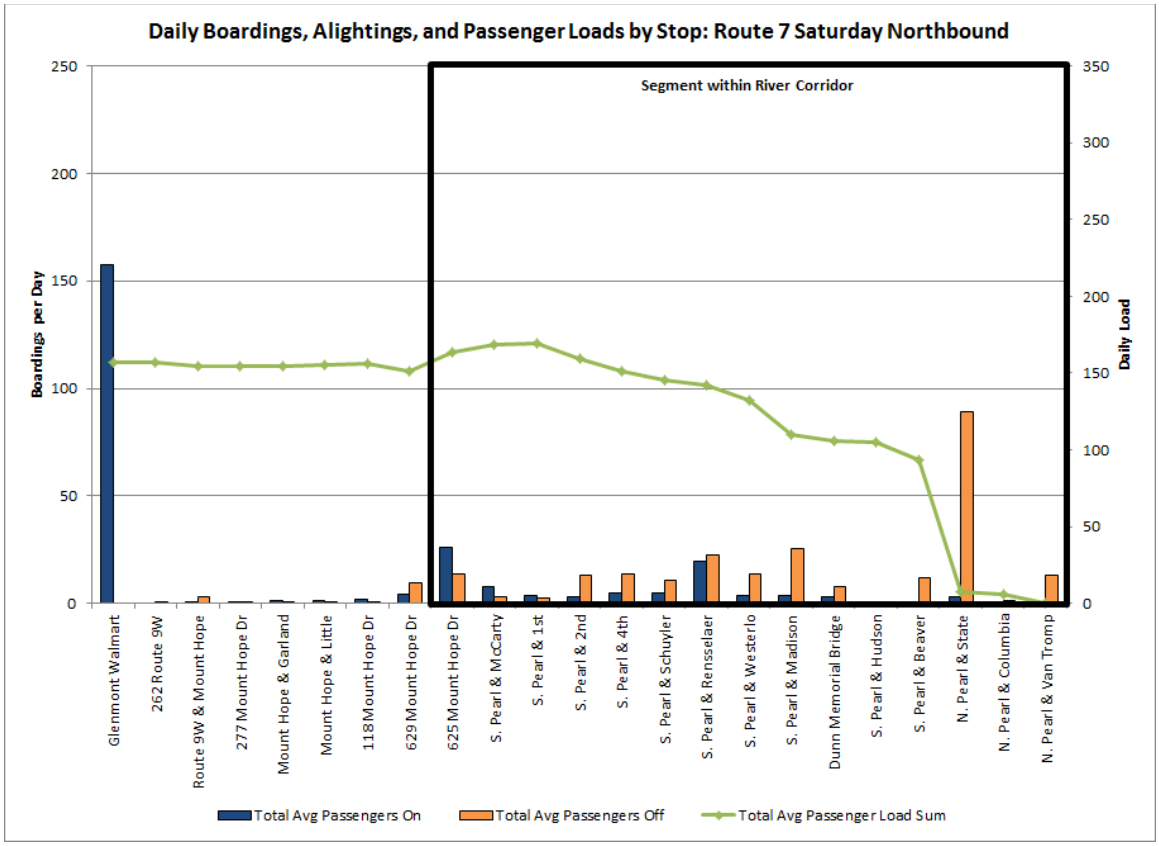

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 6 Sunday Northbound
Segment within River Corridor
Boardings per Day
Daily Load
0
10
20
30
40
50
60
70
0
20
40
60
80
100
120
St. Peter's Hospital
New Scotland & Halsdorf
New Scotland & Euclid
New Scotland & Harding
New Scotland & Collins
New Scotland & Hurst
Whitehall & Collins
Whitehall & Maxwell
Whitehall & Picotte
Whitehall & S. Main
Whitehall & Cardinal
Whitehall & Carlisle
Whitehall & Mariette
Whitehall & Elbel
Whitehall & Edgecomb
Whitehall & Holmes
Whitehall & Sard
Whitehall & Delaware
468 2nd Ave
2nd & Alden
2nd & S. Bertha
2nd & Hoffman
2nd & Frisbie
2nd & Bogart
2nd & Grandview
2nd & Leonard
2nd & Krank
2nd & Benjamin
2nd & S. Pearl
S. Pearl & Gansevoort
S. Pearl & 4th
S. Pearl & Schuyler
S. Pearl & Rensselaer
S. Pearl & Westerlo
S. Pearl & Madison
Dunn Memorial Bridge
S. Pearl & Hudson
S. Pearl & Beaver
N. Pearl & State
N. Pearl & Columbia
N. Pearl & Van Tromp
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

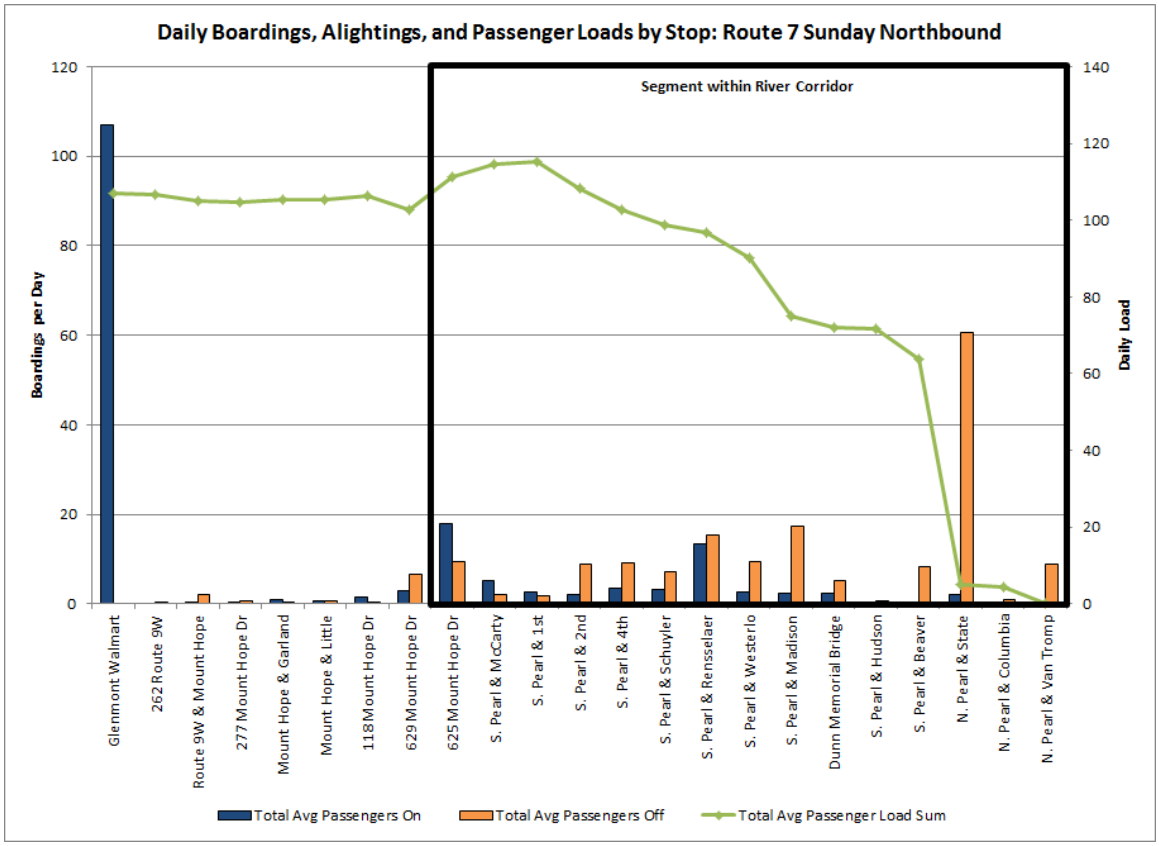

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 6 Saturday Southbound
Segment within River Corridor
Boardings per Day
Daily Load
0
20
40
60
80
100
120
140
160
0
50
100
150
200
250
Broadway & Orange
N. Pearl & Clinton
N. Pearl & Sheridan
N. Pearl & State
S. Pearl & Beaver
S. Pearl & Van Zandt
S. Pearl & Westerlo
S. Pearl & Morton
S. Pearl & Schuyler
S. Pearl & 4th
S. Pearl & 2nd
2nd & Teunis
2nd & Elizabeth
2nd & Sloan
2nd & Grandview
2nd & Slingerland
2nd & Frisbie
2nd & W. Van Vechton
2nd & S. Bertha
2nd & Jeanette
2nd & Delaware
Whitehall & Sard
Whitehall & Marwill
Whitehall & Edgecomb
Whitehall & Clayton
Whitehall & Betwood
Whitehall & Marwood
Whitehall & Sycamore
Whitehall & Cardinal
Whitehall & Fleetwood
Whitehall & S. Main
S. Manning & Whitehall
S. Manning & Keeler
S. Manning & Arthur
319S. Manning Blvd
St. Peter's Hospital
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

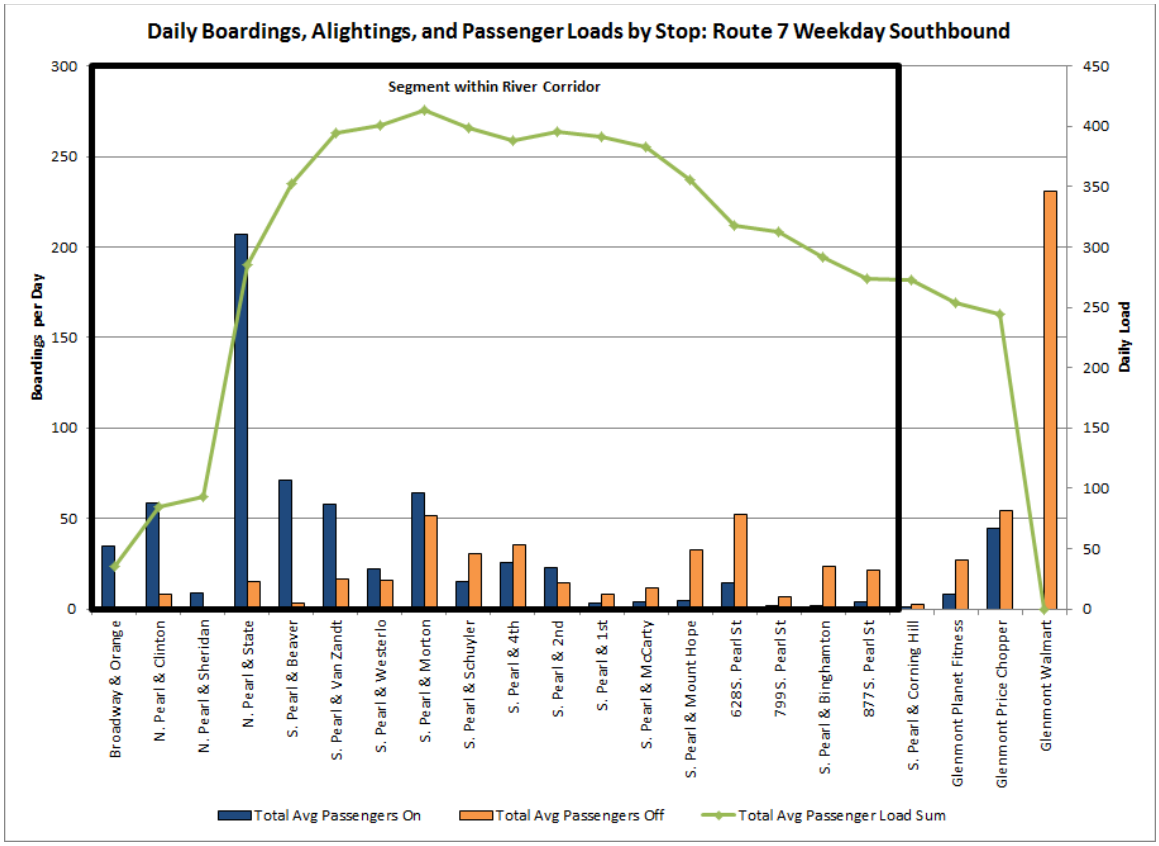

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 6 Weekday Southbound
Segment within River Corridor
Boardings per Day
Daily Load
0
50
100
150
200
250
300
350
0
100
200
300
400
500
600
700
Broadway & Orange
N. Pearl & Clinton
N. Pearl & Sheridan
N. Pearl & State
S. Pearl & Beaver
S. Pearl & Van Zandt
S. Pearl & Westerlo
S. Pearl & Morton
S. Pearl & Schuyler
S. Pearl & 4th
S. Pearl & 2nd
2nd & Teunis
2nd & Elizabeth
2nd & Sloan
2nd & Grandview
2nd & Slingerland
2nd & Frisbie
2nd & W. Van Vechton
2nd & S. Bertha
2nd & Jeanette
2nd & Delaware
Whitehall & Sard
Whitehall & Marwill
Whitehall & Edgecomb
Whitehall & Clayton
Whitehall & Betwood
Whitehall & Marwood
Whitehall & Sycamore
Whitehall & Cardinal
Whitehall & Fleetwood
Whitehall & S. Main
S. Manning & Whitehall
S. Manning & Keeler
S. Manning & Arthur
319S. Manning Blvd
St. Peter's Hospital
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

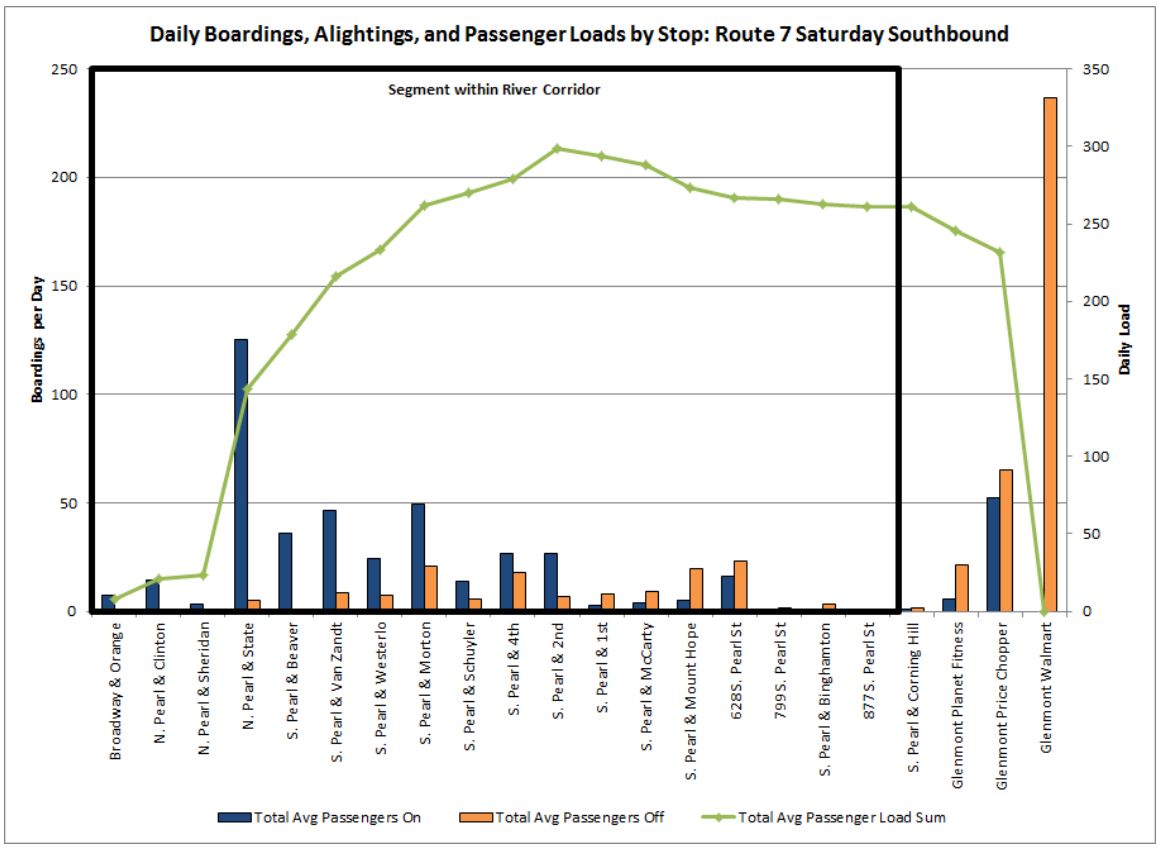

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 6 Sunday Southbound
Segment within River Corridor
Boardings per Day
Daily Load
0
10
20
30
40
50
60
70
0
20
40
60
80
100
120
Broadway & Orange
N. Pearl & Clinton
N. Pearl & Sheridan
N. Pearl & State
S. Pearl & Beaver
S. Pearl & Van Zandt
S. Pearl & Westerlo
S. Pearl & Morton
S. Pearl & Schuyler
S. Pearl & 4th
S. Pearl & 2nd
2nd & Teunis
2nd & Elizabeth
2nd & Sloan
2nd & Grandview
2nd & Slingerland
2nd & Frisbie
2nd & W. Van Vechten
2nd & S. Bertha
2nd & Jeanette
2nd & Delaware
Whitehall & Sard
Whitehall & Marwill
Whitehall & Edgecomb
Whitehall & Clayton
Whitehall & Betwood
Whitehall & Marwood
Whitehall & Sycamore
Whitehall & Cardinal
Whitehall & Fleetwood
Whitehall & S. Main
S. Manning & Whitehall
S. Manning & Keeler
S. Manning & Arthur
319 S. Manning Blvd
St. Peter's Hospital
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

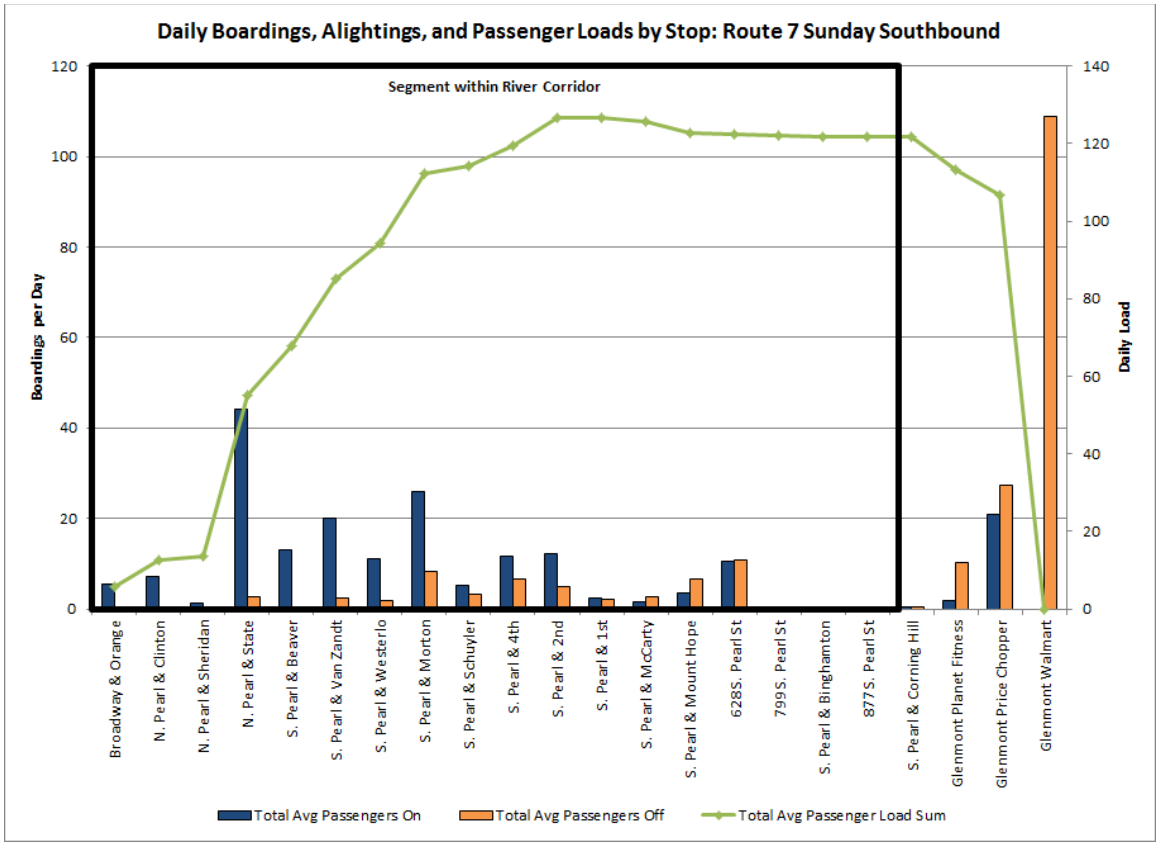

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 7 Weekday Northbound
Segment within River Corridor
Boardings per Day
Daily Load
0
50
100
150
200
250
300
0
50
100
150
200
250
300
350
400
450
Glenmont Walmart
262 Route 9W
Route 9W & Mount Hope
277 Mount Hope Dr
Mount Hope & Garland
Mount Hope & Little
118 Mount Hope Dr
629 Mount Hope Dr
625 Mount Hope Dr
S. Pearl & McCarty
S. Pearl & 1st
S. Pearl & 2nd
S. Pearl & 4th
S. Pearl & Schuyler
S. Pearl & Rensselaer
S. Pearl & Westerlo
S. Pearl & Madison
Dunn Memorial Bridge
S. Pearl & Hudson
S. Pearl & Beaver
N. Pearl & State
N. Pearl & Columbia
N. Pearl & Van Tromp
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

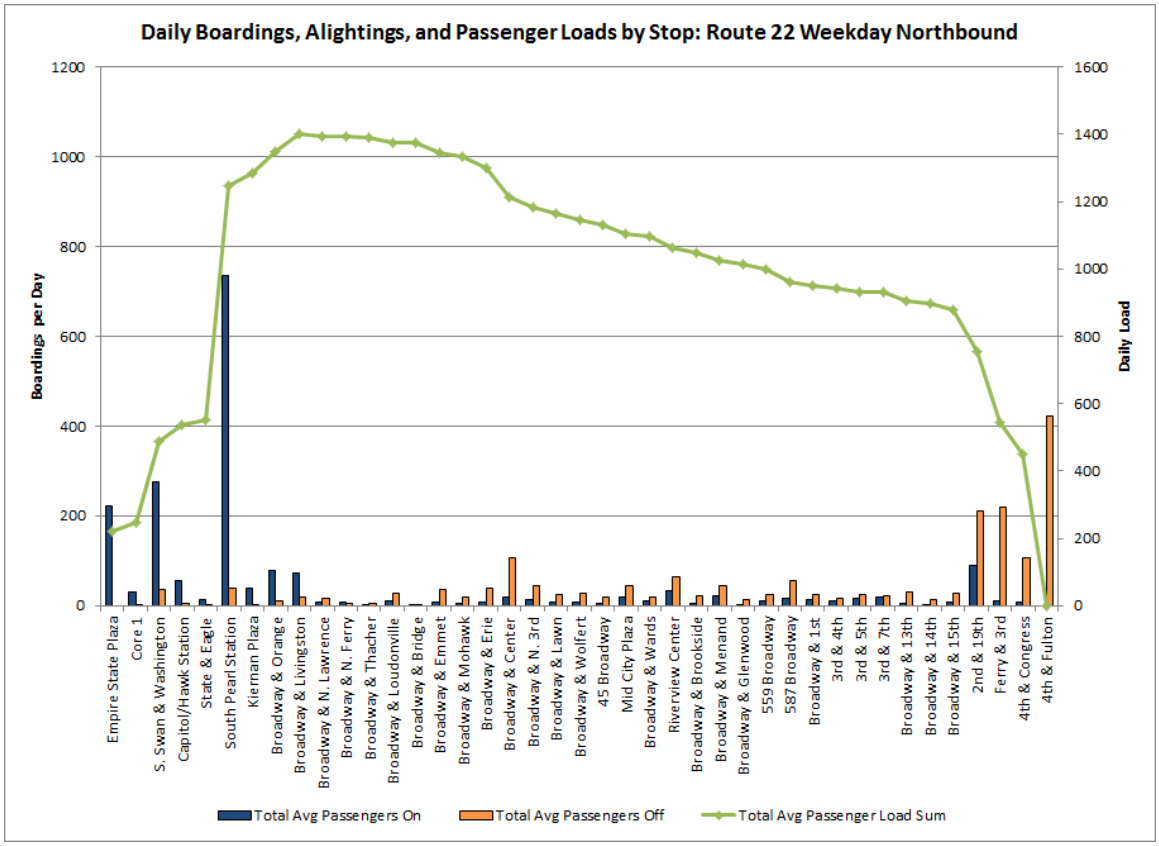

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 7 Saturday Northbound
Segment within River Corridor
Boardings per Day
Daily Load
250
200
150
100
50
0
350
300
250
200
150
100
50
0
Glenmont Walmart
262 Route 9W
Route 9W & Mount Hope
277 Mount Hope Dr
Mount Hope & Garland
Mount Hope & Little
118 Mount Hope Dr
629 Mount Hope Dr
625 Mount Hope Dr
S. Pearl & McCarty
S. Pearl & 1st
S. Pearl & 2nd
S. Pearl & 4th
S. Pearl & Schuyler
S. Pearl & Rensselaer
S. Pearl & Westerlo
S. Pearl & Madison
Dunn Memorial Bridge
S. Pearl & Hudson
S. Pearl & Beaver
N. Pearl & State
N. Pearl & Columbia
N. Pearl & Van Tromp
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

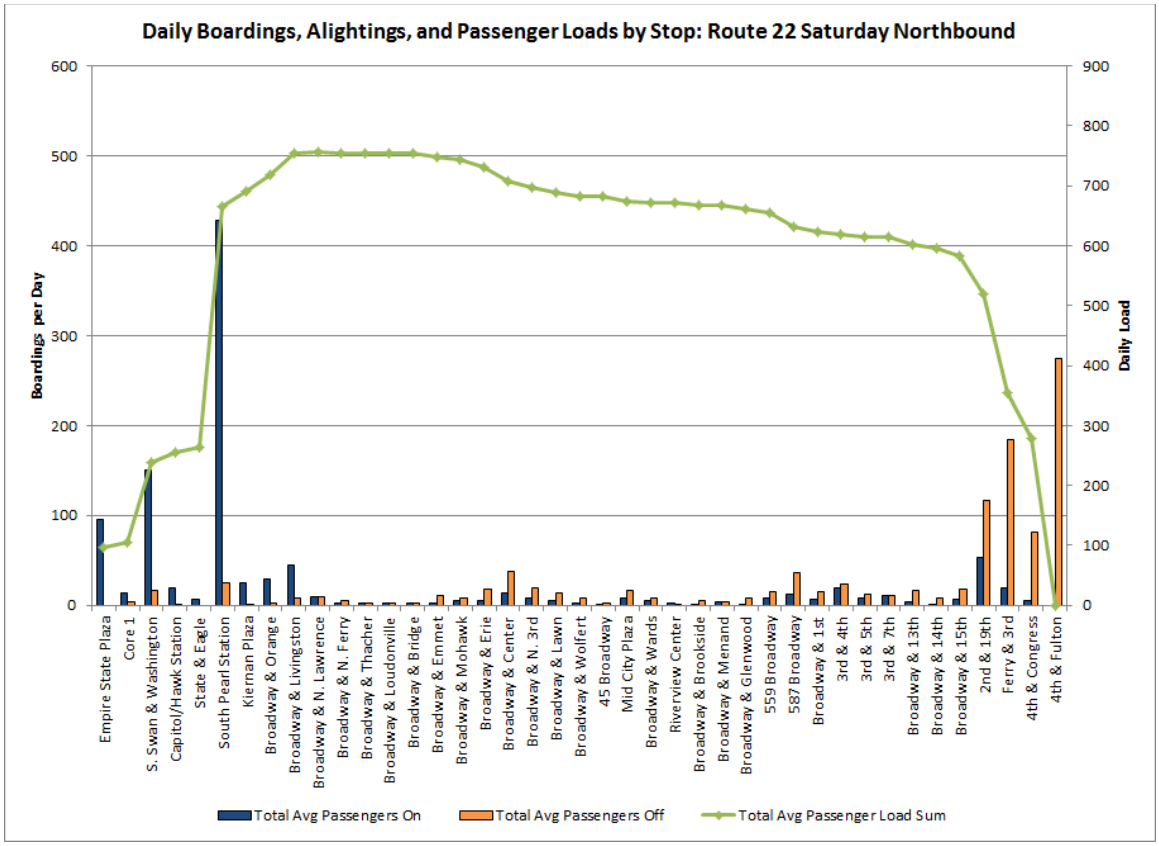

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 7 Sunday Northbound
Segment within River Corridor
Boardings per Day
Daily Load
120
100
80
60
40
20
0
140
120
100
80
60
40
20
0
Glenmont Walmart
262 Route 9W
Route 9W & Mount Hope
277 Mount Hope Dr
Mount Hope & Garland
Mount Hope & Little
118 Mount Hope Dr
629 Mount Hope Dr
625 Mount Hope Dr
S. Pearl & McCarty
S. Pearl & 1st
S. Pearl & 2nd
S. Pearl & 4th
S. Pearl & Schuyler
S. Pearl & Rensselaer
S. Pearl & Westerlo
S. Pearl & Madison
Dunn Memorial Bridge
S. Pearl & Hudson
S. Pearl & Beaver
N. Pearl & State
N. Pearl & Columbia
N. Pearl & Van Tromp
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

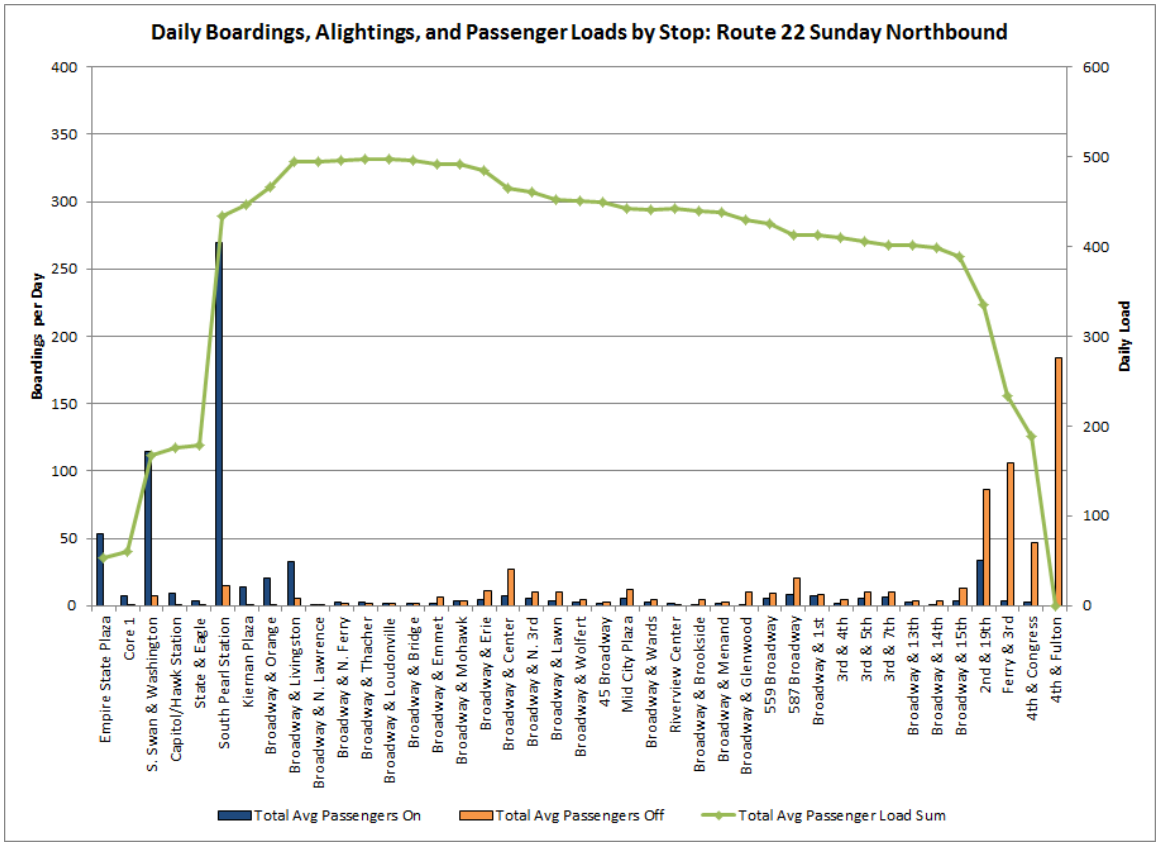

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 7 Weekday Southbound
Segment within River Corridor
Boardings per Day
Daily Load
300
250
200
150
100
50
0
450
400
350
300
250
200
150
100
50
0
Broadway & Orange
N. Pearl & Clinton
N. Pearl & Sheridan
N. Pearl & State
S. Pearl & Beaver
S. Pearl & Van Zandt
S. Pearl & Westerlo
S. Pearl & Morton
S. Pearl & Schuyler
S. Pearl & 4th
S. Pearl & 2nd
S. Pearl & 1st
S. Pearl & McCarty
S. Pearl & Mount Hope
628S. Pearl St
799S. Pearl St
S. Pearl & Binghamton
877S. Pearl St
S. Pearl & Corning Hill
Glenmont Planet Fitness
Glenmont Price Chopper
Glenmont Walmart
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

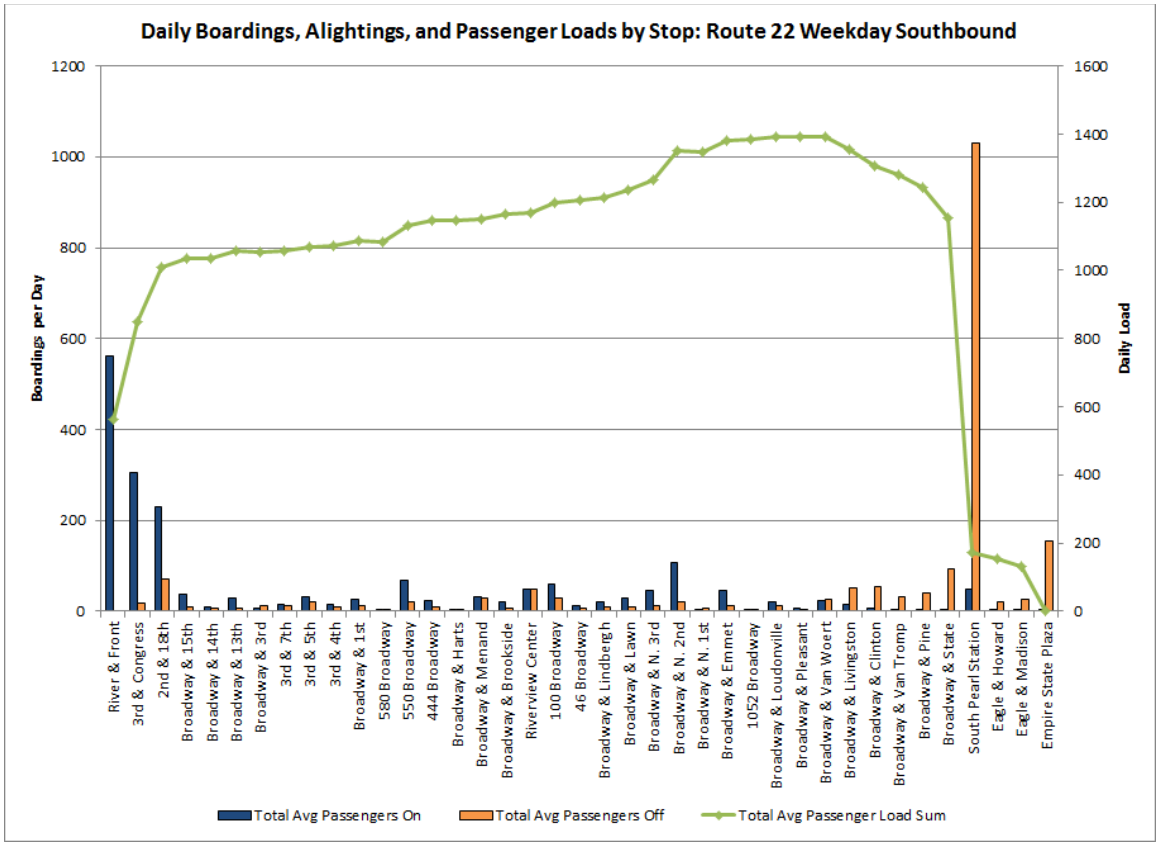

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 7 Saturday Southbound
Segment within River Corridor
Boardings per Day
Daily Load
250
200
150
100
50
0
350
300
250
200
150
100
50
0
Broadway & Orange
N. Pearl & Clinton
N. Pearl & Sheridan
N. Pearl & State
S. Pearl & Beaver
S. Pearl & Van Zandt
S. Pearl & Westerlo
S. Pearl & Morton
S. Pearl & Schuyler
S. Pearl & 4th
S. Pearl & 2nd
S. Pearl & 1st
S. Pearl & McCarty
S. Pearl & Mount Hope
628S. Pearl St
799S. Pearl St
S. Pearl & Binghamton
877S. Pearl St
S. Pearl & Corning Hill
Glenmont Planet Fitness
Glenmont Price Chopper
Glenmont Walmart
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

