CDTC
Capital District Transportation Committee

CDTA

CAPITAL REGION
BUS LANE FEASIBILITY STUDY

Final Report

February 2023

Produced by Foursquare ITP, with IBI Group and MJ Engineering

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ACKNOWLEDGEMENTS

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Disclaimer: The Capital Region Bus Lane Feasibility Study was prepared with support from the Capital District Transportation Committee and the Capital District Transportation Authority. The study was funded in part through grants from the Federal Highway Administration, U.S. Department of Transportation. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation and do not commit Cities, Towns, Villages, Counties, CDTC, CDTA or other partners to project funding. The recommendations are conceptual in nature and are presented to characterize the types of improvements that are desirable, and that may be implemented as part of future transportation improvement projects. All transportation concepts will require further engineering evaluation and review. Undertaking additional engineering or other follow up work will be based upon funding availability.

1. EXECUTIVE SUMMARY

As part of the Capital Region's long range metropolitan transportation plan, the Capital District Transportation Committee (CDTC) and the Capital District Transportation Authority (CDTA) identified the use of bus only lanes and infrastructure improvements as potential tools to support the development of a high-performance regional transit system. CDTA currently operates two BRT lines and is building a third but identified a need to expand the number and intensity of bus priority treatments to improve bus operations and the customer experience. To determine the feasibility of implementing bus only lanes (and other bus priority treatments), the project team engaged in a study that resulted in four concept designs focused on an implementable, tactical approach.

The study consisted of data analysis to identify bus lane candidate locations, a public education and participation program, a visual display of bus lane street layouts, an assessment of bus priority treatment options, and development of bus and bike priority concepts. This process included evaluating twelve (12) different corridors to help prioritize improvements at key locations. As part of this evaluation, consideration was given to bus only lanes, shared bus and parking lanes, as well as shared bus and bike lanes in BRT and other transit corridors throughout CDTA's service area. The identified improvements will allow buses to operate faster and more reliably and will improve service to thousands of riders daily. The resulting recommendations from this study will set the stage for moving bus priority in the region forward. **Figure 1** provides an outline of the project scope and workflow.

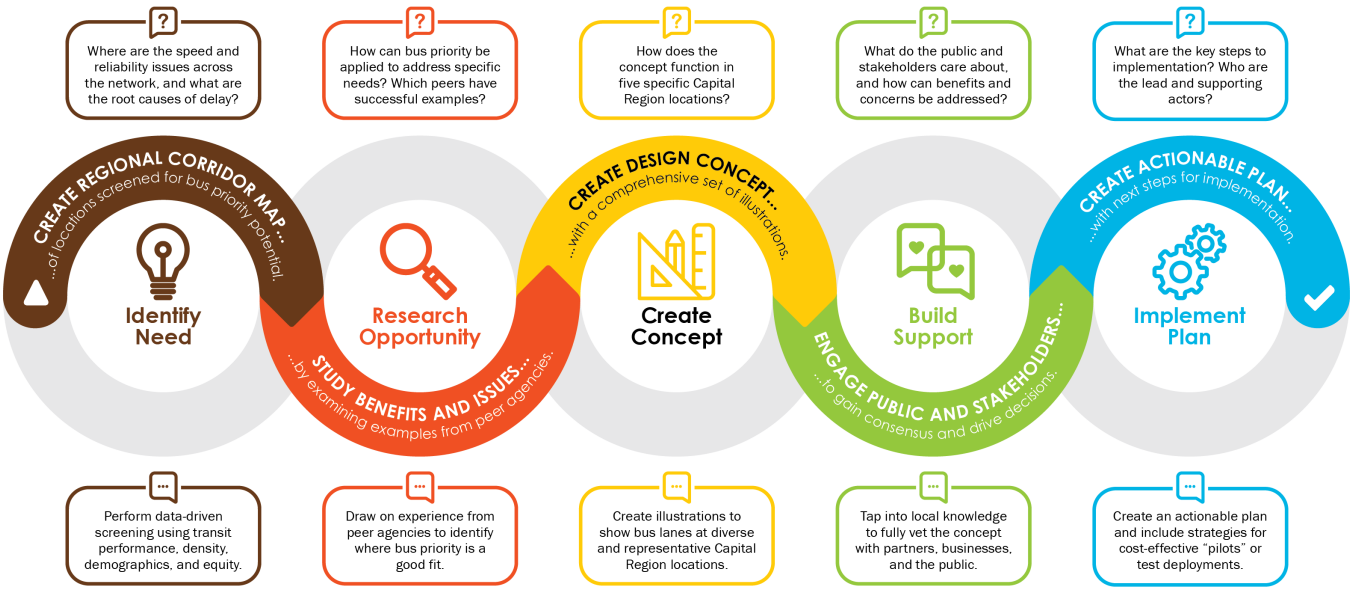


Figure 1: Bus Lane Study Project Flow

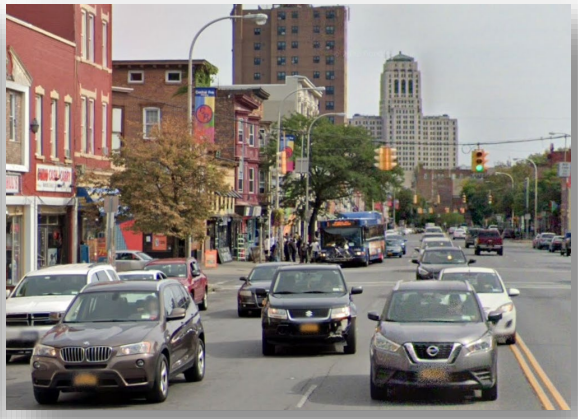
Previous Plan and Peer Review

Several previous planning documents and peer studies were identified and reviewed for relevant takeaways pertaining to bus lane feasibility and implementation. The Capital Region's local plans identified bus only lanes and transit priority treatments as key strategies for reducing travel times. Peer studies provided context and guidance on successful implementation of bus only lanes, drawing attention to the importance of tactical pilot implementations, speed and reliability benefits, and minimal to no impacts to personal vehicles.

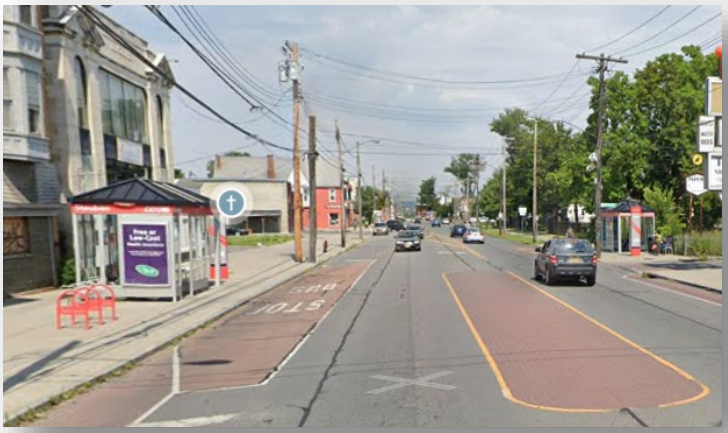
Corridor Identification, Assessment, and Screening

Preliminary corridors were identified based on locations with population and employment density; a significant amount of bus trips and bus passengers; relatively low transit speeds, significant concentrations of traditionally disadvantaged populations; and overall value to the transit network. Based on these criteria in addition to an existing conditions analysis and extensive stakeholder engagement, five priority corridors were selected to move forward to the conceptual design process. During the process, in consultation with City of Albany staff, two of these corridors, Washington/State and Broadway, were combined, resulting in four study corridors moving forward.

Troy - 3rd / 4th Street Corridor



Albany - Central Avenue Corridor



Schenectady - State Street Corridor

Albany - State/Broadway Corridor

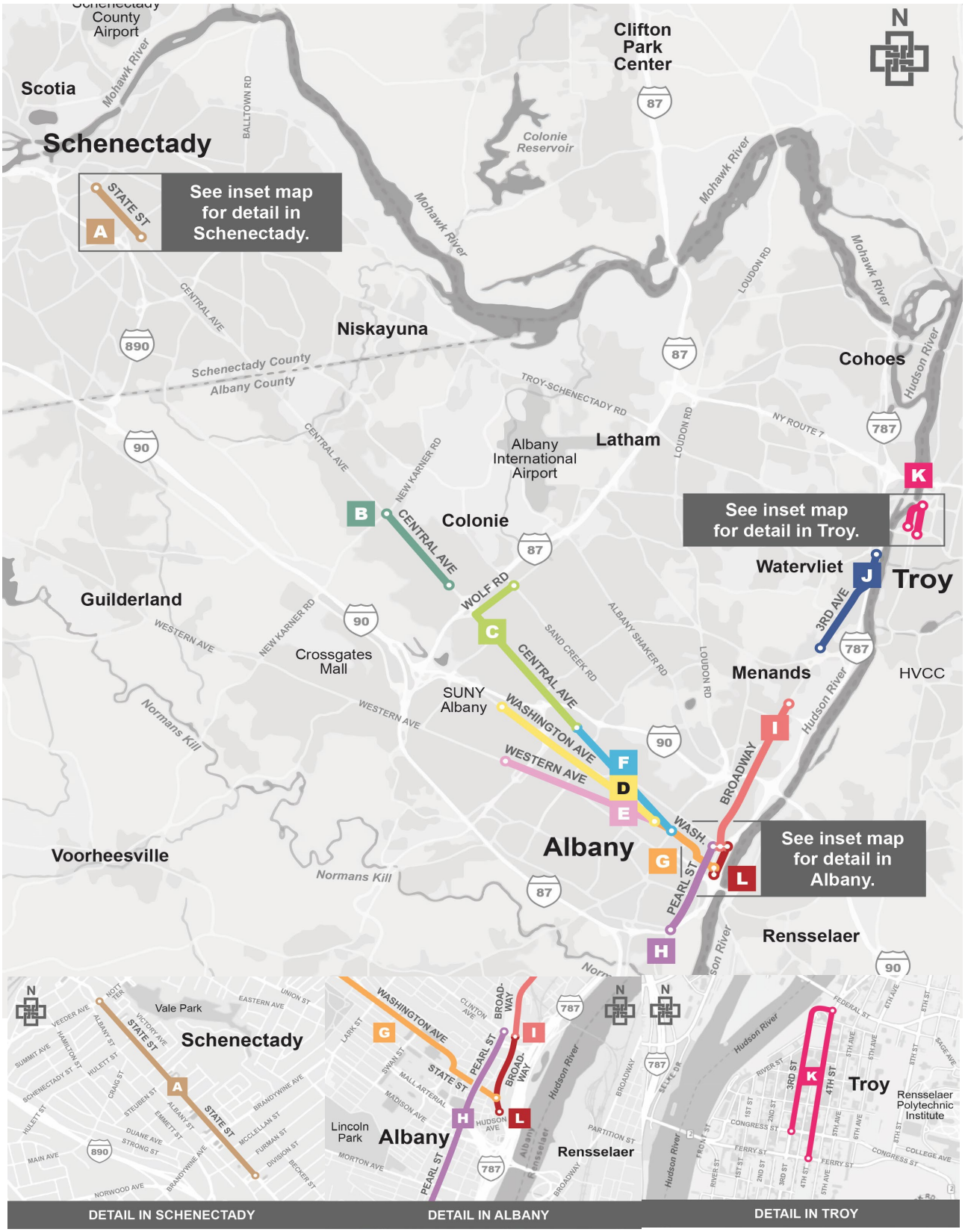


Figure 2: Potential Priority Corridors

Bus Lane Concepts

For each of the final priority corridors, several strategies were identified for the potential implementation of bus only lanes and other transit priority treatments. Accompanying the strategies for each corridor are conceptual designs and visualizations of bus only lanes and queue jumps implemented into the streetscape. These concepts were discussed and vetted with the Stakeholder Committee, Leadership Committee, and local agency planning and engineering staff. As a result, several adjustments were made to the concepts before they were presented to the public. Two examples of many are shown below.

