



THE
I-81
CHALLENGE

Syracuse Transit System Analysis Phase 1

Executive Summary

DATE:

May 2013

PREPARED FOR:

New York State Department of Transportation



NYS Department of Transportation

I. Introduction

This document presents a summary of Phase 1 of the Syracuse Transit System Analysis (STSA). The STSA is intended to serve as a long-range vision for the transit system in the Syracuse metropolitan area that is consistent with the overall vision of the I-81 corridor being developed as part of *The I-81 Challenge*. Phase 1 of the study consists of an existing conditions assessment, identification of transit system needs, and the development of strategies to address those needs.

The Phase 1 document presents the methodology used to identify six transit enhancement corridors; major corridors within the Syracuse metropolitan area that have characteristics that could support transit enhancements. In addition, three transit enhancement strategies are identified, including a low investment strategy to enhance the existing bus system, a moderate investment strategy that incorporates bus rapid transit (BRT), and a high investment strategy that incorporates light rail transit (LRT). Each enhancement strategy provides a general application of the associated improvements on the six transit enhancement corridors, which will then be evaluated in Phase 2.

The goal of the STSA is to develop a strategy to assist the Syracuse metropolitan area in achieving a balanced transportation system that supports economic growth, improves quality of life, and supports the vision of the communities that it serves. Objectives of the STSA include:

- Reducing congestion within the City, particularly along corridors adjacent to I-81 and I-690;
- Facilitating sustainable economic development within the City, including the planned development in University Hill;
- Reducing parking demand in Downtown and on University Hill;
- Examining the feasibility of increasing the frequency and number of hours per day that buses operate;
- Improving connectivity and integration of Downtown with University Hill;
- Increasing transportation options for young, elderly, disabled, and low-income populations;
- Decreasing noise and air pollution generated from traffic; and,
- Improving transit travel times on commuter routes to be more competitive with private vehicle travel time.

The STSA utilizes a variety of information sources to evaluate existing conditions, identify needs, and develop analysis corridors and enhancement strategies. Public involvement through *The I-81 Challenge* has been a key component to the overall STSA. Public and stakeholder feedback included displays at *The I-81 Challenge* public information sessions, surveys of current riders and non-riders, meetings with project advisory committees, and coordination with agencies such as CENTRO, the Syracuse Metropolitan Transportation Council (SMTC), and the New York State Department of Transportation (NYSDOT). Public and stakeholder feedback was enhanced with field data collection, the review of existing reports and studies, demographic data, land use and growth data, and the assessment of existing transit systems in cities similar to Syracuse, in order to identify needs and develop the transit enhancement corridors and associated enhancement strategies.

II. Transit System Needs

Transit system needs were identified through an assessment of ridership, infrastructure, and usability, utilizing a combination of field data collection, public meetings and surveys, and the review of existing reports and studies. Based on these results of the assessment, the following list of transit system needs was developed:

- 1. Improve operations for core ridership that meets existing needs as well as retains riders.**
 - a. Increase frequency and hours of operation on highly utilized routes and routes that serve employment centers.
 - b. Maintain an affordable fare.
 - c. Improve on-time performance.
 - d. Provide higher intensity improvements to meet demand on highly utilized corridors.
 - e. Improve system flexibility to meet changes in demand.
- 2. Attract new ridership, particularly suburban/commuter ridership to reduce roadway congestion and parking demand in Downtown and on University Hill.**
 - a. Reduce transit travel time to be more comparable with private vehicles.
 - b. Improve rider amenities (Wi-Fi, comfortable seating for commuter routes, etc.).
 - c. Improve safety and public perception of the public transit system.
 - d. Improve accessibility to park-and-rides by locating new facilities near freeway interchanges and providing express bus services.
- 3. Improve the visibility and usability of the system for all riders.**
 - a. Provide real-time transit information (online, by phone, at bus stops, etc.).
 - b. Provide route information on bus stop signs.
 - c. Revise policies for bus information displays.
 - d. Adjust the route naming convention to develop single, continuous routes that pass through the Downtown Hub.
 - e. Enhance route numbers with corridor branding on highly utilized corridors.
 - f. Provide adequate signing along major routes to highlight the location of park-and-rides and/or rail stations.
- 4. Utilize transit to improve connectivity between key locations in the Syracuse metropolitan area and provide for economic development opportunities.**
 - a. Provide direct connections between major regional destinations.
 - b. Provide additional/more-frequent connections between Downtown and University Hill.
 - c. Encourage local municipalities to implement transit-friendly land use and zoning policies to encourage transit-oriented design.
 - d. Locate high-intensity transit services along corridors that mix residential, retail, and office uses.