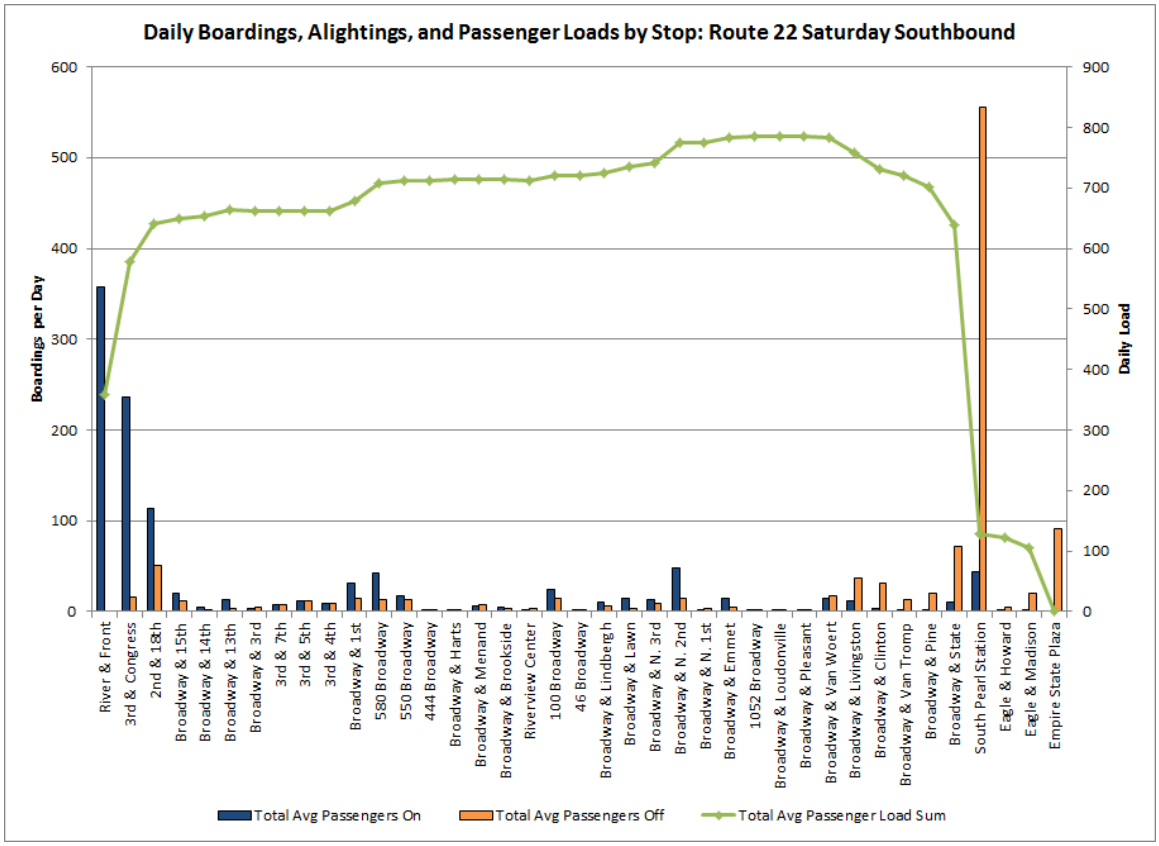

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 7 Sunday Southbound
Segment within River Corridor
Boardings per Day
Daily Load
120
100
80
60
40
20
0
140
120
100
80
60
40
20
0
Broadway & Orange
N. Pearl & Clinton
N. Pearl & Sheridan
N. Pearl & State
S. Pearl & Beaver
S. Pearl & Van Zandt
S. Pearl & Westerlo
S. Pearl & Morton
S. Pearl & Schuyler
S. Pearl & 4th
S. Pearl & 2nd
S. Pearl & 1st
S. Pearl & McCarty
S. Pearl & Mount Hope
628 S. Pearl St
799 S. Pearl St
S. Pearl & Binghamton
877 S. Pearl St
S. Pearl & Corning Hill
Glenmont Planet Fitness
Glenmont Price Chopper
Glenmont Walmart
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

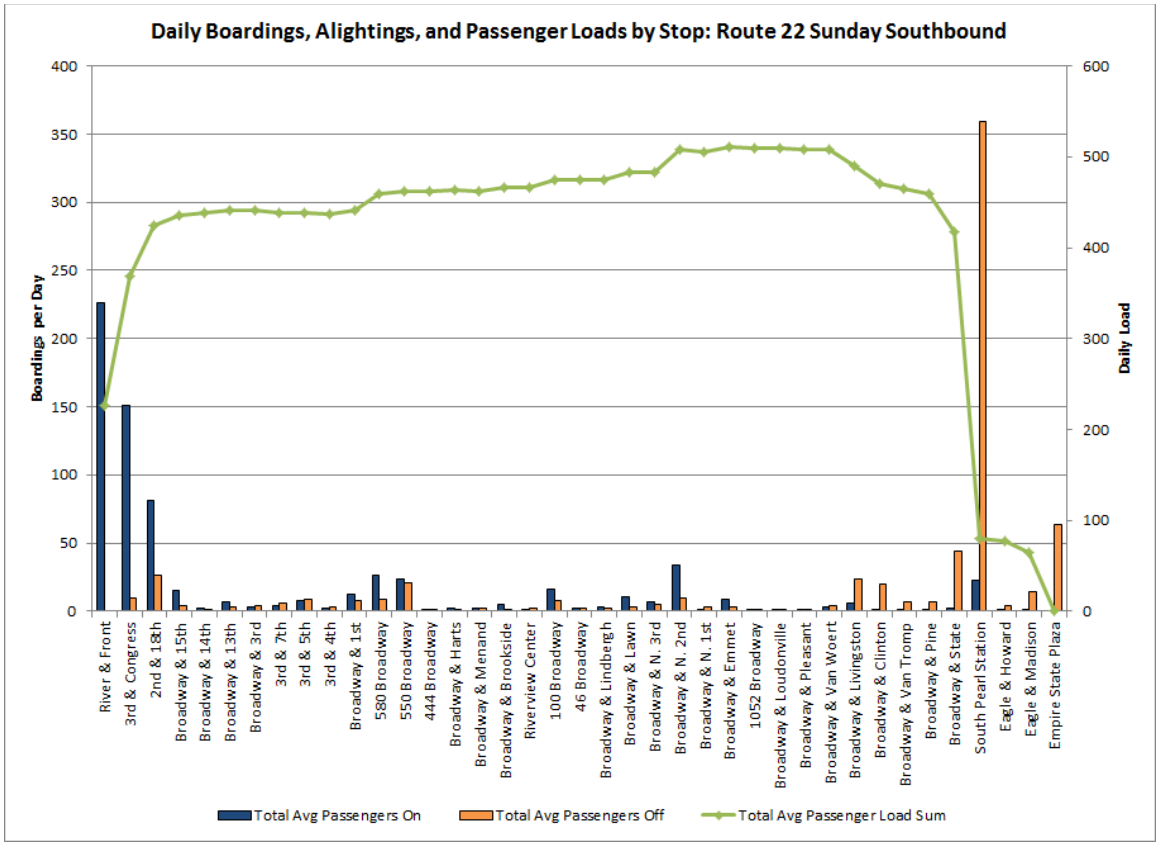

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 22 Weekday Northbound
Boardings per Day
Daily Load
1200
1000
800
600
400
200
0
1600
1400
1200
1000
800
600
400
200
0
Empire State Plaza
Core 1
S. Swan & Washington
Capitol/Hawk Station
State & Eagle
South Pearl Station
Kiernan Plaza
Broadway & Orange
Broadway & Livingston
Broadway & N. Lawrence
Broadway & N. Ferry
Broadway & Thacher
Broadway & Loudonville
Broadway & Bridge
Broadway & Emmet
Broadway & Mohawk
Broadway & Erie
Broadway & Center
Broadway & N. 3rd
Broadway & Lawn
Broadway & Wolfert
45 Broadway
Mid City Plaza
Broadway & Wards
Riverview Center
Broadway & Brookside
Broadway & Menand
Broadway & Glenwood
559 Broadway
587 Broadway
Broadway & 1st
3rd & 4th
3rd & 5th
3rd & 7th
Broadway & 13th
Broadway & 14th
Broadway & 15th
2nd & 19th
Ferry & 3rd
4th & Congress
4th & Fulton
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

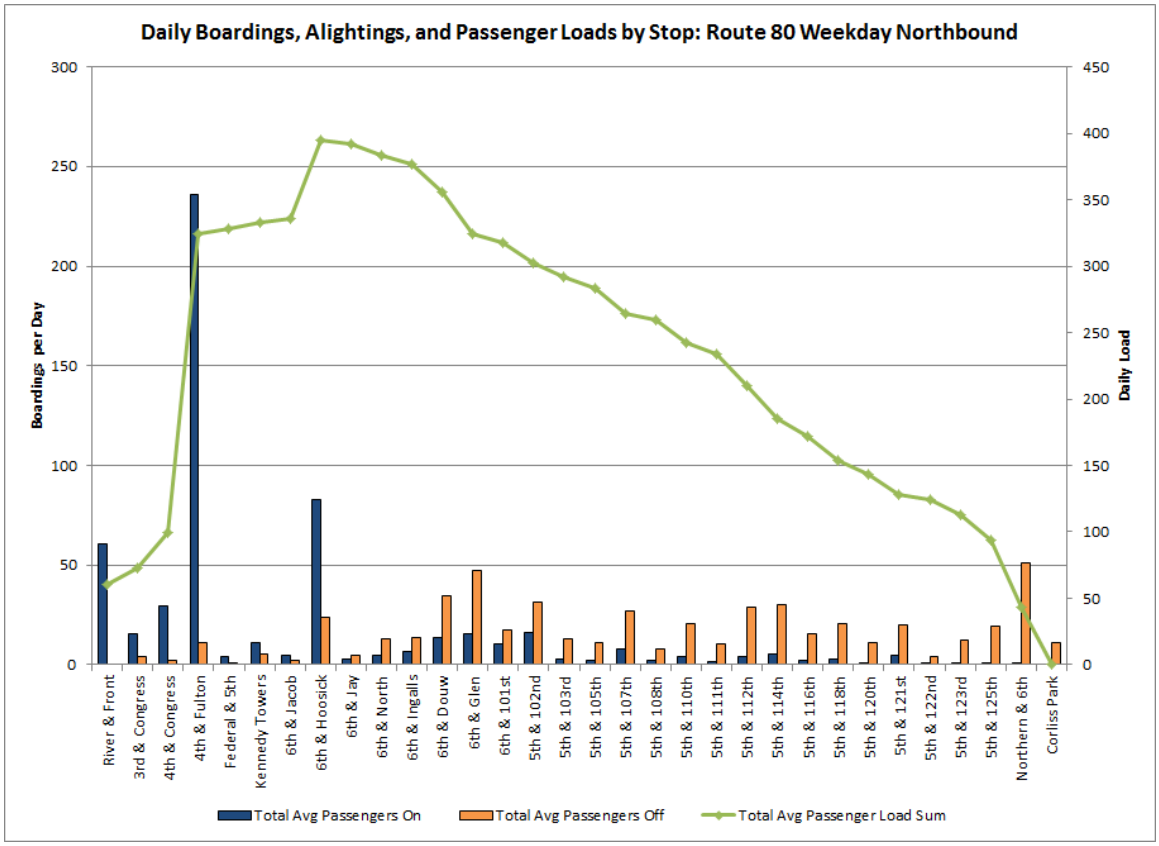

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 22 Saturday Northbound
Boardings per Day
Daily Load
0
100
200
300
400
500
600
0
100
200
300
400
500
600
700
800
900
Empire State Plaza
Core 1
S. Swan & Washington
Capitol/Hawk Station
State & Eagle
South Pearl Station
Kiernan Plaza
Broadway & Orange
Broadway & Livingston
Broadway & N. Lawrence
Broadway & N. Ferry
Broadway & Thacher
Broadway & Loudonville
Broadway & Bridge
Broadway & Emmet
Broadway & Mohawk
Broadway & Erie
Broadway & Center
Broadway & N. 3rd
Broadway & Lawn
Broadway & Wolfert
45 Broadway
Mid City Plaza
Broadway & Wards
Riverview Center
Broadway & Brookside
Broadway & Menand
Broadway & Glenwood
559 Broadway
587 Broadway
Broadway & 1st
3rd & 4th
3rd & 5th
3rd & 7th
Broadway & 13th
Broadway & 14th
Broadway & 15th
2nd & 19th
Ferry & 3rd
4th & Congress
4th & Fulton
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

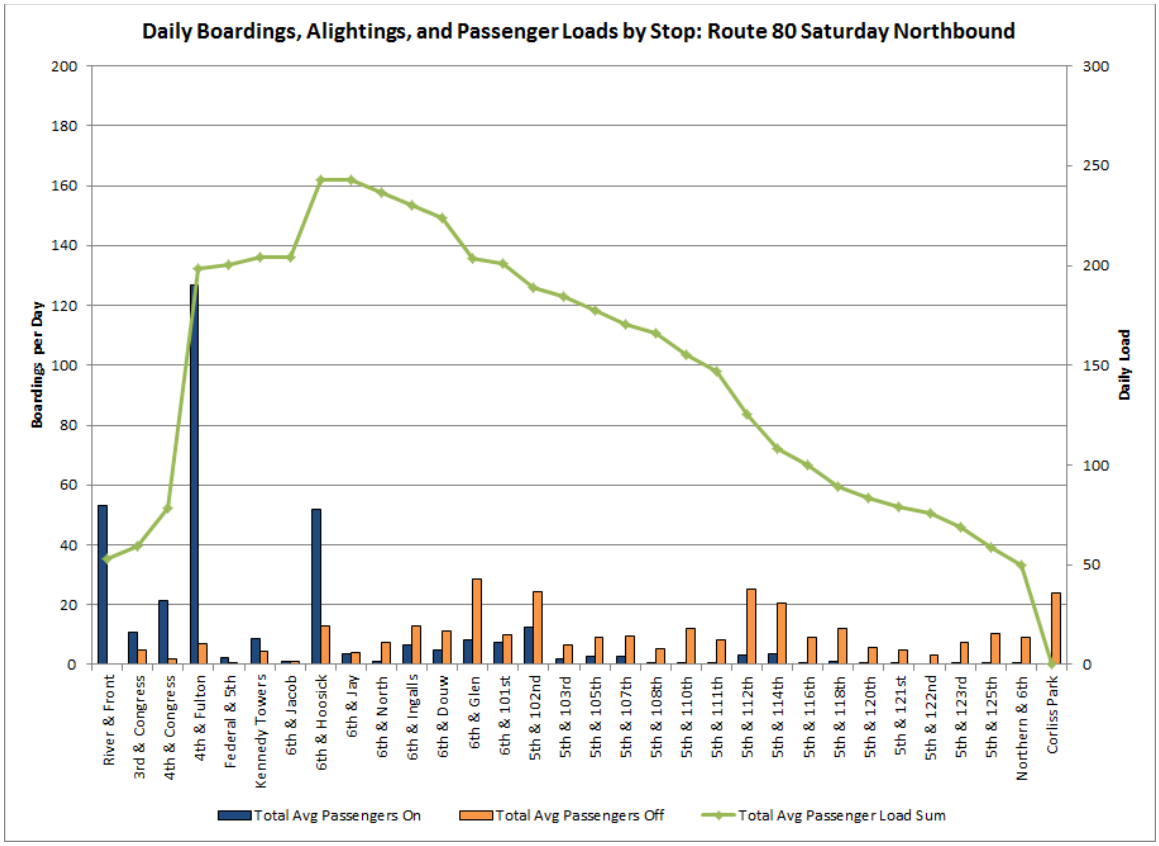

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 22 Sunday Northbound
Boardings per Day
Daily Load
0
50
100
150
200
250
300
350
400
0
100
200
300
400
500
600
Empire State Plaza
Core 1
S. Swan & Washington
Capitol/Hawk Station
State & Eagle
South Pearl Station
Kiernan Plaza
Broadway & Orange
Broadway & Livingston
Broadway & N. Lawrence
Broadway & N. Ferry
Broadway & Thacher
Broadway & Loudonville
Broadway & Bridge
Broadway & Emmet
Broadway & Mohawk
Broadway & Erie
Broadway & Center
Broadway & N. 3rd
Broadway & Lawn
Broadway & Wolfert
45 Broadway
Mid City Plaza
Broadway & Wards
Riverview Center
Broadway & Brookside
Broadway & Menand
Broadway & Glenwood
559 Broadway
587 Broadway
Broadway & 1st
3rd & 4th
3rd & 5th
3rd & 7th
Broadway & 13th
Broadway & 14th
Broadway & 15th
2nd & 19th
Ferry & 3rd
4th & Congress
4th & Fulton
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

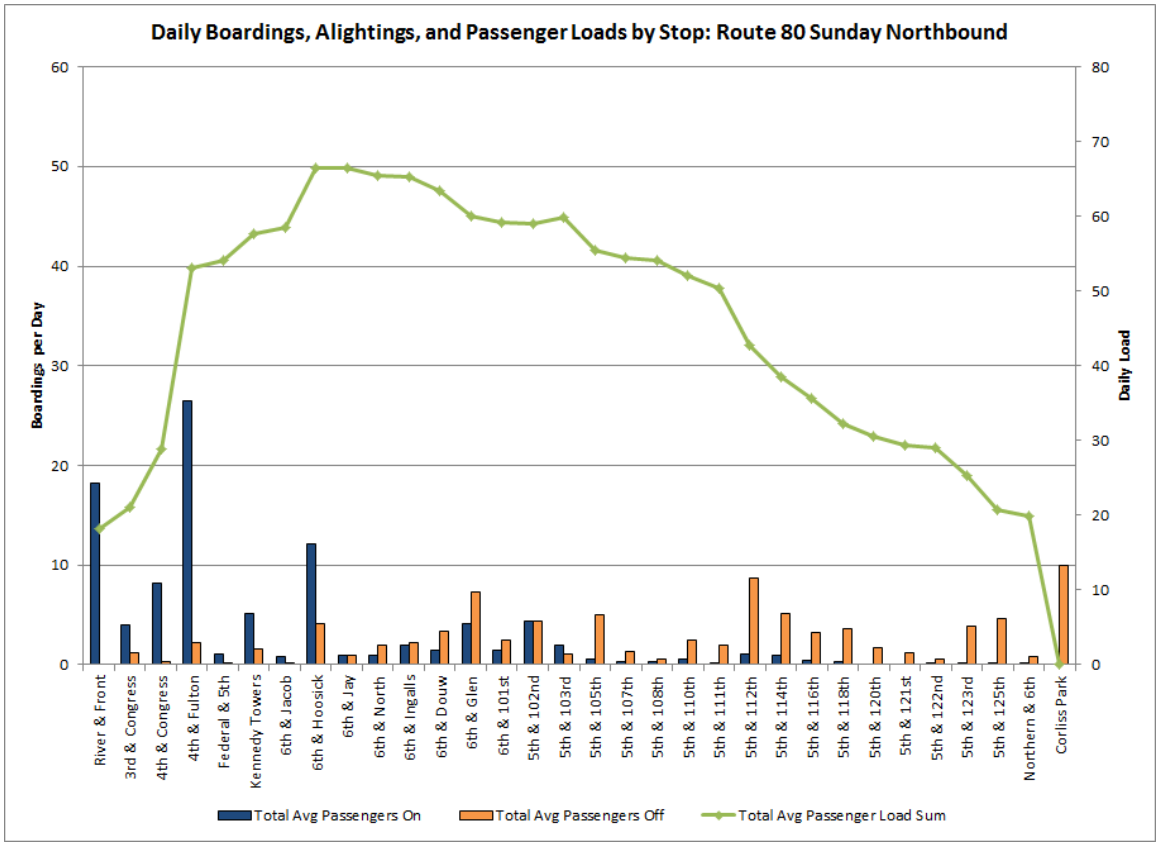

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 22 Weekday Southbound
Boardings per Day
Daily Load
0
200
400
600
800
1000
1200
1400
1600
River & Front
3rd & Congress
2nd & 18th
Broadway & 15th
Broadway & 14th
Broadway & 13th
Broadway & 3rd
3rd & 7th
3rd & 5th
3rd & 4th
Broadway & 1st
580 Broadway
550 Broadway
444 Broadway
Broadway & Harts
Broadway & Menand
Broadway & Brookside
Riverview Center
100 Broadway
46 Broadway
Broadway & Lindbergh
Broadway & Lawn
Broadway & N. 3rd
Broadway & N. 2nd
Broadway & N. 1st
Broadway & Emmet
1052 Broadway
Broadway & Loudonville
Broadway & Pleasant
Broadway & Van Woert
Broadway & Livingston
Broadway & Clinton
Broadway & Van Tromp
Broadway & Pine
Broadway & State
South Pearl Station
Eagle & Howard
Eagle & Madison
Empire State Plaza
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

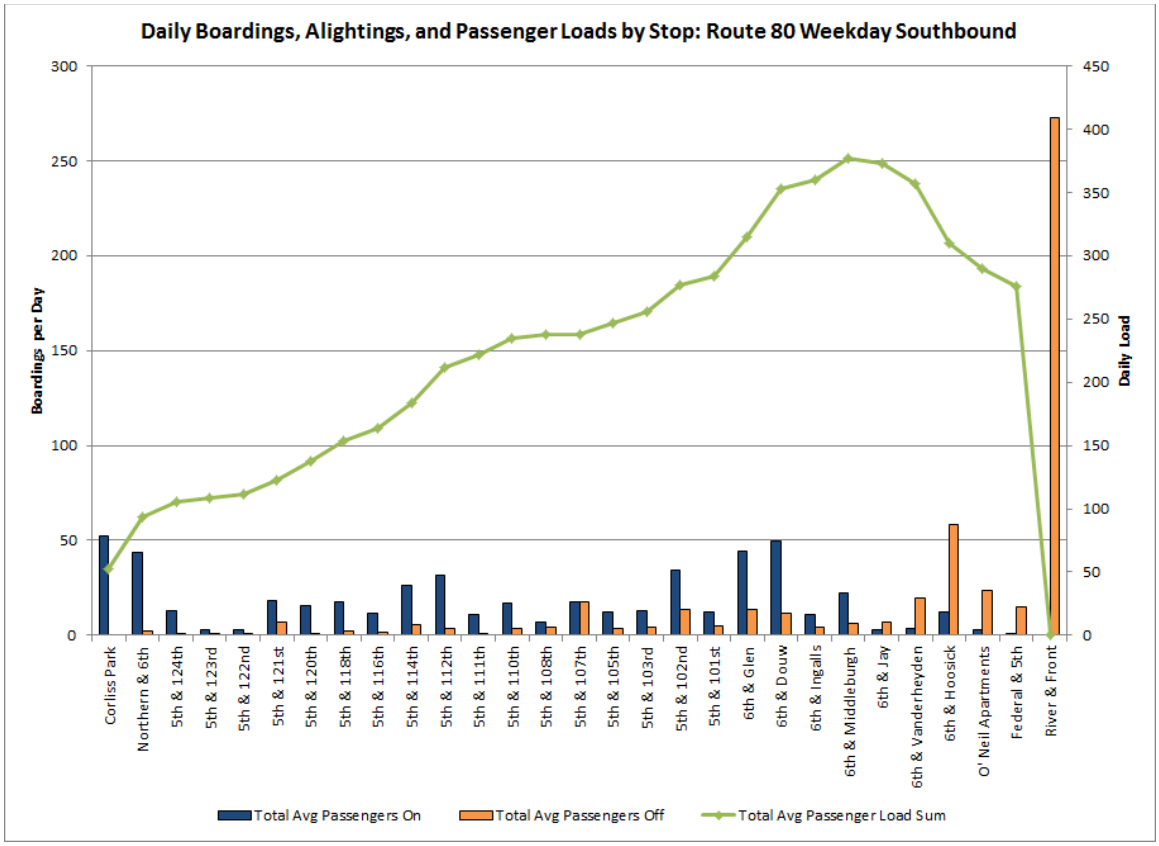

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 22 Saturday Southbound
Boardings per Day
Daily Load
0
100
200
300
400
500
600
700
800
900
River & Front
3rd & Congress
2nd & 18th
Broadway & 15th
Broadway & 14th
Broadway & 13th
Broadway & 3rd
3rd & 7th
3rd & 5th
3rd & 4th
Broadway & 1st
580 Broadway
550 Broadway
444 Broadway
Broadway & Harts
Broadway & Menand
Broadway & Brookside
Riverview Center
100 Broadway
46 Broadway
Broadway & Lindbergh
Broadway & Lawn
Broadway & N. 3rd
Broadway & N. 2nd
Broadway & N. 1st
Broadway & Emmet
1052 Broadway
Broadway & Loudonville
Broadway & Pleasant
Broadway & Van Woert
Broadway & Livingston
Broadway & Clinton
Broadway & Van Tromp
Broadway & Pine
Broadway & State
South Pearl Station
Eagle & Howard
Eagle & Madison
Empire State Plaza
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

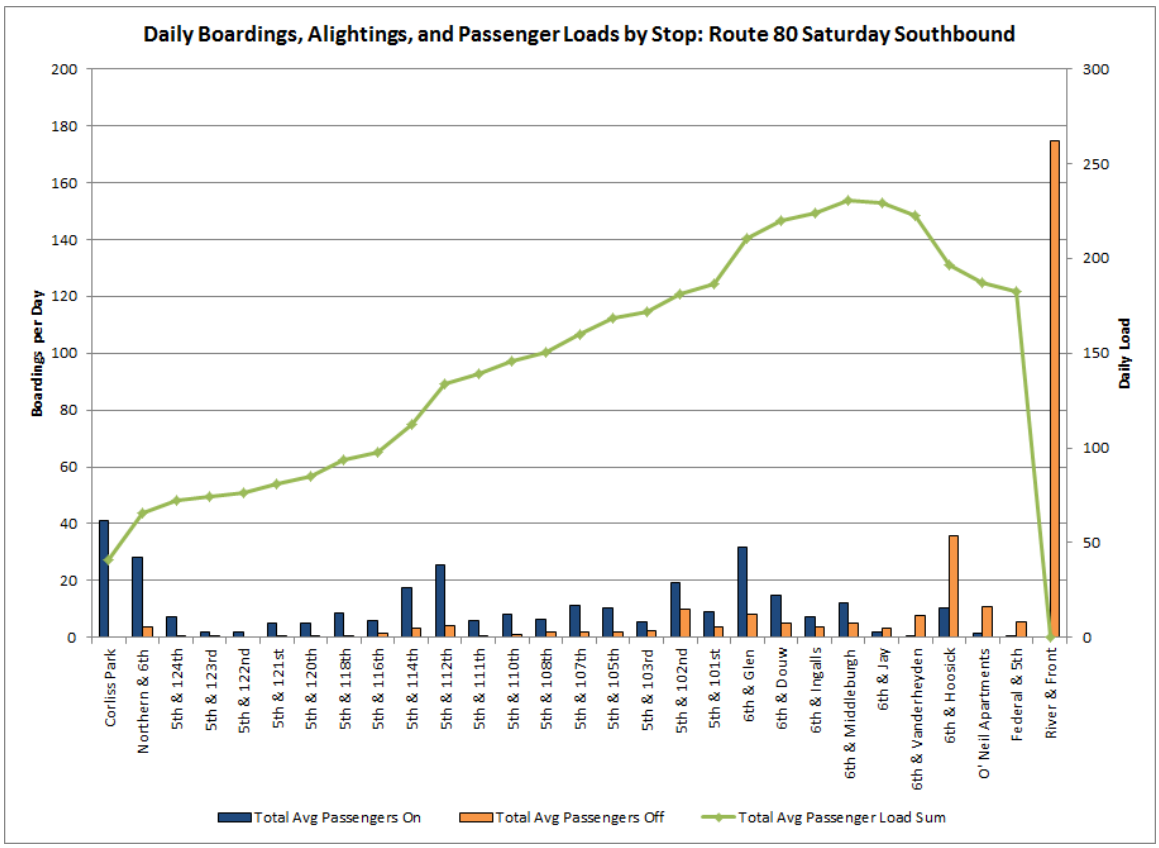

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 22 Sunday Southbound
Boardings per Day
Daily Load
0
50
100
150
200
250
300
350
400
0
100
200
300
400
500
600
River & Front
3rd & Congress
2nd & 18th
Broadway & 15th
Broadway & 14th
Broadway & 13th
Broadway & 3rd
3rd & 7th
3rd & 5th
3rd & 4th
Broadway & 1st
580 Broadway
550 Broadway
444 Broadway
Broadway & Harts
Broadway & Menand
Broadway & Brookside
Riverview Center
100 Broadway
46 Broadway
Broadway & Lindbergh
Broadway & Lawn
Broadway & N. 3rd
Broadway & N. 2nd
Broadway & N. 1st
Broadway & Emmet
1052 Broadway
Broadway & Loudonville
Broadway & Pleasant
Broadway & Van Woert
Broadway & Livingston
Broadway & Clinton
Broadway & Van Tromp
Broadway & Pine
Broadway & State
South Pearl Station
Eagle & Howard
Eagle & Madison
Empire State Plaza
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

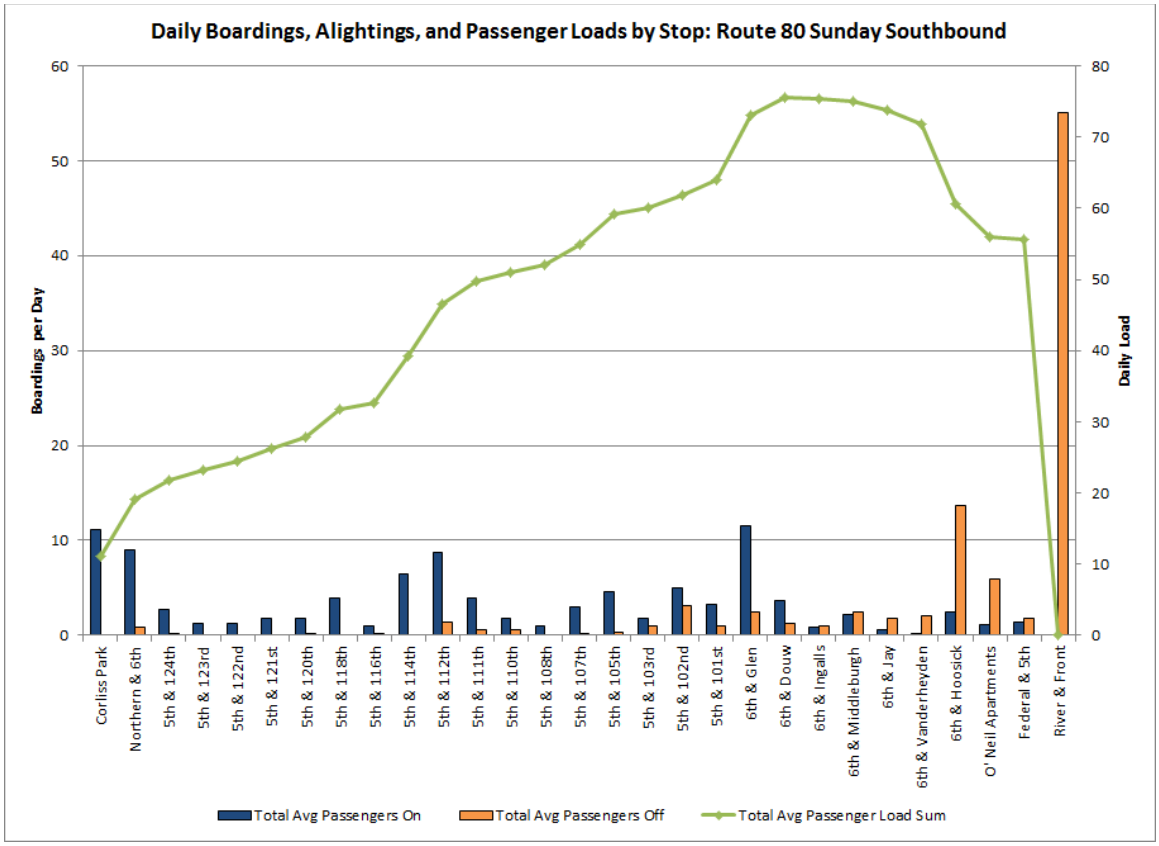

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 80 Weekday Northbound
Boardings per Day
Daily Load
0
50
100
150
200
250
300
0
50
100
150
200
250
300
350
400
450
River & Front
3rd & Congress
4th & Congress
4th & Fulton
Federal & 5th
Kennedy Towers
6th & Jacob
6th & Hoosick
6th & Jay
6th & North
6th & Ingalls
6th & Douw
6th & Glen
6th & 101st
5th & 102nd
5th & 103rd
5th & 105th
5th & 107th
5th & 108th
5th & 110th
5th & 111th
5th & 112th
5th & 114th
5th & 116th
5th & 118th
5th & 120th
5th & 121st
5th & 122nd
5th & 123rd
5th & 125th
Northern & 6th
Corliss Park
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

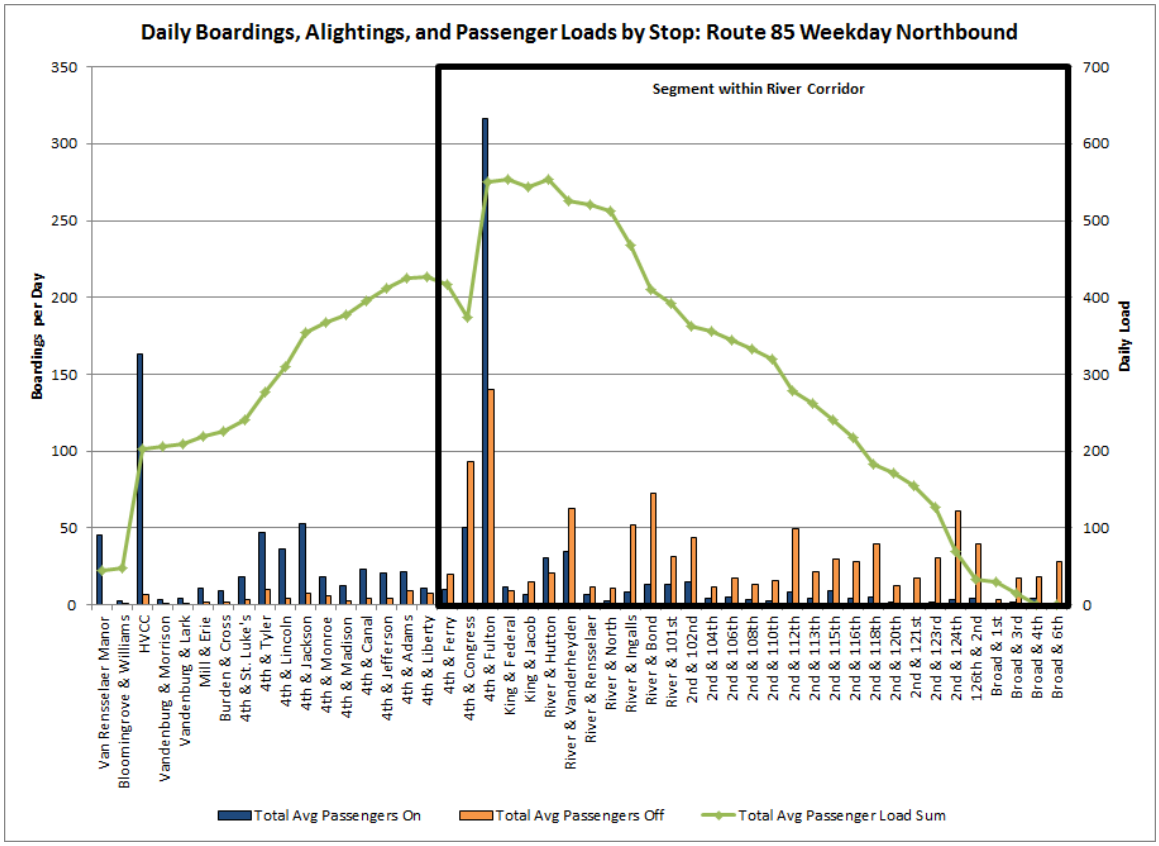

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 80 Saturday Northbound
Boardings per Day
Daily Load
0
20
40
60
80
100
120
140
160
180
200
0
50
100
150
200
250
300
River & Front
3rd & Congress
4th & Congress
4th & Fulton
Federal & 5th
Kennedy Towers
6th & Jacob
6th & Hoosick
6th & Jay
6th & North
6th & Ingalls
6th & Douw
6th & Glen
6th & 101st
5th & 102nd
5th & 103rd
5th & 105th
5th & 107th
5th & 108th
5th & 110th
5th & 111th
5th & 112th
5th & 114th
5th & 116th
5th & 118th
5th & 120th
5th & 121st
5th & 122nd
5th & 123rd
5th & 125th
Northern & 6th
Corliss Park
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