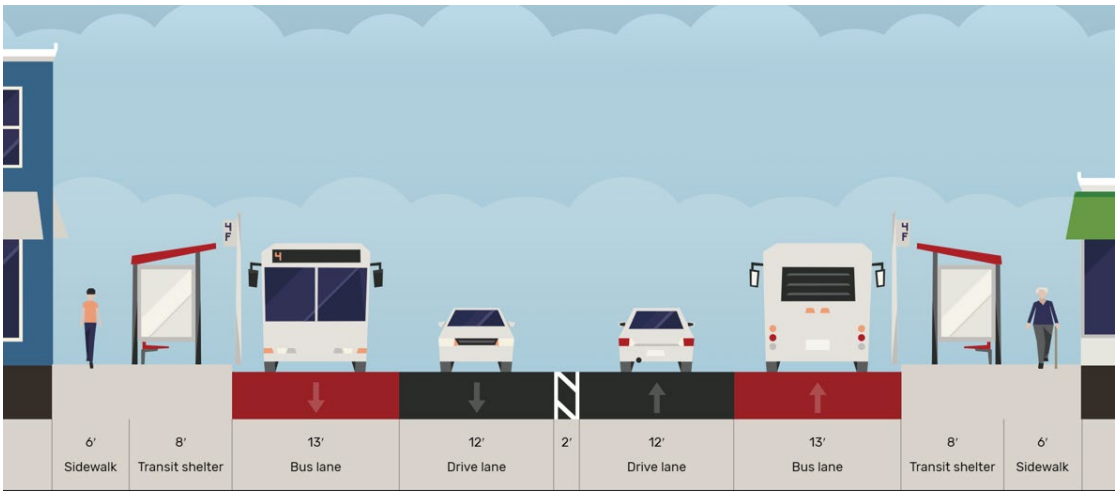


Figure 3: Bus Lane Concept Example 1

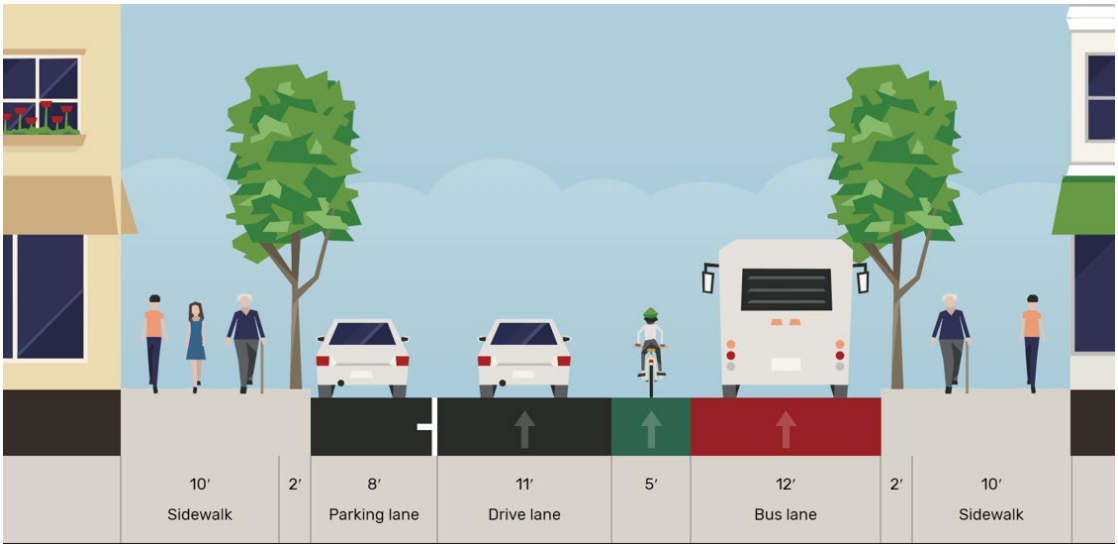


Figure 4: Bus Lane Concept Example 2

Public and Stakeholder Engagement Results

Public and stakeholder engagement revealed strong support for bus only lanes and bus priority treatments, with respondents emphasizing the importance of improving congestion and travel time reliability. Respondents also provided rankings of their modal priorities for each corridor, ranking pedestrian improvements as the number one priority for each of the identified corridors. In all corridors bus priority treatments were ranked second place, followed by bicycle priority improvements, and finally personal vehicles were ranked last in every corridor by a wide margin. In total over 2,000 people from across the region participated in the study through pop-up events and online surveys.

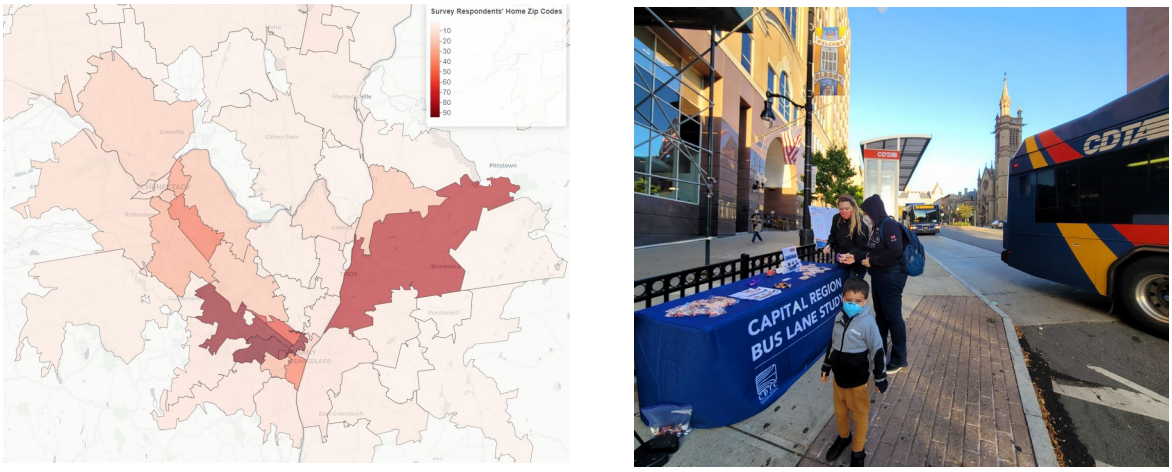


Figure 5: Phase II Survey Respondents Home Zip Code and Phase I Pop-Up Event

Final Recommendations

As a result of the extensive community and public input, feedback, and comments; the final recommendation for each corridor includes a combination of bus, bike, and pedestrian improvements to improve safety for all users while increasing bus service performance. In each corridor this means that rather than having a single bus priority recommendation in a given segment, the recommendation is to pursue multimodal improvements that prioritize pedestrian safety and comfort, bicyclist safety and comfort, and improve bus operations through targeted and tactical strategies. The latter will come in a variety of forms including bus lanes, queue jumps, and transit signal priority. Other priority treatments described in the *Capital Region Bus and Bike Priority Toolbox* may also be deployed to this end.

SMART TRANSIT CORRIDORS

All of the final recommendations are being presented through a new concept for the region called Smart Transit Corridors (Figure 6). The Smart Transit Corridor concept combines three key elements: the geography of intended improvements (four corridors presented in this plan); the types of bus priority recommendations intended for each corridor; and the anticipated benefits from deployment of the bus priority strategies. The Smart Transit Corridor concept is not intended to be prescriptive in terms of specific strategies at specific locations (which require further study, analysis, and design). Rather it is intended to provide the framework for moving bus priority implementation forward across a system of roadways throughout the entire region. As the region changes, and CDTA service adapts to those changes, the Smart Transit Corridor concept may also change, including the potential for additional corridors to be added in the future.