III. Transit System Vision

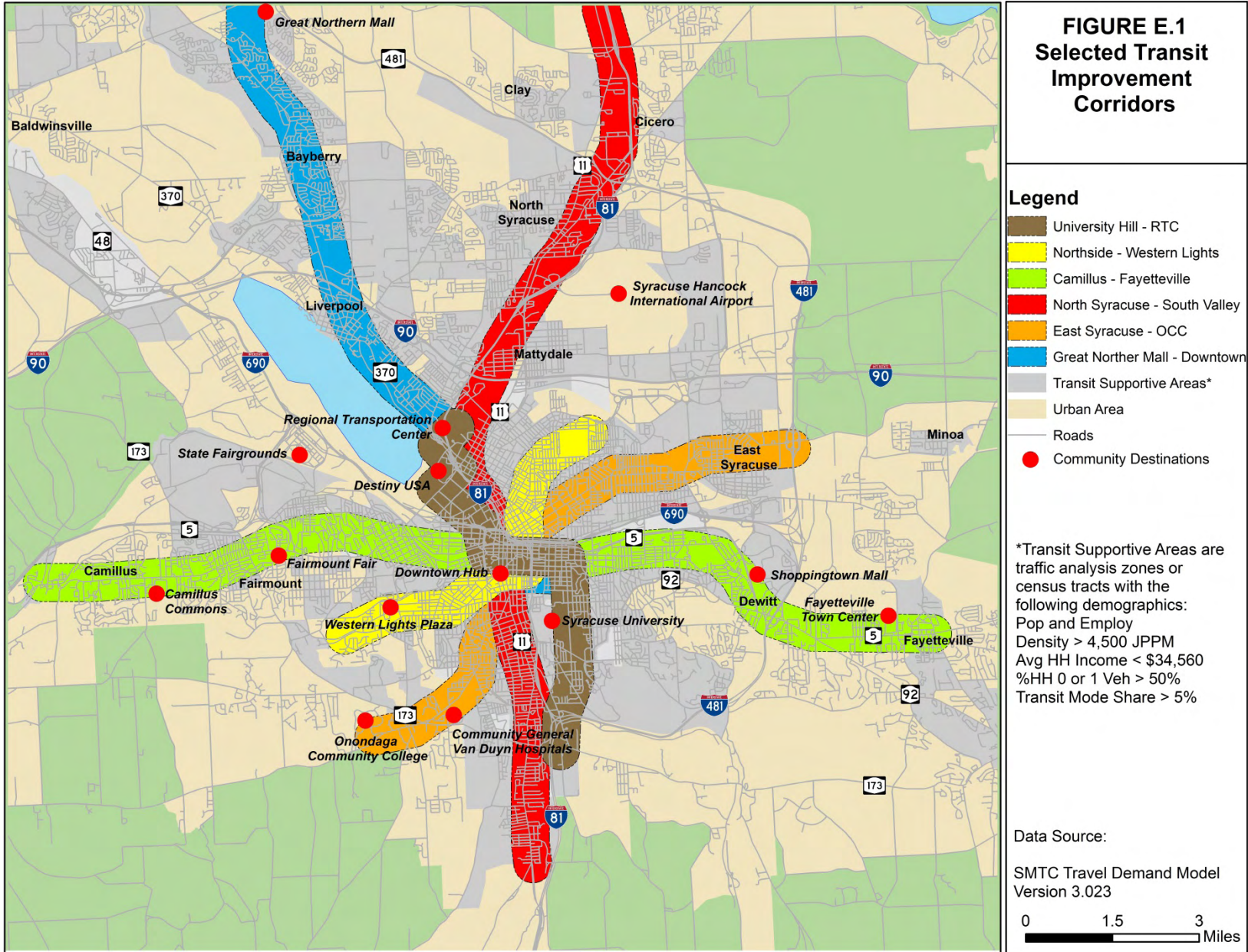
The STSA will present concepts that leverage existing areas of high transit use in order to establish the basis for “transit enhancement corridors”. The corridors contain higher-frequency, highly visible transit services with improved rider amenities and shorter travel times that serve both urban and suburban areas. The higher-frequency, expanded services would improve the usability for existing users while offering amenities and service styles that would attract new riders, particularly commuters. Establishing formal transit services along the enhancement corridors would also support the development of specialized land use policies in the study area, which would support higher-density, transit-oriented, and pedestrian-friendly designs. These features would enhance the transit corridors, increase ridership, improve quality of life, and grow the economy of the region.