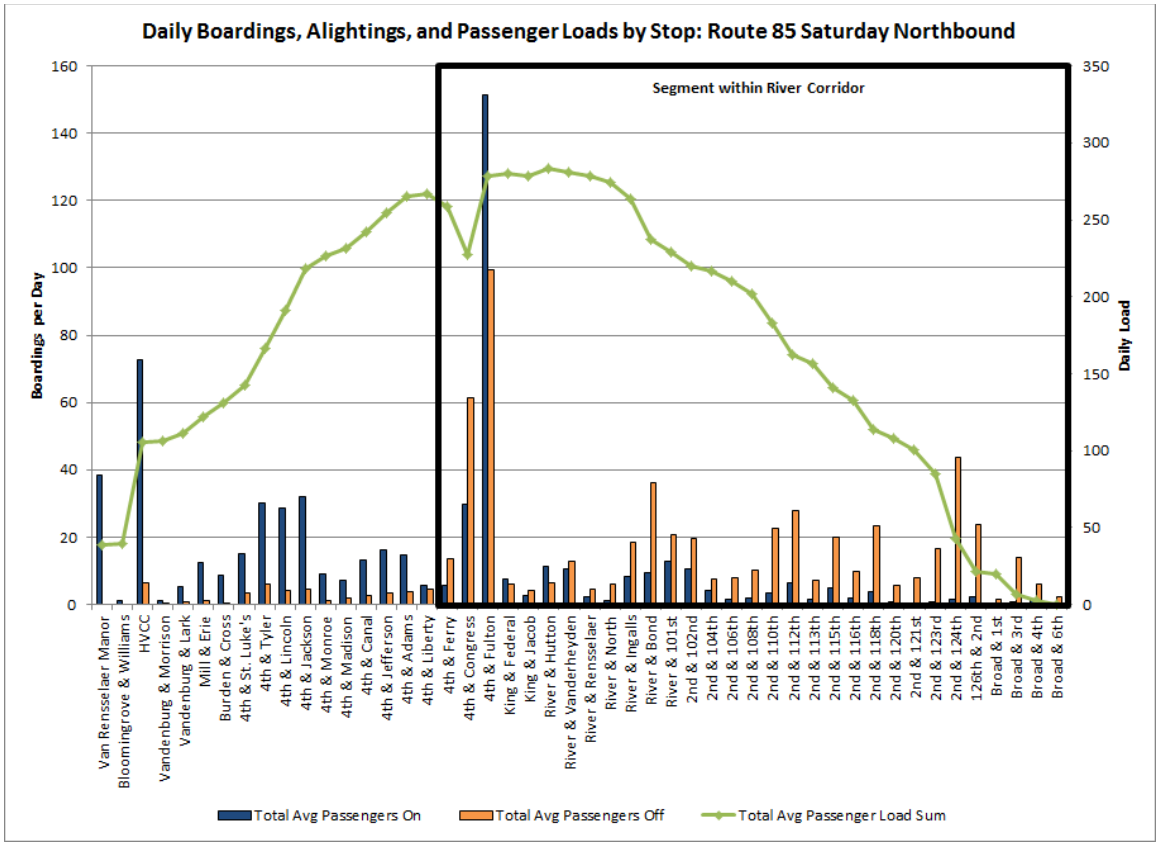

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 80 Sunday Northbound
Boardings per Day
Daily Load
0
10
20
30
40
50
60
0
10
20
30
40
50
60
70
80
River & Front
3rd & Congress
4th & Congress
4th & Fulton
Federal & 5th
Kennedy Towers
6th & Jacob
6th & Hoosick
6th & Jay
6th & North
6th & Ingalls
6th & Douw
6th & Glen
6th & 101st
5th & 102nd
5th & 103rd
5th & 105th
5th & 107th
5th & 108th
5th & 110th
5th & 111th
5th & 112th
5th & 114th
5th & 116th
5th & 118th
5th & 120th
5th & 121st
5th & 122nd
5th & 123rd
5th & 125th
Northern & 6th
Corliss Park
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

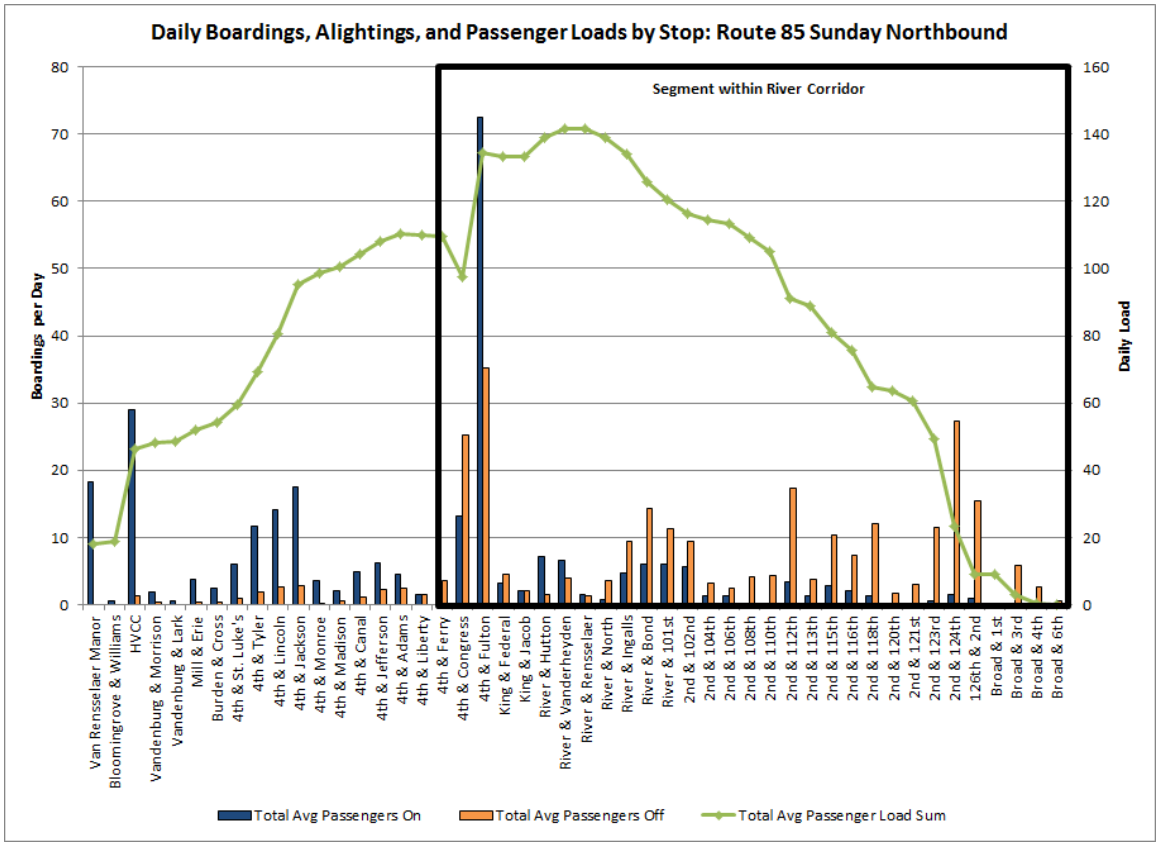

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 80 Weekday Southbound
Boardings per Day
Daily Load
0
50
100
150
200
250
300
350
400
450
Corliss Park
Northern & 6th
5th & 124th
5th & 123rd
5th & 122nd
5th & 121st
5th & 120th
5th & 118th
5th & 116th
5th & 114th
5th & 112th
5th & 111th
5th & 110th
5th & 108th
5th & 107th
5th & 105th
5th & 103rd
5th & 102nd
5th & 101st
6th & Glen
6th & Douw
6th & Ingalls
6th & Middleburgh
6th & Jay
6th & Vanderheyden
6th & Hoosick
O' Neil Apartments
Federal & 5th
River & Front
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

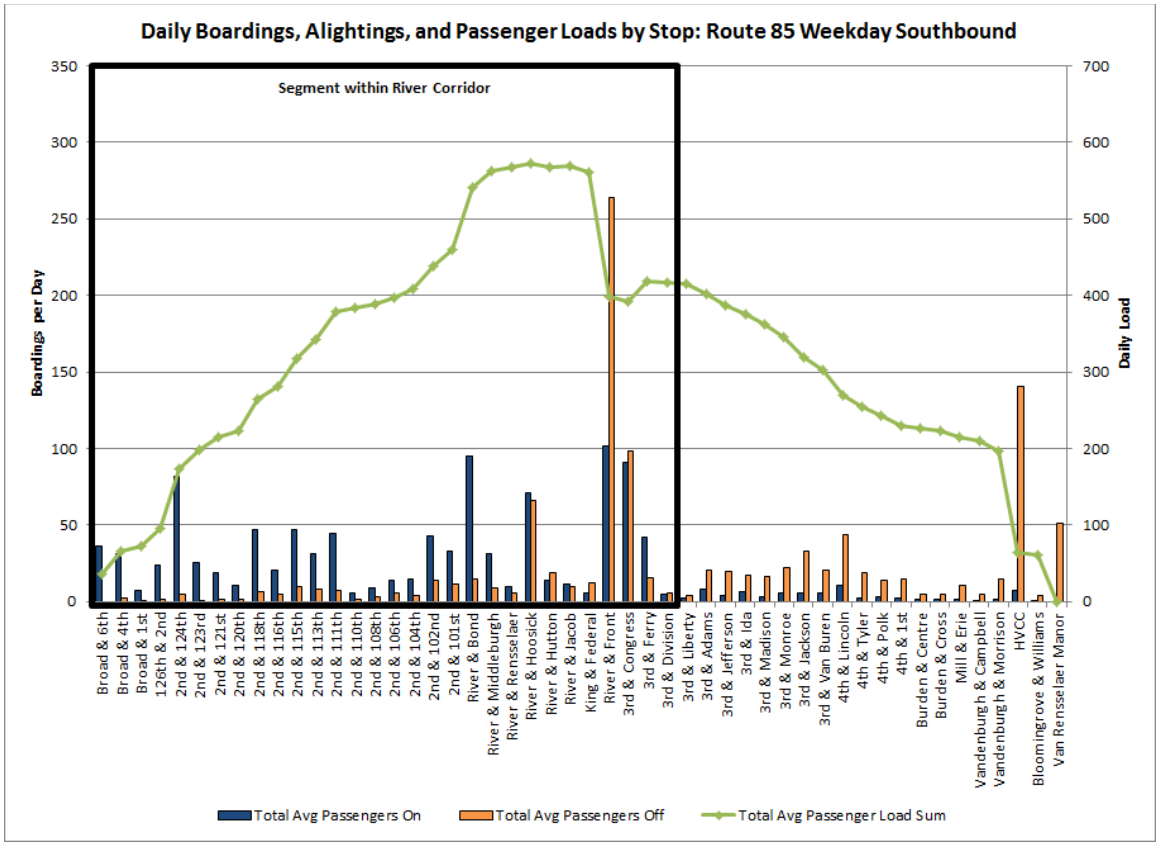

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 80 Saturday Southbound
Boardings per Day
Daily Load
0
20
40
60
80
100
120
140
160
180
200
0
50
100
150
200
250
300
Corliss Park
Northern & 6th
5th & 124th
5th & 123rd
5th & 122nd
5th & 121st
5th & 120th
5th & 118th
5th & 116th
5th & 114th
5th & 112th
5th & 111th
5th & 110th
5th & 108th
5th & 107th
5th & 105th
5th & 103rd
5th & 102nd
5th & 101st
6th & Glen
6th & Douw
6th & Ingalls
6th & Middleburgh
6th & Jay
6th & Vanderheyden
6th & Hoosick
O' Neil Apartments
Federal & 5th
River & Front
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

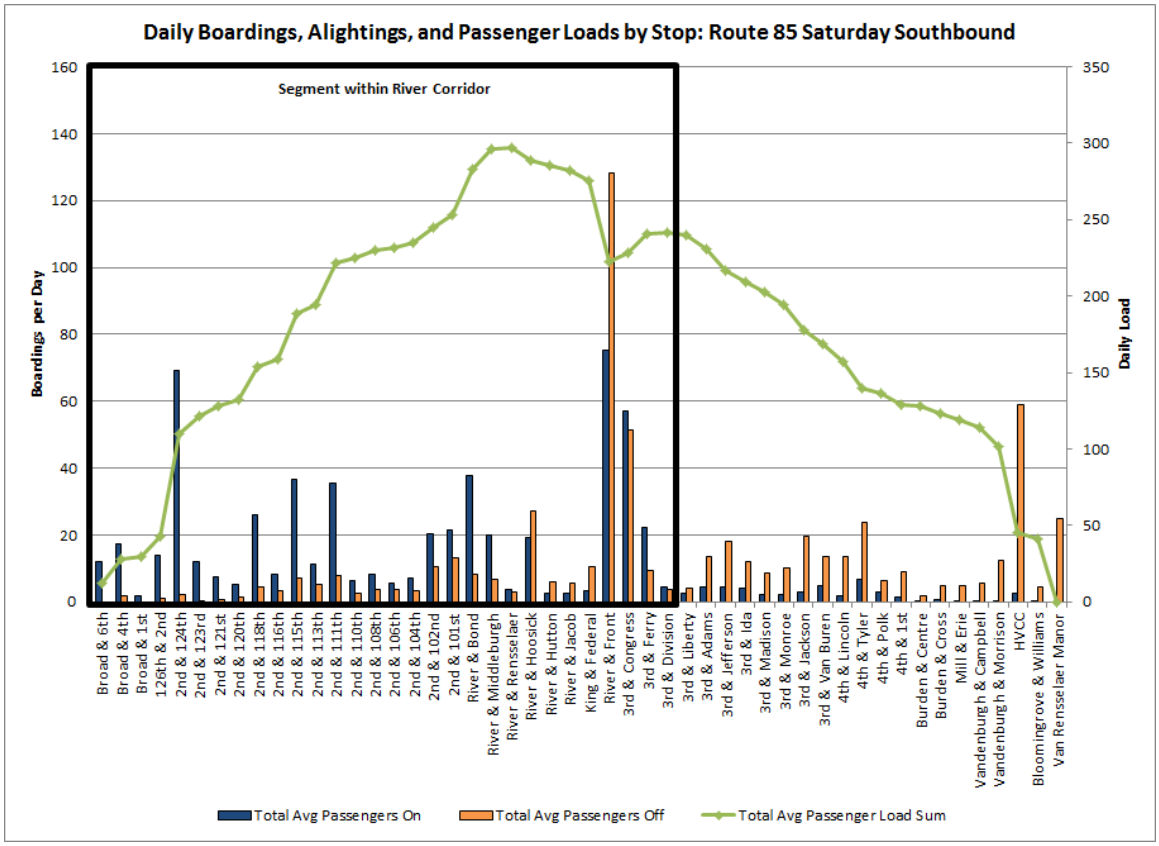

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 80 Sunday Southbound
Boardings per Day
Daily Load
0
10
20
30
40
50
60
70
80
Corliss Park
Northern & 6th
5th & 124th
5th & 123rd
5th & 122nd
5th & 121st
5th & 120th
5th & 118th
5th & 116th
5th & 114th
5th & 112th
5th & 111th
5th & 110th
5th & 108th
5th & 107th
5th & 105th
5th & 103rd
5th & 102nd
5th & 101st
6th & Glen
6th & Douw
6th & Ingalls
6th & Middlebugh
6th & Jay
6th & Vanderheyden
6th & Hoosick
O' Neil Apartments
Federal & 5th
River & Front
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

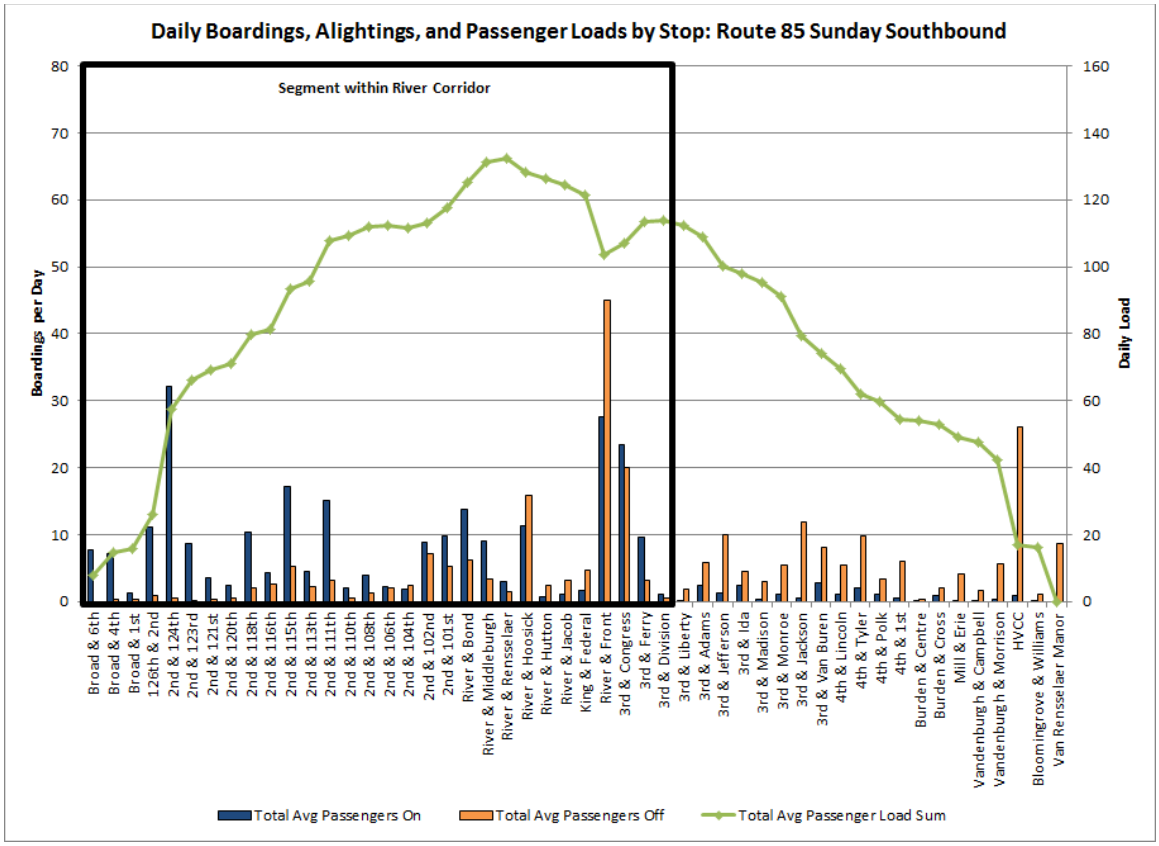

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 85 Weekday Northbound
Segment within River Corridor
Boardings per Day
Daily Load
0
50
100
150
200
250
300
350
0
100
200
300
400
500
600
700
Van Rensselaer Manor
Bloomingrove & Williams
HVCC
Vandenburg & Morrison
Vandenburg & Lark
Mill & Erie
Burden & Cross
4th & St. Luke's
4th & Tyler
4th & Lincoln
4th & Jackson
4th & Monroe
4th & Madison
4th & Canal
4th & Jefferson
4th & Adams
4th & Liberty
4th & Ferry
4th & Congress
4th & Fulton
King & Federal
King & Jacob
River & Hutton
River & Vanderheyden
River & Rensselaer
River & North
River & Ingalls
River & Bond
River & 101st
2nd & 102nd
2nd & 104th
2nd & 106th
2nd & 108th
2nd & 110th
2nd & 112th
2nd & 113th
2nd & 115th
2nd & 116th
2nd & 118th
2nd & 120th
2nd & 121st
2nd & 123rd
2nd & 124th
126th & 2nd
Broad & 1st
Broad & 3rd
Broad & 4th
Broad & 6th
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

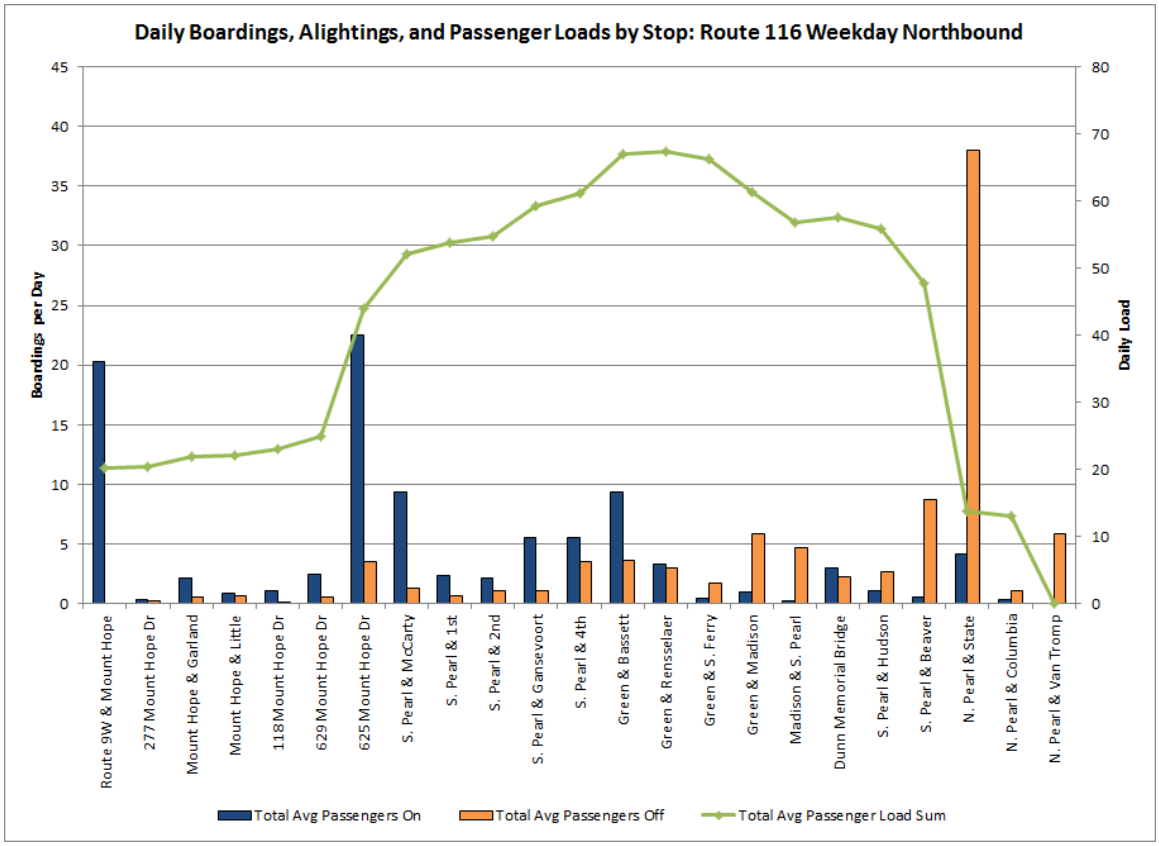

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 85 Saturday Northbound
Segment within River Corridor
Boardings per Day
Daily Load
0
20
40
60
80
100
120
140
160
0
50
100
150
200
250
300
350
Van Rensselaer Manor
Bloomingrove & Williams
HVCC
Vandenburg & Morrison
Vandenburg & Lark
Mill & Erie
Burden & Cross
4th & St. Luke's
4th & Tyler
4th & Lincoln
4th & Jackson
4th & Monroe
4th & Madison
4th & Canal
4th & Jefferson
4th & Adams
4th & Liberty
4th & Ferry
4th & Congress
4th & Fulton
King & Federal
King & Jacob
River & Hutton
River & Vanderheyden
River & Rensselaer
River & North
River & Ingalls
River & Bond
River & 101st
2nd & 102nd
2nd & 104th
2nd & 106th
2nd & 108th
2nd & 110th
2nd & 112th
2nd & 113th
2nd & 115th
2nd & 116th
2nd & 118th
2nd & 120th
2nd & 121st
2nd & 123rd
2nd & 124th
126th & 2nd
Broad & 1st
Broad & 3rd
Broad & 4th
Broad & 6th
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

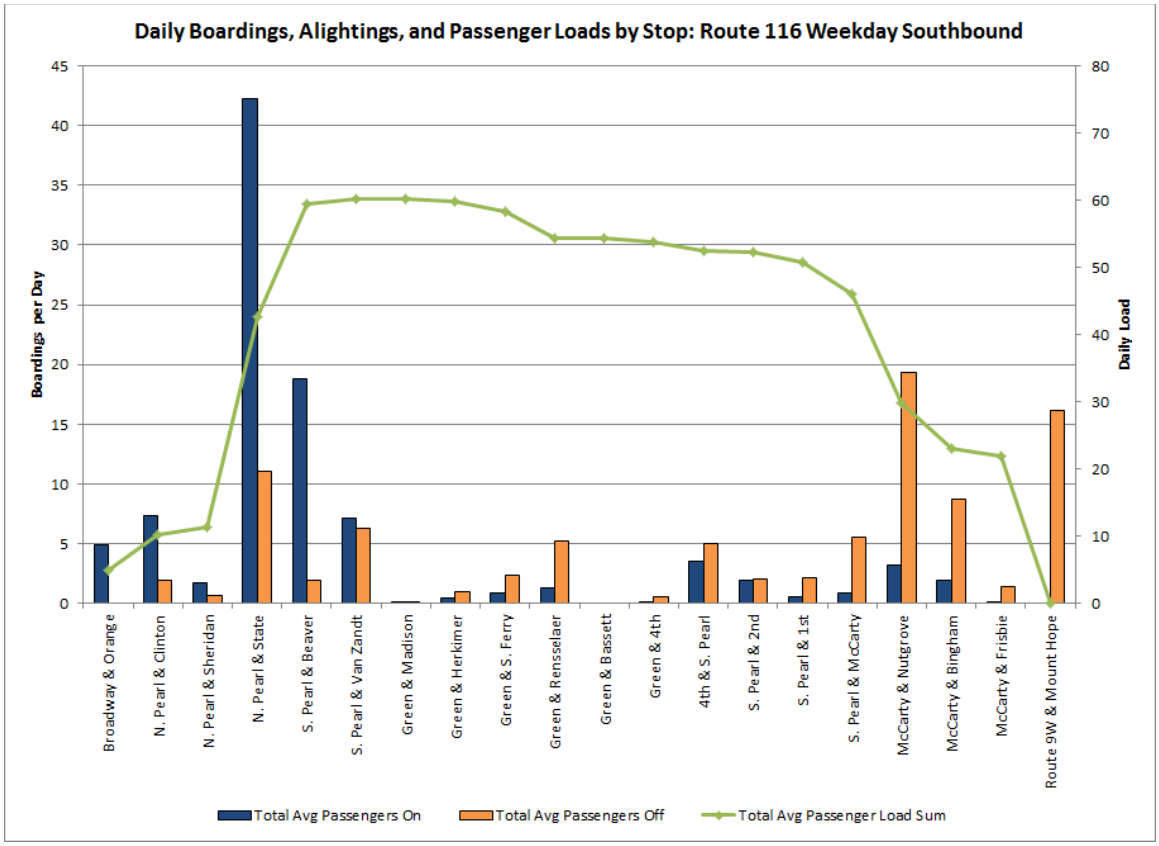

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 85 Sunday Northbound
Segment within River Corridor
Boardings per Day
Daily Load
0
10
20
30
40
50
60
70
80
0
20
40
60
80
100
120
140
160
Van Rensselaer Manor
Bloomingrove & Williams
HVCC
Vandenburg & Morrison
Vandenburg & Lark
Mill & Erie
Burden & Cross
4th & St. Luke's
4th & Tyler
4th & Lincoln
4th & Jackson
4th & Monroe
4th & Madison
4th & Canal
4th & Jefferson
4th & Adams
4th & Liberty
4th & Ferry
4th & Congress
4th & Fulton
King & Federal
King & Jacob
River & Hutton
River & Vanderheyden
River & Rensselaer
River & North
River & Ingalls
River & Bond
River & 101st
2nd & 102nd
2nd & 104th
2nd & 106th
2nd & 108th
2nd & 110th
2nd & 112th
2nd & 113th
2nd & 115th
2nd & 116th
2nd & 118th
2nd & 120th
2nd & 121st
2nd & 123rd
2nd & 124th
126th & 2nd
Broad & 1st
Broad & 3rd
Broad & 4th
Broad & 6th
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

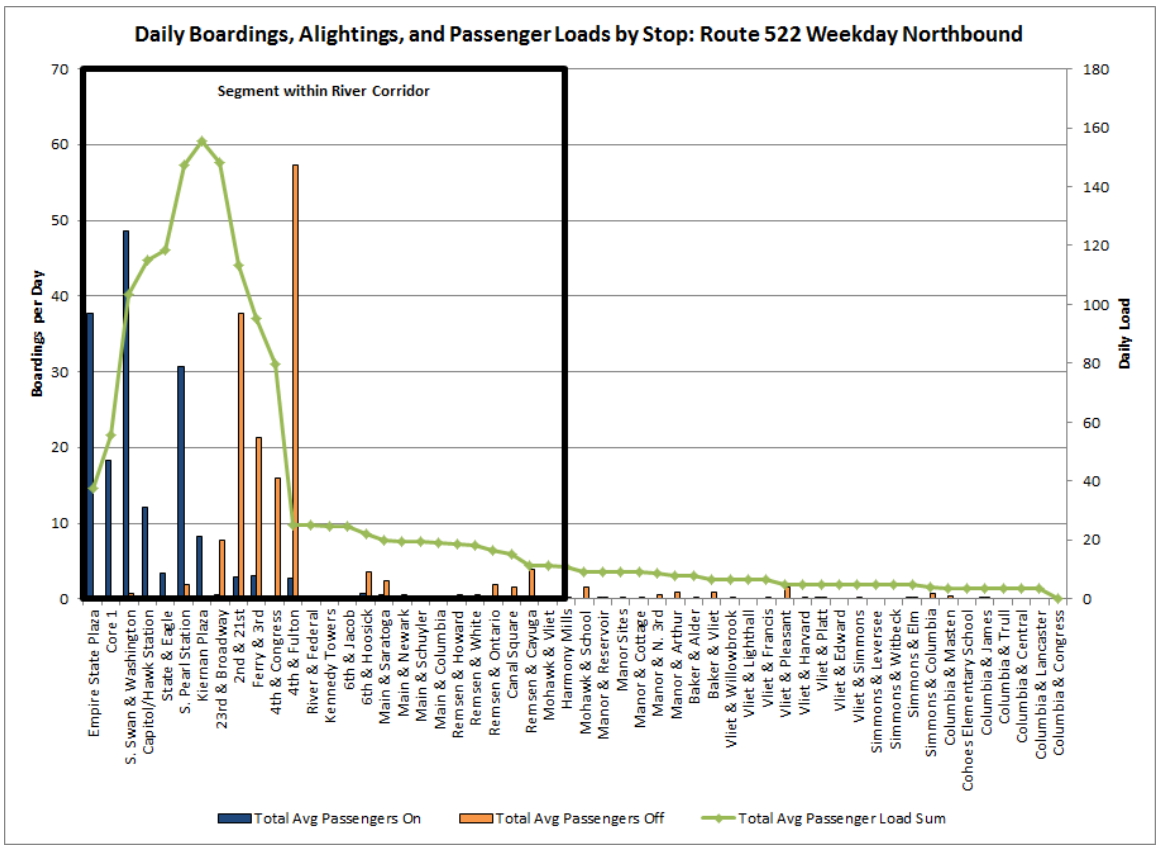

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 85 Weekday Southbound
Segment within River Corridor
Boardings per Day
Daily Load
0
50
100
150
200
250
300
350
0
100
200
300
400
500
600
700
Broad & 6th
Broad & 4th
Broad & 1st
126th & 2nd
2nd & 124th
2nd & 123rd
2nd & 121st
2nd & 120th
2nd & 118th
2nd & 116th
2nd & 115th
2nd & 113th
2nd & 111th
2nd & 110th
2nd & 108th
2nd & 106th
2nd & 104th
2nd & 102nd
2nd & 101st
River & Bond
River & Middleburgh
River & Rensselaer
River & Hoosick
River & Hutton
River & Jacob
King & Federal
River & Front
3rd & Congress
3rd & Ferry
3rd & Division
3rd & Liberty
3rd & Adams
3rd & Jefferson
3rd & Ida
3rd & Madison
3rd & Monroe
3rd & Jackson
3rd & Van Buren
4th & Lincoln
4th & Tyler
4th & Polk
4th & 1st
Burden & Centre
Burden & Cross
Mill & Erie
Vandenburgh & Campbell
Vandenburgh & Morrison
HVCC
Bloomingrove & Williams
Van Rensselaer Manor
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

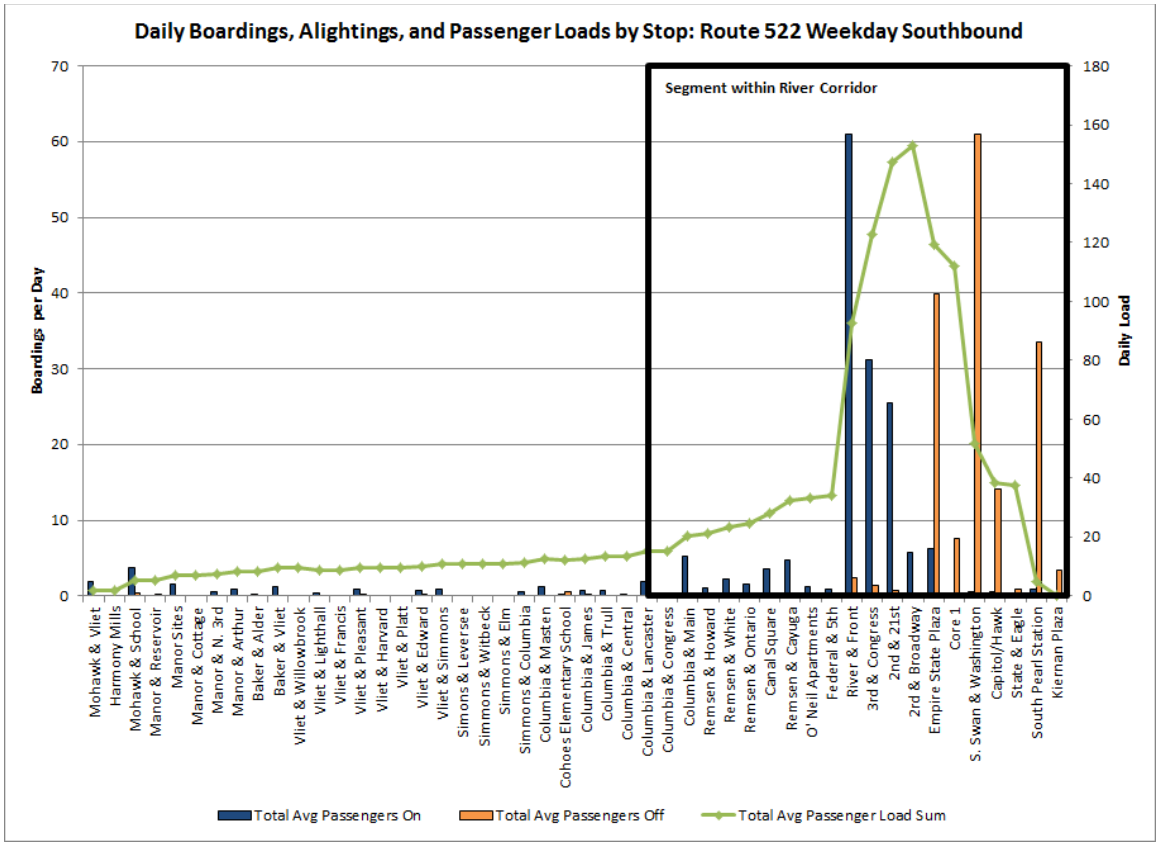

Daily Boardings, Alightings, and Passenger Loads by Stop: Route 85 Saturday Southbound
Segment within River Corridor
Boardings per Day
Daily Load
0
20
40
60
80
100
120
140
160
0
50
100
150
200
250
300
350
Broad & 6th
Broad & 4th
Broad & 1st
126th & 2nd
2nd & 124th
2nd & 123rd
2nd & 121st
2nd & 120th
2nd & 118th
2nd & 116th
2nd & 115th
2nd & 113th
2nd & 111th
2nd & 110th
2nd & 108th
2nd & 106th
2nd & 104th
2nd & 102nd
2nd & 101st
River & Bond
River & Middleburgh
River & Rensselaer
River & Hoosick
River & Hutton
River & Jacob
King & Federal
River & Front
3rd & Congress
3rd & Ferry
3rd & Division
3rd & Liberty
3rd & Adams
3rd & Jefferson
3rd & Ida
3rd & Madison
3rd & Monroe
3rd & Jackson
3rd & Van Buren
4th & Lincoln
4th & Tyler
4th & Polk
4th & 1st
Burden & Centre
Burden & Cross
Mill & Erie
Vandenburgh & Campbell
Vandenburgh & Morrison
HVCC
Bloomingrove & Williams
Van Rensselaer Manor
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum


Daily Boardings, Alightings, and Passenger Loads by Stop: Route 85 Sunday Southbound
Segment within River Corridor
Boardings per Day
Daily Load
Broad & 6th
Broad & 4th
Broad & 1st
126th & 2nd
2nd & 124th
2nd & 123rd
2nd & 121st
2nd & 120th
2nd & 118th
2nd & 116th
2nd & 115th
2nd & 113th
2nd & 111th
2nd & 110th
2nd & 108th
2nd & 106th
2nd & 104th
2nd & 102nd
2nd & 101st
River & Bond
River & Middleburgh
River & Rensselaer
River & Hoosick
River & Hutton
River & Jacob
King & Federal
River & Front
3rd & Congress
3rd & Ferry
3rd & Division
3rd & Liberty
3rd & Adams
3rd & Jefferson
3rd & Ida
3rd & Madison
3rd & Monroe
3rd & Jackson
3rd & Van Buren
4th & Lincoln
4th & Tyler
4th & Polk
4th & 1st
Burden & Centre
Burden & Cross
Mill & Erie
Vandenburgh & Campbell
Vandenburgh & Morrison
HVCC
Bloomingrove & Williams
Van Rensselaer Manor
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum


Daily Boardings, Alightings, and Passenger Loads by Stop: Route 116 Weekday Northbound
Boardings per Day
Daily Load
Route 9W & Mount Hope
277 Mount Hope Dr
Mount Hope & Garland
Mount Hope & Little
118 Mount Hope Dr
629 Mount Hope Dr
625 Mount Hope Dr
S. Pearl & McCarty
S. Pearl & 1st
S. Pearl & 2nd
S. Pearl & Gansevoort
S. Pearl & 4th
Green & Bassett
Green & Rensselaer
Green & S. Ferry
Green & Madison
Madison & S. Pearl
Dunn Memorial Bridge
S. Pearl & Hudson
S. Pearl & Beaver
N. Pearl & State
N. Pearl & Columbia
N. Pearl & Van Tromp
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum


Daily Boardings, Alightings, and Passenger Loads by Stop: Route 116 Weekday Southbound
Boardings per Day
Daily Load
0
5
10
15
20
25
30
35
40
45
0
10
20
30
40
50
60
70
80
Broadway & Orange
N. Pearl & Clinton
N. Pearl & Sheridan
N. Pearl & State
S. Pearl & Beaver
S. Pearl & Van Zandt
Green & Madison
Green & Herkimer
Green & S. Ferry
Green & Rensselaer
Green & Bassett
Green & 4th
4th & S. Pearl
S. Pearl & 2nd
S. Pearl & 1st
S. Pearl & McCarty
McCarty & Nutgrove
McCarty & Bingham
McCarty & Frisbie
Route 9W & Mount Hope
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum


Daily Boardings, Alightings, and Passenger Loads by Stop: Route 522 Weekday Northbound
Segment within River Corridor
Boardings per Day
Daily Load
0
10
20
30
40
50
60
70
0
20
40
60
80
100
120
140
160
180
Empire State Plaza
Core 1
S. Swan & Washington
Capitol/Hawk Station
State & Eagle
S. Pearl Station
Kiernan Plaza
23rd & Broadway
2nd & 21st
Ferry & 3rd
4th & Congress
4th & Fulton
River & Federal
Kennedy Towers
6th & Jacob
6th & Hoosick
Main & Saratoga
Main & Newark
Main & Schuyler
Main & Columbia
Remsen & Howard
Remsen & White
Remsen & Ontario
Canal Square
Remsen & Cayuga
Mohawk & Viet
Harmony Mills
Mohawk & School
Manor & Reservoir
Manor Sites
Manor & Cottage
Manor & N. 3rd
Manor & Arthur
Baker & Alder
Baker & Viet
Viet & Willowbrook
Viet & Lighthall
Viet & Francis
Viet & Pleasant
Viet & Harvard
Viet & Platt
Viet & Edward
Viet & Simmons
Simmons & Leversee
Simmons & Witbeck
Simmons & Elm
Simmons & Columbia
Columbia & Masten
Cohoes Elementary School
Columbia & James
Columbia & Trull
Columbia & Central
Columbia & Lancaster
Columbia & Congress
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum


Daily Boardings, Alightings, and Passenger Loads by Stop: Route 522 Weekday Southbound
Segment within River Corridor
Boardings per Day
Daily Load
0
10
20
30
40
50
60
70
0
20
40
60
80
100
120
140
160
180
Mohawk & Vliet
Harmony Mills
Mohawk & School
Manor & Reservoir
Manor Sites
Manor & Cottage
Manor & N. 3rd
Manor & Arthur
Baker & Alder
Baker & Vliet
Vliet & Willowbrook
Vliet & Lighthall
Vliet & Francis
Vliet & Pleasant
Vliet & Harvard
Vliet & Platt
Vliet & Edward
Vliet & Simmons
Simmons & Leversee
Simmons & Witbeck
Simmons & Elm
Simmons & Columbia
Columbia & Masten
Cohoes Elementary School
Columbia & James
Columbia & Trull
Columbia & Central
Columbia & Lancaster
Columbia & Congress
Columbia & Main
Remsen & Howard
Remsen & White
Remsen & Ontario
Canal Square
Remsen & Cayuga
O' Neil Apartments
Federal & 5th
River & Front
3rd & Congress
2nd & 21st
2rd & Broadway
Empire State Plaza
Core 1
S. Swan & Washington
Capitol/Hawk
State & Eagle
South Pearl Station
Kiernan Plaza
Total Avg Passengers On
Total Avg Passengers Off
Total Avg Passenger Load Sum

APPENDIX C: ALTERNATIVES DISMISSED

IBI GROUP
384 Broadway – 3rd Floor
Albany NY 12207 USA
tel 518 434 0132 fax 617 450 0702
ibigroup.com

Memorandum

To/Attention	Michael Williams	**Date**	August 19, 2014
From	Martin D. Hull	**Project No**	35940
cc	Ross Farrell		
Subject	Alternatives Dismissed		

Alternatives Dismissed

The Capital Region has developed a thorough and methodical approach to planning for fixed guideway transit. Understanding the significant benefits of fixed guideway transit but at the same time aware of the significant cost, the CDTA, CDTC, and other regional partners have taken a sober and objective approach to improving the region's transit system over time. This includes making cost effective improvements as funding become available in the context of an agreed-upon regional network while at the same time continuing to assess longer term improvements.

The process started in the mid 1990's with the Capital District Transportation Committee's (CDTC) Transit Futures Task Force which explored transit investment options in the Capital Region. The work of the Transit Task Force was used to inform the development of transit policies, strategies and actions to be incorporated into the *New Visions*, the regional transportation plan adopted in 1997. The transit investment options considered complementary activities, particularly changes in land use policy, private sector development, local transit financing and overall transportation policy.

Because of its potential to provide competitive travel times for transit, the Transit Task Force's final report noted that preferential bus treatments should be fully explored in the primary transit markets suggested for fixed guideway transit. Preferential traffic treatments for buses in key corridors include traffic signal priority, bus lanes, queue jump lanes and other improvements. This strategy was adopted into the *New Visions* regional transportation plan in 1997 and the Central Avenue/State Street corridor (NY 5 Corridor), being the most heavily traveled transit corridor in the region, was identified for immediate exploration.

It was through the exploration of options for both land use and transit in the NY 5 Corridor that a regional consensus emerged about the cost effectiveness of bus rapid transit (BRT). In addition, CDTA completed the *Understanding the Transit Travel Market in the Capital District* study in 2005 which looked at land use and census data to identify transit corridors with a higher likelihood of transit use. The report concluded that the urban centers offer the greatest opportunities for high end transit investments, including BRT. In its *2007 Transit Development Plan*, CDTA identified a series of premium routes as potential candidates for premium service. Premium routes offer the highest level of service and are considered for BRT or express

services. This concept included a full region-wide network of BRT lines including the Washington Western corridor and the River Corridor in addition to the Route 5 Corridor. The 2009 *Assessment of Capital Region North/South Corridors to Improve Access to Emerging Employment Centers* (or the North-South Corridor Study for short) provided the first detailed look at transit options in the Hudson River Corridor directly north of the City of Albany including the communities of Menands, Watervliet, Troy, Cohoes, and Waterford. The study looked at commuter rail, LRT, and BRT alternatives. The study confirmed the previous work of the Transit Task Force and *Transit Development Plan* in the River Corridor and recommended that BRT be implemented in the near term, but that future planning for LRT was warranted. A copy of the conclusions of the study are included in Attachment A.

The Purpose and Need Statement of the *River Corridor Simplified Alternatives Analysis* was developed based on this previous work and expressly includes reasonable cost and near term implementation as goals for the project.

For these reasons LRT was considered in the alternatives development stage of the *River Corridor Simplified Alternatives Analysis* but not advanced further. It is not considered feasible at this time due to high capital cost, lack of a viable local funding source of sufficient means, and the long lead time for development. In addition, *New Vision 2035*, the latest update of the regional transportation plan, does not call for LRT in the Capital District during the current planning horizon. This does not mean that LRT might not be revisited in the future as conditions change, funding becomes available, and travel patterns evolve.

Over the last 20 years, CDTA and CDTC have maintained a clear and consistent commitment to providing the Capital Region with a cost effective and flexible transit system. The River Corridor represents the next step in implementing a BRT system for in the Capital Region.

Michael Williams – August 19, 2014

Assessment of Capital Region North/South Corridors to Improve Access to Emerging Employment Centers FINAL REPORT

January 26, 2009

Parsons Brinkerhoff, Creighton Manning, and Arch Street Communications

CONCLUSIONS

The evaluation of the initial and refined set of alternatives leads to several conclusions about transit alternatives in the North/South Corridors.

In all corridors, light rail is very expensive, especially relative to the potential market of transit riders. With the possible exception of the CPR Corridor, due to the relatively low return on ridership for a high transit investment, light rail should be deferred from consideration at this time for transit technologies in the North–South corridors.

For the US 9 and I-87 corridors, improvements to the existing NX Service and local bus services appear to be sufficient to meet future demand. Managed lanes would be an option to prioritize transit. The addition of a shuttle service to Luther Forest/SEMATECH, supported by the business park, is another viable improvement along the I-87 or US 9 corridors.
The River Corridor, on the other hand, appears to have high potential benefits. Existing transit in this corridor enjoys high ridership, and transit improvements could reach new markets. As a result, there is much higher market demand in the River Corridor than in the US 9/I-87 corridors. Investing in transit options in the River Corridor would also focus regional transit investment on targeted redevelopment areas.

Despite the high market potential, however, the River Corridor alignments both require further analysis because each has a serious issue requiring resolution. The CPR Corridor is now a minimally active rail line owned by a private railroad operator. Implementing BRT or possibly LRT in this corridor will require vacating the rail line and converting it to a dedicated transit way. This will require negotiation and compensation with the private railroad. This option also requires much more construction and is thus much more expensive than the US 4 option, which runs on street. While the US 4 option is less costly, has better access and some other advantages, its on-street operation causes it to run very slowly and thus be less attractive to potential customers. Further exploration in this corridor must determine the receptivity of the railroad to discuss use of the CPR Corridor for passenger operations, while investigating options to reduce travel time on a roadway-based option.

Unlike other transit alternatives, commuter rail options can build on investments made for other purposes. For example, double-tracking of the West Corridor is planned to be implemented by the State of New York to improve rail performance for the entire system. Upgrading local passenger operations on this route therefore becomes a relatively inexpensive proposition. A phased approach to adding local commuter service allows the service to be tailored to demand.

Capital District
Transportation Committee

January 28, 2013

Alternative Fixed Guideway Options for the Capital District

In the mid-1990's, the Capital District Transportation Committee's (CDTC) Transit Futures Task Force explored transit investment options in the Capital Region. The work of the Transit Task Force was used to inform the development of transit policies, strategies and actions to be incorporated into the New Visions regional transportation plan, adopted in 1997. The transit investment options considered complementary activities, particularly changes in land use policy, private sector development, local transit financing and overall transportation policy. To support the efforts of the Transit Task Force, the Capital District Transportation Authority (CDTA) funded a *Fixed Guideway Transit Feasibility Study*. A summary of that study's findings is attached as Appendix A.

Four applications of fixed guideway transit were highlighted in the Feasibility Study as being most promising in the Capital Region. One of those applications was in the Western Avenue and Washington Avenue corridors, from Fuller Road to the vicinity of where Washington, Western and Central Avenues merge. The concept called for the development of light rail transit linking major shopping, office and other trip generators such as Crossgates Mall, the University at Albany, and the Harriman State Office Campus with downtown Albany. Two key challenges were noted: 1) the "ring road" nature of the major trip generators would make direct access to destinations difficult for light rail and 2) capital cost estimates for light rail on Washington Avenue or Western Avenue would exceed $90 M (in 1994 $'s) for an in roadway system. That would be roughly $140 M today.

The Transit Task Force and CDTC staff also explored bus transit options to determine how the benefits of actions that modify fare policy and bus service levels compare with those of fixed guideway investment. This assessment included an investigation of exclusive busways which offer advantages over rail systems in terms of cost and operational flexibility. The technical work performed to evaluate fixed guideway options against the "best bus" options resulted in the Task Force viewing fixed guideway in a different way. The key findings of the Transit Task Force's technical work and policy discussions were:

1. *Continuous improvement in site design and pedestrian accommodations are critical to the success of transit in the Capital District.*

2. *There appears to be much that can be gained through enhancing the bus service options available to the region.*

3. *One of several fixed guideway options – each serving a distinctly different set of purposes – is achievable over the next twenty years if the region is willing to carry out a range of land use, pricing and capital investment actions.*

4. *Financing of new bus or fixed guideway initiatives will require both broad regional support and access to adequate public financing sources.*

Because of its potential to provide competitive travel times for transit, the Transit Task Force's final report noted that preferential bus treatment should be fully explored in the primary transit markets suggested for fixed guideway transit, if fixed guideway options are not pursued in those markets. Preferential traffic treatment for buses in key corridors and service areas could include traffic signal priority, bus lanes, etc. This strategy was adopted into the New Visions regional transportation plan in 1997 and the Central Avenue/State Street corridor (NY 5 Corridor) was identified for immediate exploration.

It was through the exploration of options for both land use and transit in the NY 5 Corridor that a regional consensus emerged about the cost effectiveness of bus rapid transit. BRT was identified as the preferred transit option for the NY 5 corridor. In addition, CDTA completed the *Understanding the Transit Travel Market in the Capital District* study in 2005 which looked at land use and census data to identify transit corridors with a higher likelihood of transit use. The report concluded that the urban centers offer the greatest opportunities for high end transit investments, including bus rapid transit. In its *2007 Transit Development Plan*, CDTA identified a series of premium routes, including the Washington/Western corridor, for potentially being candidates for premium service. Premium routes offer the highest level of service and are considered for Bus Rapid Transit or Specialized Express services. This concept was referred to and mapped by CDTA as the 100 miles of BRT for the Capital Region. The Washington/ Western corridor was included in this framework as a BRT corridor.

In 2011, CDTA completed the Washington/Western Avenue Bus Rapid Transit Conceptual Design Study. CDTC adopted the principles of that study as a refinement to the New Visions Regional Transportation Plan (*New Visions 2030*) for the corridor and supported CDTA in its initiation of the Alternatives Analysis process for funding Bus Rapid Transit on the Washington/Western Corridor. Therefore, the Regional Transportation Plan has established that BRT is preferred over light rail transit in the Washington/Western corridor. The full resolution is attached as Appendix B.

Over the last 15 plus years, CDTA and CDTC have maintained a commitment to providing the Capital Region with a cost effective and flexible transit system. The Washington/Western corridor represents the next step in implementing Bus Rapid Transit in the Capital Region.

Fixed Guideway Transit Investigation
Summary Report
Executive Summary
July 1995

Prepared by Parsons, Brinckerhoff, Quade & Douglas, Inc., the CDTC Staff and the CDTC Transit Futures Task Force.

As part of CDTC's "New Visions" process, the Transit Futures Task Force has assessed the potential for application of fixed guideway transit in the Capital District by the year 2015. The assessment consisted of consultant work to compare this region to "peer cities" which have or are considering rail transit; the consultant's articulation of available (and future) technologies; assessment of potential markets in the Capital District; and a system-level cost and performance evaluation of both full systems and corridor-specific applications.

The peer city comparison reveals that the overall size of the potential fixed guideway market, as measured by total population and employment, is smaller in Albany than in other peer cities. Moreover, region wide population and employment densities are considerably below that in other areas. This is an important finding, which suggests a limitation on the region's capacity for supporting an extensive network of fixed guideway facilities.

On a more positive note, centralization of population and employment within the three central cities of Albany, Schenectady, and Troy – where traditional transit markets are located – is consistent with and in some cases greater than elsewhere. In addition, the Capital District is comprised of three major urban hubs and an interior suburban area, which means that "dual hub" corridors may be constructed with major concentrations of trip making at both ends of the corridor.

Examination of several full system configurations shows that when combined with highway and parking pricing strategies, the systems show significant performance benefits in areas of access (percentage of trips with a time-competitive transit option), congestion relief and overall assumed "trend" land use configuration, extensive fixed guideway systems do not return monetary benefits comparable to the level of investment required through the year 2015 although access improvements and other measures are positively affected.

The analysis also examines four corridor-specific applications: light rail transit between Albany and Schenectady (as a land use strategy); express Northway LRT or busway service; a local LRT or automated guideway connector in the urban core; and a commuter rail service using existing rail lines. These applications are much less costly than the full systems considered. Each serves a very different purpose from the others and is shown as a representation of the potential role of fixed guideway transit in the Capital District. When combined with increased parking costs in downtown Albany and improved bus service (limited additional feeder service and better transfer scheduling), each is associated with noticeable improvement in access measures and transit

ridership; generating net monetary benefits to users, government and society depends upon land use actions. The performance measures provided in the report provide the basis for judging the relative merit and tradeoffs involved in pursuing fixed guideway service in the Capital District, compared to other actions identified by CDTC's task forces.

APPENDIX D: COST ESTIMATES

River Corridor BRT - Alt 1
April 2015

Conceptual Cost Estimate Summary

Description		Total Cost
Stations - Site Work (28 stations)	$	5,250,000
Stations - Shelters, Amenities, Rebrand and Installation (28 stations)	$	3,240,000
Uncle Sam Transit Center	$	1,460,200
QJ - Site Work (Assume improvements at 3 sites)	$	750,000
Transit Signal Priority and Other Improvements (See Traffic Signal Inventory)	$	1,785,000
Corridor Improvements (Road Diet, Restriping)	$	250,000
North Pearl Street Underpass	$	250,000
Park and Ride Lots (2; Port of Albany; Route 378 no cost)	$	500,000
CONSTRUCTION SUB-TOTAL	**$**	**13,485,200**
UNALLOCATED CONTIGENCY (30%)	$	4,045,560
MOBILIZATION (4%)	$	701,230
SUB-TOTAL	**$**	**18,231,990**
PROFESSIONAL SERVICES (30%)	$	5,469,597
VEHICLES (17)	$	12,750,000
TOTAL	**$**	**36,451,588**

* This estimate does not include costs for the three potential transit centers along the route.

River Corridor BRT - Alt 2 (Preferred Alt.)
April 2015

Conceptual Cost Estimate Summary

Description		Total Cost
Stations - Site Work (28 stations)	$	5,250,000
Stations - Shelters, Amenities, Rebrand and Installation (28 stations)	$	3,240,000
Uncle Sam Transit Center	$	1,460,200
QJ - Site Work (Assume improvements at 3 sites)	$	750,000
Transit Signal Priority and Other Improvements (See Traffic Signal Inventory)	$	1,035,000
Corridor Improvements (Road Diet, Restriping)	$	250,000
Park and Ride Lots (2; Port of Albany; Route 378 no cost)	$	500,000
CONSTRUCTION SUB-TOTAL	**$**	**12,485,200**
UNALLOCATED CONTIGENCY (30%)	$	3,745,560
MOBILIZATION (4%)	$	649,230
SUB-TOTAL	**$**	**16,879,990**
PROFESSIONAL SERVICES (30%)	$	5,063,997
VEHICLES (17)	$	12,750,000
TOTAL	**$**	**34,693,988**

* This estimate does not include costs for the three potential transit centers along the route.

River Corridor BRT - Alt 3
April 2015

Conceptual Cost Estimate Summary

Description		Total Cost
Stations - Site Work (22 stations)	$	3,375,000
Stations - Shelters, Amenities, Rebrand and Installation (22 stations)	$	2,460,000
Uncle Sam Transit Center	$	1,460,200
QJ - Site Work (Assume improvements at 3 sites)	$	750,000
Transit Signal Priority and Other Improvements (See Traffic Signal Inventory)	$	710,000
Corridor Improvements (Road Diet, Restriping)	$	250,000
Park and Ride Lots (Port of Albany)	$	500,000
CONSTRUCTION SUB-TOTAL	**$**	**9,505,200**
UNALLOCATED CONTIGENCY (30%)	$	2,851,560
MOBILIZATION (4%)	$	494,270
SUB-TOTAL	**$**	**12,851,030**
PROFESSIONAL SERVICES (30%)	$	3,855,309
VEHICLES (15)	$	11,250,000
TOTAL	**$**	**27,956,340**

* This estimate does not include costs for the three potential transit centers along the route.

APPENDIX E: INITIAL ENVIRONMENTAL SCREENING AND NEPA DOCUMENTATION

River Corridor BRT

Section 1:
Initial Environmental Screening for Probable Categorical Exclusion

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Table of Contents

List of Tables

List of Figures

List of Attachments

1. Purpose and Need

Purpose

The purpose of the project is to provide faster, more direct, more frequent, and more reliable north south transit service connecting the major activity centers along the River Corridor at a reasonable cost and schedule. High levels of existing ridership, significant clusters of transit-supportive demographics, and transit-oriented development patterns indicate a clear need for improved transit services. The major activity centers include:

- the Port of Albany
- the City of Albany neighborhoods of:
  - Kenwood
  - Krank Park
  - the South End
  - the Mansion District
  - the Pastures
  - Downtown Albany
  - Arbor Hill
  - the Warehouse District
  - North Albany
- the Village of Menands
- the Town of Colonie
- the City of Watervliet including:
  - Port Schuyler
  - 19th Street / Uptown
- the City of Troy neighborhoods of:
  - Downtown Troy
  - North Central
  - Lansingburgh
- the City of Cohoes neighborhoods of:
  - Downtown Cohoes
  - Van Schaick Island
- the Village of Waterford

Several educational institutions are located along or near the corridor, including:

- the Capital South Campus Center
- Schenectady County Community College - Albany Campus
- Russell Sage College
- the Rensselaer Polytechnic Institute (RPI)
- and multiple elementary schools

In addition to the central business districts in downtown Albany and downtown Troy, major employment centers on the corridor include:

- the Broadway industrial district in North Albany
- the Watervliet Arsenal Business and Technology Partnership
- the Port of Albany

Many large public housing projects are located along the corridor, including:

- the Albany Housing Authority sites of:
  - Ezra Prentice Homes

  - Nutgrove Garden Apartments
  - Jared Holt Mews townhomes and Capital South Properties
  - Creighton Story Homes
  - Lincoln Square Homes
  - Steamboat Square Homes
  - Ida Yarbrough Homes
  - North Albany Homes

- the Watervliet Housing Authority sites of:
  - Abram Hilton Apartments
  - Michael J. Day Apartments
  - Eugene Hanratta Senior Housing
  - Daniel Quinn Senior Housing

- the Troy Housing Authority sites of:
  - John Taylor Apartments
  - Grand Street Apartments
  - Arnold Fallon Apartments
  - Martin Luther King Apartments
  - Edward Kane Apartments
  - Corliss Park Apartments.

- the Cohoes Housing Authority site of:
  - Jay McDonald Towers.

Several New York State Government buildings line the corridor, including:

- the Office of the State Comptroller (OSC) Building
- the Department of Environmental Conservation (DEC) headquarters
- Various offices on State Street, Pearl Street, and Broadway in Albany
- NYS offices in Menands and Troy.

A key intercity transportation connection is made at the Greyhound-Trailways intercity bus station in downtown Albany. The project purpose is consistent with CDTA's Transit Development Plan (TDP), the City of Albany's 2030 Comprehensive Plan, and the Capital District Transportation Committee's Regional Transportation Plan (RTP), *New Visions*.

<u>Need</u>

Fast, efficient, and environmentally sound connections between major activity centers are needed in the study corridor. A key success factor for the River Corridor will be increasing ridership to, from, and between the existing and emerging centers along the route including downtown Albany, downtown Troy, downtown Cohoes and neighborhoods undergoing urban revitalization. The new BRT service will directly link many centers along the corridor that have never been linked by a continuous route before, resulting in significant reductions in overall trip time and transfer inconvenience. Improved access between the urban economic and cultural centers of Albany and Troy will support revitalization efforts and development of efficient land use patterns.

Improved mobility for the transit dependent populations throughout the study corridor is needed. The River Corridor has a significant percentage of its population that does not own an automobile. Some sections of the study area, particularly those in proximity to transit stations, exceed 50% without a car, in contrast to 8% for the Albany-Schenectady-Troy metro area. These individuals and households would find improved access to jobs, shopping, schools and universities, and other key destinations throughout the corridor. The corridor is also home to many people with disabilities who depend on transit for many of their travel needs. Twenty-eight percent of all CDTA bus boardings with a wheelchair or other mobility device occur on routes within the River Corridor. Faster, more direct, and more relatable transit service would improve their mobility and access to essential services.

There is a need to encourage redevelopment and revitalization that is transit supportive. In some parts of the corridor, properties and parcels are underutilized. High quality transit service will improve the regional accessibility of these sites, making them more economically viable and encourage development. It will provide improved access to jobs, education, shopping, and service for local residents leading to increased investment in residential areas. In other parts of the corridor, development patterns are currently auto-centric and inefficient. Access to high quality transit will support redevelopment in a more compact, pedestrian-oriented way and will encourage revisions to existing land use regulations to reinforce these patterns of development. The proposed transit center in Downtown Troy will improve the waiting experience for passengers of the River Corridor BRT and other local routes, and project a modern, attractive image of transit that will encourage redevelopment of the surrounding parcels.

There is a need to alleviate parking problems and the costs associated with the provision of parking. Parking is a long standing and continuous problem in the study corridor both in historic neighborhoods and in the major downtowns and commercial districts. Parking is also a concern at major institutions, especially universities and colleges. Surface parking in particular requires large areas of land that are costly to purchase, require on-going maintenance and create a variety of environmental problems. Structured parking reduces the amount of land required but construction costs can be very high. Encouraging greater transit use by providing high quality service will reduce the need for parking, encourage more productive land uses, reduce costs for institutions, and improve air quality.

2. Environmental Impact Information Regarding the Proposed Action

The project will be required to follow the requirements of the National Environmental Policy Act (NEPA) and the State Environmental Quality Review Act (SEQR). The anticipated project classification is a NEPA Class II Categorical Exclusion (CE) per Code of Federal Regulations (CFR) Title 23 Section 771.118(c) and a SEQR Type II Action. The preliminary analysis of environmental impacts is summarized in Table 1. Based on the results of the environmental review it is anticipated that the proposed project will have no adverse effect on cultural/historic resources, but may affect endangered species, pending correspondence with review agencies.

Table 1: Summary of Environmental Impacts

Environmental Impact	Anticipated Finding
Land Use and Zoning	Easements or acquisitions required.
Traffic	No adverse effect
Aesthetics	No adverse effect
Air Quality	Regulate during construction. Positive impact upon completion.
Coastal Zone	No effect
Environmental Justice	No adverse effect
Floodplains	No adverse effect
Hazardous Materials	Potential effect.
Noise and Vibration	No effect
Navigable Waterways	No effect
Resources: Endangered Species	May affect; concurrence required
Resources: Archeological	No adverse effect
Resources: Historic Properties and Parklands (Section 106)	No adverse effect
Water Quality	No adverse effect; SPDES permit required
Wetlands	No effect
Construction Impacts	No adverse effect
Cumulative or Indirect Impacts	Not anticipated
Property Acquisition	No adverse effect

As project development progresses, further assessment of environmental issues and properties will likely be required. As part of the NEPA review, a Hazardous Waste and Contaminated Materials Screening Report will be prepared. Section 106 coordination, Section 4(f), and Endangered Species coordination will also likely be required.

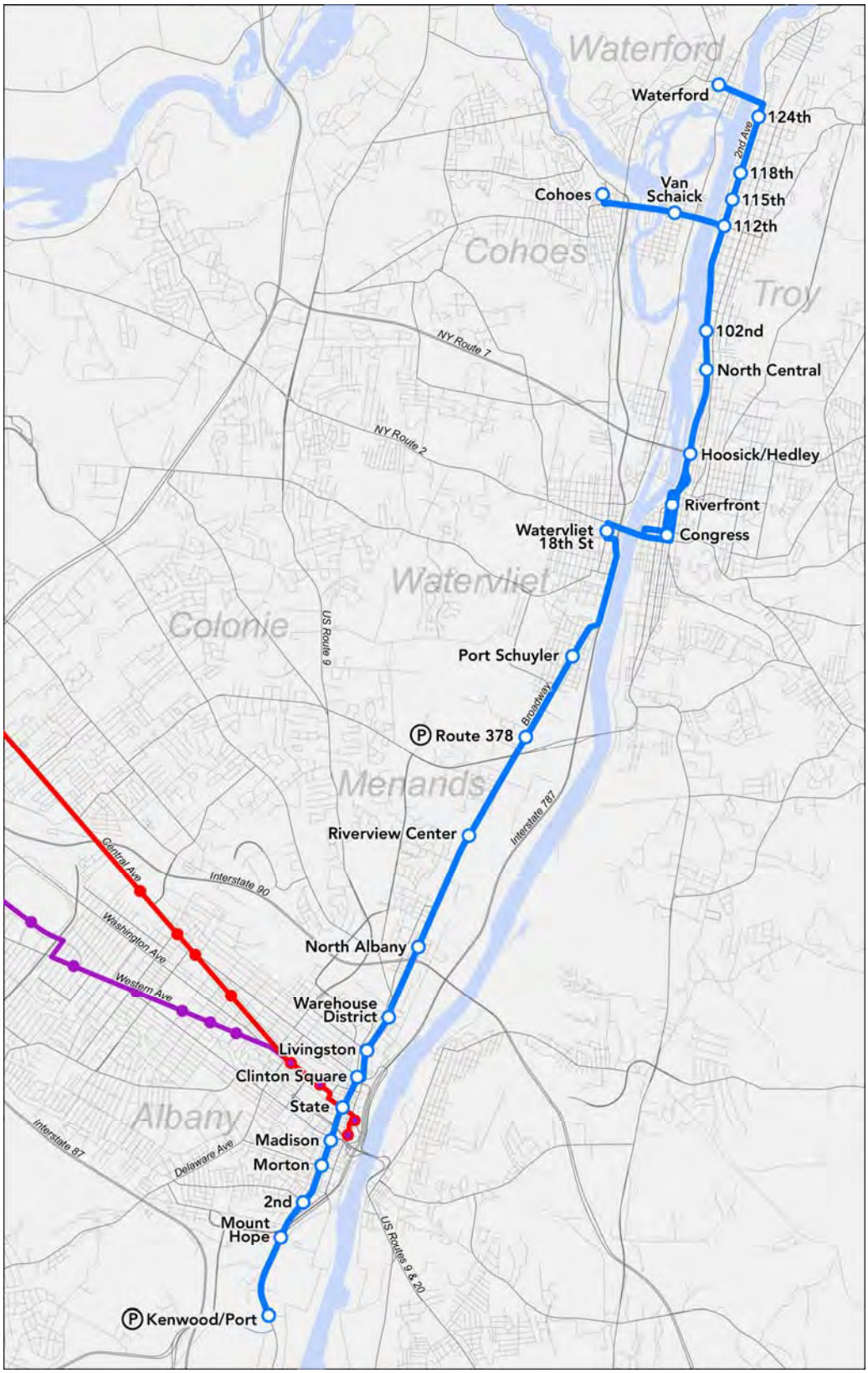
A. Detailed Project Description

The Blue Line BRT project refers to the high-volume transportation corridor along the Hudson River Corridor between the Village of Waterford and the South End of the City of Albany. Being the third busiest transit corridor in the Capital Region with over 2 million boardings per year, it is considered an ideal corridor for expansion of CDTA's BusPlus BRT system. Just over 15 miles in length, the Blue Line BRT project runs primarily along the existing highways of NY Route 32 and US Route 4. (See map on next page.)

The project will introduce arterial BRT service to the corridor using a fleet of 17 articulated buses stopping at 26 new bus stations along the way, with infrastructure improvements at each station. New transit signal priority systems and queue jump lanes will be implemented at numerous locations. Service frequency will be increased to every 10 minutes during the day and every 15 to 20 minutes during the evening and on weekends.

The Blue Line BRT project will provide direct service starting from two branches, one from Cohoes and one from Waterford, which meet in Lansingburgh and travel through downtown Troy to Watervliet, Menands, downtown Albany and end at the Port of Albany in South Albany. This will be the first time that these high-density, transit-supportive communities are linked by a through, no-transfer transit service.

Figure 1 Proposed River Corridor Route



B. Location and Zoning

Location

There are generally four land use categories within the corridor. They consist of urban residential, urban commercial, urban mixed use and industrial. On the southern end of the corridor at the Kenwood Port stop the area is characterized by industrial development and is transportation-oriented generally with an abundance of surface parking. The Mt. Hope and 2nd Street stops are urban residential then travelling north, the study corridor is primarily characterized by urban commercial land uses with on-street parking, surface lots and parking garages for the Morton, State, Clinton Square Livingston and Warehouse District and North Albany stops. The corridor between Riverview Center and Route 378 is dominated by industrial and commercial use with neighboring residential use to the west. Parking is available on-street along some of Broadway and in off-street parking lots for the commercial and retail establishments. Port Schuyler and Watervliet/18th Street as well as the Congress, Riverfront and Hoosick / Hedley stops are located in urban areas with mixed use commercial and residential. Stops located in the north Troy area (Lansingburgh) including North Central, 102nd, 112th, 115th, 118th, are located in mostly urban residential areas, with commercial use intermixed. The Station at 2nd and 124th is commercial in nature. The stations at Van Schaick and Cohoes along with Waterford are located in urban residential and mixed commercial use, as well. The density of development varies with the heaviest density occurring in Albany and Troy. Table 2 summarizes the land uses adjacent to the proposed BRT stops along the three route alternatives.

It is important to note that one goal of BRT is to promote transit oriented development throughout the corridor, spurring economic revitalization in an environmentally sustainable way. Enhanced pedestrian amenities associated with improved public transportation service can reduce dependence on automobile transportation.

Table 2: Land Use

Stop Location	Land Use
Kenwood Port	Industrial
Mount Hope	Urban – Residential
2nd	Urban – Residential
Morton	Urban – Residential
Madison	Urban - Commercial
State	Urban - Commercial
Clinton Square	Urban - Commercial
Livingston	Urban - Commercial
Warehouse District	Urban - Commercial
North Albany	Urban - Commercial
Riverview Center	Urban – Retail/Commercial
South Watervliet	Urban - Residential
Watervliet, 18th Street	Urban - Commercial
Congress SB	Urban – Mixed Use Commercial - Residential
Congress NB	Urban - Mixed Use Commercial - Residential
Riverfront NB	Urban - Mixed Use Commercial - Residential
Riverfront SB	Urban - Mixed Use Commercial - Residential
Hoosick / Hedley	Urban - Commercial
North Central	Urban - Residential
102nd	Urban - Residential
112 th	Urban - Residential
115 th	Urban - Residential
118 th	Urban - Residential
124 th	Urban - Commercial
Waterford	Urban – Mixed Use Commercial - Residential
Van Schaick	Urban – Mixed Use Commercial - Residential
Cohoes	Urban – Mixed Use Commercial - Residential

Zoning

Table 2 summarizes the current zoning for the area surrounding the BRT stations along the Alternative 2 Route.