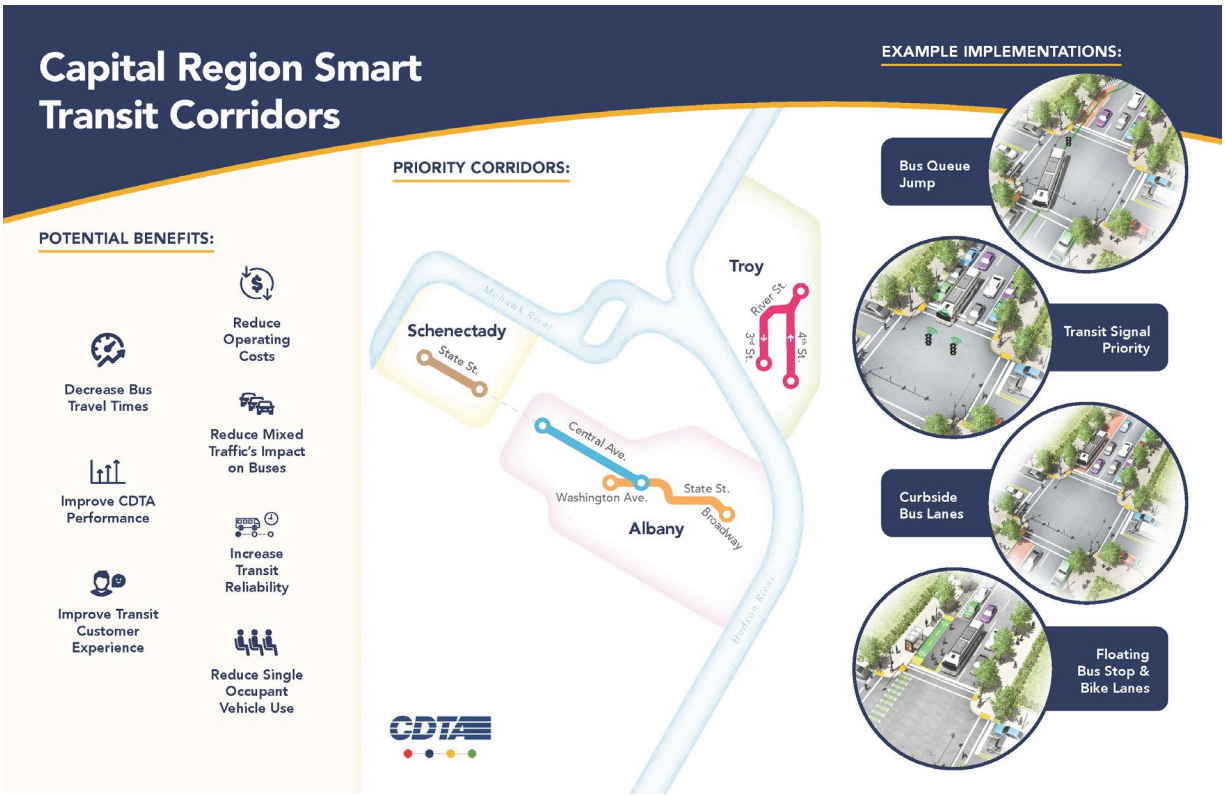


Figure 6: Smart Transit Corridors Concept

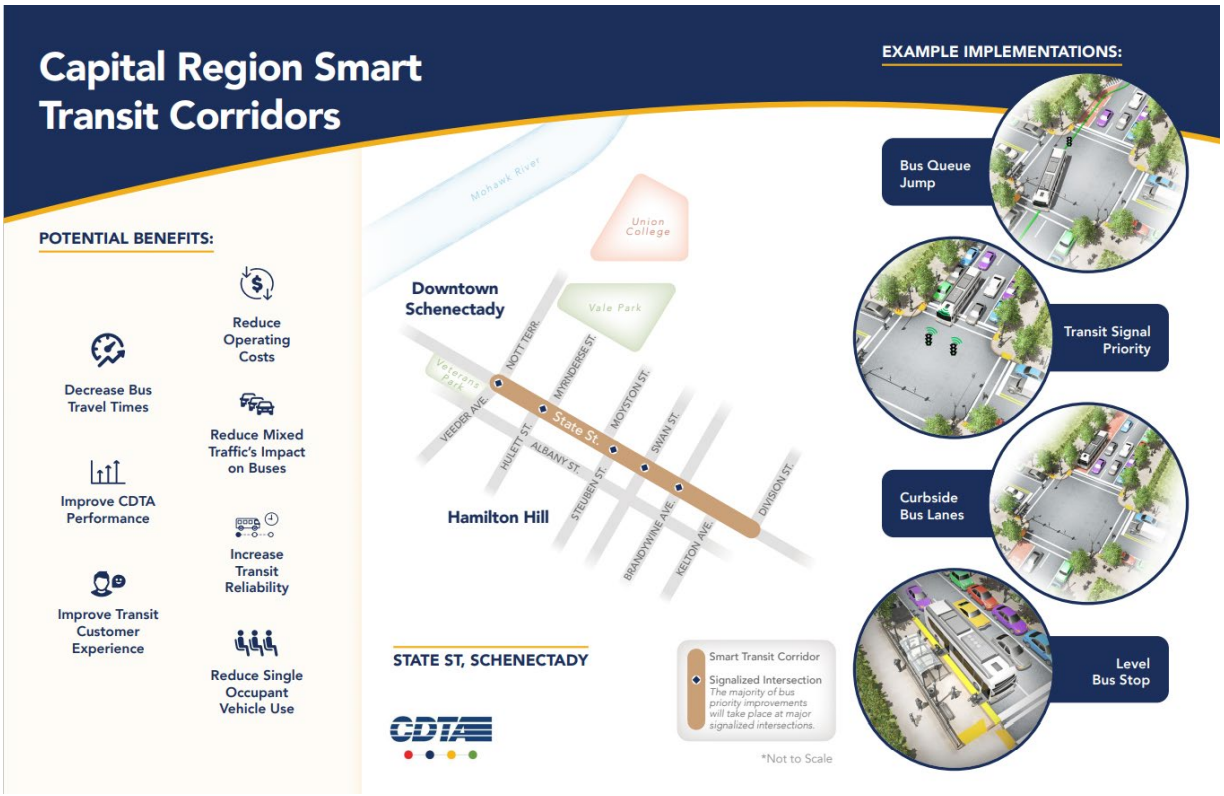


Figure 7: Schenectady State Street - Smart Transit Corridors Concept

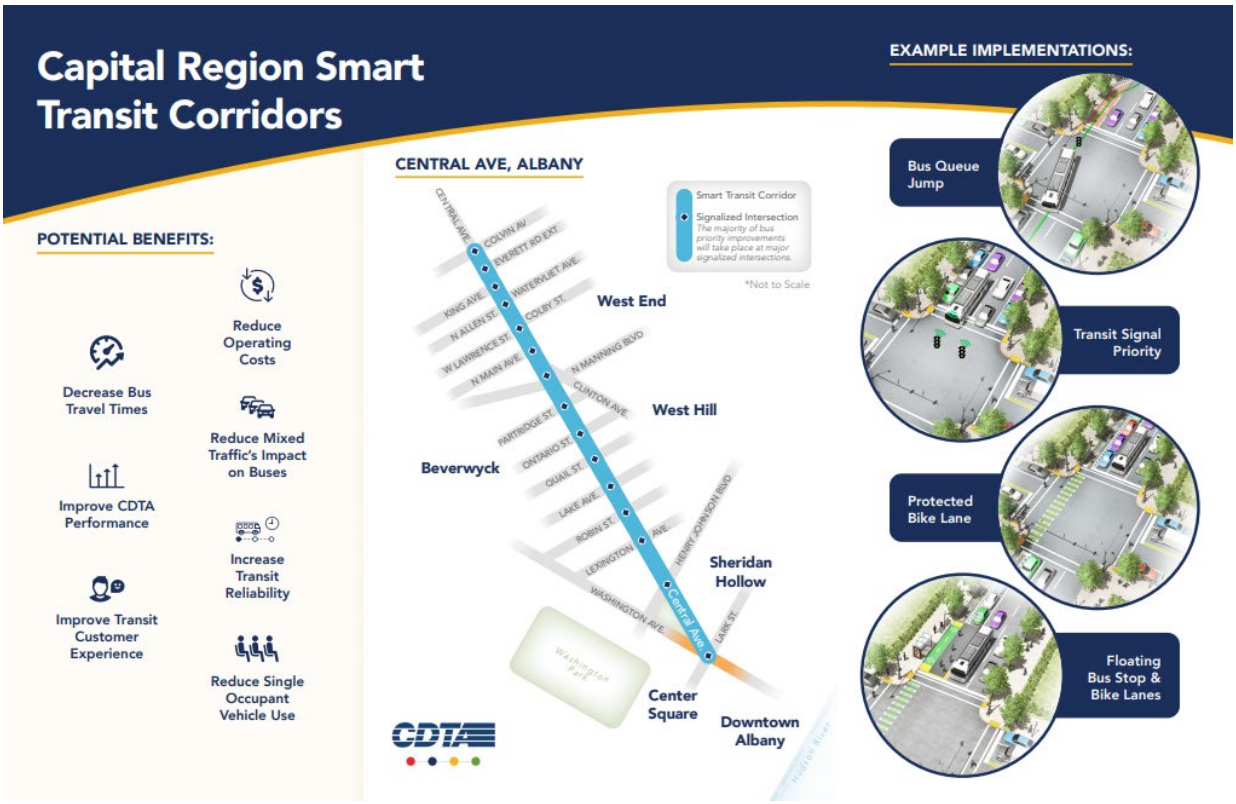


Figure 8: Albany Central Avenue - Smart Transit Corridors Concept

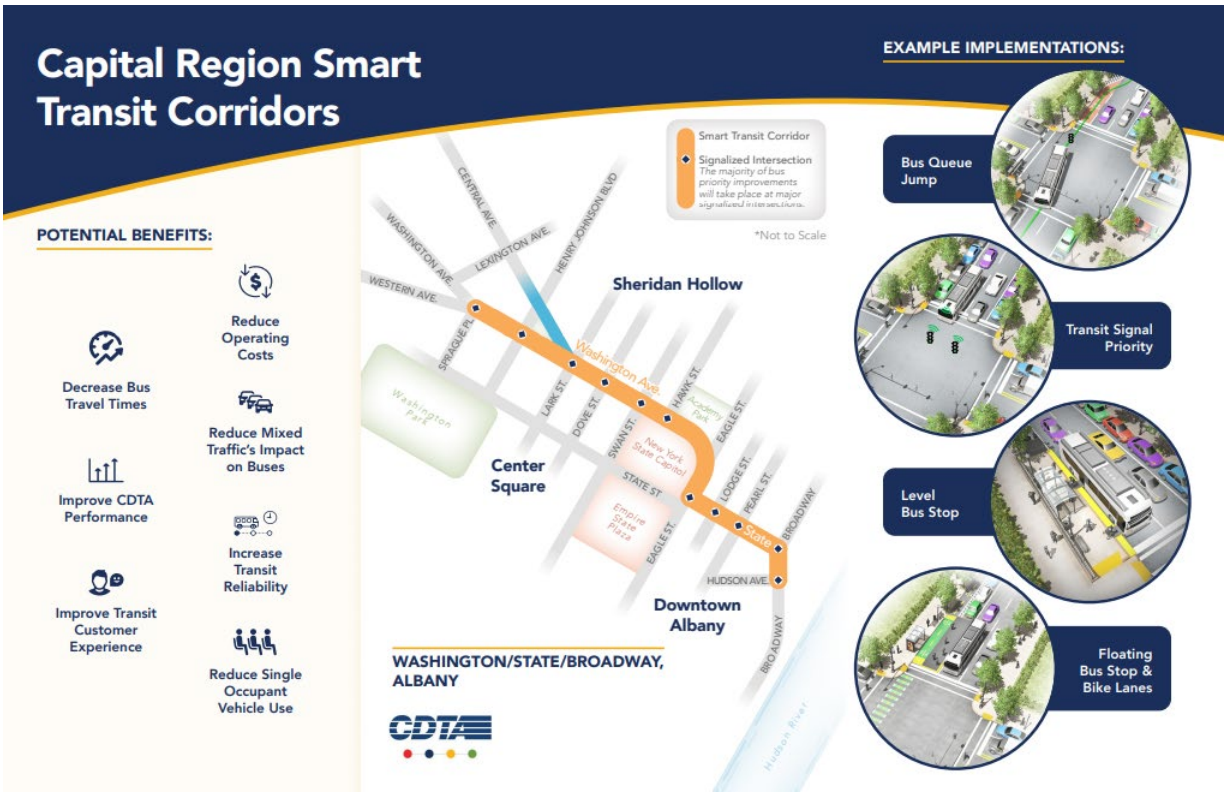


Figure 9: Albany Washington/State/Broadway - Smart Transit Corridors Concept

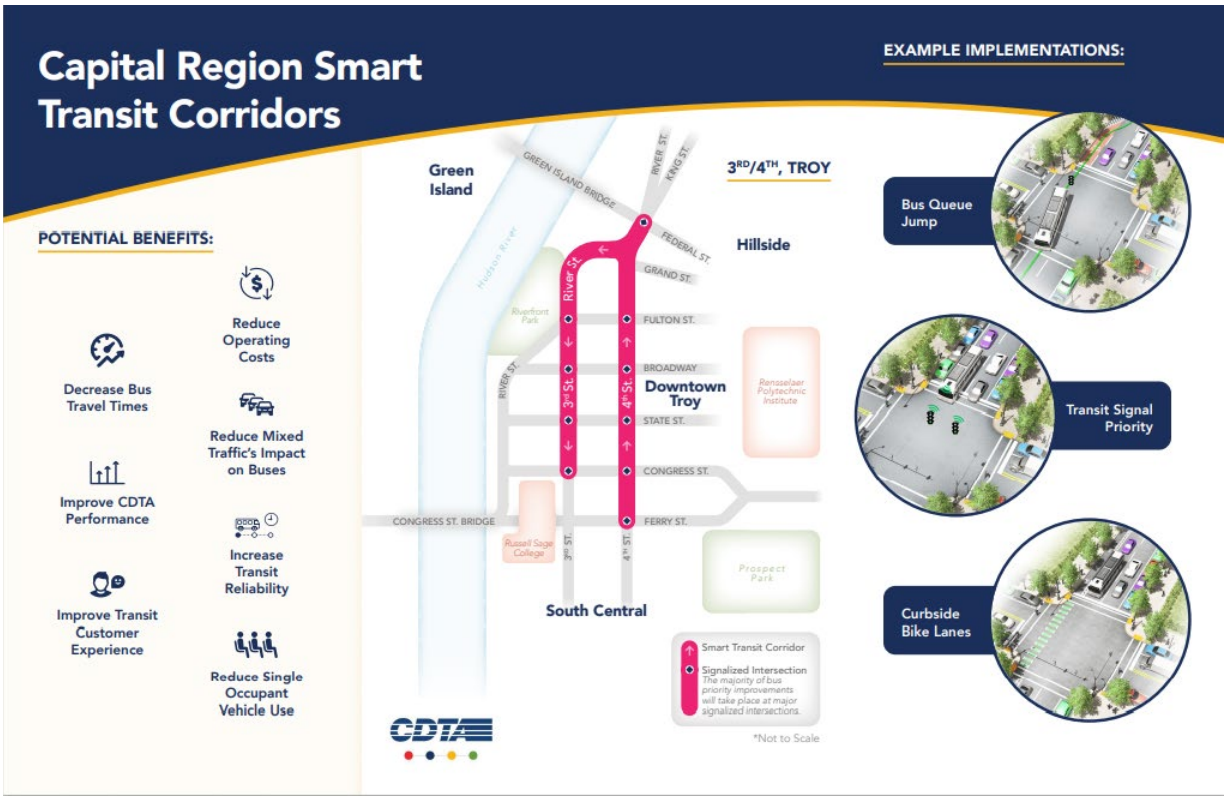


Figure 10: Troy 3rd/4th Street - Smart Transit Corridors Concept

Implementation Plan

The implementation of the improvements described in this report will require further study, project champions, design, funding, construction, and monitoring. The timing of the various improvements (pedestrian, bicycle, and bus) will need to be carefully coordinated and planned, as they may occur incrementally and not through a combined project. The first task for agency partners will be to identify additional study that is required for each corridor (Figure 11). After those studies, and once improvement plans are confirmed, the design of improvements can commence, in parallel with securing funding for implementation. Coordination with the New York State Department of Transportation (NYSDOT) will be required for all state facilities.

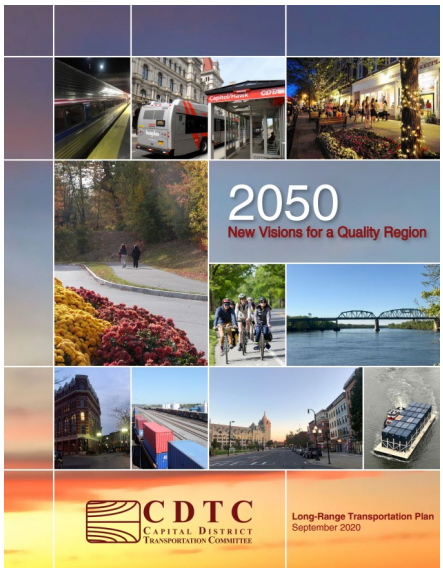
Figure 11: Potential Areas of Additional Study for Each Corridor

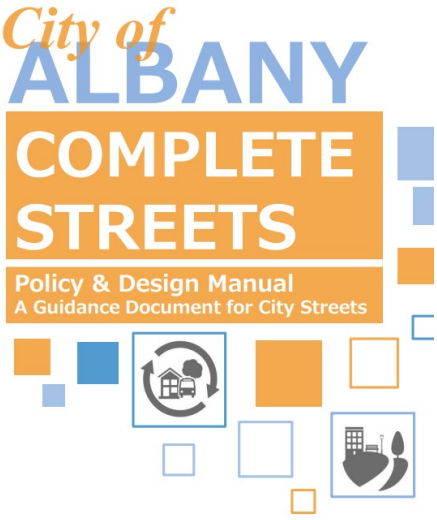
2. PREVIOUS PLAN AND PEER REVIEW

As part of this study, the project team identified, reviewed, and summarized relevant planning and policy documents related to or impacting the implementation of bus lanes and bus priority within the study area. Additional peer planning studies and resources were also included to build upon lessons learned to apply to this project. The input from previous plans and national examples will assist in planning a feasible and implementable network of transit-supportive streets in the study area. Beyond highlighting recent relevant studies and recommendations, this review is an important step towards coordinating the various regional planning initiatives to optimize the effectiveness and minimize duplication of efforts. Additional detail on the Previous Plan and Peer Review can be found in Appendix A.

Local Plans

The identified local plans include CDTA's Transit Development Plan, CDTC's New Visions reports, BRT design standards, parking feasibility, and complete streets guidelines. Review of these documents highlighted several best practices and lessons learned that are important to the project. Many of the plans highlighted the importance of reducing travel times and improving customer convenience, indicating Bus Only Lanes/Exclusive Lanes as the most effective means of doing so. Multiple plans also suggested potential locations for queue-jump lanes and transit signal priority, calling attention to their ability to shorten travel times and delay times while also improving customer experience. However, the documents outlined important considerations when implementing these recommendations, most critically the need to take space away from other lanes of travel, parking, sidewalks, and/or private property. This challenge presents several tradeoffs with other modes and right-of-way impacts and limits the opportunity for Bus Only Lanes/Exclusive Lanes to areas with numerous bus routes, very high ridership, and broad street widths. Given these challenges, the plans discussed can help provide guidelines and best practices for how to cohesively implement Bus Only Lanes/Exclusive Lanes into an existing street network.