IV. Identification of Transit Enhancement Corridors

In order to address the identified needs and meet the goals and objectives of the STSA, it was necessary to evaluate improvements along “transit enhancement corridors”. A transit enhancement corridor is defined as a general alignment of one or more major travel routes within the Syracuse metropolitan area that is selected for the purposes of evaluating transit enhancements. Corridors may have one or more existing bus routes, of which some or all of the routes may be consolidated into a new service as part of the proposed enhancements. In addition, corridors may consist of a combination of roadway and rail infrastructure.

A literature review was conducted to identify community factors that affect transit mode share in order to provide additional measures to select the transit enhancement corridors. Community factors that were utilized in the STSA include existing ridership; population and employment density; vehicle ownership; home-based work trip production and attraction densities; average commute time; transit mode share; household income; and, master plans, regional plans, and planned development. Based on the assessment of the factors, the following transit enhancement corridors were selected (**FIGURE E.1**):

- East Syracuse – OCC via South Avenue and James Street
- University Hill – Destiny and RTC via Solar Street
- North Syracuse/Cicero – South Valley via US 11/I-81
- Northside – Western Lights via Butternut Street/Grant Avenue and Onondaga Street
- Camillus – Fayetteville via Genesee Street/Erie Boulevard (NY 5 and NY 92)
- Great Northern Mall – Downtown/University Hill via Liverpool (CR 57)



V. Transit Enhancement Strategies

Three transit enhancement strategies were developed to evaluate various levels of transit enhancements on the identified corridors. The purpose of the enhancement strategies is to provide general alignments that can be used for the analysis of the application of various levels of transit. Each strategy offers a different level of improvements for the transit system, from enhancements to the basic bus service (low investment) to fixed guide-way (high investment) improvements. Service objectives are established for each of the strategies, and features that would meet the system needs and vision are proposed. The routes, stops, and hubs shown as part of each of the enhancement strategies are for analysis purposes and represent a general alignment only. They do not indicate final alignments. A detailed alternatives analysis would be required to outline the exact routes, stop locations, hubs, and a detailed examination of costs and benefits before implementation.

Strategy 1: Base Build (Low Investment)

The purpose of the Base Build strategy is to identify enhancements that would maximize the level of service on a core group of routes to enhance efficiency by consolidating routes and optimizing basic bus service on high-use corridors. It is considered a Base Build strategy because it would provide an improved system that could be included in each of the subsequent strategies. The strategy centers on the establishment of trunk routes along the transit enhancement corridors, which would be oriented around a dual hub system in the urban core formed by the existing Downtown Syracuse Transit Hub and a proposed hub on University Hill (see **APPENDIX FIGURE 1**). The trunk routes would consolidate parallel routes and deviations to form continuous corridors that would allow CENTRO to provide more-frequent bus service, as well as permit easy to understand corridor-branding schemes. Establishing the dual hub system would also provide one seat rides to University Hill on all trunk routes, and provide enhanced and more-frequent connections between Downtown and University Hill.

In addition to the trunk route structure, the Base Build strategy also provides guidance for new bus stop signs, shelters, and park-and-ride facilities (see **APPENDIX TABLE 1**). The guidance is focused on reducing transit travel time, providing more information for riders, improving operations for existing riders, and enhancing the transit infrastructure to make the system more attractive to new users.

Strategy 2: BRT (Moderate Investment)

Strategy 2 includes the enhancements proposed in the Base Build strategy, but expands upon them by introducing bus rapid transit (BRT) routes. BRT systems differ from basic bus service in that their facilities, vehicles, and operating structures are more like light rail transit (LRT). BRT is considered a lower-cost and more flexible alternative to rail transit, with similar travel time and ridership-generating benefits as LRT when supported with facilities such as separate transit-ways, bus-only lanes, queue-jumpers, consolidated high-quality stops, corridor branding, transit signal priority/preemption, frequent service and modern vehicles.

In general, the routes follow the alignment of the trunk routes, but have some minor adjustments to enhance links between BRT-supportive regions of the study area, and to provide better connections to major destinations (see **APPENDIX FIGURES 2A** and **2B**). All of the BRT routes, with the exception of the US 11 BRT, pass through the Downtown Syracuse Transit Hub and proposed University Hill Hub, providing one-seat access to both locations. In addition to the proposed BRT alignments, this strategy also provides guidance for service features such as vehicles, bus stops, headways, and operating hours (see **APPENDIX TABLE 2**). The guidance is focused on reducing transit travel time, establishing branded corridors, establishing a sense of place and permanence within the community, supporting economic growth, and attracting new users.