Table 3: Zoning

Stop Location	Municipality	Zoning
Kenwood Port	City of Albany	C-M - Light Industrial, M-1 - General Industrial
Mount Hope	City of Albany	R-2B, 1 & 2 Family Medium Density Residential, M-1- General Industrial
2nd	City of Albany	C-M - Light Industrial, M-1- General Industrial
Morton	City of Albany	R-3B – Multifamily Medium Density Residential
Madison	City of Albany	R2-C – 1 & 2 Family Row House Residential C-1 – Neighborhood Commercial
State	City of Albany	C-3 – Central Business District
Clinton Square	City of Albany	C-3 – Central Business District
Livingston	City of Albany	C-3 – Central Business District C-1 – Neighborhood Commercial R-4 – Multifamily High Rise Residential
Warehouse District	City of Albany	C-M – Light Industrial M-1 – General Industrial
North Albany	City of Albany	C-1 – Neighborhood Commercial
Riverview Center	Village of Menands	B - Business
Route 378	Village of Menands	B - Business
Port Schuyler	City of Watervliet	MU 1 – Mixed Use 1
Watervliet, 18th Street	City of Watervliet	B - Business
Congress SB	City of Troy	B4 - Central Commercial INST - Institutional
Congress NB	City of Troy	B4 - Central Commercial
Riverfront NB	City of Troy	B4 - Central Commercial
Riverfront SB	City of Troy	B4 - Central Commercial
Hoosick / Hedley	City of Troy	HWD – Hoosick St. Waterfront District
North Central	City of Troy	R4 – Urban Neighborhood Residential
102nd	City of Troy	R2 – Two Family Residential B2 – Community Commercial
112 th	City of Troy	WMD – Waterfront Mixed Use District B2 – Community Commercial
115 th	City of Troy	R4 – Urban Neighborhood Residential B2 – Community Commercial
118 th	City of Troy	R1 - Single Family Detatched B2 – Community Commercial
124 th	City of Troy	B3, Shopping Center Commercial
Waterford	Village of Waterford	C - Commercial
Van Schaick	City of Cohoes	MU-1 – Mixed Use
Cohoes	City of Cohoes	MU-1 – Mixed Use

C. Traffic

Traffic

A traffic assessment of TSP and queue jump locations was completed, as contained in the AA report Appendix, and shows little impact to the existing transportation operations. Implementation of these roadway priority measures will reduce the bus travel time, improve service reliability and help to increase transit ridership.

Parking
For all alternatives, there will be minimal parking impacts to allow for queue jump lanes and curbside bus stops. Parking will be mitigated where feasible.

D. Aesthetics

The proposed project will have a positive impact on the aesthetics of the project area; old bus shelters will be replaced and sidewalks will be improved around the proposed BRT stations.

E. Air Quality

The BRT project, when completed, will have a positive impact on air quality as the improved public transportation service increases ridership and reduces passenger vehicle trips.

Air quality will be regulated during the construction process. Construction contracts will include requirements to comply with all Federal, State and local guidelines, including the 1990 Clean Air Act Amendments, et seq.

F. Coastal Zone

The Hudson River, south of the federal dam in Troy, NY is designated as a New York State Coastal Water. It is not a Coastal Erosion Hazard Area (CEHA).

The project area is not located within a navigable waterways or coastal zone boundary.

G. Environmental Justice

Title VI of the Civil Rights Act prohibits discrimination on the basis of race, creed, color or national origin in program receiving federal financial assistance. The FTA is responsible for oversight of its grantees to assure compliance with this statute. The currently applicable guidance is contained in FTA Circular C4702.1B issued in October, 2012. For the purpose of this analysis, the proposed implementation of a bus rapid transit service along the River Corridor will be considered a *major service change*[1]. The primary purpose of this assessment is to determine if a specific major service change results in a disparate impact on the basis of race, color or national origin. In addition, an assessment of the population with (limited English proficiency) must be undertaken to assure that project materials are published in an accessible format.

Environmental Justice
The minority percent in the CDTA service area is about 12.4%. A census tract that has more than twice the regional proportion of minorities is considered a minority census. The project area has more than 25% minority percentage, with multiple stations shown within Environmental Justice areas. Thus, the tracts near the proposed route alignments are considered minority tracts.

The minority population at Stops within a potential Environmental Justice Area within in the project service area shown in Table 5 is as follows:

[1] There is actually little difference in the number of vehicle trips or service hours between the current service configuration and that proposed in this plan. However, the visibility of the project, the expense of implementation coupled with changes to the service configuration, mostly elongation of the distance between bus stops warrants its consideration as a major service change.

Table 4: Minority Percentage per Stop

Stop/Station	Minority Percentage
Kenwood	76 %
Mount Hope	76 %
2nd	76 %
Morton	72 %
Madison	56 %
State	56 %
Clinton Square	56 %
Livingston	56 %
Warehouse District	56 %
Schuyler Flats	4 %
Congress SB	36 %
Riverfront SB	38 %
Hoosick / Hedley	60 %
North Central	49 %
124th	17 %
Cohoes	9 %

According to the NYS GIS website census data the poverty level associated with communities in which the River Corridor route is proposed is higher than the State average of 14.5%.

Table 5: Poverty Level

City	Estimated Pop. 2013	% Below Poverty Level	# Below poverty level
Albany	98,424	25.4 %	24,999
Cohoes	16,193	16.8 %	2,720
Troy	49,974	25.9 %	12,943
Watervliet	10,236	15.3 %	1,566
Totals	***174,827***	***24 %***	***42,228***

The effects of the proposed service plan are almost universally positive. The primary measures of service quality – span, frequency, load factor and passenger amenities for the service currently in place and the service planned in this project are discussed below.

- Minor reductions in existing service spans and headways are proposed; All areas will be served by the higher frequency and longer span BRT service, albeit at stop locations spaced with greater distance
- In the proposed service plan, a number of bus stations will be implemented along the BRT corridor, increasing the level of amenity.
- Customers in the corridor whose origins or destinations are at stops which will not be served by the BRT service will experience a reduction in the frequency of service.

Overall the impact is small, and consistent with on-going route restructuring and system optimization by CDTA.

Limited English Proficiency

In a report prepared for CDTA (2013) “LEP Language Assistance Plan 2014-2016” an analysis was conducted of the four major factors that determine the level of need for LEP services, and outlined a five point implementation plan appropriate to the level of need and resources available as identified in the analysis.

A survey of operators within CDTA who interact with customers who spoke languages other than English was also conducted. The top four languages the CDTA operators encounter are summarized in the following table:

Table 6: Languages other than English within the CDTA Service Population

Language	Percent
Spanish	89%
Chinese	48%
Arabic	20%
Italian	10%

Not indicative of the percentage of the overall CDTA ridership

As a screening tool, the LEP populations for the Cities of Albany, Troy, Watervliet and Cohoes were assessed. The percentage of non-English spoken at homes for persons age five and older 2008-2012 is listed below for communities along the River corridor:

Table 7: Non-English Speaking Households

City	Estimated Pop. 2013	Non-English spoken at Home (persons +5 years age)
Albany	98,424	15.2 %
Cohoes	16,193	9.2 %
Troy	49,974	12.3 %
Watervliet	10,236	4.8 %
Totals	***174,827***	***13.2 %***

The study indicates that in communities along the proposed River Corridor residents spoke Spanish in a higher percentage than other languages. The percentage of those speaking Spanish and speaking English "less than very well" is between 2 and 11%. A small portion of the River Corridor, within the City of Albany, indicates the percentage of those speaking Spanish and speaking English "less than very well" is between 6 and 11%. The Stations potentially affected include Madison, State, Clinton Square, Livingston, and the Warehouse District

The Department of Justice's Safe Harbor Provision outlines circumstances that can provide a "safe harbor" for recipients regarding translation of written materials for LEP populations. The Safe Harbor Provision stipulates that, if a recipient provides written translation of vital documents for each eligible LEP language group that constitutes five percent (5%) or 1,000 persons, whichever is less, of the total population of persons eligible to be served or likely to be affected or encountered, then such action will be considered strong evidence of compliance with the recipient's written translation obligations

The CDTA "LEP Language Assistance Plan 2014-2016" identifies tools for outreach including , training staff, translators and a targeted, neighborhood level approach to outreach to locations in downtown Albany where LEP is between 6 and 11%.

H. Floodplains

Based on a review of FEMA Flood Maps, more than half of the sites are above the 100 year flood zone; with thirteen sites above the 500 year and 7 between the 100 and 500 year zones. One site (Waterford Station is located in the 100 year zone with no base flood elevation and 5 sites are located in the 100 year zone with a based elevation determined.

The construction within the flood zone will be minor and will consist of bus shelters that will not displace water. Construction will be focused within the existing transportation corridor

and will not have a significant impact on new or undisturbed areas. The scope of this project will not increase base flood elevations or otherwise have an impact on designated flood zones.

Table 8: Flood Zones

Stop Location	Flood Zone	Flood Boundary
Mount Hope	Zone C	Above 500 year, minimal flooding
2nd	Zone C	Above 500 year, minimal flooding
Morton	Zone A12	100 year flood zone, flood hazard factor
Madison	Zone C	Above 500 year, minimal flooding
State	Zone C	Above 500 year, minimal flooding
Clinton Square	Zone C	Above 500 year, minimal flooding
Livingston	Zone C	Above 500 year, minimal flooding
Warehouse District	Zone B	Between 100 year and 500 year
North Albany	Zone C	Above 500 year, minimal flooding
Riverview Center	Zone C	Above 500 year, minimal flooding
Schuyler Flats	Zone B	Between 100 year and 500 year
Port Schuyler	Zone B	Between 100 year and 500 year
Watervliet, 18th Street	Zone B	Between 100 year and 500 year
Congress SB	Zone C	Above 500 year, minimal flooding
Congress NB	Zone A12	100 year flood zone, flood hazard factor
Riverfront NB	Zone B	Between 100 year and 500 year
Riverfront SB	Zone B	Between 100 year and 500 year
Hoosick / Hedley	Zone B	Between 100 year and 500 year
North Central	Zone C	Above 500 year, minimal flooding
102nd	Zone C	Above 500 year, minimal flooding
111 th	Zone B	Between 100 year and 500 year
115 th	Zone A11	100 year flood zone, flood hazard factor
118 th	Zone A11	100 year flood zone, flood hazard factor
124 th	Zone A11	100 year flood zone, flood hazard factor
Waterford	Zone AE	100 year , base flood determined
Van Schaick	Zone C	Above 500 year, minimal flooding
Cohoes	Zone C	Above 500 year, minimal flooding

I. Hazardous Materials

A hazardous waste and contaminated materials screening was completed as part of the Alternatives Assessment. The screening included a review of NYS GIS database. The preliminary screening is included in **Attachment A** and summarized in the table below.

Table 9: Hazardous Material Sites

Stop Location	Hazardous Site Type	Hazardous Site Number, Name
Kenwood / Port	N/A	
Mount Hope	N/A	
2nd	N/A	
Morton	Petroleum Bulk Storage	0 4-162620 -Giffen Memorial School
Madison	N/A	
State	Petroleum Bulk Storage	0 4-600548 - 90 State Street 0 4-600667 - Albany Pearl St. Heights 0 4-600750 - MCI-DBA Verizon Business.
Clinton Square	N/A	0 4-600034 - Palace Theater
Livingston	N/A	
Warehouse District	Petroleum Bulk Storage	EPA # 3305 - (CMP Industries LLC)
Warehouse District	NYS DEC remedial Site Petroleum Bulk Storage	DEC # 226 -(401057 – C & F Plating 0 4-435406 - American Boiler Co.
North Albany	Petroleum Bulk Storage	0 4-162779 - School No 20

Riverview Center	N/A	
Route 378	Petroleum Bulk Storage	0 4-020117 - Carco Inc.
Port Schuyler	N/A	
Watervliet, 18th Street	N/A	
Congress SB	N/A	
Congress NB	N/A	
Riverfront NB	EPA Regulated Facility Petroleum Bulk Storage	EPA # 10222 - CVS Pharmacy #0344 0 4-600869 - Troy Atrium
Riverfront SB	N/A	
Hoosick / Hedley	Petroleum Bulk Storage	0 4-600618 - Form Standard Furn. Bldg.
North Central	N/A	
102nd	N/A	
111 th/112 th	EPA Regulated Facility Petroleum Bulk Storage	EPA # 10223 - CVS Pharmacy #0906 0 4-142107 - Stewart's Shop #131
115 th	N/A	
118 th	N/A	
124 th	EPA Regulated Facility	
Waterford	Petroleum Bulk Storage	0 5-143936 - Amna Enterprises, Inc.
Van Schaick	Petroleum Bulk Storage	0 4-036722 Cumberland Farms #3114
Cohoes	N/A	

According to the GIS website, sixteen (16) of the sites had no areas of concern identified in close proximity. There were thirteen (13) mapped sites identified in the vicinity of the proposed Alternative.

The potential areas of concern have been identified as part of this initial review. Of these, three (3) sites are EPA Regulated Facilities, one (1) is a NYS DEC Remedial Site and eleven (11) are petroleum bulk storage.

The potential areas of concern correspond to properties where past spills were reported and a potential for residual contamination exists. For many sites, the areas are not likely to impact the project. However, a field review and additional understanding of the scope of work is necessary before eliminating them from the table as a potential concern. If right-of-way is needed at a location identified above, additional hazardous material screenings (Environmental Site Assessments) are required.

J. Navigable Waterways

The project area is near navigable waters (Hudson River) but the sites are not located within or adjacent to the navigable waterway. The Hudson is a tidal river to the Troy Dam just north of the Hoosick/Hedley Station.

K. Noise and Vibration

Noise

Implementation of bus rapid transit along the River Corridor would result in enhanced transit service in a corridor in which frequent traffic and transit operations currently exist. As such, buses and the associated noise are part of the character of the corridor. A three decibel increase in noise creates a discernable change to human ears. To create a three decibel increase, traffic volumes in the corridor would have to double. Enhanced transit service will not double traffic volumes along the River Corridor; rather the project has the potential to decrease traffic volumes through modal shifts. Therefore, the implementation of BRT service along the corridor will not negatively impact noise levels along the proposed BRT route.

Vibration

Some increased vibration along the River Corridor may occur during construction activities, but will be temporary. Much of the current land use in the corridor is residential, commercial, and industrial adjacent to a busy transportation corridor. Existing vibration along the corridor is due to automotive activity along the corridor and is not projected to increase due to this project.

L. Resources

Natural

The project route passes by some parks and passive use areas along the proposed corridor. Two. Work associated with the following stations is proposed adjacent to existing parkland:

- State – Ten Eyck Park
- Clinton Square – Wallenburg Park
- 111th Street/ 112th Street – Powers Park

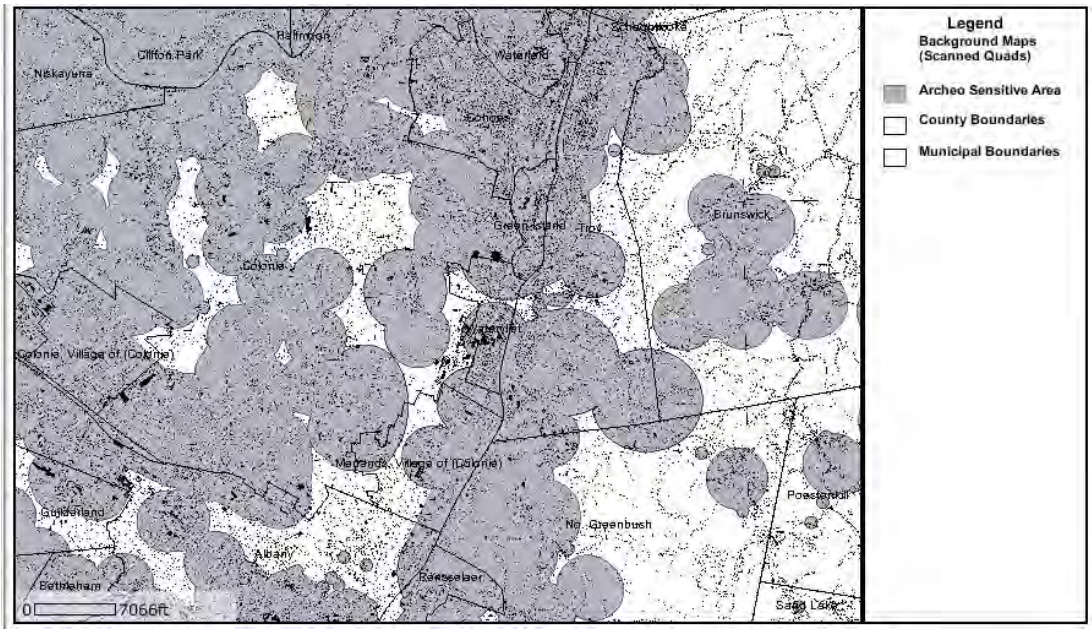
Parkland will not be adversely affected by the proposed work.

Section 106 coordination with the New York State Office of Parks, Recreation and Historic Preservation will be initiated to confirm clearance for the project for Historic and Parkland properties.

Archeological Sites

Access to the NYS OPRHP website was not available at the time this report was prepared; however a screening of the New York State Historic Preservation Office (NYSHPO) website identified much of the corridor falling within an archeologically sensitive area (see map below). Overall, there is a low potential of finding intact archeological sites, although the presence of neighboring sites makes for a high archeological sensitivity overall. Previous roadway construction and development have contributed to previous widespread disturbance where work is currently proposed. Additional study may be required in this area as the project enters the next phase.

Figure 2 Archeo Sensitive Areas



Historic Places

There are five (5) National Register-listed buildings adjacent to proposed bus stations within the project area (Table 11), which are also shown in the Cultural Resource figures in Attachment A. Properties include Church of the Holy Innocents, (Livingston Station), City of Albany; First Reformed Church, Palace Theater (Clinton Square Station), City of Albany; and the Ilium Building (Riverfront NB Station), City of Troy, Waterford Village Historic District (Waterford Station), Village of Waterford.

There are five station locations that are near or adjacent to National Register sites. These include the following:

Table 10: Historic Sites

Location	Station	Historic Site	SPHINX Number
Albany	*Clinton Square*	*Quackenbush House, Palace Theater*	*90NR02817 90NR01645*
Albany	*Livingston*	*Church of the Holy Innocents*	*90NR01622*
Troy	*Riverfront NB*	*Illium Building*	*90NR00999*
Troy	*Riverfront SB*	*National State Bank Building*	*90NR01000*
Waterford	*Waterford*	*Waterford Village Historic District*	*90NR02613*

Historic Districts:

There are 10 potential stations within Historic Cultural Resource Districts. The stations and their associated historic districts are identified below:

Table 11: Historic Districts

City	Station	Historic District
Albany	*2nd*	*South End-Groesbeckville Historic District*
Albany	*Morton*	*South End-Groesbeckville Historic District*
Albany	*Madison*	*Pastures Historic District, Mansion Historic District*
Albany	*State*	*Downtown Albany Historic District*
Albany	*Clinton Square*	*Clinton Ave. Historic District*
Albany	*Livingston*	*Broadway - Livingston Ave. Historic District*
Troy	*Congress NB/SB*	*Central Troy Historic District*
Troy	*Riverfront NB*	*Central Troy Historic District*
Cohoes	*Cohoes*	*Downtown Cohoes Historic District*
Waterford	*Waterford*	*Waterford Village Historic District*

Section 106 coordination with the New York State Office of Parks, Recreation and Historic Preservation will be initiated to confirm clearance for the project for Historic and Parkland properties.

Endangered Species

Federally-Listed Animals:

An initial screening was initiated on July 30, 2014 through the United States Fish and Wildlife Service (USFWS) IPaC (Information, Planning and Conservation System – Environmental Conservation Online System). The project area was identified and for the following counties; Albany, Rensselaer and Saratoga. The Endangered Species Act Species List includes four (4) threatened, endangered, or candidate species on the list that should be considered; Karner blue butterfly (*Lycaeides Melissa samuelis*) (endangered), Indiana bat

(*Myotis sodalis*) (endangered), Northern Long-eared Bat (proposed endangered) and the Bog Turtle (Clemmys muhlenbergii) (threatened).

The Karner blue butterfly has also been listed as an endangered species with known or likely occurrences within the project area. Karner blue butterfly larvae feed solely on the Blue lupine plant. The butterfly's habitat is dependent on the lupine. The project area is urban in nature with limited vegetation, no blue lupine plant was observed within the project limits; therefore, it appears that impacts to the Federally-endangered Karner blue butterfly will not occur.

Recent information provided by the USFWS indicates that that Indiana bats are likely extirpated or in such small numbers that it is unlikely that they would be present and impacted by any specific project in the subject Counties. However, the closest station (Kenwood / Port) is located approximately 12 miles east from a historically known hibernaculum (Haile's Cave, John Boyd Thatcher State Park in Albany County). As the project has the potential to remove trees, there is likely to be a "may affect, but not likely to adversely affect" determination regarding the Indiana Bat. Seasonal restrictions on clearing may be required as a result of this determination. Coordination with the USFWS will be initiated during the NEPA phase using their online project review process, if required.

The Northern Long-eared bat (NLEB) will be listed as a threatened species effective May 4, 2015. According to the USFWS "Northern Log-eared Bat Interim Conference and Planning Guidance", dated January 6, 2014 the Northern long-eared bat spends winter hibernating in caves and abandoned mines. During summer, they roost alone or in small colonies underneath the bark or in cavities or crevices of both live trees and dead trees. The suitable spring / fall swarming habitat is most typically within 5 miles of a hibernaculum. Their migration range varies greatly between 5 and 168 miles. Suitable NLEB roost trees have a diameter of 3" or greater at breast height. It is anticipated that this project will be issued a "may affect, but not likely to adversely affect" determination regarding the NLEB and will be subject to tree clearing date restrictions

The threatened Bog turtle is currently listed as a historic record for Albany County. This semi-aquatic species prefers a habitat that provides cool, shallow slow-moving water, deep muck soils, and tussock-forming vegetation. Since the project area is urban in nature and no wetlands, meeting the characteristics identified above, will be disturbed by the project, no impact on the bog turtle or its habitat is anticipated.

The Bald Eagle (*Haliaeetus leucocephalus*), is listed as occurring in the project area (Reference the USFWS list). According to the IPaC system, there are no known breeding sites within the project area. There are no Endangered Species Act (ESA) requirements for the Bald Eagle; however, it is protected under the Bald and Golden Eagle Protection Act. As there are no large nesting trees of wooded areas within the project study area, suitable Bald Eagle habitat does not exist; therefore, it is assumed that impacts to the Bald Eagle will not occur.

The NYSDEC Natural Heritage Program (NHP) was contacted on July 14, 2014 via email. A formal response was received August 3, 2014. The following species were listed as endangered:

State-Listed Animals:

- Peregrine Falcon

This species is listed as a State Endangered Species. NYSDEC's website lists the Peregrine Falcon as a crow sized falcon admired for its incredible speed. It plunges from tremendous heights in pursuit of bird prey, primarily; which it takes in flight. The falcon prefers open country to high mountains, as well as open forests and tall buildings. Nests are built on buildings, bridges and high ledges, 50 to 200 feet off the ground. In 2003 there were close to 50 pairs statewide. New York City has the largest urban population. There are nests on every Hudson River Bridge south of Albany. The Dunn Memorial Bridge and Collar City Bridge have nesting sites. No work is proposed along the Hudson River or its bridges.

- Shortnose Sturgeon

This species is listed as a State and Federal Endangered Species. NYSDEC's website lists the Shortnose Sturgeon's habitat as the Hudson River, from the tip of Lower Manhattan to the federal dam in Troy. No work is proposed within the Hudson River.

The proposed project does not involve any work in or near a stream or body of water. Also, any disturbance associated with the project would affect previously disturbed urbanized areas; therefore impacts to the threatened or endangered species will not likely occur.

Ecologically-Sensitive Areas

Ecological communities within the project area have been defined using the classification system presented in Ecological Communities of New York (Reschke 1990). The project corridor is classified as Terrestrial Cultural. This includes "*communities that are either created or maintained by human influence to such a degree that the physical conformation of the substrate, or the biological composition of the resident community is substantially different for the character of the substrate community that existed prior to human influence."*

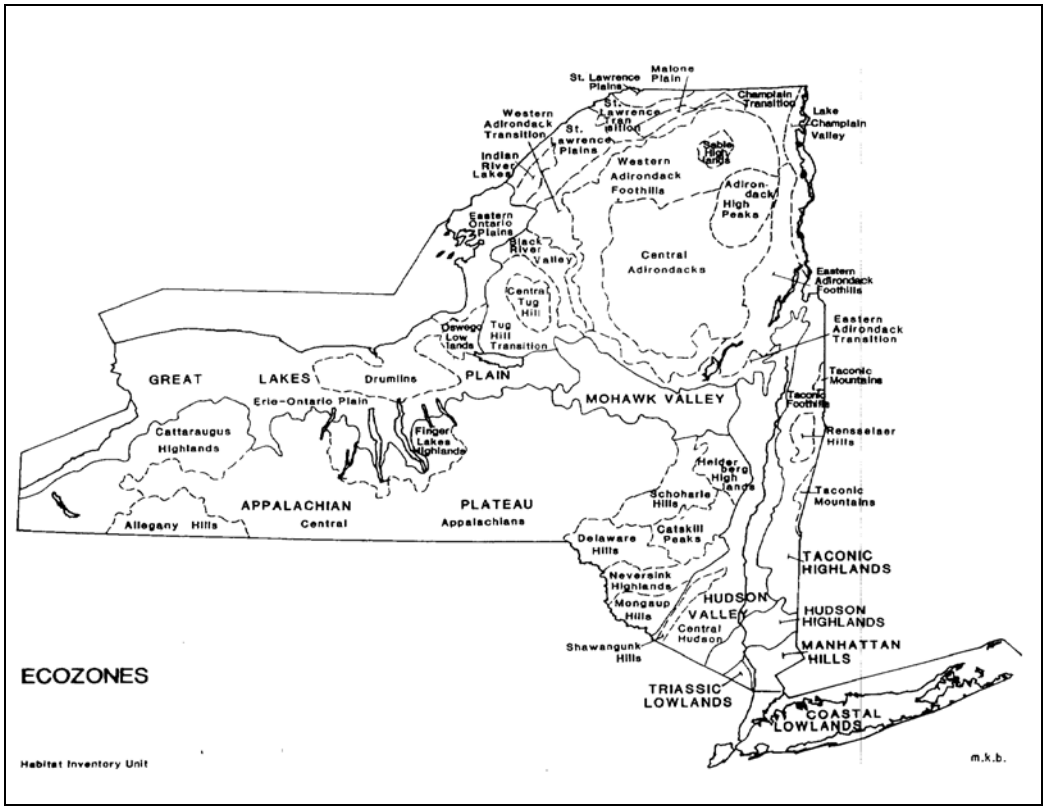
Within the Terrestrial Cultural division the project corridor contains paved roads / paths. The roadway or path is paved with either asphalt, concrete or brick. Vegetation is sparse consisting of vegetation rooted in cracks in the paved surface or planted street trees.

Ecoregions

According to the Ecoregions of New York State, prepared by the EPA, USGS AND NRCS the project site is located in the Northeastern Central Zone Ecoregion – Hudson Valley.

The Northeastern Coastal Zone ecoregion covers most of southern New England and the coastal areas of New Hampshire and southern Maine. Its landforms include rolling or irregular plains. The Soils are Inceptisols formed from glacial till. This ecoregion contains considerably less surface irregularity and a higher human population density. Although European settlers attempted to farm much of the Northeastern Coastal Zone until the mid-19th century, woodland and urban and suburban development now dominate much of the landscape, with minor areas of pasture and cropland.

Figure 3 Ecozones for New York State



"The Hudson Valley ecoregion includes the valley from the Glaciated Reading Prong/Hudson Highlands to the Eastern Adirondack Foothills and Champlain Lowlands in the north.

The underlying geology of the Hudson Valley includes mostly Ordovician shales and siltstones. The shales were more easily eroded than the surrounding gneiss, schist, and sandstone-capped shales of the surrounding highlands. During the Pleistocene Epoch, glacial flood waters shaped Hudson Valley topography, and Glacial Lake Albany filled the valley from Bear Mountain to Glens Falls. Sediments deposited into Glacial Lake Albany cover the valley floor today. The coarser-grained sands deposited in the area surrounding Albany form the dunes and sand plains known as the Pine Bush, where pitch pine and scrub oak predominate. Low elevations and the moderate climate of the Hudson Valley allow Appalachian oak-hickory forest to penetrate northward." (From Reschke, 1990)

The project corridor is located mostly in urban areas including the City of Albany, Troy and Cohoes and the Village of Waterford and Menands. Population density and land use is moderately high. None of the project stations are proposed in areas that are undeveloped.

Farmland/Agricultural Property

The majority of the project corridor does not contain soils mapped as prime or unique farmland. The Waterford Station (Village of Waterford) contains areas mapped as prime farmland or farmland of statewide importance. However this site is located in an urban area where prior disturbance of the topsoil layer has previously occurred. (Reference Figure L-4, **Attachment A**).

The project corridor land use is zoned as a mix of Industrial, Commercial and High to Medium Density Residential. As such, no further involvement is necessary with respect to the Farmland Protection Policy Act. The project area is not within a designated agricultural district; therefore, the provisions of the Agriculture and Markets Law do not apply.

Critical Environmental Areas

The NYSDEC does not identify any Critical Environmental Areas (CEA) for Albany County, or Rensselaer County; and the one CEA in Saratoga County is located more than 20 miles north of the project site. Therefore, the project will not negatively impact a CEA.

The USFW service IPaC screening did not identify any critical habitat within the project area.

M. Water Quality

The proposed Alternative does not involve new highway construction, significant pavement widening, construction of additional travel lanes or a significant net increase in impervious area; therefore further study regarding the effect of the project on the principal aquifer is not necessary. Temporary Erosion and sediment control measures will be incorporated into contract documents as necessary; due to the nature of the project no significant impact to groundwater quality is anticipated. Any cumulative potential adverse impacts would be mitigated through the SPDES permit process for both temporary and permanent conditions.

No surface water bodies are located on or adjacent to the proposed BRT station locations. Water quality is not anticipated to be negatively impacted by the proposed project.

N. Wetlands

National Wetlands Inventory (NWI) and New York State Department of Environmental Conservation (NYSDEC) Freshwater wetlands maps, topographic mapping, the County Soil Survey, and hydric soils lists were reviewed to assist with identifying potential wetland locations. There are no NYSDEC Freshwater Wetlands or Federal wetlands mapped within the project study area. The Federal NWI wetlands maps were consolidated with our GIS

mapping and are labeled as Figure N-1, Federal Wetlands South and Figure N-2 Federal Wetlands North **(Attachment A)**.

The routes proposed utilize existing roadways and the proposed stop locations are not adjacent to wetlands. As such, no wetland impacts are anticipated for the project area.

Surface Water

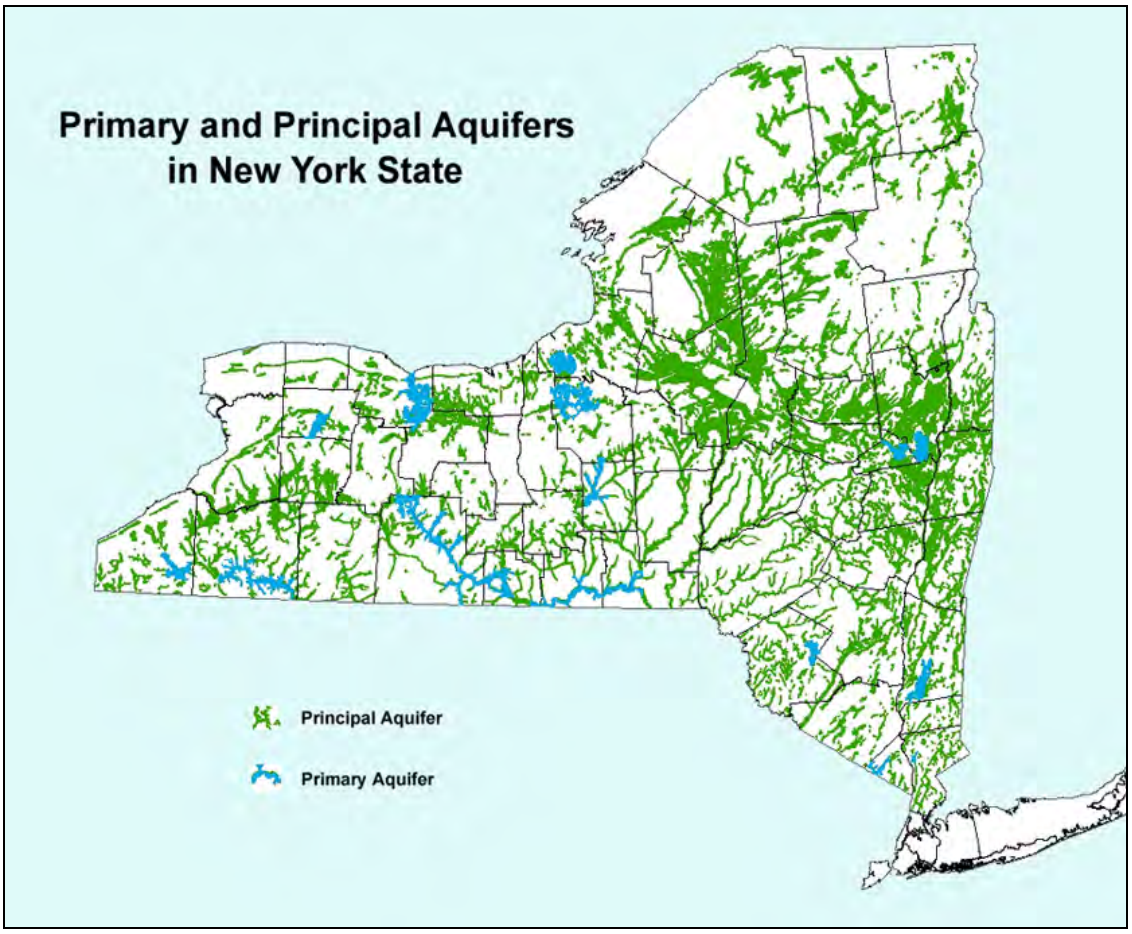
Surface waters for the existing corridor currently flow to municipal closed storm drainage within the road right-of-way. The proposed station areas currently consist of impervious surfaces and the proposed condition is the same. The project is not expected to impact these surface waters. Any potential adverse impact would be mitigated through stormwater management during the State Pollutant Discharge Elimination System (SPDES) permit process for both temporary and permanent conditions if the total disturbance area for the project exceeds 1 acre in size.

Groundwater

The only US EPA Region 2 designated Sole Source Aquifer (SSA) near the project site is the Schenectady - Niskayuna SSA. The project site is not located within the limits of the Schenectady - Niskayuna SSA.

The project site is not located over a NYS DEC Primary Aquifer. The closest New York primary Aquifer is Clifton Park, located west and up-gradient from the project site. Much of the project area is, however, situated over a NYSDEC designated principal aquifer as shown on the map below.

Figure 4 Aquifers in New York



O. Construction Impacts

Construction impacts associated with the project may result in temporary parking, air quality, noise, vibration, water quality, visual, travel and access impacts near the proposed BRT station and TSP or queue jump locations.

Any air quality impacts associated with construction activities would be temporary and would be in the form of emissions from diesel-powered construction equipment and wind-blown dust. Air pollution associated with the creation of wind-blown particles would be effectively controlled through the use of Best Management Practices, including watering of the site during construction to prevent fugitive dust emissions. Air pollution associated with gasoline- or diesel- powered construction equipment would be controlled through effective tuning and maintenance of diesel- and gasoline-powered construction equipment.

Noise and vibration impacts could result from heavy equipment movement and construction activities such as compaction. Potential noise and vibration impacts would be controlled through the use of Best Management Practices and observation of City or County noise ordinances, and work time restrictions.

Potential water quality impacts from construction would be controlled through the implementation of approved methods and Best Management Practices included in the New York State Stormwater Management Design Manual.