KEY TAKEAWAYS

- Bus Only Lanes/Exclusive Lanes are the most effective means of reducing travel time for BRT service
- Transit priority treatments, such as queue jumps and transit signal priority, are key strategies to help shorten travel times and delay times
- Implementing Bus Only Lanes/Exclusive lanes require tradeoffs with on-street parking, roadway widening, bicycle accommodations, and other on-street facilities

Peer Bus Lane Experiences

Eight peer examples were reviewed, including bus lane experiences from LA Metro, Portland TriMet, Boston MBTA, San Francisco MUNI, Seattle RapidRide, Baltimore MTA, New York MTA, and DC DDOT. In each of the peer examples, the addition of bus lanes resulted in travel time savings and speed increases. Furthermore, many of the peer cities saw their ridership improve and the number of buses involved in crashes decrease. In addition to providing insight into the benefits of bus lanes, the peer city examples also offer important considerations and lessons learned. For example, the peer studies revealed that full time bus lanes are more successful than bus lanes that only operate at peak periods. Red paint treatments were also found to have a positive impact on bus lanes by improving enforcement and compliance concerns. For lanes that are not full-time and are not painted red, it is important to consider how the peak periods will be enforced.

Figure 12: Boston MBTA Shared Bus/Bike Lane. Source.

Figure 13: Everett, MA Bus-Only Lane Pilot Project. Source.

KEY TAKEAWAYS

- Full time bus lanes are more successful than bus lanes that operate at certain times of day (Seattle)
- Red paint increases visibility of bus lanes and their compliance (Boston)
- Pilot projects are key (Everett, MA)
- Bus lanes need to be continuous (LA Metro)
- Enforcement and compliance are critical to the success of bus lanes (LA Metro)
- There are more methods to improving transit reliability than bus lanes alone (DC, Portland, Baltimore)
- Across all peers bus lanes universally improved bus speeds and reliability without measurably impacting personal vehicle flows.

3. CORRIDOR IDENTIFICATION, ASSESSMENT, AND SCREENING

Based on existing conditions, several potential bus lane corridors were identified, screened, and ranked. Potential corridors are those that may warrant dedicated bus lanes or priority treatments to improve service and realize operational cost savings. Throughout the Capital Region, the potential corridors were identified using a variety of inputs. Building upon a review of previous plans, corridors with the following aspects were focused on:

- Relatively high bus density and/or congestion
- Lower transit speeds
- Higher value to the network based on transfer opportunities to other routes
- Identified for growth and/or redevelopment with higher concentrations of equity populations.

A screening methodology and criteria were developed to narrow down the list of potential corridors. The methodology focused on those with the highest potential benefits for reducing passenger and bus delay and serving the most people now and in the future with the implementation of bus priority implementation. A bus priority toolbox was also developed with various bus priority treatments to improve speed and reliability, as well as supporting strategies and amenities.

Existing Conditions

The Capital Region is made up of the cities and surrounding areas of Albany, Troy, Schenectady, and Saratoga Springs. For this study, the region is defined as the core four counties of Albany, Rensselaer, Saratoga and Schenectady with a population of 850,000 over 2,250 square miles. The Capital District Transportation Authority (CDTA) is the mobility company serving the Capital Region with an annual ridership of 15.3 million, a fleet of 248 buses, and 50 routes. In May 2022, Montgomery County was added to the core four counties CDTA serves but was not included in this assessment due to the type of services being offered. CDTA's premier services in the core counties include two current BRT routes in operation, the BusPlus Red Line and the BusPlus Blue Line, and the BusPlus Purple Line expected to open in early 2023.

An existing conditions assessment was conducted to identify potential corridors for dedicated bus lanes or other priority treatments. The existing conditions assessment began with an analysis of transit potential, looking at both population and employment densities in 2020 and 2030, and transit need that focuses on transit reliant populations. Transit potential and transit need will be used as primary metrics to screen and prioritize the potential corridors.

Transit potential, or density of both people and jobs, is shown in **Figure 14**.

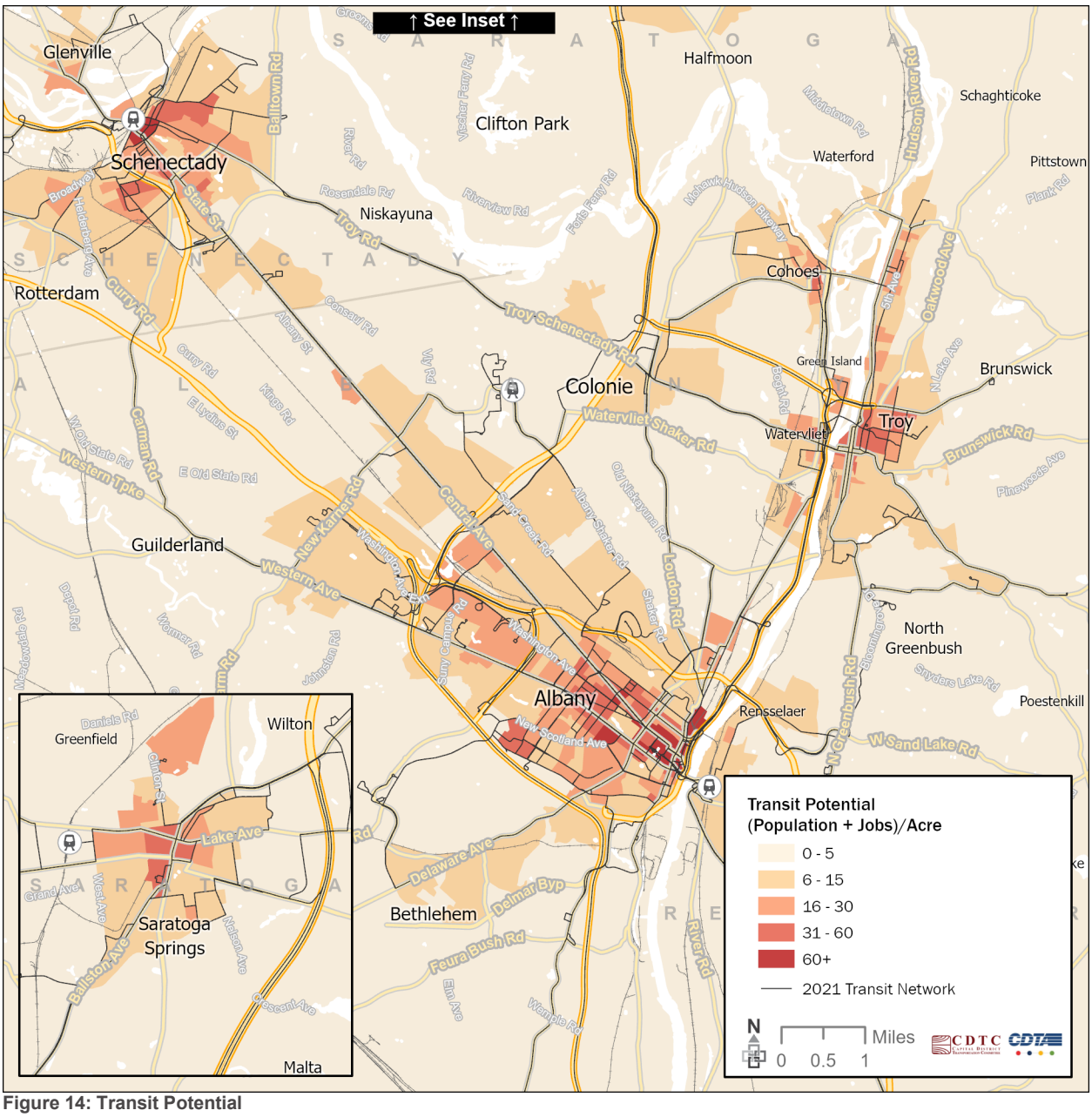


Figure 14: Transit Potential

EQUITY ANALYSIS

As part of the equity analysis, four equity variables were examined across the study area, including low-income households (less than 150 percent of the federal poverty line), minority populations, disabled populations, and zero and one car households. These four variables were combined to create an overall equity score, which is represented by transit propensity throughout the study area.

Figure 15 shows the composite of the equity variables into a single transit-oriented population propensity index. This combined index shows the highest propensity in the region's denser urban cores (Albany, Troy, and Schenectady) with moderate propensity scores extending out along major transportation arteries (such as Central Avenue and the Hudson River).

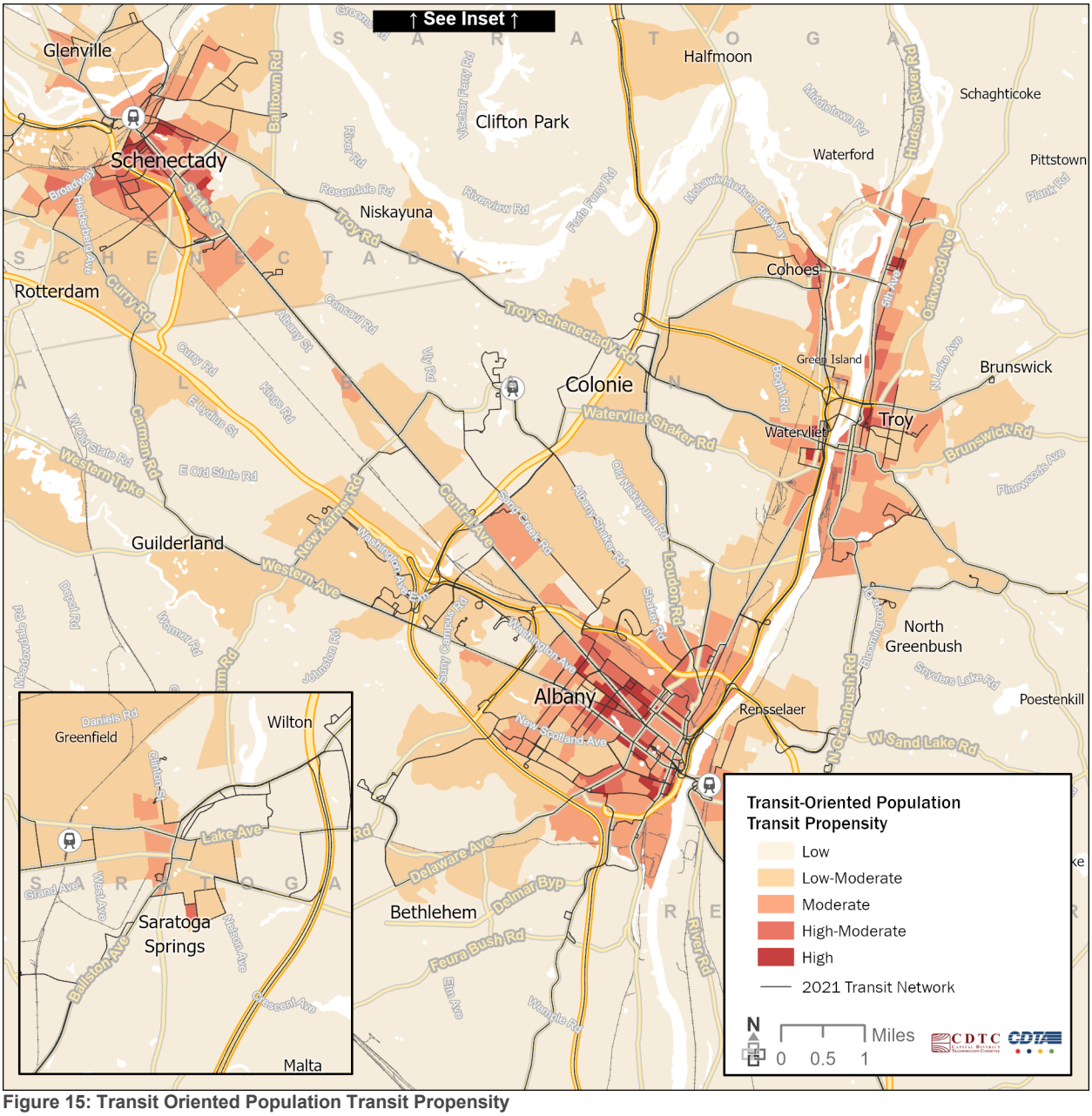


Figure 15: Transit Oriented Population Transit Propensity

EXISTING SYSTEM

As part of the process to identify potential bus lane corridors, the existing system was analyzed to understand which corridors would benefit the most from priority treatments. Effective headway, speed, schedule deviation, ridership activity, and throughput were analyzed to evaluate existing conditions, identify which corridors have the highest ridership, and identify which corridors experience the most delays due to congestion.

The existing CDTA system operates 50 routes, including two current BRT routes and one future BRT route. The BusPlus system includes the Red Line, a 17-mile route between Downtown Albany and Downtown Schenectady; the Blue Line, a 16-mile route in the Hudson River communities of Albany, Menands, Watervliet, Troy, Cohoes and Waterford; and the Purple Line, an eight-mile route from Downtown Albany to Crossgates Mall, expected to open in 2023. **Figure 16** shows the existing bus priority treatments. The existing queue jumps and transit signal priority treatments are along the Red and Blue BusPlus routes.