Some construction equipment and materials stored for the project may be visually displeasing to local residents and businesses. This would be a temporary situation and would result in no longlasting effects. Maintenance of traffic and sequence of construction would be planned and scheduled so as to minimize traffic delays and inconvenience. Access to some businesses may be temporarily impacted; however, access will be maintained throughout the construction process.

All proposed construction debris will be properly disposed of in construction/demolition landfills. If encountered, lead-based paint and asbestos-containing materials will be disposed of in accordance with all federal, state, and local regulations.

P. Cumulative and Indirect Impacts

At this time, cumulative and indirect impacts are not anticipated. The project proposes to provide additional transit service along a transportation corridor where transit service and existing ridership demand currently exist. All proposed construction is within or adjacent to the existing transportation corridor, with minor right-of-way acquisitions identified in Section Q of this document.

Q. Property Acquisition

Construction of BRT station improvements outside of the highway boundary is a potential. It is understood that satisfactory continuing control of the asset is required. The following lists the preferential order in which land acquisition will be sought for proposed BRT stations.

- Avoidance;
- Use of easements;
- Lease of property;
- Market rate purchase, and;
- Eminent domain.

There are no displacements and relocations anticipated as part of the proposed project. The areas adjacent to the proposed stations range from commercial to residential land use. Sensitive land use impacts are not anticipated.

There are nine (9) stations that currently impact the right-of-way:

- Port of Albany/Kenwood
- Mount Hope
- 2nd Avenue
- Morton Ave
- State Street
- Riverview Center
- Schulyer Flatts
- Congress (NB)
- Cohoes

The following general guidance is provided at this stage.

- Property Acquisition - CDTA can use federal funds to acquire a lease for real property. This can be a "one-time" payment or spread out in periodic payments. The net present value of the lease should be determined and an appraisal conducted to assure reasonable prices. FTA pre-approval is required.
- Leasehold Improvements - CDTA can make improvements to real property that it does not own. There has to be "satisfactory continuing control" over the federally funded investment which is reviewed at the triennial FTA review of CDTA to assure that in the future the asset will be used for transit purposes. The lease term must exceed the useful life of the improvement.

R. Mitigation Measures

None anticipated at this time.

S. Other Federal Actions

Not anticipated at this time.

T. State and Local Policies and Ordinances

The following state and local policies will be followed:

- State Environmental Quality Review Act (SEQR)
- State Pollution Discharge Elimination System (SPDES)
- NYSDOT Highway Work Permit
- Local municipality permit processes

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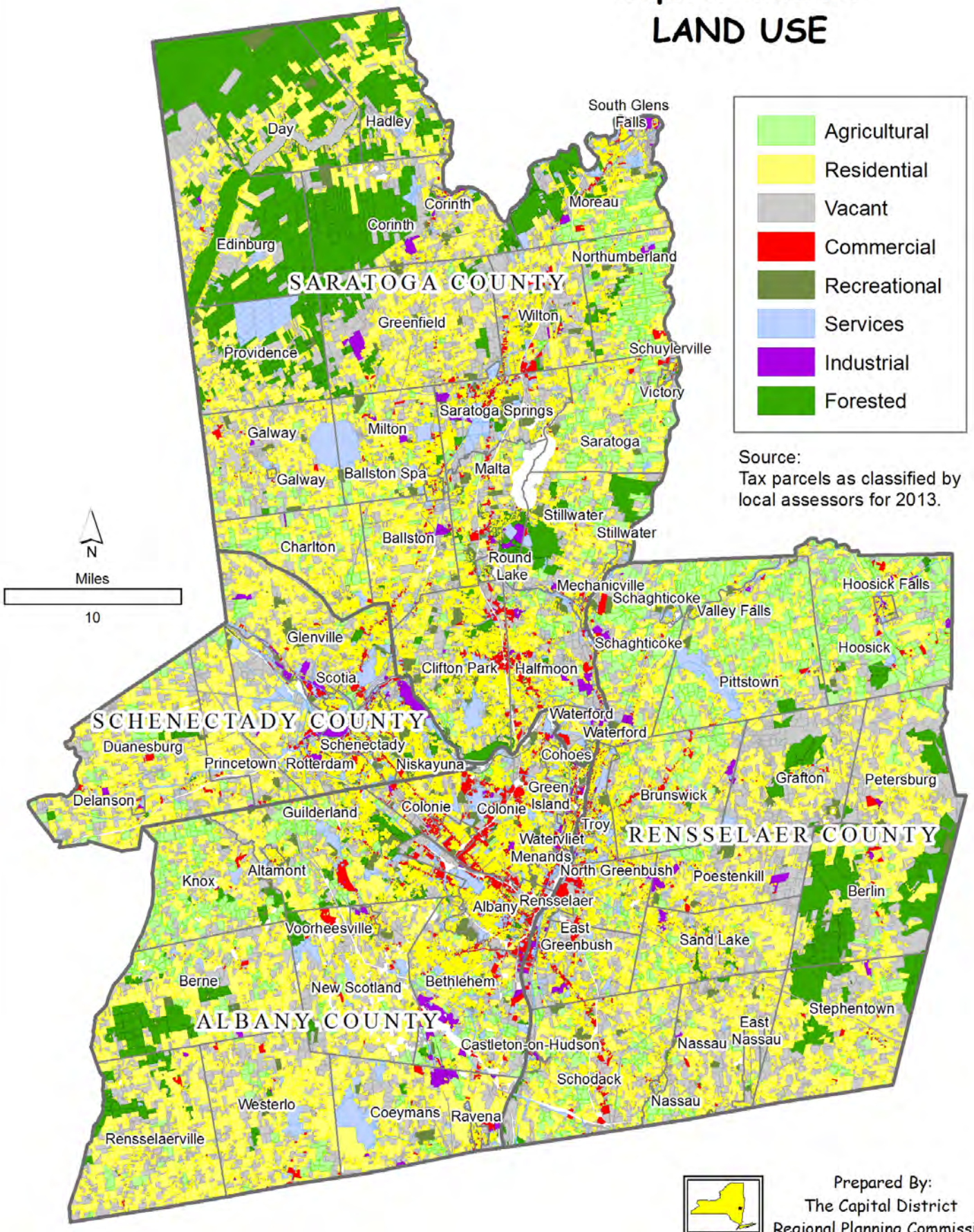
Attachment A
Environmental and Cultural Resources
Figures

Capital District
LAND USE



CDRPC

Prepared By:
The Capital District
Regional Planning Commission
2014

Figure: B-1

Legend

- Stop Locations
- Main Route
- Alternate Route
- <all other values>
- C-1
- C-2
- C-3
- C-M
- C-O
- C-PB
- LC
- M-1
- R-1A
- R-1B
- R-1LL
- R-2A
- R-2B
- R-2C
- R-3A
- R-3B
- R-4
- R-O
- WF-1
- WF-2

North Albany
Warehouse District
Livingston
Clinton Square
State
Madison
Morton
2nd
Mont Hope
Kenwood/Port

0 0.25 0.5 1 Miles

Sources: Esri, DeLorme, NAVTEQ, To
NPS, NRCAN, GeoBase, IGN, Kadast
Kong), swisstopo, and the GIS User C

Creighton Manning	FIGURE: B-2
	DATE: 8/2014
	TITLE: City of Albany Zoning
CDTA RIVER CORRIDOR	

OFFICIAL ZONING MAP

City of Troy

1ST AVE - D14,D15,D16,E16,E17
1ST ST - B3,B4,B5,B6,B7
1ST STREET ALY - B3,B4,B5,B6,B7
2ND AVE - D12,D13,D14,D15,E15,E16,
E17,E18,E19,F19
2ND ST - B3,B4,B5,B6,C6,C7,C8
3RD AVE - D13,D14,D15,E15,E16,E17,E18,F18,F19
3RD ST - B4,B5,C5,C6,C7,C8
4TH AVE - D13,D14,E14,E15,E16,E17,F17,F18
4TH ST - B3,B4,B5,C5,C6,C7,C8
5TH AVE - C5,C6,C7,C8,C9,D9,D10,D11,D12,D13,D14,
E14,E15,E16,E17,F17,F18
6TH AVE -C5,C6,C7,C8,D8,D9,D10,D11,D12,D13,
E13,E14,E15,E16,F16,F17
7TH AVE - D10,D11,D12,D13,E13,E14,E15,E16,F16,F17
7TH ST - C5,C7
8TH AVE - E12,E14,E15,F17,F18
8TH ST - D7,D8,D9,D10
9TH AVE - E12,E14,F15,F17,F18,G18
9TH ST - D8,D9,D10,D11,E11
10TH AVE - E12,G18
10TH ST - D8,D9,D10,E10
11TH ST - D7,D8,D9,E10
12TH ST - D8,D9
13TH ST - D6,D7,D8,E8,E9
14TH ST - D6,D7,D8,E8,E9
15TH ST - D6,D7,E7,E8,E9,E10
16TH ST - D6,E8,E9,E10
18TH ST - E10,F10
17TH ST - E8,E9,E10
19TH ST - E8,E9
21ST ST - F9
22ND ST - F9
23RD ST - F9
24TH ST - F9
25TH ST - F9
101ST ST - D11,D12,E11
102ND ST - D12,E12
103RD ST - D12,D13,E12
104TH ST - D13,E13
105TH ST - D13,E13
106TH ST - D13,E13
107TH ST - D13,D14,E13
108TH ST - D14,E13,E14
109TH ST - D14,E14
110TH ST - D14,E14
111TH ST - D14,E14
112TH ST - D15,E14,E15
112TH STREET BRIDGE - D15
113TH ST - D15,E15
114TH ST - D15,E15,F15
115TH ST - D15,E15,F15
116TH ST - D16,E15,E16
117TH ST - E15,E16
118TH ST - E16,F16
119TH ST - E16,F16
120TH ST - E16,F16
121ST ST - E16,E17,F16
122ND ST - E17,F17
123RD ST - E17,F17
124TH ST - E17,F17
125TH ST - E17,E18,F17
126TH ST - E18,F17,F18,G17
126TH STREET BRIDGE - E18
ADAMS CT APTS WAY - E3
ADAMS ST - B6,C6
ADARE RD - E2
AHERN AVE - F6,F7
ALBERT ST - G2
ALBIA AVE - G3
ALBRIGHT CT - E7,E8,F7
ALDER AVE - F4
ALMA CT - D12,E12
ANCHOR PARK WAY - E18,F18
ANNIE ST - G2
ANTONIA CT - F16
APEX LN - G15
ARCHIBALD ST - D9,E9
ARNOLD E FALLON APTS - D11
ARTHUR CT - C5
ARTS ST - H2
ASHLAND PL - C6
AUTUMN LN - F12
BAL HARBOUR - H17
BALLINA ST - D2,D3,E2
BALSAM AVE - E5
BALTIC AVE - D6
BANK ST - D6,E6
BEDFORD ST - C4,C5
BELLE AVE - E5,F5
BEMAN LN - F8
BERKELEY ST - G1
BILLINGS AVE - G2,H2
BIRCH ST - D6
BISCAYNE BLVD - H16,H17
BLAKELY CT - F3,G3
BLATCHFORD DR - F8
BLEEKER AVE - E6
BOLIVAR AVE - F6,F7
BOND ST - D11
BORADAILE DR - F16
BOUTON RD - D7,E6,E7
BRENTWOOD AVE - C1,C2
BRIDGE AVE - C8
BRINSMADE TERR - F8
BROADWAY - C7
BROOKVIEW AVE - G2
BROOKVIEW LN - G2
BRUNSWICK AVE - E6
BRUNSWICK RD - E6,F6,G6
BUCKLEY ST - C5,C6
BURDEN AVE - B2,B3
BURDETT AVE - E6,E7,E8,E9,F9
BURDETT CT - F8
BURGER LN - C2
BURKE ST - B2
BURRETT LN - G2
CALDER ST - B2
CAMERON RD - G1
CAMPBELL AVE - C2,D2,D3,E3,E4,F4
CANAL AVE - B5,C5,D5
CARLYLE AVE - G7
CARROLL PL - D4
CARROLL HILL CT - D4
CARY CT - G8
CATHERINE SWEENEY APTS - B4,C4,C5
CEDAR AVE - F19
CEMETERY RD - F16,G16,G17
CENTER ALY - D11
CENTRE ST - B3
CENTER VIEW DR - F9,F10
CENTRAL AVE - G3,G4,G5
CESTA LN - D2
CHELTON AVE - G7
CHERRY ST - C3,C4
CHERYL CT - F6
CHRISTIE ST - D6,E6
CHURCH ST - B5,C5,C6,C7
CLARENDON ST - G2
CLARK AVE - D4,D5
CLEARVIEW DR - C4
CLIFF ST - B2
CLINTON AVE - G8
CLOVERLAWN AVE - G9
COBBLESTONE LN - F3
COLLAR CITY - C9,D8,D9
COLLEEN RD - E2
COLLEGE AVE - D7
COLLINS AVE - F4,F5
COLVIN CIR - F7
CONGRESS ST - B7,C7,D6,D7,E6
CONGRESS STREET BRIDGE - B7
CONWAY CT - G9
COOK DR - F7
CORLISS PARK - F18
CORNING AVE - F4
COTTAGE ST - B1,B2,C2
CPL WILLIAM A DICKERSON PL - D8,D9
CRAGIN AVE - D11
CRESTWOOD AVE - C1,C2
CROCKETT AVE - B1,B2
CROSS RD - D1
CROSS ST - B3
CYPRESS ST - D6
DALEY CT - G2,G3
DARTMOUTH ST - G2
DEFREEST AVE - C2
DELAWARE AVE - C4,D4
DENISE DR - F12
DESSON AVE - G3,G4
DETROIT AVE - E8,F8
DETROIT DR - F8
DIACK PL - D14
DIAMOND ROCK CIR - G15
DIVISION ST - B7,C6,C7
DONEGAL AVE - D3,E2,E3
DOUW ST - C11,D11
DROUIN ST - D10,D11
DUKE ST - B3
DUNHAM ST - D4
DUNLEER DR - D2,E2
E GLEN AVE - D11
E PARK PL - E15
E SUNNYSIDE - D10,D11,E11
E SUNNYSIDE WAY - D10,E10
EAGLE ST - D8,E8
EARL ST - C8,D8,D9,D10
EAST INDUSTRIAL PKWY - B3,B4
EATON RD - E7,E8
EDDYS LN - E11
EDGEHILL TERR - F8
ELDRIDGE CT - G8
ELM PL - D9
ELM ST - B2
ELMGROVE AVE - F4,G4,G5
EMMA WILLARD WAY - F4,G4,G5
ERIE ST - B3,C3
EUCLID AVE - G6,G7,G8
EXCELSIOR AVE - G3,G4
FAIRFIELD RD - G5
FALES CT - G3
FARM ST - D6,D7
FARRELL ROAD EXT - G15
FARRINGTON AVE - G1,G2
FARVIEW AVE - E10
FEDERAL ST - C8,D8
FERRY ST - B7,C7,D7
FLORENCE PL - D12
FONDA AVE - F3,G2,G3
FORBES AVE - B1,B2
FORD AVE - G2,G3
FOREST AVE - G2,G3
FORSYTH DR - F8
FOXFORD RD - D2
FRANCIS ST - C4
FRANKLIN PL - C6
FRANKLIN ST - B3,B4,B5,B6,C6,C7,C8
FREAR ALY - B4,B5,B6,B7,C7
FREAR PARK RD - E10,F10,G10
FREDERICK ST - B1
FRONT ST - B6,B7,C7,C8
FULTON ST - C8
GARDEN CT - D11,E11
GEORGE E HOLLIDAY DR - C1,D1
GEORGE ST - D11
GEORGIAN CT - F7,F8,F9
GILLETTE AVE - D2,E2
GLEN AVE - D11,E11
GRACE CT - D12,E12
GRAND ST - C8
GRANDVIEW AVE - F9
GRANITE LN - F3
GRANT AVE - D2
GRAPE ST - B4,C4
GREEN ISLAND BRIDGE - C8
GREGORY CT - G3
GRISWOLD AVE - G2,H2,H3
GURLEY AVE - F15,F16,G16,G17
HADDEN LN - C1
HALE ST - D6
HAMILTON AVE - G1,G2
HANOVER ST - C4,C5
HARRIS RD - G16,G17
HARRISON PL - D8
HARRISON ST - B4
HAVERMANS AVE - C6
HAWTHORNE AVE - E4,E5,F5
HEYDEN RD - F3,F4
HIALEAH DR - H17
HICKORY ST - C4
HIGH ST - B2
HIGHLAND AVE - E6,F6
HIGHPOINTE DR - G15,G16
HILL ST - C5,C6,D5
HILLS LDG - G4,H4
HILLTOP CT - G15
HOLLIDAY DR - C1,D1
HOOSICK ST - C9,D9,E9,F9,G9
HOPKINS ST - B3
HORIZON LN - G15,G16
HOUSE AVE - E11
HOWARD ST - C3
HUDSON AVE - B4
HUDSON ST - B1
HUMISTON AVE - F12
HUTTON ST - C9,D8,D9,E8
HYLAND CIR - G16
HYLAND CT - G16
HYLAND DR - G16
IDA ST - B5,C5,D5
INDUSTRIAL PARK RD - E2,E3
INGALLS AVE - D10,E10
IPHOFEN DR - G2
IRVING PL - C6,C7
IVES CT - F17,G17
JACKSON PL - B6
JACKSON ST - B5
JACOB ST - C8,D8,E8
JAY ST - C9,D9
JEFFERSON ST - B6,C6
JESSE CT - G2,G3
JOHN ST - B1
JOSEPH CT - G8,G9
JOSEPH ST - G8
JOSEPH STREET EXT - G8
KANE ST - D6
KELLOGG DR - F8
KELLY ST - B3
KENNEDY LN - C6
KERRY DR - E2
KING ST - C8
KINLOCH AVE - G3,G4
KINNEY ST - G3
LAKEWOOD PL - F5
LANDFILL RD - E2
LANGLOTZ LN - C7
LANN AVE - G17
LANSING AVE - F4
LANSING TERR - E16
LARCH AVE - F5
LARK ST (2-6) - E4
LARK ST - C2
LAUNDRY PL - C8
LAVIN CT - E9,E10
LEE AVE - G8,G9
LEVERSEE RD - H17,H18
LEVI AVE - G2
LEWIS ST - G9
LEXINGTON AVE - E4
LIBERTY ST - B6,C6
LILAC LN - G2
LILLIAN LN - D5
LINCOLN AVE - B4,C4
LINDEN AVE - D5,E6,E5
LINDENWOOD CT - E9,E10
LIVINGSTON ST - H17
LOCUST AVE - E4,F4
LORI JEAN PL - F16
LUTHER ST - G1,G2,H1
M ST - F18,G18
MAC SHERRY CT - E2
MADISON AVE - C4,C5,D4,D5,E4,F4
MADISON ST - B5,C5
MAIN ST - A2,A3,B3
MANCHESTER AVE - G9
MANN AVE - B4,C3,C4
MANNING AVE - D4
MANOR BLVD - C4,C5
MAPLE AVE - F4,F5
MARCY AVE - G2,H2
MARQUIS CT - C4
MARSHALL ST - D6
MARSHLAND CT - F9,G9
MARVIN AVE - B1,B2
MASON ST - D4,D5
MASSACHUSETTS AVE - E9,E10
MAXWELL DR - A1,B1
MCCHESNEY CT - F3
MCCLELLAND AVE - C5,D4,D5
MCLOUGHLIN LN - D12
MCLEOD RD - E7,E8
MEADOWLAWN AVE - F9,G9
MECHANIC ST - B3,C3
MENANDS BRIDGE - A2,B2
MERIDIAN CT - G16
MICHIGAN AVE - F8,F9
MIDDLEBURGH ST - D10,E10
MILL ST - B3,C2,C3
MITCHELL ST - B2
MONETA OVERLOOK - G16
MONROE ST - B5,C5
MONTGOMERY ST - C4
MONUMENT SQ - B7,C7,C8
MORRISON AVE (100+) - H2,H3
MORRISON AVE (5-105) - B2,C2
MORRISON MANOR APTS - C2
MOUNTAINVIEW AVE - H2
MT PLEASANT AVE - G9
MT ST MARYS AV - F7
MUNRO CT - F3,G3
MYRTLE AVE - F4
N 1ST ST - C8,C9,D9,D10
N LAKE AVE - G9,G10
NEW HAMPSHIRE AVE - E9
NEW TURNPIKE RD - F17,F18,F19
NORTH RD - C1,D1
NORTH ST - D10
NORTH RIDGE EST - G17
NORTHERN DR - F17,F18,G17,G18,H17
NORTON ST - B4,C4
NOTT DR - F8
NYROY DR - F9
O ST - G18
OAK ST - C4
OAKWOOD AVE - D9,E9,E10,E11,E12,F12,F13,G16,G17,H17
OAKWOOD TERR - D9
ODELL ST - E4
OIL MILL HILL RD - G18,H18
OLD MILL ST - C3
OLD CAMPBELL AVE - E3,E4
ONEIL ST - D4
ORCHARD AVE - F6
ORR ST - D10,D11
OUTLOOK CT - G15
PALLISADE CT - G16
PALMETTO CT - G17,H16,H17
PARK AVE - D11
PARK BLVD - E10,F10
PARK DR - F10
PARKVIEW COURT EXT - F2,F3
PARKVIEW CT - F3,G3
PARMENTER AVE - G3,G4
PAT ST - B3,C3
PATONY ST - C5,C6
PATRICIA DR - E2
PATTISON WAY - E4
PAWLING AVE - E5,E6,F3,F4,F5,G2,G3,H2
PECK DR - F7,F8
PEOPLES AVE - D8,E8,F7,F8
PETERSON CT - F3
PHELAN CT - B3
PINEWOODS AVE - E5,F5,G5,H5
PLANK RD - H17
PLEASANT ACRES DR - F18,F19
PLUM AVE - G2,G3
POINT VIEW DR - F9,F10
POLK ST - B3
POMPANO DR - H17
POND LN - G15,G16
POPLAR ST - F5
PRESIDENT ST - D10,D11
PRINCE ST - B2
PROJECT RD - D4,E3,E4
PROSPECT AVE - D6,E6
PROSPECT PARK RD - C6,D6
PROUT AVE - G8
PUTNAM ST - G9
R ST - F18,G18
RANKIN AVE - G7,G8
RED ROCK RD - F16,G16
REGATTA PL - D11
REID AVE - G8,G9
RENSSELAER ST - C10,D9,D10
RICHMOND ST - D6
RIDGE CIR - G15
RIDGE DR - C4
RIVER ST - B6,B7,C7,C8,C9,D9,D10,D11,D12
ROBBINS AVE - B4,C4
ROCK AVE - G3
ROOSEVELT AVE - E19,F18,F19
ROSELAWN AVE - F9,G9
ROSS TECH PK - E12
ROW A WAY - E18,F18
ROW B WAY - E18,F18
ROW C WAY - E18,F18
ROW D WAY - E18, F18
ROW E WAY - E18,F18
ROW F WAY - E18,F18
RPI FIELDHOUSE WAY - E8,F8
RPI WAY - D7,D8,E7
RUSSELL ST - D7
S LAKE AVE - G6,G7,G8,G9
S RIVER ST - B3
SAGE AVE - D7,D8,E7
SAMPSON AVE - E5,E6
SAUSSE AVE - D9,E9
SCHANZ PL - E15
SEWARD ST - C4
SEYMOUR CT - F5
SHELDON AVE - E5
SHERIDAN AVE - C2,D2
SHERMAN AVE - C2,D2,E2
SHERRY RD - E7
SMITH AVE - D11
SNYDER AVE - B3
SPENCE ST - G2
SPRING AVE - D5,E4,E5,F3,F4,G3,H3
SPRINGWOOD EST - C3
SPRUCE ST - B2
ST JOSEPHS ST - B4
ST JOSEPHS AVE - C6
ST LUKES AVE - B3
ST MARYS AVE - C6
ST MICHAELS AVE - B2
ST PAULS PL - C7
ST PETERS AVE - C6
ST VINCENTS AVE - C5
STANNARD AVE - D11
STANTON ST - C4
STATE ST - B7,C7
STERLING AVE - D2,E2
STONELEDGE DR - F15,G15
STOW AVE - B1,B2
STRATTON CIR - G16
SULLIVAN ST - B3
SUMMIT AVE - E10,E11
SUNSET CT - C4,C5
SUNSET TERR - F7,F8
SWIFT ST - D11
SYCAMORE PL - F5
TAFT AVE - G2
TAYLOR CT - F9,G9
TAYLOR LN - G6
TERRACE PL - E5,F5
THE CROSSWAYS - H4
THOMAS ST - D2
THOMPSON ST - B3,C2,C3
THORNTON ST - C4
THURLES CT - E2
THURMOND LN - F5
TIBBITS AVE - D6,E6,F6,F7,G7,G8
TOM PHELAN PL - E7,E8
TRACEY CT - D5
TRENTON ST - B4,C4
TRUBEL PL - G8
TYLER ST - B4,C3,C4
UNION ST - C7,C8
VALLEY VIEW AVE - F9,G9
VAN BUREN ST - B4
VAN EVERY AVE - B3,B4
VANDENBURGH AVE - C1,C2
VANDENBURGH PL - C1,C2,D1,D2
VANDERHEYDEN ST - C9,D9
VICTORIA AVE - H2
VIEWPOINT DR - G16
VINE ST - B4,C4
VISTA AVE - G4
W GLEN AVE - D11
W PARK PL - E15
W SUNNYSIDE - D10,D11,E11
W SUNNYSIDE WAY - E11
WALKER AVE - E4,F4,F5
WALNUT ST - D6
WARREN AVE - G8,G9
WASHINGTON PL - B6,C6
WASHINGTON ST - B6,C6
WATER PLANT RD - G18,H17,H18
WATER ST - B2,B3
WENDELL AVE - G7,G8
WESTOVER RD - E5
WHITMAN CT - E5
WILDE ST - C1,C2
WILLARD AVE - F3,G3
WILLIAMS ST - C5,C6,C7,C8
WILLIAMS ST ALY - C6
WILLIS ST - C2
WILLOW ST - B4
WINNIE AV - D11, E11
WINSLOW AVE - B3
WINTER ST - G1,G2
WOODLAWN CT - F2,G2,G3
WOODROW CT - G9
WOODS PTH - G15
WOOL AVE - H2
WRPI PLZ - D7
WYNANTSKILL WAY - E4,F3,F4
YATES ST - G10
ZETTA PL - G2,H2

Zoning Legend

ZONE, DEFINITION

- B1, Neighborhood Commercial
- B2, Community Commercial
- B3, Shopping Center Commercial
- B4, Central Commercial
- B5, Highway Commercial
- CON, Conservation
- HCD, Hoosick St Commerce District
- HPD, Hoosick St Professional District
- HWD, Hoosick St Waterfront District
- IND, Industrial
- INST, Institutional
- P, Planned Development
- R1, Single Family Residential, Detached
- R2, Two Family Residential
- R3, Multiple Family Residential, Medium Density
- R4, Urban Neighborhood Residential, Medium To High Den
- R5, High Rise Residential, High Density
- UC, Urban Core
- WCD, Waterfront Commercial District
- WMD, Waterfront Mixed Use District
- WTD, Waterfront Trade District

Zoning Data Information:

Adopted: 10/1988
Amended: 06/2001
06/2005
09/2009

Map Produced: 11/2013.

Figure B-3

0 0.2 0.4 0.8 1.2 1.6 Miles

0 650 1,300 2,600 3,900 5,200 Feet

Layer Legend

- Index
- Tax Parcels
- Municipal Boundaries
- Waterbodies

RouteMarkers

- % County
- þ State
- ¤ US Highway

Streets

- Interstate
- US Highway
- State
- County
- Local
- Way

Map produced by Rensselaer County Bureau of Research and Information Services . Dated 11/2013.

Legend - Potential Environmental Justice Area

- Station Locations
- MainRoute
- Alternate Route
- Environmental Justice Area

Watervliet
Route 378
State Hwy 378
City of Troy
Vil. of Menands
Broadway
Riverview Center
U S Route 9
Interstate 90
North Greenbush
N Pearl St
North Albany
Warehouse District
Central Ave
Washington Ave
Western Ave
Lark St
Livingston
Albany
Clinton Square
State
North Greenbush
City of Rensselaer
Delaware Ave
Madison
Morton
2nd
Interstate 787
S Pearl St
Mount Hope
US Routes 9 & 20
Columbia Tpke
East Greenbush
Kenwood/Port
Bethlehem

0 0.25 0.5 1 Miles

Creighton Manning

FIGURE: G-1	
DATE: 7/2014	
TITLE: Env. Justice Area SOUTH	
CDTA RIVER CORRIDOR	

Legend - Potential Environmental Justice Area

- Station Locations
- Main Route
- Alternate Route
- Environmental Justice Area

Schaghticoke
Waterford
124th
2nd Ave
118th
Cohoes
115th
Cohoes
Van Schaick
Colonie
112th
Brunswick
Interstate 787
102nd
North Central
Green Island
Colonie
City of Troy
NY Route 7
NY Route 7
Hoosick/ Hedley
Troy Schenectady Rd
NY Route 2
Riverfront SB
Riverfront NB
Watervliet
Congress SB
Watervliet 18th St
Congress NB
Port Schuyler
Vil. of Menands

0 0.25 0.5 1 Miles

Creighton Manning	FIGURE: G-2
	DATE: 7/2014
	TITLE: Env. Justice Area North
CDTA RIVER CORRIDOR	

Legend - Environmental Sites

- Station Locations
- MainRoute
- Alternate Route
- Hazardous Waste
- Brownfield Cleanup Program
- Environmental Restoration Program
- Voluntary Cleanup Program
- Resource Conservation & Recovery Act
- Petroleum Bulk Storage
- Chemical Bulk Storage
- Major Oil Storage Facility
- EPA Regulated Facilities

Watervliet
Route 378
State Hwy 378
City of Troy
Vil. of Menands
Broadway
Riverview Center
North Greenbush
N Pearl St
North Albany
Interstate 90
Warehouse District
Central Ave
Washington Ave
Western Ave
Lark St
Livingston
Albany
Clinton Square
State
North Greenbush
City of Rensselaer
Madison
Delaware Ave
Morton
Interstate 787
2nd
US Routes 9 & 20
East Greenbush
Columbia Tpke
Mont Hope
Kenwood/Port
Bethlehem

0 0.25 0.5 1 Miles

Creighton Manning	FIGURE: I-1
	DATE: 7/2014
	TITLE: Environmental Sites -South
CDTA RIVER CORRIDOR	

Colonie
Schaghticoke
Colonie
Colonie
Cohoes
Colonie
Brunswick
Green Island
City of Troy
Watervliet
Vil. of Menands
Text
NY Route 7
NY Route 7
NY Route 2
2nd Ave
Waterford
124th
118th
115th
112th
102nd
North Central
Cohoes
Van Schaick
Hoosick/ Hedley
Riverfront SB
Riverfront NB
Congress NB
Congress SB
Watervliet 18th St
South Watervliet

Legend - Environmental Sites

- Station Locations
- Main Route
- Alternate Route
- Hazardous Waste
- Brownfield Cleanup Program
- Environmental Restoration Program
- Voluntary Cleanup Program
- Resource Conservation & Recovery Act
- Petroleum Bulk Storage
- Chemical Bulk Storage
- Major Oil Storage Facility
- EPA Regulated Facilities

0 0.25 0.5 1 Miles

Creighton Manning

FIGURE: I-2
DATE: 3/2014
TITLE: Environmental Sites - North
CDTA RIVER CORRIDOR

Colonie
Colonie
Colonie
Cohoes
Schaghticoke
Waterford
125th
2nd Ave
118th
115th
112th
Van Schaick
Cohoes
Brunswick
102nd
Interstate 787
Text
North Central
Green Island
City of Troy
NY Route 7
Hoosick/ Hedley
NY Route 7
Riverfront SB
Riverfront NB
Congress NB
Congress SB
Watervliet
Watervliet 18th St
Port Schuyler
Vil. of Menands

Legend - Cultural Resources

- Station Locations
- Main Route
- Alternate Route

Points

- Historic Places
- Park
- National Register Sites
- Urban Heritage Areas

0 0.25 0.5 1 Miles

Creighton Manning

FIGURE: L-2	
DATE: 7/2014	
TITLE: Cultural Resources - NORTH	
CDTA RIVER CORRIDOR	

Legend - Cultural Resources

- Station Locations
- MainRoute
- Alternate Route

Points

- Historic Places
- Park
- National Register Sites
- Urban Heritage Areas

Watervliet
Broadway
Route 378
State Hwy 378
Vil. of Menands
Riverview Center
U S Route 9
Interstate 90
North Greenbush
N Pearl St
North Albany
Central Ave
Washington Ave
Western Ave
Lark St
Warehouse District
Livingston
Albany
Clinton Square
Delaware Ave
State
Madison
Morton
2nd
Interstate 787
Mont Hope
Kenwood/Port
Bethlehem
City of Rensselaer
East Greenbush
US Routes 9 & 20 Columbia Tpke

0 0.25 0.5 1 Miles

Creighton Manning	FIGURE: L-1
	DATE: 7/2014
	TITLE: Cultural Resources - SOUTH
CDTA RIVER CORRIDOR	

Legend - Farmland Classification

- Station Locations
- Main Route
- Alternate Route

Farmlandcl

- Not Prime Farmland
- Prime Farmland
- Farmland of Statewide Importance

State Hwy 378
Broadway
Interstate 90
N Pearl St
Interstate 90
Central Ave
Washington Ave
Western Ave
Lark St
Delaware Ave
Interstate 787
S Pearl St
US Routes 9 & 20
Columbia Tpke

Colonie
Vil. of Menands
City of Troy
North Greenbush
North Greenbush
North Greenbush
Albany
City of Rensselaer
North Greenbush
East Greenbush
Bethlehem

0 0.25 0.5 1 Miles

Source: Esri, DigitalGlobe, GeoEye, i
swisstopo, and the GIS User Commu

Creighton Manning	FIGURE: L-3
	DATE: 8/2014
	TITLE: Farmland Class- South
CDTA RIVER CORRIDOR	

Waterford
125th
118th
115th
112th
102nd
North Central
Riverfront SB
Riverfront NB
Congress NB
Congress SB
Watervliet 18th St
Port Schuyler
Hoosick/ Hedley
Van Schaick
Cohoes
2nd Ave
Interstate 787
NY Route 7
NY Route 2
Schaghticoke
Brunswick
Green Island
City of Troy
Watervliet
Colonie
Cohoes

Legend -
Farmland Classification

- Station Locations
- Main Route
- Alternate Route

Farmlandcl

- Not Prime Farmland
- Prime Farmland
- Farmland of Statewide Importance

Text

0 0.25 0.5 1 Miles

Source: Esri, DigitalGlobe, GeoEye, i
swisstopo, and the GIS User Commu

Creighton Manning	FIGURE: L-4
	DATE: 8/2014
	TITLE: Farmland Class- North
CDTA RIVER CORRIDOR	

Legend - Federal Wetlands

- Station Locations
- MainRoute
- Alternate Route
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Watervliet
City of Troy
Vil. of Menands
North Greenbush
City of Rensselaer
East Greenbush
Albany
Bethlehem

Route 378
State Hwy 378
Broadway
Riverview Center
North Albany
N Pearl St
Warehouse District
Livingston
Clinton Square
State
Madison
Morton
2nd
Mont Hope
Kenwood/ Port
Central Ave
Washington Ave
Western Ave
Lark St
Delaware Ave
S Pearl St
Interstate 787
Interstate 90
US Routes 9 & 20
Columbia Tpke

0 0.25 0.5 1 Miles

Creighton Manning

FIGURE: N-1
DATE: 7/2014
TITLE: Federal Wetlands - SOUTH
CDTA RIVER CORRIDOR

Colonie
Colonie
Colonie
Cohoes
Schaghticoke
Brunswick
Green Island
City of Troy
Watervliet
Vil. of Menands
Waterford
124th
2nd Ave
118th
115th
112th
Cohoes
Van Schaick
102nd
North Central
Hoosick/ Hedley
Riverfront SB
Riverfront NB
Congress SB
Congress NB
Watervliet 18th St
Port Schuyler
NY Route 7
NY Route 7
NY Route 2
Troy Schenectady Rd
Text

Legend - Federal Wetlands

- Station Locations
- Main Route
- Alternate Route
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

0 0.25 0.5 1 Miles

Creighton Manning

FIGURE: N-2
DATE: 7/2014
TITLE: Federal Wetlands - NORTH
CDTA RIVER CORRIDOR

River Corridor BRT

Section 2:
NEPA/SEQR Documentation

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ENGINEERS
PLANNERS
SURVEYORS

March 4, 2015

Ross Farrell
Director of Planning
Capital District Transportation Authority
Albany, NY 12206

Re: Capital District Transportation Authority (CDTA) – SEQR Type II
River Corridor Bus Rapid Transit
Cities of Albany, Watervliet, Cohoes and Troy
Villages of Menands and Waterford, Town of Colonie
Albany, Rensselaer, and Saratoga Counties, New York

Dear Mr. Farrell

We have completed Environmental Screenings for the Capital District Transportation Authority (CDTA) regarding the subject project. In accordance with 6 NYCRR, Part 617, "Procedures for Implementation of State Environmental Quality Review Act", this project is a SEQR Type II Action. No further SEQR processing is required. The project has been identified as a Type II action, per the following sections:

> 617.5(c)(2)". . . replacement, rehabilitation or reconstruction of a structure or facility, in kind, on the same site, including upgrading buildings to meet building or fire codes, unless such action meets or exceeds any of the thresholds in section 617.4 of this Part"
>
> 617.5(c)(7): "construction or expansion of a primary or accessory/appurtenant, non-residential structure or facility involving less than 4,000 square feet of gross floor area and not involving a change in zoning or a use variance and consistent with local land use controls, but not radio communication or microwave transmission facilities;"

Based on this transmittal, the SEQR process is concluded. Please keep this transmittal for your records. If you have any questions or require additional information regarding this request, please do not hesitate to call us at (518) 446-0396.

Sincerely,

Douglas A. Teator, PE
Project Engineer

Cc: M. Sargent, J. Pangburn; Creighton Manning

2 Winners Circle
Albany, NY 12205
518.446.0396 (p)
518.446.0397 (f)
www.cmellp.com

ENGINEERS
PLANNERS
SURVEYORS

March 4, 2015

Ross Farrell
Director of Planning
Capital District Transportation Authority
Albany, NY 12206

Re: Capital District Transportation Authority (CDTA) – NEPA Classification
River Corridor Bus Rapid Transit
Cities of Albany, Watervliet, Cohoes and Troy
Villages of Menands and Waterford, Town of Colonie
Albany, Rensselaer, and Saratoga Counties, New York

Dear Mr. Farrell

We have completed Environmental Screenings for the Capital District Transportation Authority (CDTA) regarding the subject project and are recommending that CDTA submit the project with a proposed finding of a "C" list Categorical Exclusion (CE) under the following CE category:

> (9) Assembly or construction of facilities that is consistent with existing land use and zoning requirements (including floodplain regulations) and uses primarily land disturbed for transportation use, such as: buildings and associated structures; bus transfer stations or intermodal centers; busways and streetcar lines or other transit investments within areas of the right-of-way occupied by the physical footprint of the existing facility or otherwise maintained or used for transportation operations; and parking facilities.

For "record keeping" purposes, we have completed the enclosed FTA Region 2 Categorical Exclusion Worksheet. The checklist does note some environmental categories where a review of additional information was warranted; however, after reviewing the available relevant information, comparing the findings to recent environmental conclusions, and the fact that the proposed project is contained within the limits of existing transportation corridors, it is reasonable to propose that there will be no significant impacts as a result of the project.

Based on this transmittal, we encourage CDTA to submit the project into TEAM-Web using the attached detailed project description in the worksheet or similar. If you have any questions or require additional information regarding this request, please do not hesitate to call us at (518) 446-0396.

Sincerely,

Douglas A. Teator, PE
Project Engineer

Cc: M. Sargent, J. Pangburn; Creighton Manning

2 Winners Circle
Albany, NY 12205
518.446.0396 (p)
518.446.0397 (f)
www.cmellp.com

darin.allan@dot.gov

CATEGORICAL EXCLUSION WORKSHEET

FTA REGION 2

(Updated 01/14/2015)

The purpose of this worksheet is to assist project sponsors in collecting and organizing information for environmental impact analysis required under the *National Environmental Policy Act* of 1969 (NEPA) and other federal environmental laws, and to support the project sponsor's proposed environmental finding. This worksheet is not intended as an exhaustive checklist, but it can be used to guide your analysis. The worksheet would be most helpful for a project that appears to qualify as a Categorical Exclusion (CE).

Please speak with your designated FTA Region 2 Community Planner (or Environmental Protection Specialist) regarding this worksheet; some may not request completion of this worksheet for specific projects. If requesting pre-award authority for project expenses in a grant application, please speak with your Community Planner regarding the appropriate level of environmental documentation *prior* to the commencement of any project activities. Lastly, the environmental finding is generally made at the time of grant award; therefore, this worksheet does not constitute an environmental finding for the project.

PART I PROJECT DESCRIPTION

Date You Submitted This Worksheet 3/4/2015

Sponsoring Agency Capital Distric Transportation Authority

Project Manager/Contact Ross Farrell

Project Title River Corridor Bus Rapid Transit

FTA Grant # Click here to enter text.

Project Description The Blue Line BRT project refers to the high-volume transportation corridor along the Hudson River Corridor between the Village of Waterford and the South End of the City of Albany. Being the third busiest transit corridor in the Capital Region with over 2 million boardings per year, it is considered an ideal corridor for expansion of CDTA's BusPlus BRT system. Just over 15 miles in length, the Blue Line BRT project runs primarily along the existing highways of NY Route 32 and US Route 4. The project will introduce arterial BRT service to the corridor using a fleet of 17 articulated buses stopping at approximately 26 new bus stations along the way, with infrastructure improvements planned at each station. New transit signal priority systems and queue jump lanes will be implemented at numerous locations. Service frequency will be increased to every 10 minutes during the day and every 15 to 20 minutes during the evening and on weekends. The Blue Line BRT project will provide direct service starting from two branches, one from Cohoes and one from Waterfor, which meet in Lansignburgh and travel through downtown Troy to Watervliet, Menands, downtown Albany and end at the Port of Albany in South Albany. This will be the first time that these high-densityr, transit-supportive communities are lined by a no-transfer transit service.

Which is the current status of the project?

◉ Planning ○ Engineering ○ Construction

Is the project programmed in the Statewide Transportation Improvement Program (STIP) for New York or New Jersey?

○ Yes – STIP PIN or other identifier Click here to enter text.

◉ No – When will it be added (month & year)? Click here to enter a date.

PART II NEPA CLASS OF ACTION

Answer the following questions to help you and FTA to determine the project's potential environmental class of action. For more detailed guidance, please consult FTA's *Guidance for Implementation of FTA's Categorical Exclusions (23 CFR §771.118)*, updated November 4, 2014.

> ***23 CFR § 771.118 FTA categorical exclusions***
>
> *(a) Categorical exclusions (CEs) are actions which meet the definition contained in 40 CFR 1508.4, and, based on past experience with similar actions, do not involve significant environmental impacts. They are actions which: do not induce significant impacts to planned growth or land use for the area; do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; do not have significant impacts on travel patterns; or do not otherwise, either individually or cumulatively, have any significant environmental impacts.*
>
> *(b) Any action which normally would be classified as a CE but could involve unusual circumstances will require FTA, in cooperation with the applicant, to conduct appropriate environmental studies to determine if the CE classification is proper. Such unusual circumstances include:*
>
> *(1) Significant environmental impacts;*
> *(2) Substantial controversy on environmental grounds;*
> *(3) Significant impact on properties protected by Section 4(f) of the DOT Act or Section 106 of the National Historic Preservation Act; or*
> *(4) Inconsistencies with any federal, state, or local law, requirement or administrative determination relating to the environmental aspects of the action.*

Will the project create any unusual circumstances as defined above?

○ Yes – Skip to PART III ADDITIONAL INFORMATION REQUESTED

◉ No – Continue to the C-List

C-LIST

> *(c) Actions that FTA determines fall within the following categories of FTA CEs and that meet the criteria for CEs in the CEQ regulation (40 CFR 1508.4) and paragraph (a) of this section normally do not require any further NEPA approvals by FTA.*

Is the project consistent with any from the following "C-List" of potential CEs?

○ No – Skip to the D-List

◉ Yes – Check the appropriate category number below and continue to PART III.

Note: The descriptions below are derived from TEAM. You can view the full regulatory text in the Code of Federal Regulations – 23 CFR §771.118(c).

1. ☐Utility and Similar Appurtenance Action
2. ☐Pedestrian or Bicycle Action
3. ☐Environmental Mitigation or Stewardship Activity
4. ☐Planning and Administrative Activity
5. ☐Action Promoting Safety, Security, Accessibility
6. ☐Acquisition, Transfer of Real Property Interest
7. ☐Acquisition, Maintenance of Vehicles/Equipment
8. ☐Maintenance, Rehab, Reconstruction of Facilities
9. ☒Assembly or Construction of Facilities
10. ☐Joint Development of Facilities
11. ☐Emergency Recovery Actions
12. ☐Action Within Existing Operational Right-of-Way
13. ☐Action With Limited Federal Financial Assistance
14. ☐Bridge Removal and Related Activities
15. ☐Preventative Maintenance of Culverts/Channels
16. ☐Geotechnical and Other Similar Investigations

D-LIST

(d) Additional actions which meet the criteria for a CE in the CEQ regulations (40 CFR 1508.4) and paragraph (a) of this section may be designated as CEs only after FTA approval. The applicant shall submit documentation which demonstrates that the specific conditions or criteria for these CEs are satisfied and that significant environmental effects will not result. Examples of such actions include but are not limited to:

Is the project consistent with any from the following "D-List" of potential CEs?

○ No – Skip to PART III ADDITIONAL INFORMATION REQUESTED

○ Yes – Check the appropriate category number below and continue to PART III.

Note: The descriptions below are derived from TEAM. You can view the full regulatory text in the Code of Federal Regulations – 23 CFR §771.118(d).

1. ☐Highway Modernization
2. ☐Bridge Replacement or Rail Grade Separation
3. ☐Hardship or Protective Property Acquisition
4. ☐Acquisition of Right-of-Way
5. (Reserved)
6. ☐Facility Modernization
7. ☐Minor Facility Realignment for Rail Safety Purposes
8. ☐Facility Modernization/Expansion Outside Existing ROW

☐Other – Describe Click here to enter text.

PART III ADDITIONAL INFORMATION REQUESTED

A. DESIGN AND/OR CONSTRUCTION

Does the project's scope include final design, construction, and/or installation activities?

○ No – Skip to "S."

◉ Yes – Continue to "B."

B. LAND USE & ZONING

If applicable, attach a map identifying the project's location and surrounding land uses. If applicable, note any critical resource areas (see Item I.) or sensitive noise or vibration receptors (see Item H.). If the project will occur at a specific street address, please provide this and/or a link to the location in Google Maps. NEPAssist may also be useful in producing a map for FTA review.

Briefly describe the existing land uses of the project area and indicate whether the proposed project is consistent. Include a description of the community (geographic, demographic, economic, and population characteristics) in the vicinity of the project.

Completed in Environmental Screening document, submitted under separate cover.

C. ENVIRONMENTAL JUSTICE

Is the project located within a neighborhood containing minority or low-income residents?

○ No

◉ Yes – Indicate whether the project will have and describe potentially disproportionately high and adverse impacts on minority or low-income populations. Describe outreach efforts targeted specifically at minority or low-income populations.

No adverse impact. Additional service is universally positive.

D. TRANSPORTATION

If applicable, describe potential significant impacts to traffic and parking – including whether the existing roadways have adequate capacity to handle increased bus or other vehicular traffic – and connectivity with other transportation facilities and modes, including bicycles and pedestrians. Include a map or diagram if the project will modify existing roadway configurations. Attach and reference the concurrence of the jurisdiction's Chief Traffic Engineer or other official that the project will not result in significant traffic impacts.

No significant impacts are anticipated.

E. AESTHETICS

Will the project substantially degrade the existing visual character or quality of the site, its surroundings, and/or recognized view sheds?

◉ No

○ Yes – Describe. Click here to enter text.

F. HAZARDOUS MATERIALS

Is there any known or potential contamination at the project site?

○ No – Describe the steps taken to determine whether hazardous materials are present on the site. Click here to enter text.

◉ Yes – Note the mitigation and clean-up measures that will be taken to remove hazardous materials from the project site. The potential areas of concern correspond to properties where past spills were reported and a potential for residual contamination exists. The areas are not likely to impact the project.

G. AIR QUALITY

Does the project have the potential to adversely impact air quality?

◉ No

○ Yes – Describe. Click here to enter text.

Is the project located in an Environmental Protection Agency (EPA)-designated air quality non-attainment or maintenance area?

◉ No

○ Yes – Indicate the criteria pollutant and contact FTA to determine if a hot spot analysis is necessary.

☐Carbon Monoxide (CO)

☐Ozone (O_3)

☐Particulate Matter (PM-10)

☐ Particulate Matter (PM-2.5)

If the non-attainment area is also in a metropolitan area, was the project included in the metropolitan planning organization (MPO)'s air quality conformity analysis?

◉ No

○ Yes – Indicate the date of USDOT's conformity finding. Click here to enter a date.

H. NOISE AND VIBRATION

Does the operation of the project have the potential to increase noise or vibration?

◉ No

○ Yes – Describe the impacts and provide a map identifying sensitive receptors such as schools, hospitals, parks, churches, and residences. If the project will result in a change in noise and vibration sources, you must use *FTA's Transit Noise and Vibration Impact Assessment* (May 2006) methodology to determine impact.
Click here to enter text.

I. NATURAL, CULTURAL, & HISTORIC RESOURCES

Does the project have the potential to impact any of the resources listed below?

☐No

☐Natural – Parks, playgrounds, natural areas, and wildlife refuges. Describe the resources and impacts below. Impacts to these natural resources may constitute a use under Section 4(f) and may trigger require an evaluation, which requires consideration of avoidance alternatives. Attach the Section 4(f) evaluation, if required.
Click here to enter text.

☒Archaeological – Describe the resources and impacts below or attach a supporting Section 106 analysis, including any finding(s) from the State Historic Preservation Office (SHPO) in New York or New Jersey.
It is reasonable to expect that no significant impacts to archaeologicical resources would result from this project.

☒Historic – Indicate whether there are any historic resources either eligible or listed on the National Register of Historic Places in the vicinity of the project. Describe the resources and impacts below or attach a supporting Section 106 analysis, including any

finding(s) from the State Historic Preservation Office (SHPO) in New York or New Jersey. It is reasonable to expect that no significant impacts to historic resources would result from this project.

☒Endangered Species – If applicable, the project sponsor must consult the most recent list of threatened and endangered species in the project area from the US Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration-Fisheries (NOAA-Fisheries). Attach the most recent species information. Describe any critical habitat, essential fish habitat, flora, or other ecologically sensitive areas.
It is reasonable to expect that no significant impacts to natural resources would result from this project.

J. COASTAL ZONE

Is the proposed project located in a designated coastal zone management area?

◉ No

○ Yes – Describe coordination with the state regarding consistency with the coastal zone management plan and attach the state's finding, if available.
Click here to enter text.

K. FLOODPLAINS

Is the proposed project located within the Federal Emergency Management Agency (FEMA) 100-year floodplain?

○ No

◉ Yes – Describe potential impacts and include the FEMA map with the project location identified.
The construction within the flood zone will results in small increases in impervious area and will consist of bus stations and shelters that will not displace water. Construction will be focused within the existing transportation corridor and will not have a significant impact on new or undisturbed areas. The scope of this project will not increase base flood elevations or otherwise have an impact on designated flood zones.

L. NAVIGABLE WATERWAYS

Does the proposed project cross or have the potential to impact a navigable waterway or a waterway that was formerly navigable?

◉ No

○ Yes – Describe potential impacts and any coordination with the US Coast Guard, US Army Corps of Engineers (ACOE), and state environmental protection agencies.
Click here to enter text.

M. WATER QUALITY

Does the project have the potential to impact water quality?

- (•) No
- ( ) Yes – Describe potential impacts. Click here to enter text.

Will the project result in an increase or decrease in impervious surface?

- ( ) No
- (•) Yes – Describe potential project impacts on stormwater (in terms of changes to direction of flow, volume of run-off, rate of flow, and water quality) both on and off the project site. Include a statement on the adequacy of existing stormwater mitigation measures (e.g. storm sewers, ponds, infiltration beds, etc.) and any proposed new measures.
  There is potential for minor increases in impervious areas at bus stations throughout the corridor. The increase is runoff is deemed to be insignificant and will be collected in existing stormwater drainage systems. At the Port of Albany park and ride lot, stormwater detention ponds will be utilized to maintain existing run-off rates.

Is the project located in the vicinity of an EPA-designated sole source aquifer?

- (•) No
- ( ) Yes – Describe potential impacts and provide a map of the sole source aquifer with the project location identified. Click here to enter text.

N. WETLANDS

Does the proposal impact any federally- or state-mapped wetlands or require alterations to streams or waterways?

- (•) No
- ( ) Yes – Describe potential impacts. Click here to enter text.

O. CUMULATIVE AND INDIRECT IMPACTS

Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Indirect impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems, including ecosystems.

Are *adverse* cumulative and/or indirect impacts likely?

- (•) No

○ Yes – Describe the reasonably foreseeable. Click here to enter text.

P. PROPERTY ACQUISITION, LEASES, & EASEMENTS

If there will be an expansion of a footprint of an existing facility, please describe whether a property easement, permit, or acquisition is needed. Small property acquisitions are expect for placement of shelters. Easements are preferred in place of acquisitions.

If eminent domain will be used to acquire the property, please discuss.
Eminent domain is not expected.

If property acquisition, easement, or a permit for expanded footprint is needed for the project, indicate whether this will result in relocation of businesses, residences, or individuals.
Yes, property acquisitions or easements are needed.
Property acquisitions are di minimus in nature and will not result in the relocation of any businesses, residences or individuals.

Note: To ensure the eligibility for federal participation, grantees may not acquire property with either local or federal funds prior to completing the NEPA process and receiving written concurrence in the NEPA recommendation. For acquisitions over $500,000, FTA concurrence in the property's valuation is also required.

Q. CONSTRUCTION IMPACTS

Describe the construction duration, locations of any construction staging (indicate on map, if possible), and identify potential impacts due to construction noise, utility disruption, debris and spoil disposal, and staging areas. Address air and water quality impacts, safety and security issues, and disruptions to transit, automobile and pedestrian traffic and access to property.
The construction duration is anticipated to be 1 year. Impacts to adjacent land owners will be minimized with restrictions on work durations. Impacts to traffic will be minimized by restricting lane closures to non-peak traffic periods. Temporary erosion control measure will address potential impacts to water quality. Existing transit service will be maintained throughout the project duration through the use of temporary stops where required.

R. MITIGATION MEASURES

Describe all measures to be taken to mitigate project impacts, distinguishing the measures to be taken during construction from the measures as components of implementation.
Impacts to adjacent properties have been avoided where possible. Public meetings have been held to discuss impacts to local bus service and overall station planning.

S. OTHER FEDERAL ACTIONS

Provide a list of other federal NEPA actions (EPA, HUD, ACOE, etc.) or permits related to the proposed project or in the vicinity. None.

T. STATE AND LOCAL POLICIES AND ORDINANCES

Is the project in compliance with all applicable state and local permits, policies, and ordinances?

◉ Yes

No – Explain. Click here to enter text.

Save this file and email it, along with any attachments, to your assigned FTA Region 2 Planner.

APPENDIX F: DEMOGRAPHIC ANALYSIS MAPS

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Memorandum

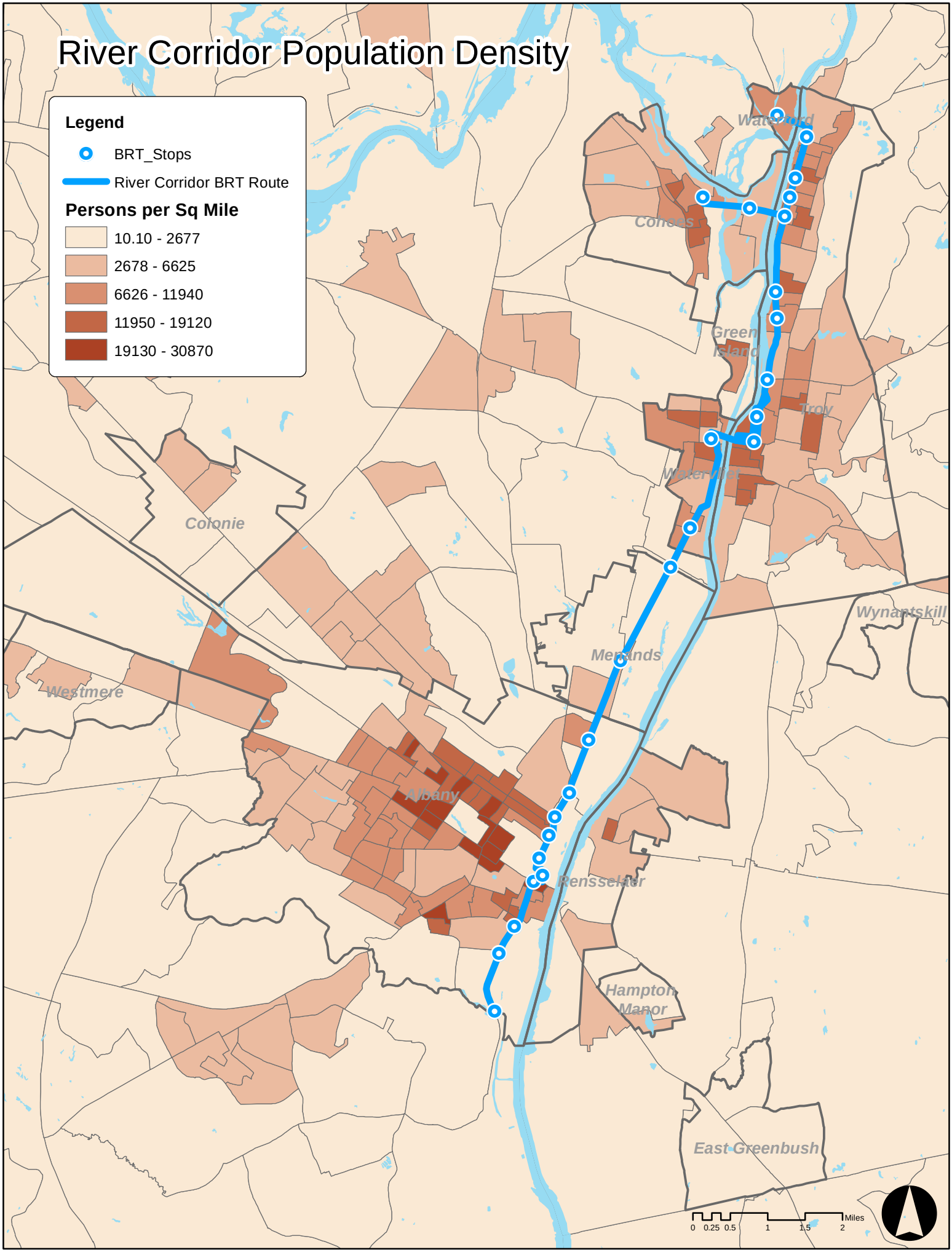
To/Attention	Michael Williams	**Date**	August 18, 2014
From	Martin Hull	**Project No**	35940
cc	Ross Farrell		
Subject	River Corridor demographic analysis		

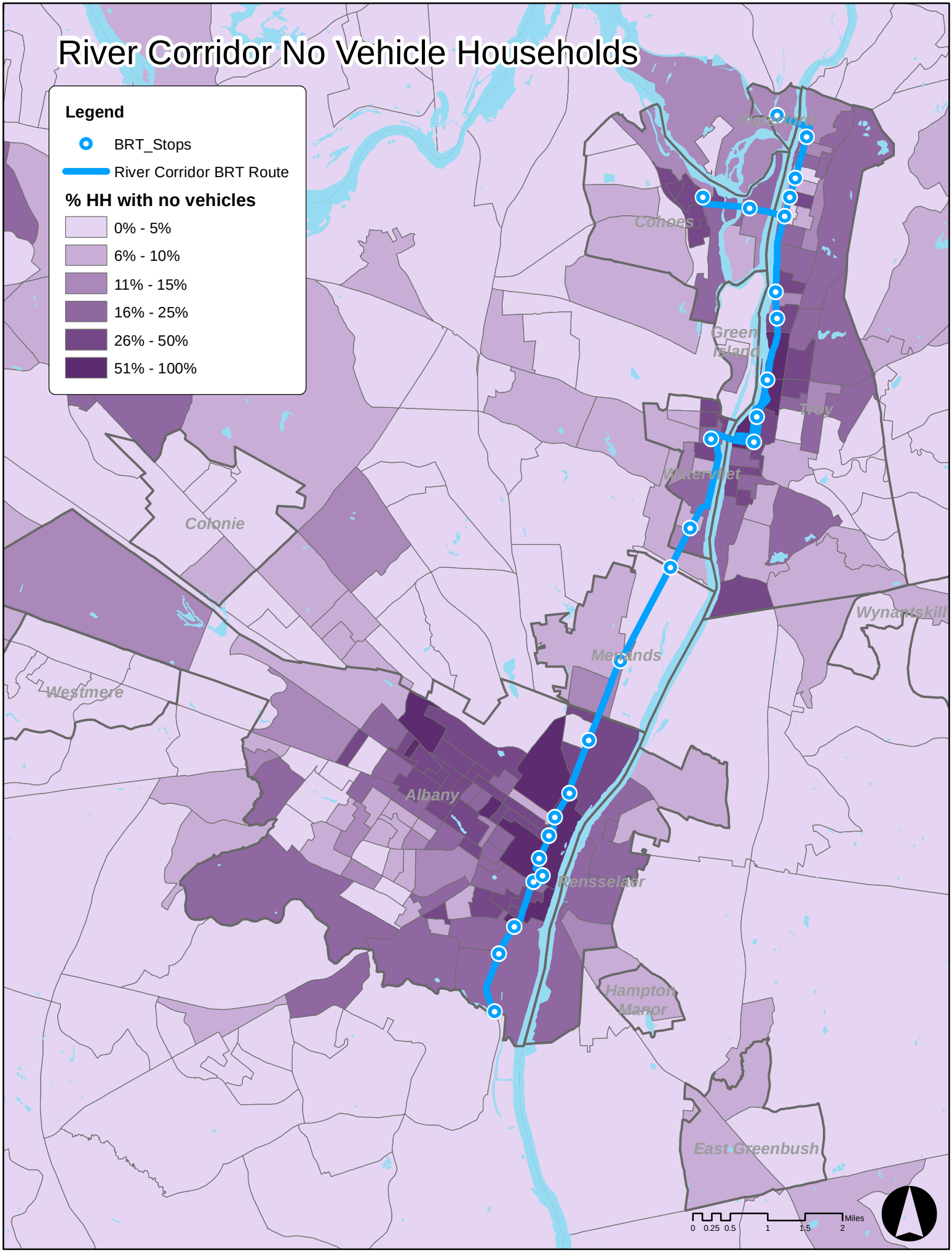
A demographic analysis was completed for the River Corridor study area. The purpose of the analysis was to determine the patterns of transit supportive demographics in the study corridor and confirm that the Locally Preferred Alternative (LPA) adequately serves them. The analysis used data from the US Census Bureau American Community Survey Census Transportation Planning Projects (CTPP) database. All data was tabulated on the tract level and thematic maps (attached) were created to clearly delineate intensity and patterns of distribution.

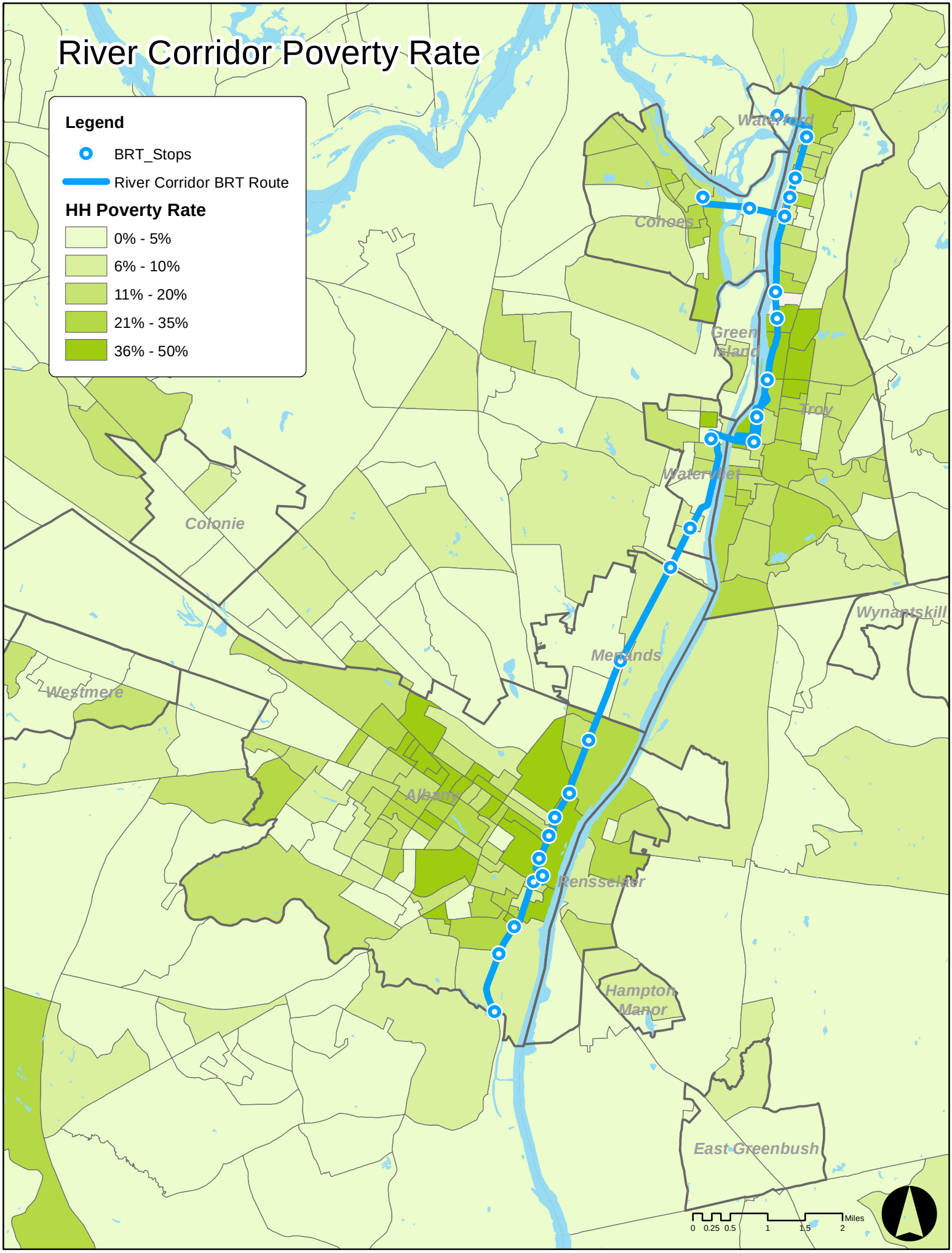
Four statistics were considered:

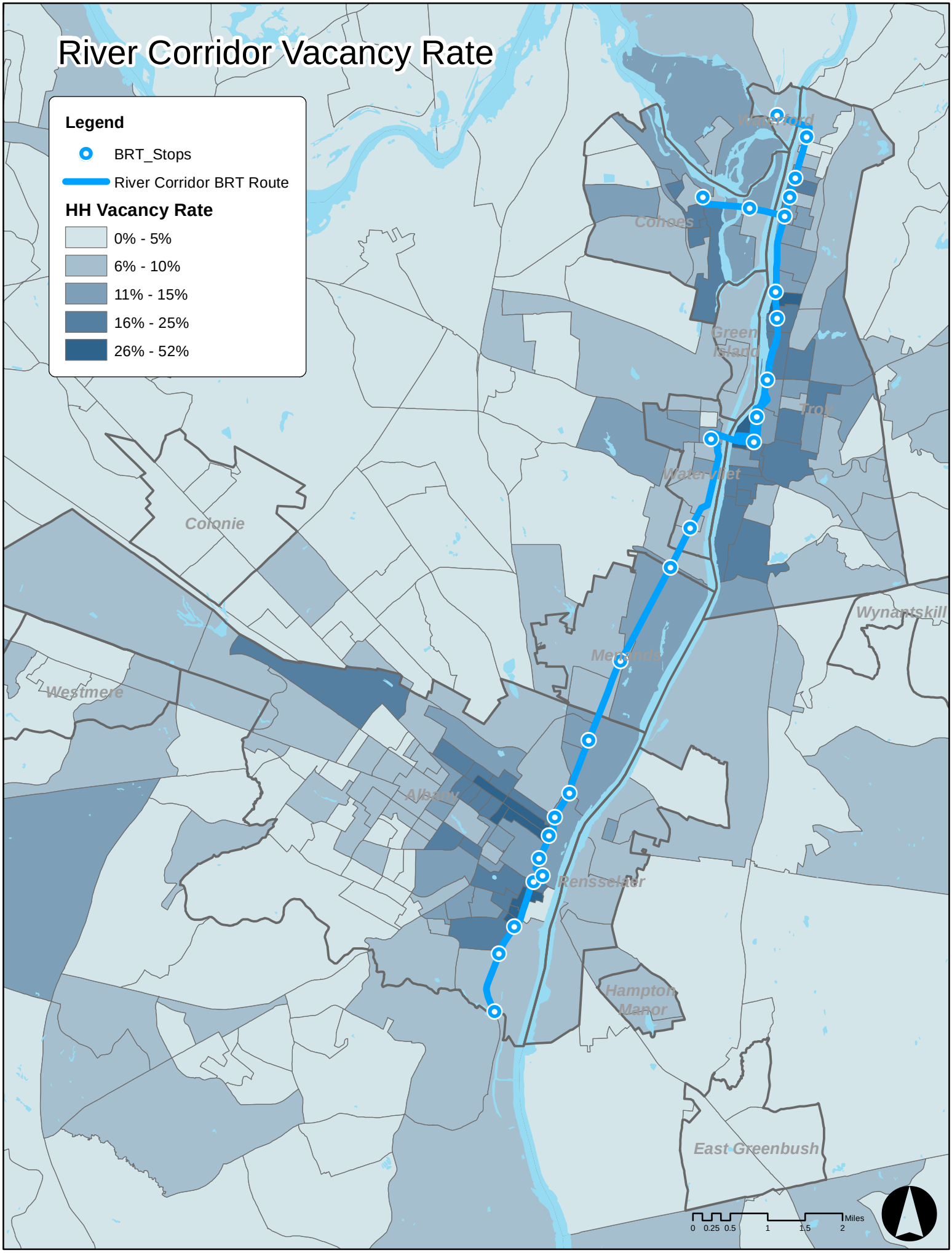
- Population Density – Denser population puts more people in easy walking distance of transit stops and reduces the amount of space available for parking, both of which lead to higher levels of transit use.
- Poverty Rate – Lower income people have less money available to buy and maintain cars and therefore rely more on public transit.
- Household Vacancy Rate – Higher levels of vacancy indicate neighborhoods in economic distress and therefore greater dependence on public transportation among residents as well as the need for public improvements to encourage revitalization.
- No Vehicle Households – Higher levels of no vehicle households, whether by choice or necessity, indicate a greater need for public transit to fill the transportation needs of residents.

The results show that the LPA for the River Corridor serves a large proportion of the tracts with higher levels of transit supportiveness or need in the study area, as indicated by the four statistics. In addition, most highly transit supportive tracts that are not on the River Corridor LPA are either served by the Red Line or will be served by the Purple Line. The one concentration of need that is not directly served by any of the proposed BRT routes is along Second Avenue to the southwest of Downtown Albany. Possible alternatives for serving this area as part of the River Corridor service plan will be investigated as the project moves forward.


River Corridor Population Density
Legend
BRT_Stops
River Corridor BRT Route
Persons per Sq Mile
10.10 - 2677
2678 - 6625
6626 - 11940
11950 - 19120
19130 - 30870
Waterford
Cohoes
Green Island
Troy
Watervliet
Colonie
Wynantskill
Menands
Westmere
Albany
Rensselaer
Hampton Manor
East Greenbush
0 0.25 0.5 1 1.5 2
Miles


River Corridor No Vehicle Households
Legend
BRT_Stops
River Corridor BRT Route
% HH with no vehicles
0% - 5%
6% - 10%
11% - 15%
16% - 25%
26% - 50%
51% - 100%
Cohoes
Green Island
Troy
Waterford
Watervliet
Colonie
Menands
Wynantskill
Westmere
Albany
Rensselaer
Hampton Manor
East Greenbush
0 0.25 0.5 1 1.5 2
Miles


River Corridor Poverty Rate
Legend
BRT_Stops
River Corridor BRT Route
HH Poverty Rate
0% - 5%
6% - 10%
11% - 20%
21% - 35%
36% - 50%
Waterford
Cohoes
Green Island
Troy
Watervliet
Colonie
Wynantskill
Menands
Westmere
Albany
Rensselaer
Hampton Manor
East Greenbush
0 0.25 0.5 1 1.5 2
Miles


River Corridor Vacancy Rate
Legend
BRT_Stops
River Corridor BRT Route
HH Vacancy Rate
0% - 5%
6% - 10%
11% - 15%
16% - 25%
26% - 52%
Waterford
Cohoes
Green Island
Troy
Watervliet
Colonie
Wynantskill
Menands
Westmere
Albany
Rensselaer
Hampton Manor
East Greenbush
0 0.25 0.5 1 1.5 2
Miles

APPENDIX G: ROADWAY PRIORITY MEASURES

Where do we put Roadway Priority Measures on CDTA's BRT River Corridor ?