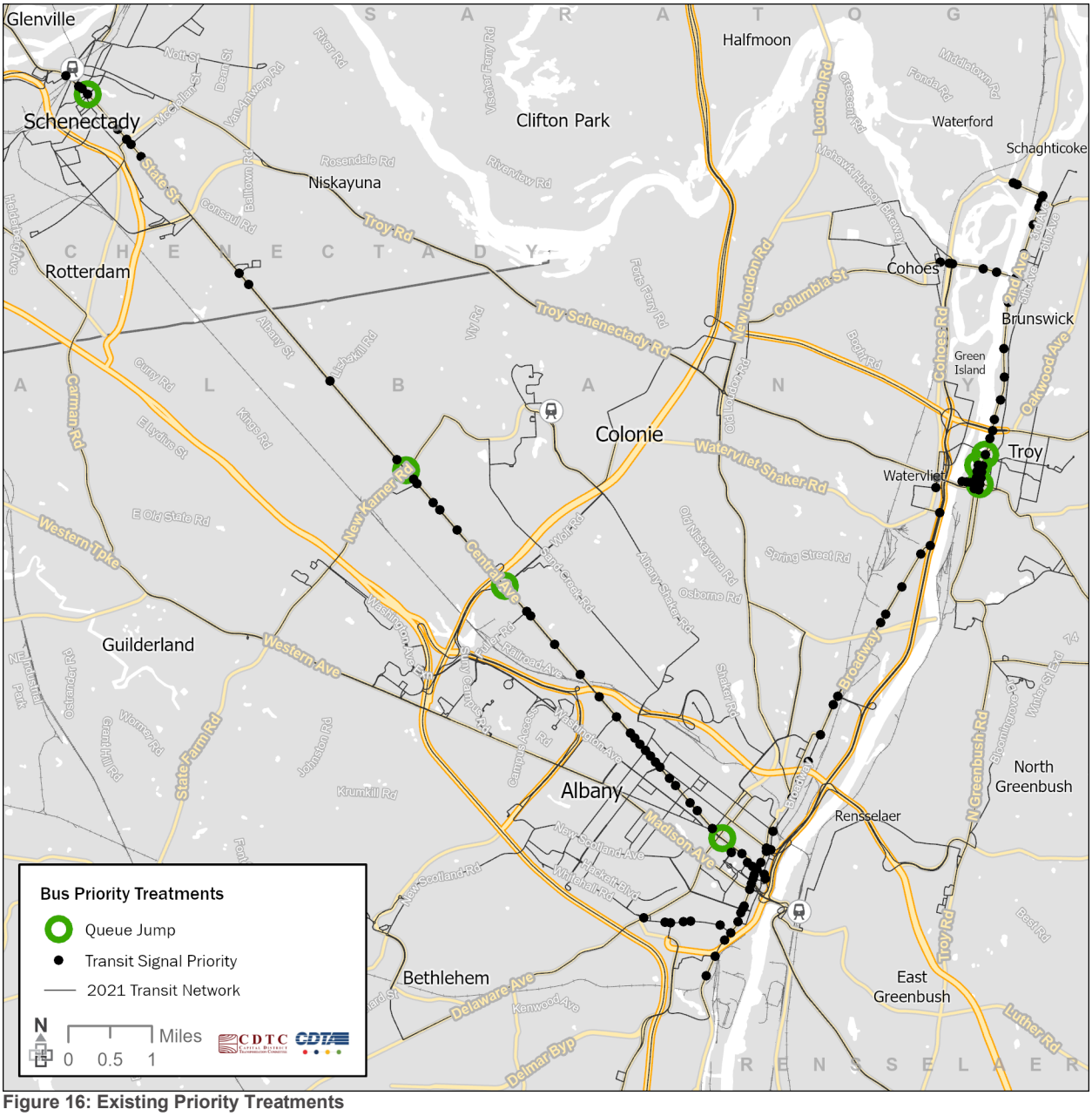


Figure 16: Existing Priority Treatments

Corridor Screening and Prioritization

PRIORITY CORRIDORS

Based on the existing conditions analysis, the corridors with more than four buses per hour, relatively low speeds, and relatively high throughput were identified as potential candidates for bus lanes and priority treatments. The number of routes the corridor serves, land use and roadway cross section, and a comparison between pre-COVID and current data was also considered.

The potential priority corridors are shown in **Figure 17**. These corridors are:

- A: State Street between Veeder Avenue and Division Street (Schenectady)
- B: Central Avenue between New Karner Road and Woolard Avenue (Colonie)
- C: Central Avenue between Sand Creek Road and Colvin Avenue (Colonie)
- D: Washington Avenue between SUNY Albany and Sprague Place (Albany)
- E: Western Avenue between Hillcrest Avenue and Sprague Place (Albany)
- F: Central Avenue between Colvin Avenue and Lark Street (Albany)
- G: Washington Avenue / State Street between Sprague Place and Broadway (Albany)
- H: Pearl Street between Clinton Avenue and McCarty Avenue (Albany)
- I: Broadway between Clinton Avenue and Riverview Center (Albany/Menands)
- J: 3rd Avenue / Broadway between Harts Lane and 16th Street (Menands/Colonie/Watervliet)
- K: 3rd Street / 4th Street between Grand Street and Congress Street / Ferry Street (Troy)
- L: Downtown Broadway between Clinton Avenue and Hudson Avenue (Albany).

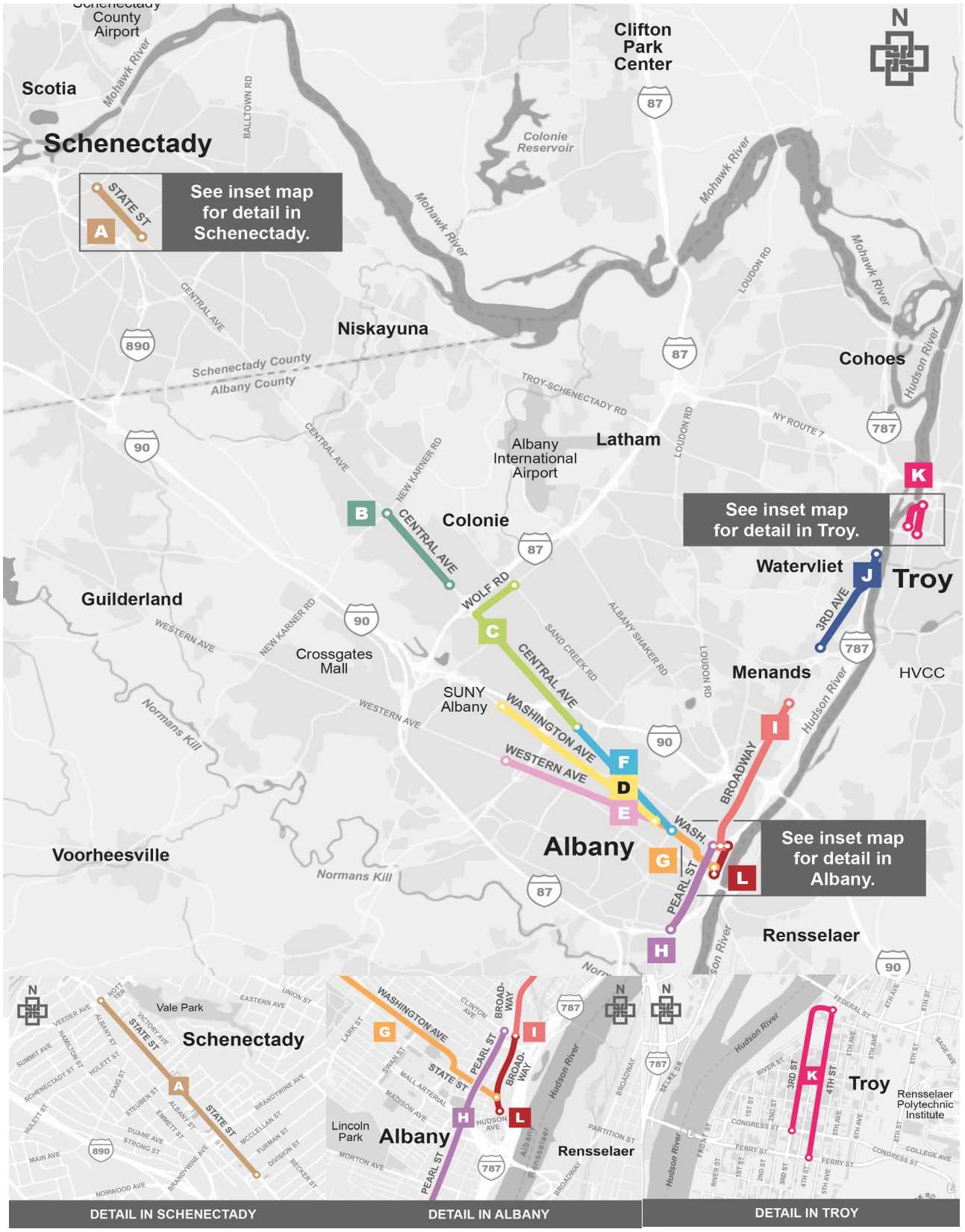


Figure 17: Potential Priority Corridors

PRIORITIZATION METHODOLOGY

The corridor prioritization methodology, discussed in detail in Appendix B, consists of several evaluation metrics for potential bus lanes and other priority improvements on the twelve (12) identified corridors in the CDTA/CDTC service area. These metrics were used to identify the corridors to be retained and further analyzed in the evaluation and ranking process.

The following metrics were used for the evaluation and ranking:

- Transit Score[1]
- Equity Score
- Land Use Score
- Commuter Score
- Existing Investment Score
- Qualitative Assessments

The transit score identified where bus priority treatments can provide the most benefit to operations, users, and the public transit network. The equity score ensured that vulnerable populations are equitably recognized and served in final prioritization of corridors. The land use score provided insight on where improving bus service can provide the greatest additional benefit to residents and workers. The commuter score helped ensure that new bus priority treatments enhance movement throughout the region. The existing investment score identified corridors with existing priority treatment, such as transit signal priority and queue jumps, or existing bus rapid transit services and will help leverage existing investments in transit. For each metric, every corridor was assigned a percentile score based on its value compared to the maximum value.

Table 1: Corridor Rankings

Rank	Corridor	Score	Segment ID
1	Albany – State Street / Washington Avenue	88	G
2	Albany – Central Avenue	61	F
3	Troy – 3rd / 4th Street	58	K
4	Albany – Downtown Broadway	53	L
5	Albany – Pearl Street	49	H
6	Schenectady – State Street	43	A
7	Albany – Western Avenue	32	E
8	Albany – Washington Avenue	26	D
9	Albany – Broadway	21	I
10	Albany – Central Avenue / Wolf Road	20	C
11	Colonie – Central Avenue	19	B
12	Watervliet – Broadway	15	J

Note: Albany – Pearl Street was eliminated from consideration through consultation with the City of Albany due to the narrow right-of-way and number of events. As a result, Schenectady – State Street moved up into the fifth ranked position.

[1] Bus speed, ridership (person throughput), and bus volume (trips) are inputs for passenger delay and bus delay. These metrics may be used to assist in decision making.

RESULTS

To determine the five corridors to move forward in the conceptual development process, multiple rounds of stakeholder engagement and field work were conducted. These touchpoints were used to educate participants on the data assessed in determining top priority corridors and to gain additional insight into the feasibility of each priority corridor for implementation based on roadway conditions and future community projects.

Based upon the results of the corridor evaluation, the stakeholder engagement, and the field work, the five following corridors were moved forward for preliminary concept design (**Figure 18**):

- Washington Avenue / State Street - Albany
- Central Avenue (between Colvin Avenue and Lark Street) - Albany
- Downtown Broadway - Albany
- State Street - Schenectady
- 3rd Street / 4th Street – Troy

During the process, in consultation with City of Albany staff, two of these corridors, Washington/State and Broadway, were combined, resulting in four study corridors moving forward.