Introduction

Roadway Priority Measures include Transit Signal Priority (TSP) and Queue Jump Lanes, and can improve bus travel times and reliability, and ultimately make transit a more competitive and attractive alternative to the personal automobile. This paper documents the methodology for determining where TSP and Queue Jump Lanes should be considered along the Capital District Transportation Authority's (CDTA) proposed Bus Rapid Transit (BRT) River Corridor.

TSP is an operational improvement designed to reduce traffic related delays for approaching buses. It is accomplished through improved hardware and detection systems that allow communications between an approaching bus and a traffic signal. The signal may then adjust green time (conditionally or unconditionally) to minimize delay to the approaching transit vehicle. Conditional TSP only assigns priority if the bus is behind schedule, for example, whereas unconditional TSP assigns priority every time a bus is present. Conditional TSP minimizes disruption to general traffic and is generally the initial implementation strategy.[1] Conditional TSP is also the strategy that CDTA uses on the Route 905 BRT corridor.

Queue Jumps are bus lanes combined with signal phasing that provide preference to approaching buses typically at congested intersections. The queue jump lane enables a bus to proceed through an intersection at the start of green ahead of other vehicles, thus decreasing overall bus delay. Queue jump lanes can be accomplished through either shared or exclusive lanes.

Guidance

Several documents were reviewed to confirm the approach to planning TSP, and queue jump lanes in the corridor, including CDTA's Route 905 BRT project; Transit Cooperative Research Program (TCRP) Synthesis 83 - Bus and Rail Transit Preferential Treatments in Mixed Traffic; and Transit Signal Priority – A Planning and Implementation Handbook, prepared for the USDOT.

Research shows that TSP is typically applied where there is significant traffic congestion, but not over saturation along a roadway. Although specific agencies have slightly different delay criteria, there is general agreement that TSP is not needed at intersections where there is little or no recurring delay, nor excessive delay.[2] This guidance also recognizes costs and maintenance by investing in TSP where there is the greatest potential benefit. Studies have found that TSP is most effective at signalized intersections operating within the level of service (LOS) "D" and "E" range, and that there is limited benefit to implementing TSP under LOS "A" to "C" conditions. [3] Under low delay situations, neither bus travel time nor reliability improvements can be achieved. Under oversaturated traffic conditions, congestion can prevent buses from getting to an intersection, and TSP can negatively impact general traffic operations.

In addition to congestion, turning movement locations can be a good location for consideration of TSP, because of the increased potential for delay typically experienced by turning vehicles, especially left turns. CDTA's Route 905 BRT project also considered traffic volumes, and intersection and traffic signal characteristics as part of the TSP assessment (ie. complex / high volume intersections). The stop location

[1] Transit Cooperative Research Program (TCRP) Synthesis 83 - Bus and Rail Transit Preferential Treatments in Mixed Traffic

[2] Transit Signal Priority – A Planning and Implementation Handbook, 2004, Prepared for the USDOT

[3] Ibid TCRP 83

can also be a factor. TSP has been found to be most effective with transit stops located on the far side of signalized intersections.[4]

Queue jump intersections are identified in a similar fashion to TSP locations. Queue jump intersections should experience high traffic volumes and high levels of delay. Secondly, they should be able to accommodate a shared queue jump lane via an existing lane or have the physical space available to add an additional lane. Near side stops generally make more sense for queue jump lanes

Methodology

Based on the above guidance, and recognizing delay as the key factor, a peak hour travel time study was completed along the corridor including three trips in each direction. Average stopped delays are summarized in the attached table. The table shows that average delays are typically in the LOS C or better range, and that very few intersections experienced LOS D. As a result, LOS C locations (20 to 35 seconds of delay) were identified initially as potential candidates for TSP.

In addition, intersection LOS information was researched from available studies and was considered, along with overall operating speeds (including stopped delay), traffic signal cycle length, and side street splits (which is the potential red time that a bus would be subject to if it arrived at the beginning of red).

Peak hour traffic volumes were also reviewed from the Capital District Transportation Committee's (CDTC) Systematic Traffic Evaluation Program (STEP) Model, since low volume side streets would not justify TSP. Roadways not coded in the Model and side streets with traffic volumes less than 90 vehicles per hour were classified as Low (L) volume. This equates to less than two vehicles per an average 60 to 80 second traffic signal cycle (typical along the corridor), and a resulting short side street signal phase. Finally, approximate age of the traffic signal is also shown in the attached table as an indication of the need to upgrade the signal to meet current standards and accommodate TSP.

It should be noted that there are 13 traffic signals located within the City of Troy that were not included in the volume assessment due to the existing traffic signal coordination plan, and minimum required pedestrian crossing times in the City's grid system that TSP would negatively impact.

Based on the above criteria and corridor drives with the project Team, the attached table summarizes the potential TSP and queue jump locations. The results of this assessment show that there are several opportunities for these roadway priority measures. There are also a number of locations with low volume or low delay and no compelling reason to pursue TSP. Altogether, there are 41 intersections that could benefit from some type of improvement. Queue jump is being explored at three (3) locations and TSP and signal upgrades at 38.

[4] Ibid TCRP 83; & TSP-Handbook

Priority Measures Assessment Table

Signal Location			Bus Stop Location (N/S)	Municipality	Ownership	Side Street Volumes	PM Peak Delay (sec)		LOS	LOS Source	Speed (MPH)		Cycle Length (Min/sec)	Side Street Split (Min/sec)	Signal appears capable of TSP add on	Estimated Capital Cost	Potential Priority Measure	Justification	Priority Measure Opportunity/Notes
Signal Number	Main Line	Cross Street (red=station)					NB	SB			NB	SB							
1	S Pearl St	S Port Rd	Far/Near	Albany	City	L	0	1				27	1:07	26	Yes	$10,000	Y	TURN	TSP
2		Binghamton St		Albany	City	L	0	0			38	33	55	22	Yes		N	VOLUME	
3		Old South Pearl St/ Kenwood Rd		Albany	City	L	0	0			44	28	-	-	Yes		N	VOLUME	Stayed green on pearl (5min)
4		Mt Hope Dr	Far/TBD	Albany	City	L	9	32	C	05-177	22	12	55	23	No	$150,000	Y	SIGNAL IMP.	Replace Signall
5		1st Ave/Green St		Albany	City		2	7			18	9	1:08	44	Yes	$10,000	Y	VOLUME	QJ 1 - Focus Area 1 - Delay
6		Second Ave	Far/Near	Albany	City		4	14			15	12	55	23	Yes	$10,000	Y	STATION	TSP
7		4th Ave		Albany	City		4	10			20	13	1:06	24	Yes	$10,000	Y	VOLUME	TSP
8		Schyler St		Albany	City	L	0	0			21	17	59	25	Yes		N	VOLUME	
9		Morton Ave/Rensselaer St	Far/Near	Albany	City		7	13			9	6	1:03	29	Yes	$10,000	Y	STATION	TSP
10		Arch St		Albany	City		9	6			8	14	1:35	17	Yes	$10,000	Y	VOLUME	TSP
11		Madison Ave	Near	Albany	City		12	26			12	4	59	39	Yes	$75,000	Y	VOLUME	TSP / Turn / Protected Left
12	Madison Ave	Green St		Albany	City	L	20	6					1:07	30	Yes	$75,000	Y	SIGNAL IMP.	TSP / Turn / Protected Left
13	Hudson Ave	Green St		Albany	City	L	0	4					45	10	Yes		N	VOLUME	
14		S. Pearl St		Albany	NYSDOT	L	18	0					47	25	Yes	$10,000	Y	TURN	TSP
15	S Pearl St	Beaver St		Albany	City	L	10	1			8	12	-	-	Yes		N	VOLUME	flashing
16		State St	Far/Near	Albany	City		28	25			5	8	1:33	1:05	Yes		N	VOLUME	QJ 2 - Focus Area 2 - Not feasible due to conflicting State St route
17	N Pearl St	Pine St		Albany	City		24	21	C	09-041	6	12	1:30	56	Yes	$10,000	Y	VOLUME	TSP
18		Orange St		Albany	City		16	11			14	8	1:11	45	Yes	$10,000	Y	VOLUME	TSP
19		Clinton Ave	Far/Far	Albany	NYSDOT		0	0			26	17	1:16	56	Yes	$10,000	Y	VOLUME	TSP
20		Livingston Ave	Near/Near	Albany	City		4	0			20	34	1:04	14	Yes	$10,000	Y	VOLUME	TSP
21		Loudonville Rd		Albany	City		11	7			27	20	1:00	33	Yes	$75,000	Y	VOLUME	TSP / Channelize
22		Emmet St		Albany	City	L	1	5			13	19	58	30	No		N	SIGNAL IMP.	New Signal or Remove?
23		N 1st St		Albany	City	L	1	5			24	20	59	31	No		N	SIGNAL IMP.	New Signal or Remove?
24		N 2nd St	Near/Near	Albany	City	L	0	12			28	15	59	32	No	$150,000	Y	SIGNAL IMP.	New Signal
25		N 3rd St		Albany	City	L	2	17			22	15	55	29	No		N	SIGNAL IMP.	New Signal or Remove?
26		Lawn Ave		Albany	City	L	4	16			14	17	1:01	23	No		N	SIGNAL IMP.	New Signal or Remove?
27		Wolfort Rd		Menands/Town	NYSDOT	L	12	6			21	8	37	23	Yes	$10,000	Y	TURN	TSP
28	Broadway	Wards Ln		Menands/Town	NYSDOT		0	6			33	18	1:19	20	Yes	$10,000	Y	VOLUME	TSP
29		I-787 Ramp	Far/Near	Menands/Town	NYSDOT		7	0			18	32	1:12	54	Yes	$10,000	Y	VOLUME	QJ 3 - Focus Area 3 - Geometry
30		Brookside Ave		Menands/Town	NYSDOT	L	0	0			31	30	4:00+	35	Yes		N	VOLUME	
31		Menands Rd		Menands/Town	NYSDOT		12	0	C	07-128	20	36	1:39	20	Yes	$10,000	Y	VOLUME	TSP
32		E Elmwood Rd 62		Menands/Town	NYSDOT		0	2			31	36	1:39	20	Yes	$10,000	Y	VOLUME	TSP
33		Route 378 Off Ramp		Menands/Town	NYSDOT		2	0	C	112-117	34	19	49	24	Yes	$10,000	Y	VOLUME	TSP
34		North of Cemetery Ave at Bank of America Rd.		Town	NYSDOT	L	0	0			29	36	4:00+	15	Yes		N	VOLUME	
35	3rd Ave	1st St		Watervliet	City		2	6			34	37	56	25	Yes	$10,000	Y	VOLUME	TSP
36		7th St		Watervliet	City	L	5	0			25	17	1:20	21	Yes		N	VOLUME	
37	8th St	Broadway		Watervliet	City	L	0	0			29	30	1:39	23	Yes	$10,000	Y	TURN	TSP
38	Broadway	13th St		Watervliet	City	L	0	0			30	21	1:00	19	Yes		N	VOLUME	
39	16th St	2nd Ave		Watervliet	City		0	4			24	13	1:12	53/38	Yes	$10,000	Y	VOLUME	TSP - Turn / 53(Arrow off)/38 (Arrow on)
40	2nd Ave	19th St (Bridge to Troy)	Near/Far	Watervliet	NYSDOT-69-1		0	4	C	112-057	8	28	2:50	1:47	Yes	$10,000	Y	VOLUME	TSP/ 1:47 (If 1st car does not turn right/full green) (0:43 after RTOR sign turns off
41	Ferry St (NB)	3rd St		Troy	City		17		B	Troy Sig	30		60	31	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
42		4th St		Troy	City		0		B	Troy Sig	23		60	31	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
43	4th St (NB)	Congress St	Near	Troy	City		0		A	Troy Sig	8		60	31	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
44		State St		Troy	City	L	8		A	Troy Sig	11		60	20	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
45		Broadway		Troy	City		2		A	Troy Sig	16		60	22	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
46		Fulton St	Far	Troy	City	L	2		A	Troy Sig	10		60	23	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
47	3rd St (SB)	Fulton	Near/QJ	Troy	City			9	B	Troy Sig		15	60	30	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
48		Broadway		Troy	City			6	A	Troy Sig		9	60	19	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
49		State St		Troy	City	L		0	B	Troy Sig		17	60	20	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
50		Congress St	Near	Troy	City			9	B	Troy Sig		10	60	31	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
51	Congress St (SB)	2nd St		Troy	City			0	A	Troy Sig		13	60	36	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
52		1st St		Troy	City	L		0				20	60	31	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
53		River St		Troy	City			0				14	60	22	Yes		N	COORD/Ped	Maintain Sig cord. No TSP
54	4th St	Federal St		Troy	NYSDOT-69-1	15,000	14	3	D	06-170	8	11	1:52 (NB)	1:11 (NB)	Yes	$10,000	Y	VOLUME	QJ 4 - Traffic Eng Focus Area 4/ (SB runs- 1:37/1:03 and 2:03/0:45)
55	River St	Hutton St		Troy	City		32	4			15	20	65	27	Yes	$10,000	Y	VOLUME	TSP
56		Hoosick	TBD	Troy	City		13	7			17	25	57	20	Yes	$10,000	Y	VOLUME	TSP
57		Middleburgh St		Troy	City	L	0	0			25	27	1:38	13	Yes		N	VOLUME	
58	2nd Ave	Bond St	Far/TBD	Troy	City	L	0	3			26	21	1:48	14	Yes	$10,000	Y	STATION	TSP
59		102nd St	Near/TBD	Troy	City		0	3			26	30	51	14	Yes	$10,000	Y	VOLUME	TSP
60		108th St		Troy	City	L	0	0			29	28	1:13	16	Yes		N	VOLUME	
61		112th St	111th	Troy	City		0	8			26	20	1:45	1:12	Yes	$10,000	Y	TURN	TSP

Priority Measures Assessment to Cohoes

Signal Location			Bus Stop Location (N/S)	Municipality	Ownership	Side Street Volumes	PM Peak Delay		LOS	LOS Source	Speed (MPH)		Cycle Length (Min/sec)	Side Street Split (Min/sec)	Signal appears capable of	Estimated Capital Cost	Potential Priority Measure	Justification	Priority Measure Opportunity/Notes
Signal Number	Main Line	Cross Street (red=station)					NB	SB			NB	SB							
62	Ontario	Park Ave	Near/Far	Cohoes	City		0	4			28	22	1:20	26	No	$150,000	Y	STATION	TSP
63		Page Ave		Cohoes	City	L	0	0			29	27	1:31	16	No		N	VOLUME	New Signal or Remove?
64		787		Cohoes	NYSDOT-69-1		7	42			20	2	2:15	1:37	Yes	$10,000	Y	VOLUME	TSP
65		Saratoga St		Cohoes	City		9	18			6	9	1:02	39	Yes	$10,000	Y	VOLUME	TSP
66		Mohawk St		Cohoes	City		5	4			12	start	1:10	26	Yes	$10,000	Y	VOLUME	TSP
67		Remsen St		Cohoes	City	L	0	0			13	-	1:10	26	Yes		N	VOLUME	

Priority Measures Assessment to Waterford

Signal Location			Bus Stop Location (N/S)	Municipality	Ownership	Side Street Volumes	PM Peak Delay		LOS	LOS Source	Speed (MPH)		Cycle Length (Min/sec)	Side Street Split (Min/sec)	Signal appears capable of	Estimated Capital Cost	Potential Priority Measure	Justification	Priority Measure Opportunity/Notes
Signal Number	Main Line	Cross Street (red=station)					NB	SB			NB	SB							
68	2nd Ave	115th St	Far/Near	Troy	City		0	6			26	15	59	21	Yes	$10,000	Y	VOLUME	TSP
69		116th St		Troy	City	L	0	0			17	25	1:59	13	Yes		N	VOLUME	
70		121st St		Troy	City	L	21	0			20	28	59	26	Yes	$10,000	Y	VOLUME	TSP
71		124th St	Near			L	6	0			23	29	55	22	Yes		N	VOLUME	
72		125th St	Near	Troy	City		5	0			15	23	1:11	38	Yes	$10,000	Y	VOLUME	TSP
73		126th St		Troy	City		2	0			14	32	1:27	**	Yes	$10,000	Y	VOLUME	TSP/ Slip lane in the SB route/ ** (25s-EB/WB Gr) (25s NB LT Gr) (37s NB/SB Gr)
74	Broad St	Pearl St		Waterford	NYSDOT-9545	L	0	0			26	23	-	-	Yes		N	VOLUME	Flashing Yellow/Red
75		Third St		Waterford	NYSDOT-9546		1	1			15	14	2:06	1:08	Yes	$10,000	Y	VOLUME	TSP
76		4th St	Near/Far	Waterford	NYSDOT-9547	L	0	9			23		1:40	37	Yes		N	STATION	

$1,025,000.00

this column reads top to bottom

this column reads bottom to top

Key:

= Proposed Roadway priority measure location

= Generally LOS D (35 to 55 Sec of Delay)

= No compelling case for priority measure (Low Volume Side Street, Semi-Actuated or Short Side Street Phase, No Delay, No Farside Station & No Signal Coordination)

APPENDIX H: BUS LANE ASSESSMENT

MEMORANDUM

Creighton Manning

ENGINEERS
PLANNERS
SURVEYORS

Date: August 15, 2014

To: Mike Williams, CDTA
From: Jeff Gentzler, I.E and Doug Teator, P.E.
cc: Ross Farrell, CDTA; Martin Hull, IBI Group; Mark Sargent, P.E.

Subject: River Corridor BRT – Bus Lane Assessment
CM# 113-263

Overview/ Purpose

The purpose of this assessment is to evaluate the feasibility of including exclusive bus lanes as part of the package of roadway priority measures being planned along CDTA's proposed River Corridor BRT. This assessment focuses on the section of Broadway (Route 32) from Clinton Avenue in the City of Albany to the Watervliet City line as shown on Figure 1 (attached), where it is perceived that excess pavement exists.

Executive Summary

This memo evaluates a minimalist implementation strategy to determine if bus lanes can be implemented along Broadway with modest investment through pavement restriping and minor roadway improvements. It examines the potential for bus lanes to fit within existing pavement width, and finds that road widening would be needed in most of the segments. Concerns for parking impacts in Albany, property access, traffic operations, bicycle accommodations and center turn lanes in Menands would also need to be addressed. The most feasible section for bus lanes in the short term appears to be in the area of Exit 6 and Wards Lane which would require further study.

Since bus lanes cannot fit in the existing corridor for the majority of the corridor and there a numerous implementation concerns, bus lanes are not recommended at this time. A long term transformational approach is needed that would include redesigning the corridor using a more complete streets concept that provides improved accommodations for all users, and offers a greater potential to influence future development. This approach will require greater capital investment and additional right-of-way, but could also mitigate several of the negative effects of the minimalist approach. It is recommended that the bus lanes concepts be retained for future study, as ridership demand and traffic congestion increase.

Background

The idea for bus lanes in this section was previously identified in the 2009 study entitled *Assessment of Capital Region North/South Corridors to Improve Access to Emerging Employment Centers,* known as the "North-South Corridor Study".

Assessments and conclusions contained in this memo are based on guidance from *Transit Cooperative Research Program (TCRP) Report 90 – Bus Rapid Transit, Volume 2*. This report includes design guidance for bus lane alternatives as well as factors that should be considered when evaluating their feasibility. Some of these factors include traffic operations, parking, desirable bus volumes of 40 vehicles per hour or more, reduced running times of 10 to 15 percent, emergency access, access to adjacent land, and public perception/support.

Alternatives

Three basic bus lane alternatives are possible as discussed below:

- Alternative 1 – Curbside Bus Lanes
- Alternative 2 – Interior (Center) Bus Lanes
- Alternative 3 – Hybrid Alternative (Combination of curbside and interior bus lanes)

Alt 1 – Curbside lanes are located next to existing sidewalks, shoulders, or on-street parking. The example to the right is located on East Fordham Road in New York City. Curbside lanes are typically less expensive, but do not provide the creation of an "exclusive" transitway, because curb lanes are subject to a variety of interference and conflicts including right-turning vehicles, vehicles seeking to park or load at the curb, and vehicles entering or exiting at driveways. They also require enforcement to ensure that they are not used by general traffic. Separation between curbside bus lanes and general traffic lanes is recommend by pavement striping, rumble strips or concrete barriers. Generally, they do not reduce corridor travel times as much as center bus lanes.

Alt 2 - Center bus lanes provide "exclusive" lanes located between opposing directions of general traffic lanes. The example shown to the right is located on Church Avenue in San Francisco. Intersections with center bus lanes should either be signalized or restrict minor street movements to right turns in and out. They also place the bus stop in a raised median between the travel lanes and the bus lanes, creating the need for more width at the stations. A 2006 study of a bus lane project in Toronto found center bus lanes to be twice the cost of curbside lanes. Center bus lanes are typically separated using raised medians, which reduces the conflicts created between buses and other vehicles, particularly left turning vehicles. This physical separation creates the "exclusive" lane that reduces corridor travel time. Center bus lanes can also be more easily converted to light rail in the future.

Alt 3 – This hybrid alternative uses elements of Alternatives 1 or 2 as a best fit based on corridor conditions. For example, assuming the restriction of left turns at driveways and unsignalized intersections associated with center bus lanes is too much of an impact, then curbside bus lanes would be preferred in segments with higher driveway densities (City of Albany areas). Also, where there is heavy right turning traffic and few driveways, then center bus lanes would be preferred. Queue jumps at signals would transition the buses between the curbside lane and center lane.

Feasibility Assessment

Using the minimalist approach established for this assessment, two bus lane typical sections (envelopes) were developed to determine if curbside lanes, or center lanes could fit within the corridor's ROW and where the probable impacts might be. The envelopes represent the *minimum* width required to implement a busway and are illustrated on the attached figure. Overall, the widths are the same for both alternatives. It is just the location of the bus lanes that varies. Desirably, widths should exceed these minimums to better accommodate pedestrians, bicycles, raised median separations, and parking in some areas. It is noted that Broadway is designated as a part of NYS Bicycle Route 9 and is classified as major bike route in the City of Albany Bicycle Master Plan.

For this assessment, the corridor was evaluated at the segment level and was divided into seven segments based on existing widths, the number of lanes, and the presence of parking as summarized in the following table. The ability to provide bus lanes was then evaluated by comparing existing facility widths to the minimum busway envelope including pavement and overall width. The comparison was used to determine probable impacts and feasibility in the study segments. Table 1 summarizes the results of the assessment.

Table 1 – Bus Lane Assessment

Segment	Street Limits	No. of Lanes	Parking	Approximate Existing Widths			Minimum Busway Pavement Width (Envelope/ ROW Width)	Probable Impacts
				Pavement	ROW	Bldg Face to Bldg Face		
1	**Clinton to Wolfert Ave Railroad Underpass***	2	Y	36'-50' 40'	66'-74'	66'-74' 54'*	52' (66')	• Road widening • On-street parking • RR Bridge • Bicycle Access
2	**Wolfert Ave to Wards Ln**	4	N	50'-54'	80'-90'	110'	52'-63' (66'-77')	• Road widening • Traffic Operations • Bike Accommodations
3	**Exit 6 Area**	6/7	N	66'-80'	95'	120'	74'(88')	• Traffic Operations
4	**Railroad Overpass Area***	3	N	44'	80'-90'	66'-74'*	52' (66')	• Road widening
5	**Menands**	3	N	44'-54'	66'	70'	52' (66')	• Road widening • Bike Accommodations • Traffic Operations
6	**378 Area 378 Underpass***	4	N	48'-62' 63'	144'	NA 69'*	52' (66')	• Road widening • Interchange Modifications • Traffic Operations
7	**Route 378 to 1st Street**	3/4	N	48'-52'	66'	80'	52' (66')	• Road widening • Traffic Operations • Bike Accommodations • DOT Road Diet

* Bridge Constraint
Note: All Dimensions are Approximate

Table 1 shows that although Broadway (Route 32) is perceived as having excess pavement width, bus lanes cannot be provided within the existing curbs for the majority of the corridor. Roadway widening would be needed in all segments and provisions for parking, bicycles, and turning traffic would also need to be addressed. The railroad bridge underpass in North Albany would also be impacted. Below is a segment by segment evaluation, which shows Alternative 3 (Hybrid Alternative) as the apparent preferred concept.

Segment 1: Segment 1 extends from Clinton Avenue to Wolfert Avenue and contains 26 unsignalized intersections and a greater number of residential and commercial driveways. It also has on-street parking throughout most of the section. The existing pavement is not wide enough to fit bus lanes using a minimalist approach; therefore the pavement would need to be widened and all on-street parking removed. The railroad bridge over Broadway is also too narrow and would need to be widened. Implementation of median lanes does not appear feasible, due to the additional width needed at stations, unless the buses merge back to mixed traffic at stations.

Curbside lanes appear more feasible than center lanes in this section, but would still impact parking, the railroad bridge, and would also require road widening.

Segment 2 and 3: Wolfert Avenue to Wards Lane is a commercial area with 80-95 feet of ROW that could potentially accommodate both curbside or median lanes with minor widening. Segment 3 is the intersection of Broadway at Exit 6 of I-787, where additional lanes are provided for heavy right turn volumes southbound from Broadway to Wards Lane, and northbound from Broadway to Exit 6. To avoid these turning conflicts, implementing a center bus lane would appear to be preferred in these segments.

If the center bus lanes were built, median lanes should require eliminating lefts turns at the unsignalized intersections/driveways. This would impact existing property access and traffic patterns.

Segment 4: The railroad overpass in this segment provides 44 feet of pavement and has an overall width of approximately 66-74 feet. Both curbside and median bus lanes in this segment would require roadway widening.

Segment 5: Segment 5 extends through Menands with the majority of intersections being unsignalized. The existing pavement is 44 to 54 feet wide with an approximate ROW of 66-feet. Although the minimalist bus lane concept could fit in this section, it would require removing the existing two-way left turn lane (TWLTL). If built, the curbside alternative appears more feasible to avoid the need for left turn prohibitions.

Segment 6: Pavement widths in the Route 378 interchange area range from 48 to 52 feet and would require some road widening to accommodate bus lanes. Due to the free flowing interchange ramps with heavy right turn volumes, center bus lanes would appear to be preferred in this section. One challenge of this section is the Broadway/Menands Road/East Elmwood Road intersection that currently experiences long delays, and has a narrow (66') envelope from building face to building face. Improvements to this intersection and the Route 378 interchange were identified in the Broadway Corridor Linkage Study. Capacity improvements and right-of-way acquisition would likely be needed in this section.

Segment 7: This segment extends from Route 378 to 1st Street in Watervliet and is 4 lanes wide with a pavement width of 48 to 52 feet. The NYSDOT is finalizing plans for a road diet in this section, which includes bicycle lanes and a reduction in the number of travel lanes from four to three. There is a high number driveways in this section and intersections are mostly unsignalized. Bus lanes would require some roadway widening and would affect the pending road diet project. Center bus lanes would negatively affect left turns in the area, so curbside lanes would appear to be preferred under the minimalist approach.

Summary/Conclusions

This assessment shows that the existing pavement width through the seven Broadway segments generally does not meet the minimum 52-foot width required to provide exclusive lanes under a minimalist implementation approach. There are also concerns over parking impacts and the rail road bridge in North Albany, property access and bicycle accommodations throughout the corridor, and center turn lanes in Menands. As a result bus lanes are not recommended for the BRT corridor at this time.

It is also noted that the travel time studies completed as part of the River Corridor Alternatives Analysis showed little traffic congestion in this section, and little potential for travel time savings with bus lanes. The proposed River Corridor BRT operating plan with 10-minute headways also falls below the TCRP guidance of 40 buses per hour for bus lanes.

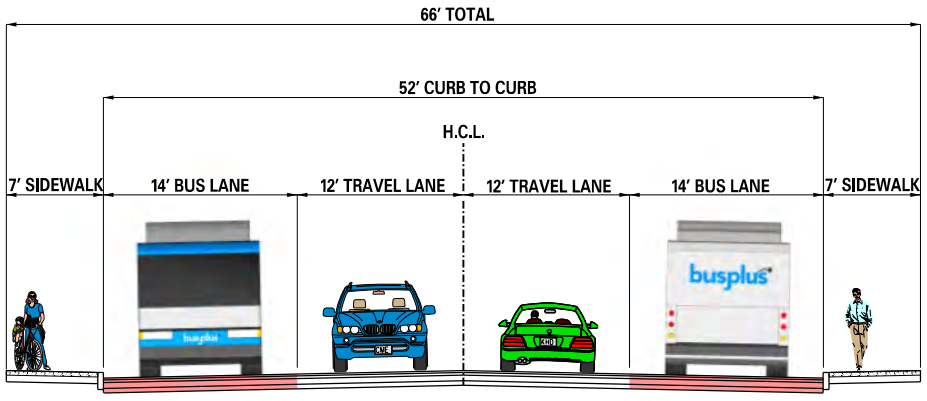
If bus lanes are pursued, the most feasible section for bus lanes in the short term appears to be the area near Wards Lane and Exit 6, which could be a catalyst for TOD and future BRT extensions.

As land development and ridership patterns change, exclusive bus lanes may be more feasible in the future, and the idea for bus lanes should be retained for future study. Since the minimalist implementation approach assessed in this memo raised many of the same issues as a more comprehensive roadway widening project, is it suggested that any future study consider a more comprehensive transformational BRT project. This approach would require a wider cross section to accommodate bike lanes and would also require greater capital investment, but could potentially mitigate some of the negative impacts of the minimalist approach.

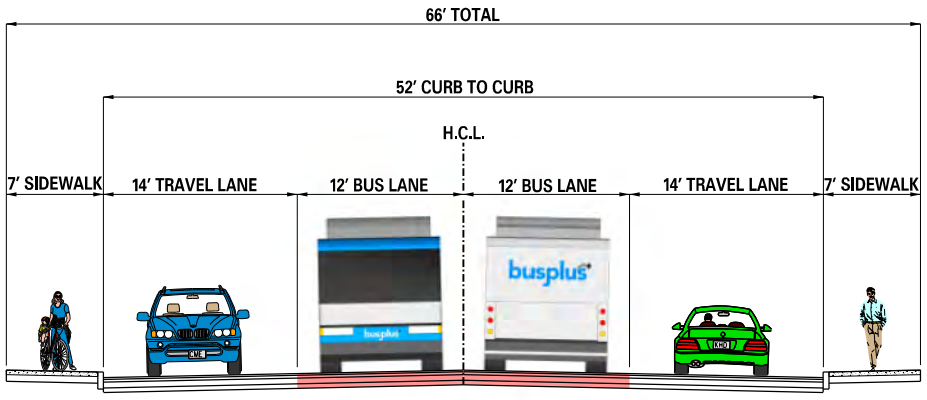
F:\Projects\2013\113-263 CDTA River Corridor\documents\113263_Buslane Options memo.docx

FILE NAME = F:\Projects\2013\113-263 CDTA River Corridor\cadd\dgn\figures\113-263_fig_bus_lane_analysis_01.dgn
DATE/TIME = 8/15/2014
USER = dborjas

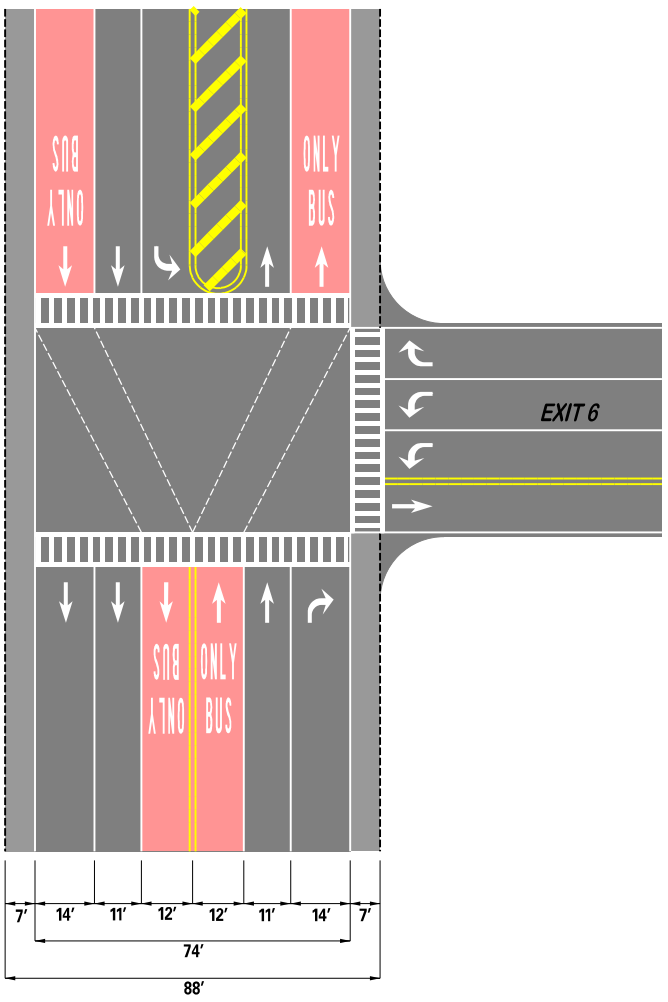
ALTERNATIVE 1
CURBSIDE BUS LANES (NO PARKING)

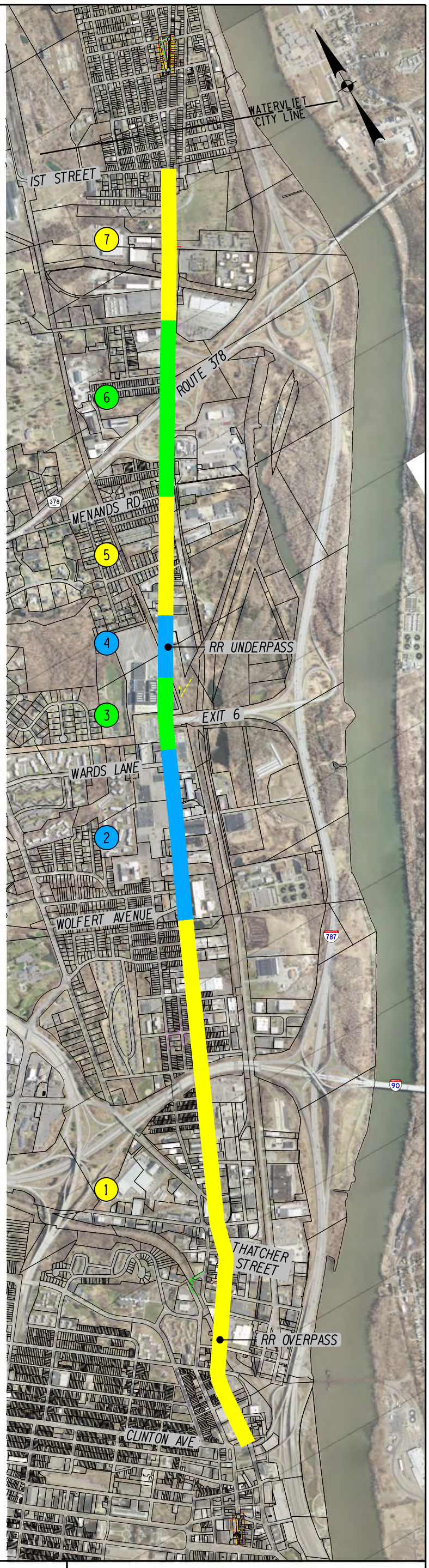


ALTERNATIVE 2
CENTER BUS LANES



ALTERNATIVE 3
AT EXIT 6





- R.O.W. = 80 - 90 FEET
- R.O.W. = 90+ FEET
- R.O.W. = 66 FEET

BUS LANE ASSESSMENT

RIVER CORRIDOR BRT
ALBANY, CO.

Creighton Manning

PROJECT: 113-263 | DATE: 08/2014 | FIGURE: 1