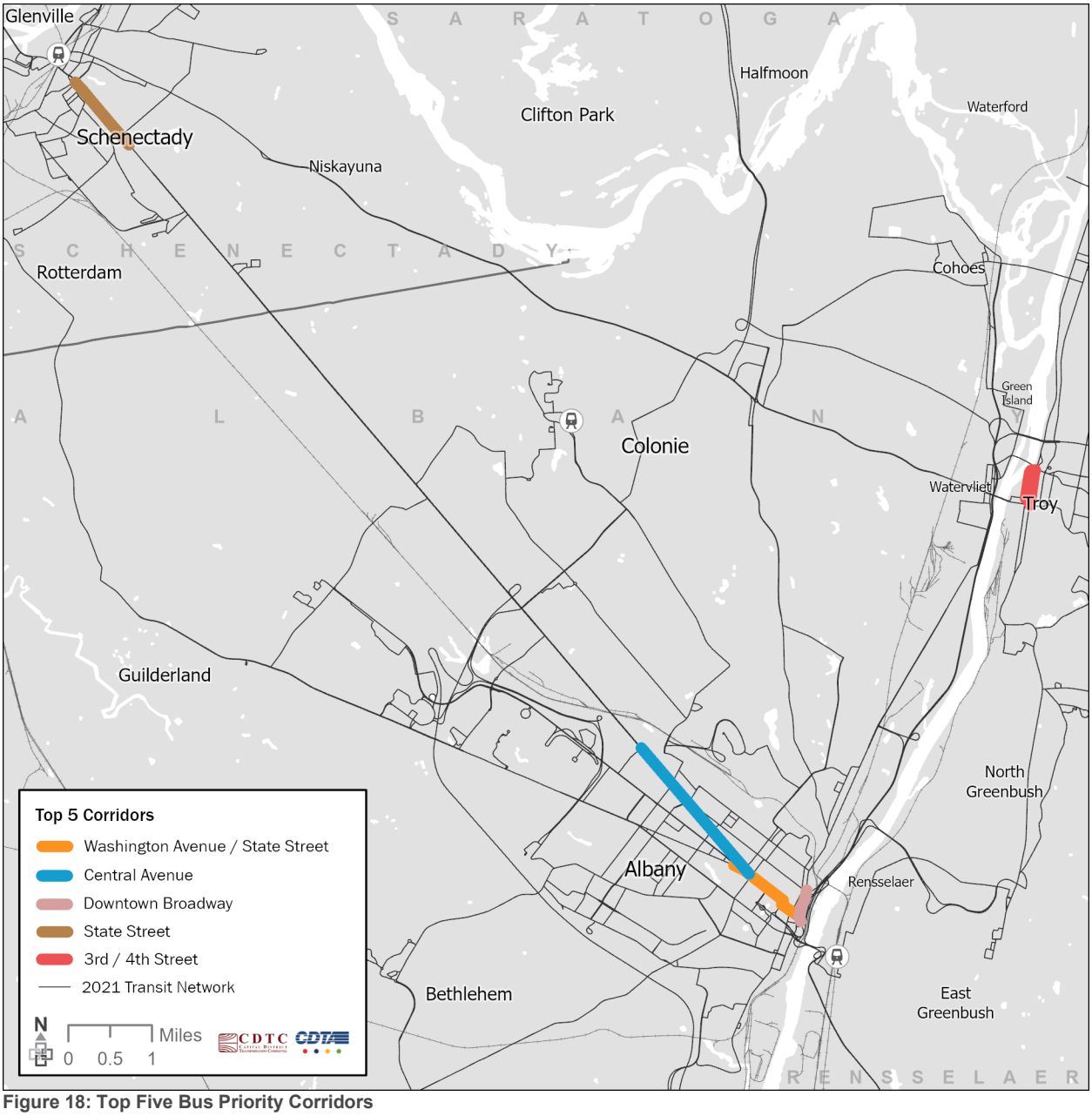


Figure 18: Top Five Bus Priority Corridors

4. BUS LANE CONCEPTS

Troy – 3rd/4th Street

The 3rd/4th street corridor has several opportunities for improvement that could be targeted using dedicated bus lanes. The corridor is currently struggling with substandard travel time at Congress Street and Fulton Street (Northbound) all day and substandard travel time variability at Front Street and Congress Street (Southbound) during midday. While a dedicated bus lane could help improve these inefficiencies, the on-street parking and narrower section of the corridor's historic commercial core present certain challenges for implementation. Therefore, it would be necessary to revisit curb management as well as delivery and loading zones throughout the corridor. The corridor also provides an opportunity to build on past projects, such as the prior TSP and queue jump improvement implemented through the River Corridor BRT.

Figure 19: Troy - 3rd/4th Street Corridor

STRATEGIES

Based on the current context and conditions of the corridor, the following potential strategies were identified:

1. Peak period shared bus/bike lanes in both directions on 3rd/4th Streets
2. Parking and bike lanes off peak serving business and residents
3. Extend bus lanes in both directions from couplet north to Federal Street/Green Island Bridge
4. Retain existing Queue Jumps and Transit Signal Priority

The following figures show potential priority options in the 3rd/4th street corridor.

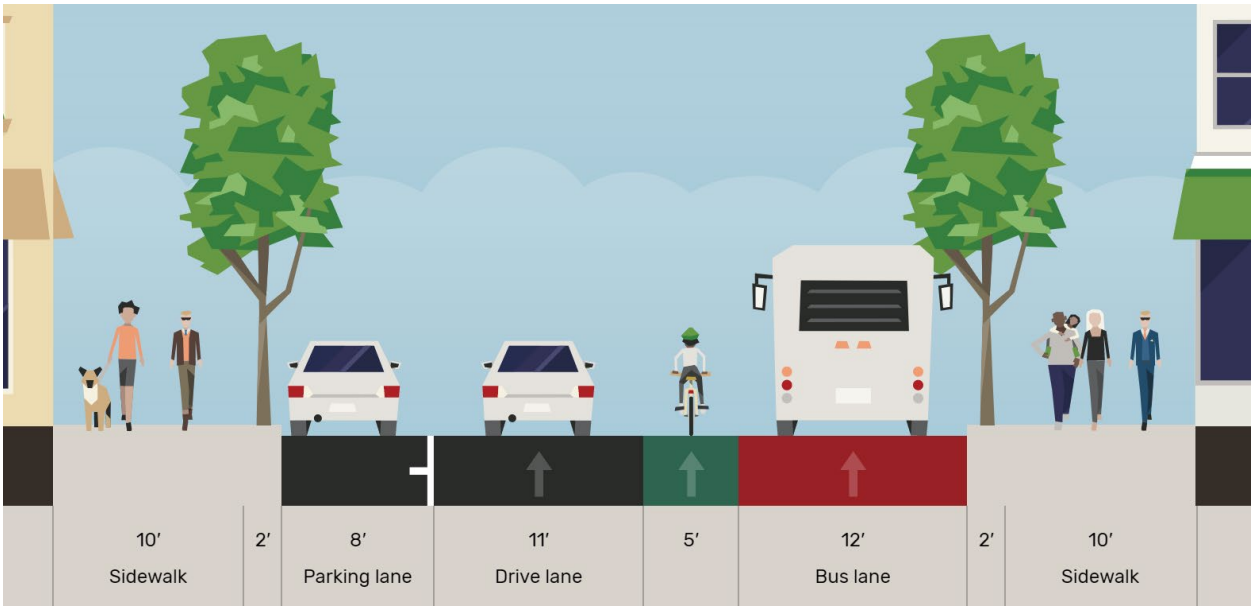


Figure 20: 3rd/4th Street Peak Period Bus Bike Lane Concept

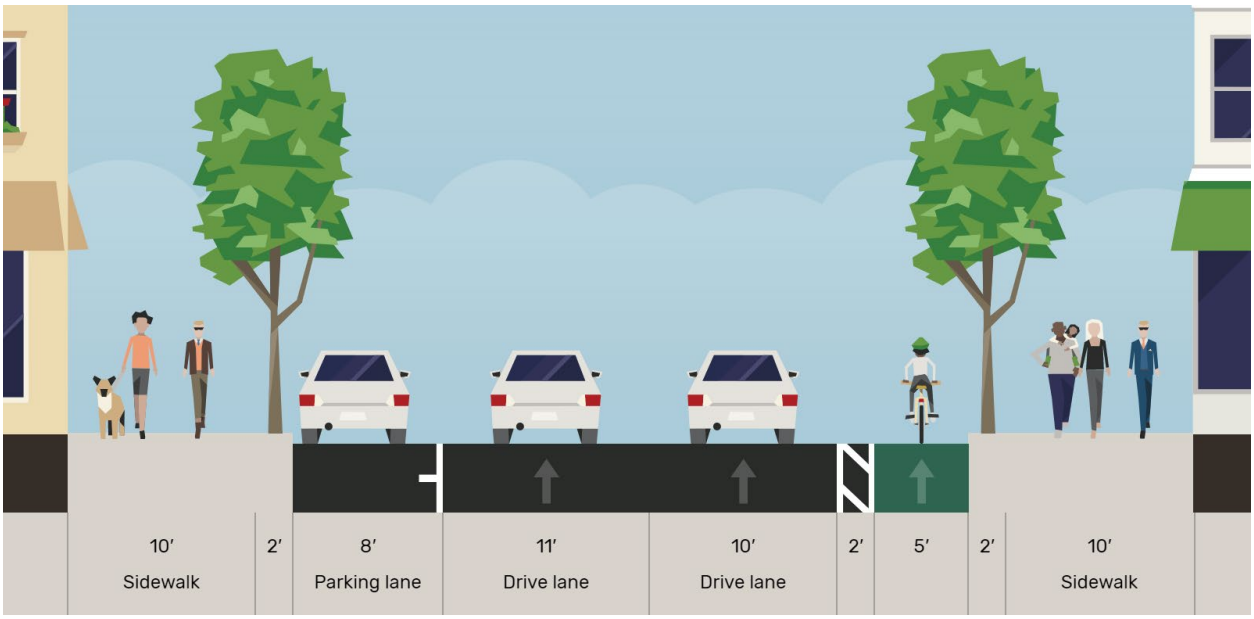


Figure 21: 3rd/4th Street Off-Peak Bike Lane Concept

Schenectady – State Street

The State Street corridor is currently experiencing substandard travel time for BRT service from Division Station to Steuben Station (Westbound) during midday and from Steuben Station to Division Station (Eastbound) during the PM peak. Furthermore, the corridor struggles with ambiguous travel and parking lane designation, especially in the Eastbound direction. Many parcels also have off-street parking, which results in intermittent on-street parking utilization. The corridor presents additional complexity due to cross-street arterial traffic, turning movements, and pedestrian activity. However, the corridor does have pre-existing BusPlus stop amenities as well as transit signal priority.

Figure 22: Schenectady - State Street Corridor

STRATEGIES

Based on the current context and conditions of the corridor, the following potential strategies were identified:

1. Formalize use of right of way through defined travel lanes
2. One general purpose travel lane per direction
3. Introduce bi-directional curb-running bus lanes to replace curb parking
4. Maintain existing travel lane/parking geometry between Kelton Avenue and Division Street (no exclusive bus lanes)
5. Bike “sharrow” option in bus lane or bike lanes as a future design consideration (if bus lanes are not pursued in a given segment)

The following figures show potential priority options in the State Street corridor.

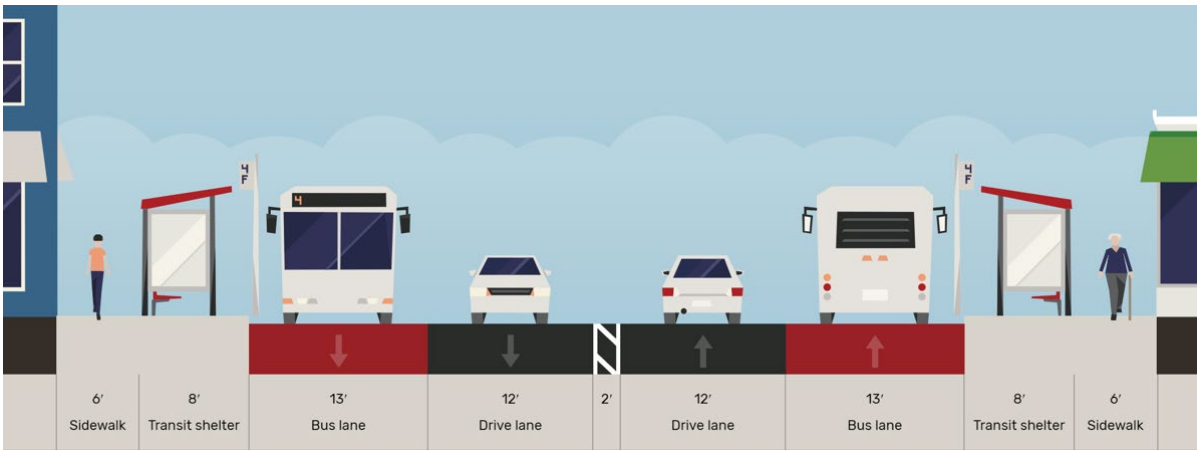


Figure 23: Schenectady - State Street Mid-Block Bus Lane Concept

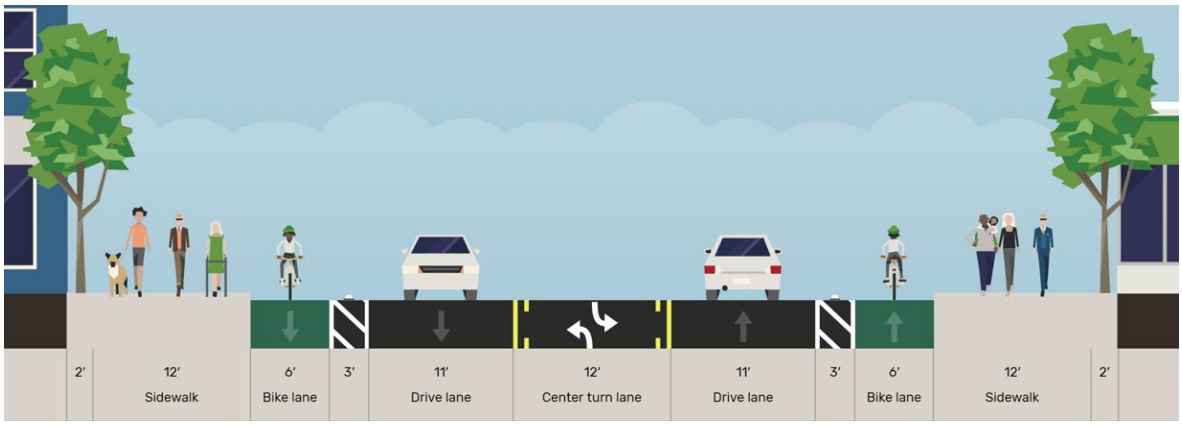


Figure 24: Schenectady - State Street Bike Lane Concept

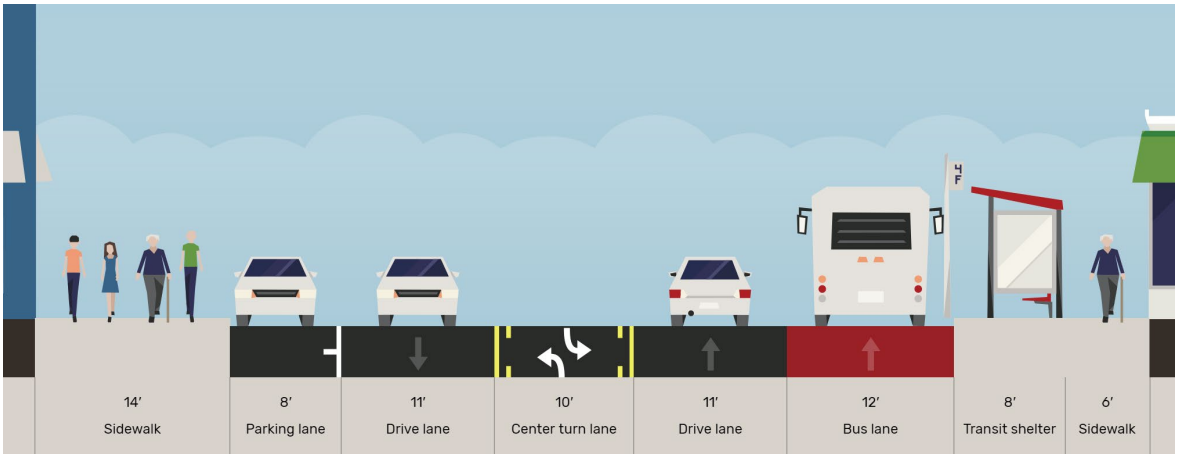


Figure 25: Schenectady - State Street Intersection Queue Jump Concept

Albany – Washington/State/Broadway

The Washington/State/Broadway corridor currently experiences substandard travel time and substandard travel variability in several locations along the route. Notably, the corridor also has the highest bus volumes in the CDTA system, and therefore experiences bus stop congestion and capacity constraints on State Street. Additionally, the State Street portion of the corridor struggles with informal parking and loading as well as significant non-compliance with parking regulations. This contextualization highlights important considerations for the potential implementation of bus lanes along the corridor.

Figure 26: Albany - Washington/State/Broadway Corridor

STRATEGIES

Based on the current context and conditions of the corridor, the following potential strategies were identified:

1. Expand length/capacity of State Street bus stops to alleviate delays and queueing
2. Repurpose general purpose lanes as curb running bus lanes (Washington at Dove to Broadway at Hudson, including State Street)
3. Install an exclusive bus left turn lane from Washington Ave to State Street Eastbound
4. Retain curbside parking in most locations
5. Retain State Street central median for parking, loading, or future landscape
6. Queue Jumps at selected locations

The following figures show potential priority options in the Washington/State/Broadway corridor.

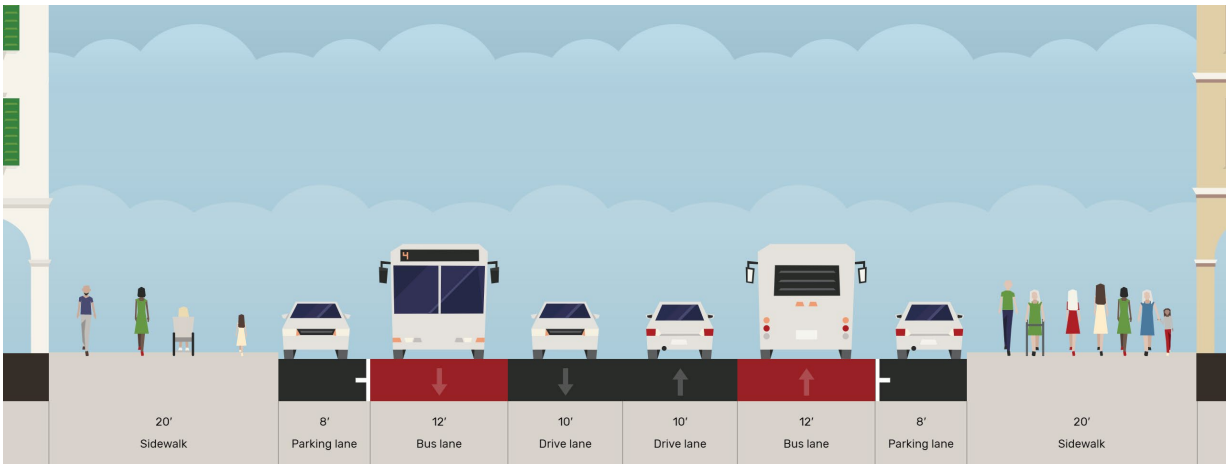


Figure 27: Albany - Washington/State/Broadway Mid-Block Bus Lane Concept

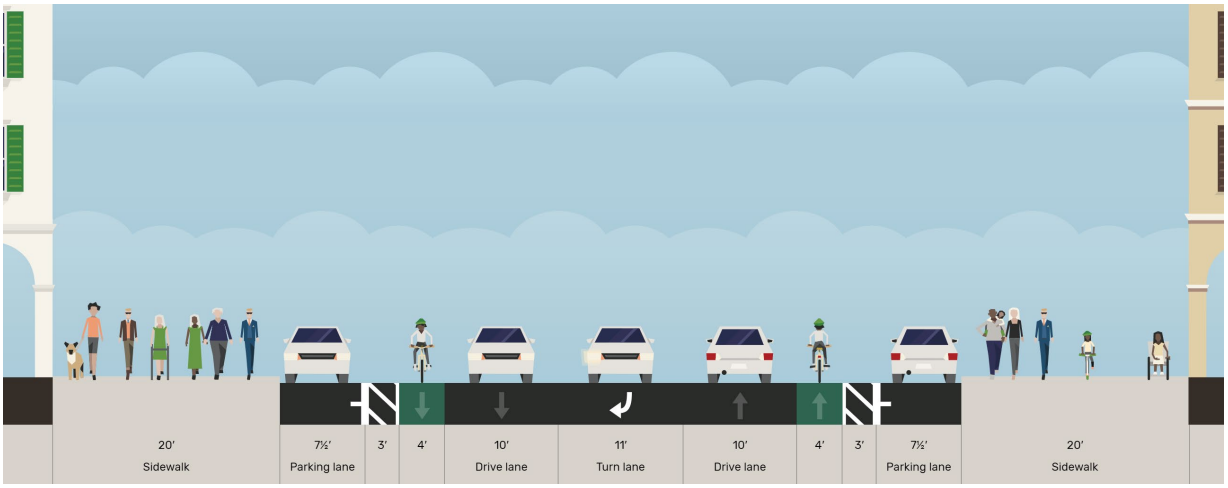


Figure 28: Albany - Washington/State/Broadway Bike Lane Concept

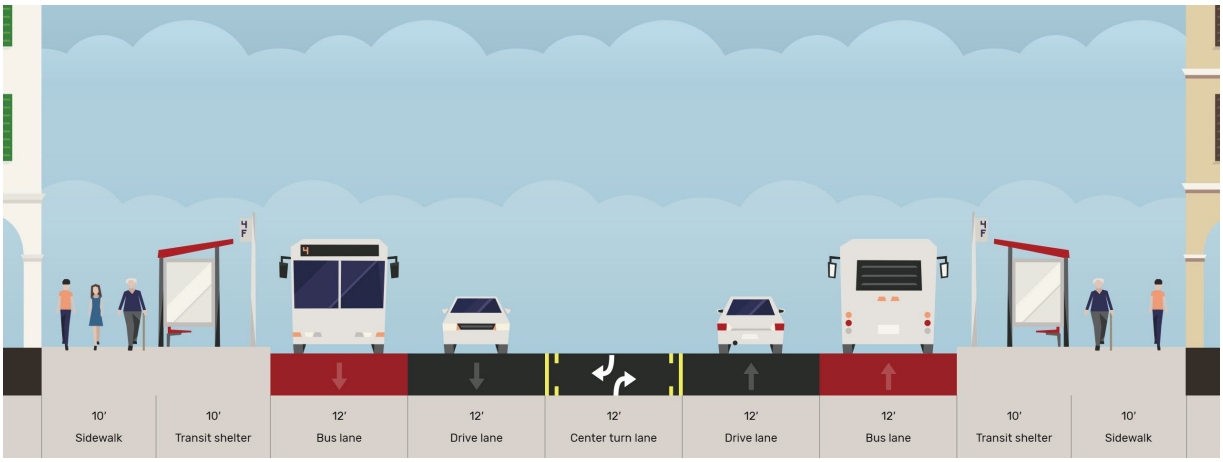


Figure 29: Albany - Washington/State/Broadway Intersection Queue Jump Concept

Albany – Central Avenue

The Central Avenue corridor currently experiences substandard travel time for BRT service and substandard BRT travel time variability at several locations throughout the route. Despite these inefficiencies, the corridor has had significant prior investments in BRT and transit priority in the Lark/Washington area as well as a recently proposed city road diet and enhanced bike and pedestrian facilities. However, there are various challenges to consider for the implementation of bus lanes throughout the corridor. Currently, on street parking is heavily utilized for adjacent retail businesses and the corridor also struggles with parking compliance issues.

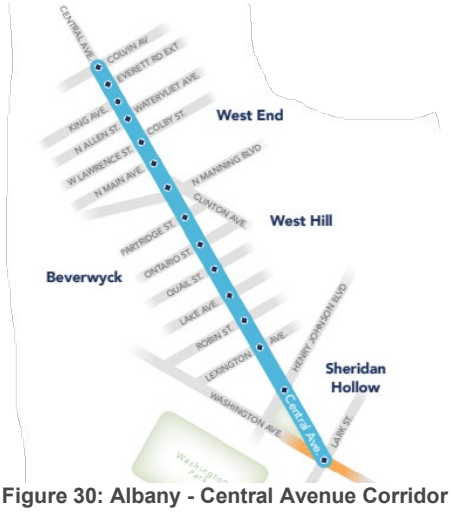


Figure 30: Albany - Central Avenue Corridor

STRATEGIES

Based on the current context and conditions of the corridor, the following potential strategies were identified:

1. Assume a reduction to one travel lane in each direction per the city's road diet concept
2. Relocate bus stops to near-side pull outs, paired with queue jump signals to facilitate bus re-entry into traffic
3. Retain curb parking on both sides, except in the immediate vicinity of bus stops
4. Introduce a protected/buffered bike lane either inboard or outboard of the parking lane

The following figures show potential priority options in the Central Avenue corridor.

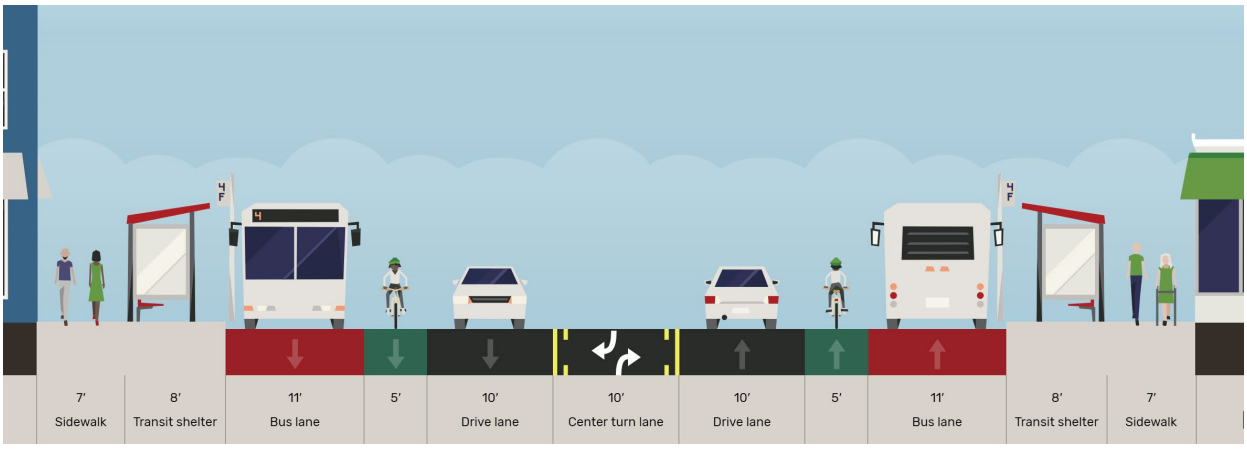


Figure 31: Albany - Central Avenue Intersection Bus Queue Jump Concept

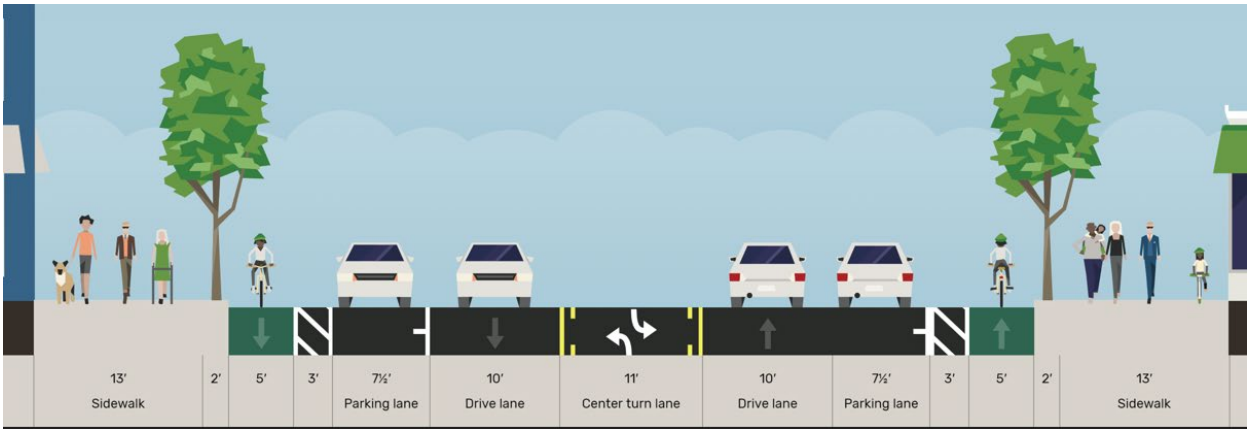


Figure 32: Albany - Central Avenue Bike Lane Concept

5. PUBLIC AND STAKEHOLDER ENGAGEMENT RESULTS

As part of public and stakeholder engagement, two surveys were created and distributed to gather input from community members including transit riders, motorists, residents, business owners, and other stakeholders. The survey periods were separated into two distinct phases, with phase I focused on the existing conditions and uses of the transit network and phase II focused on the priorities and preferences for each corridor.

The phase I survey was designed to better understand opportunities and challenges as well as tradeoffs related to bus lanes in the region. In addition to asking respondents about user experience, travel behavior, and transportation preferences, the phase I survey also included an interactive mapping exercise to understand current challenges in the street network. The phase II survey was designed to ask respondents about user experience, travel behavior and modal priorities by corridor. The survey also included a ranking exercise for each of the four identified corridors. As part of the outreach and engagement process for both survey periods, the project team held multiple pop-up events and webinars and utilized press releases, emails, stakeholder assistance, and social media for engagement purposes.

Following the release of the draft final report, a public comment period opened as phase III of public engagement. To encourage feedback and promote the project effort, the report was posted on the project website, promoted through agency social media, and promoted through paid ads on Facebook and Instagram. Additionally, an email was sent to anyone who signed up for more information or took a survey during phase I or phase II (848 contacts).

Phase I Survey Results

The survey results indicate that respondents would support bus lanes. The most selected factors that influence respondents' decision to drive or take the bus are access to frequent buses near them and travel time reliability, both of which would improve with bus lanes. Respondents' answers to the following themes show that they find congestion to be an issue and prefer bus lanes and bus priority policies and investments over those that favor private vehicles.

Congestion

- **33 percent** of respondents agree that buses are frequently stuck in congestion.
- The Slow Buses / Congestion Issues map marker received the **second-most responses.**

Bus Priority Infrastructure

- **70 percent** of respondents prefer giving buses extra green time.
- **76 percent** prefer investing in bus priority infrastructure.
- **61 percent** prefer removing parking or reducing parking time for bus lanes.

CONGESTION

More respondents agree or strongly agree (33 percent) rather than disagree or strongly disagree (26 percent) that buses are frequently stuck in congestion. Additionally, in the mapping activity, the “Slow Buses / Congestion Issues” map marker received the second-most responses after “Improve Bus Stops,” indicating riders have more issues with congestion than accessibility, safety conditions near bus stops, and intersection delay issues.

BUS PRIORITY INFRASTRUCTURE

The tradeoff exercise offered support for bus lanes. Seventy (70) percent of respondents strongly prefer or prefer giving buses extra green time over maintaining delay for private vehicles, and 76 percent strongly prefer or prefer investing in bus priority infrastructure over investing in more or wider roads. Additionally, 61 percent of respondents strongly prefer or prefer removing parking or reducing parking time for bus lanes over maintaining parking or more parking.

Phase II Survey Results

The survey results show that respondents overwhelmingly view pedestrian improvements as the number one priority. Bus lanes and bike lines were the second and third highest priority for respondents, with bus priority ranking slightly higher than bike lanes. **Table 2** shows the breakdown of respondents’ rankings between bus priority and bike lanes for each corridor.

Table 2: Modal Priorities by Corridor

Corridor	Key Takeaway
Washington/State/Broadway in Albany	Bus lanes (21%) and bike lanes (23%) tied for second place; Queue jumps had 11%. In total bus priority had 33% of the first-place votes.
Central Avenue in Albany	Queue jumps (27%) were ranked second over bike lanes (21%).
For 3rd/4th Streets in Troy	Queue jumps (25%) and bike lanes (26%) tied for second place.
State Street in Schenectady	Bus lanes (21%) ranked second over bike lanes (14%). Queue jumps had 9%. In total bus priority had 30% of the first-place votes.

MODAL PRIORITIES

The ranking exercise for modal priorities revealed pedestrian improvements to be the highest priority for many respondents. Between one third and one half of respondents ranked pedestrian improvements the highest for each corridor. Bus priority treatments received the second highest rankings, with about 25-30 percent of respondents ranking it the highest for each corridor. For the corridors with both bus lanes and queue jumps as options, bus lanes received about twice as many first-place rankings. Bike improvements were close behind bus priority, receiving 14-26 percent of the first-place rankings. Personal vehicles were overwhelmingly the lowest priority for each corridor, with no more than ten percent of respondents ranking it first. When asked about expanding the deployment of queue jumps across the region, 85 percent of respondents were favorable towards expanding their implementation, with 65 percent saying they would “definitely support” and 20 percent saying they would “probably support” the implementation of more queue jumps.

Phase III Results

Feedback from the public comment period revealed overall support for the project and final report. Many respondents were supportive of adding queue jumps and expanding bus lanes in the region, explaining that it would greatly improve current congestion delays and overall experience as a rider. While most feedback was positive, there were some concerns about the addition of bus lanes worsening car traffic and creating enforcement problems. Some respondents were also disappointed that corridors further outside Albany were not considered. Additionally, some comments felt the recommendations did not go far enough to maximize time savings, expressing disappointment that queue jumps were favored over fully dedicated bus lanes. Still, respondents were generally encouraged by the project and felt it was a positive step towards improving transit in the region. Comments from phase III can be found in Appendix D.

6. FINAL RECOMMENDATIONS

As a result of the extensive community and public input, feedback, and comments; the final recommendations for each corridor include bus, bike, and pedestrian improvements to improve safety for all users while increasing bus service performance. In each corridor this means that rather than having a single bus priority recommendation in each segment, the recommendation is to pursue multimodal improvements that prioritize pedestrian safety and comfort, bicyclist safety and comfort, and improve bus operations through targeted and tactical strategies. The latter will come in a variety of forms including bus lanes, queue jumps, and transit signal priority. Other priority treatments described in Appendix D: *Capital Region Bus and Bike Priority Toolbox* may also be deployed to this end.

Corridor: Washington/State/Broadway in Albany

Final Recommendations: Pedestrian improvements, bicycle lanes, queue jumps, and tactical bus lanes.

The analysis of the bus performance in this corridor identified the following conditions:

- **Transit quality of service assessment:**
  - Slow bus speeds measured
  - Unreliable bus service measured
- **Transit Performance:**
  - Highest bus volumes in the CDTA system traverse the corridor
  - Nearly 6,000 Daily Boardings which represents ~15% of total CDTA ridership
  - Highest passenger delay anywhere in the system
  - Nearly one bus per minute

The final recommendation for this corridor is to pursue pedestrian improvements, queue jumps[2], and bicycle priority improvements. Given the extreme variations in right-of-way and parking in this corridor the type and intensity of improvement could vary significantly. The City of Albany is currently pursuing bicycle improvements on Washington Ave. It is assumed that these will be paired with queue jumps to improve bus performance. On State Street, where the right-of-way is wider and there is diagonal parking and a center median; queue jumps, and extended bus stops are recommended. On Broadway (a short segment between State St. to Hudson Ave) short tactical bus lanes are recommended.

Corridor: Central Ave in Albany

Final Recommendations: City led lane reduction project that includes pedestrian improvements and bicycle lanes, paired with queue jumps.

The analysis of the bus performance in this corridor identified the following conditions:

- **Transit quality of service assessment:**
  - Slow speeds measured

[2] Note that some queue jumps could span multiple blocks an effectively function as tactical bus lanes.

    - Unreliable service measured
- **Transit Performance:**
    - 4,500 Daily Boardings
    - Second highest delay in the system
    - One bus every 5 minutes

The final recommendation for this corridor is to pursue pedestrian improvements, queue jumps, and bicycle priority improvements. The City of Albany is currently pursuing a lane reduction project on Central Ave that will reduce the number of travel lanes, improve pedestrian safety, and add bicycle facilities. These should be paired with queue jumps at intersections to improve bus performance. Relocation of bus stops may be warranted in some locations to improve bus operations.

Corridor: 3rd/4th Streets in Troy

Final Recommendations: Pedestrian improvements, bicycle lanes, and queue jumps.

The analysis of the bus performance in this corridor identified the following conditions:

- **Transit quality of service assessment:**
    - Slow bus speeds measured
    - Unreliable bus service measured
- **Transit Performance:**
    - Over 3,000 Daily Boardings
    - 7.5% of total CDTA system
    - Up to 29 buses per hour in the peaks
        - One bus every 2 minutes
    - Third highest amount of bus delay in the system

The final recommendation for this corridor is to pursue pedestrian improvements, queue jumps, and bicycle priority improvements. Queue jumps at intersections would be coupled with mid-block bicycle lanes on 3rd and 4th Streets. A tactical bus lane would be from the Green Island Bridge southbound onto River St and proceeding onto 3rd Street to the Riverfront Station – River St & Front St.

Corridor: State Street in Schenectady

Final Recommendations: Pedestrian improvements, bus lanes, and queue jumps.

The analysis of the bus performance in this corridor identified the following conditions:

- **Transit Quality of Service Assessment:**
    - Substandard travel time observed for BRT Service
- **Transit Performance:**
    - 4th highest population density
    - High concentrations of disadvantaged communities
        - Mobility impaired, persons of color, low-income, zero-car households
    - Nearly 1,300 Daily Boardings
    - High passenger and bus delay

The final recommendation for this corridor is to pursue pedestrian improvements, bus lanes, and queue jumps[3]. While pedestrian improvements will be pursued throughout the corridor, the application of bus lanes and queue jumps will vary by segment and potentially by direction.

[3] Note that some queue jumps could span multiple blocks an effectively function as tactical bus lanes.

7. IMPLEMENTATION PLAN

The implementation of the improvements described in this report will require further study, project champions, design, funding, construction, and monitoring. The timing of the various improvements (pedestrian, bicycle, and bus) will need to be carefully coordinated and planned, as they may occur incrementally and not through a combined project. The first task for agency partners will be to identify additional study that is required for each corridor. Subsequent to those studies, and once improvement plans are confirmed, the design of the improvements can commence, in parallel with securing funding for implementation. Coordination with the New York State Department of Transportation (NYSDOT) will be required for all state facilities. Engagement with businesses along the corridor will be necessary as well to ensure that the benefits of various priority treatments outweigh potential reallocation of parking space[4].

Corridor: Washington/State/Broadway in Albany

This corridor includes three different roadways with varying rights-of-way, traffic conditions, and parking. Close coordination will be required with the City of Albany, particularly given the City's desire to introduce bicycle facilities on Washington Ave. Traffic analysis is required as a next step to identify potential impacts of introducing queue jumps on Washington Ave and tactical bus lanes on State Street and Broadway.

Corridor: Central Ave in Albany

Similar to the previous corridor, close coordination will be required with the City of Albany, as the planned lane reduction project on Central Avenue will in part dictate what bus priority improvements can be implemented as the design will impact both traffic and transit operations. Queue jumps and bus stop relocations will ideally be integrated into the design process to ensure an integrated multimodal process.

Corridor: 3rd/4th Streets in Troy

Downtown Troy is a vibrant walkable environment but lacks a cohesive approach to parking management. The first step towards implementation of bus and bike priority treatments in this corridor will be a parking management study. The result of the study will provide the city with a path forward to better manage parking resources and reallocate space confidently. In parallel with the parking study, or subsequent to it, project partners should perform a traffic study to better understand potential impacts of additional queue jumps and tactical bus lanes. Coordination with the City of Troy throughout these studies and moving into project design will be required.

Corridor: State Street in Schenectady

The portion of State Street in Schenectady proposed for bus priority improvements includes a lack of lane definition and variable parking utilization. CDTA is currently performing additional traffic and parking analysis in this corridor. Subsequent to this study, and through additional coordination with the City of Schenectady, next steps will be determined.

[4] https://www.nrdc.org/experts/zak-accuardi/new-toolkit-supports-bus-priority-implementation

APPENDIX A: PREVIOUS PLAN AND PEER REVIEW

APPENDIX B: BASELINE CORRIDOR ASSESSMENT AND PRIORITIZATION

APPENDIX C: PHASE I AND PHASE II PUBLIC ENGAGEMENT SURVEY RESULTS

APPENDIX D: PHASE III PUBLIC ENGAGEMENT COMMENTS

APPENDIX E: ENVIRONMENTAL JUSTICE AND TITLE VI REQUIREMENTS

APPENDIX F: BUS AND BIKE PRIORITY TOOLBOX