Strategy 3: LRT (High Investment)

Strategy 3 includes the enhancements proposed in the Base Build strategy, but expands upon them by introducing light rail transit (LRT) to some of the transit enhancement corridors. LRT combines the qualities of a BRT system with the qualities of commuter rail by providing a higher-intensity service that has wider appeal, on a system that can be more easily integrated into an existing transportation network. LRT vehicles can operate on existing rail lines or roadways, allowing the service to get closer to major destinations, and they incorporate bus-like features such as only stopping at stations when a stop is requested.

LRT requires a higher population and employment density than basic bus service or BRT; therefore, the proposed LRT routes focus on high-density, mixed-use corridors within the Syracuse metropolitan area. **APPENDIX FIGURE 3** provides an overview of the proposed LRT routes, which consist of a loop connecting Downtown and University Hill. This loop would provide frequent transit service between destinations in both areas, and would serve the University Hill and Downtown redevelopment areas. The Downtown – University Hill loop would also be supported by at least one extension option. The extensions are intended to provide additional origins and destinations along mixed-use corridors within higher density sections of the Syracuse Metropolitan area, and would likely increase the viability of the Downtown – University Hill loop.

In addition to the proposed LRT alignments, this strategy also provides guidance for service features such as vehicles, LRT stations, headways, and operating hours (see **APPENDIX TABLE 3**). The guidance is focused on minimizing travel time, supporting economic growth, enhancing connections between Downtown, University Hill, and mixed-use corridors, establishing a sense of place and permanence within communities, enhancing services for existing riders, and attracting new riders.

Strategy 4: Commuter Rail (High Investment)

Strategy 4 was considered in the preliminary stages of the STSA in order to evaluate the potential for heavy commuter rail in the Syracuse Metropolitan Area. Commuter rail is typically applied in metropolitan areas in order to connect suburban residential areas with an urban core. However, due to the relatively low peak period congestion, ample, low-cost parking within the urban core, low densities, and lack of existing rail facilities in residential communities, commuter rail was not progressed in the STSA. Commuter rail is not considered a sustainable transit service that could be applied in the Syracuse metropolitan area at this time.

VI. Next Steps

Phase 2 of the STSA will consist of the evaluation of the enhancement strategies on the identified transit enhancement corridors. Each strategy will be evaluated based on the following factors:

Mobility:

- Estimated Annual Trips (FTA Measure)
- Corridor Travel Time
- Number of Major Activity Centers Served

Economic Development Effects:

- Growth Management Plans (FTA Measure)
- Transit-Supportive Corridor Policies (FTA Measure)
- Tools to Implement Land Use Policies (FTA Measure)
- Performance of Land Use Policies (FTA Measure)
- Potential Impact of Transit Project on Regional Land Use (FTA Measure)

- Plans for Affordable Housing in Corridor (FTA Measure)
- Strategic Area Connectivity

Environmental Benefits:

- Change in VMT (FTA Measure)
- Change in Air Quality, Safety, and Land Use (FTA Measure)

Cost Effectiveness:

- Annualized Capital and Operating Cost Per Trip (FTA Measure)

Land Use:

- Existing Corridor and Station Area Character (FTA Measure)
- Employment Served(FTA Measure)
- Population Density (FTA Measure)
- Existing Pedestrian Facilities(FTA Measure)
- Affordable Housing Served (FTA Measure)

The corridors and associated transit enhancement strategies will be ranked based on the above criteria in order to develop an implementation plan that includes short-term and long-term recommendations.

In addition to evaluating the transit enhancement strategies developed in Phase 1, Phase 2 will include an assessment of existing transit-supportive policies, including land use policies, zoning codes, and parking policies. Recommendations will be provided to enhance the sustainability of the transit enhancements, as well as to provide policy makers with the necessary guidance to create a transit-friendly environment within the Syracuse metropolitan area.

Phase 2 of the STSA is anticipated to be completed in the Fall of 2013. Following the completion of the study, a formal alternative analysis, will be required for any transit project that is recommended to be advanced to implementation. The alternatives analysis will need to be conducted in accordance with FTA guidelines, and in coordination with SMTC and other agencies, so that it could be used to file for FTA funding.



THE
I-81
CHALLENGE

Syracuse Transit System Analysis Phase 1

APPENDIX: Enhancement Strategy Figures and Tables

DATE:

May 2013

PREPARED FOR:

New York State Department of Transportation



NYS Department of Transportation

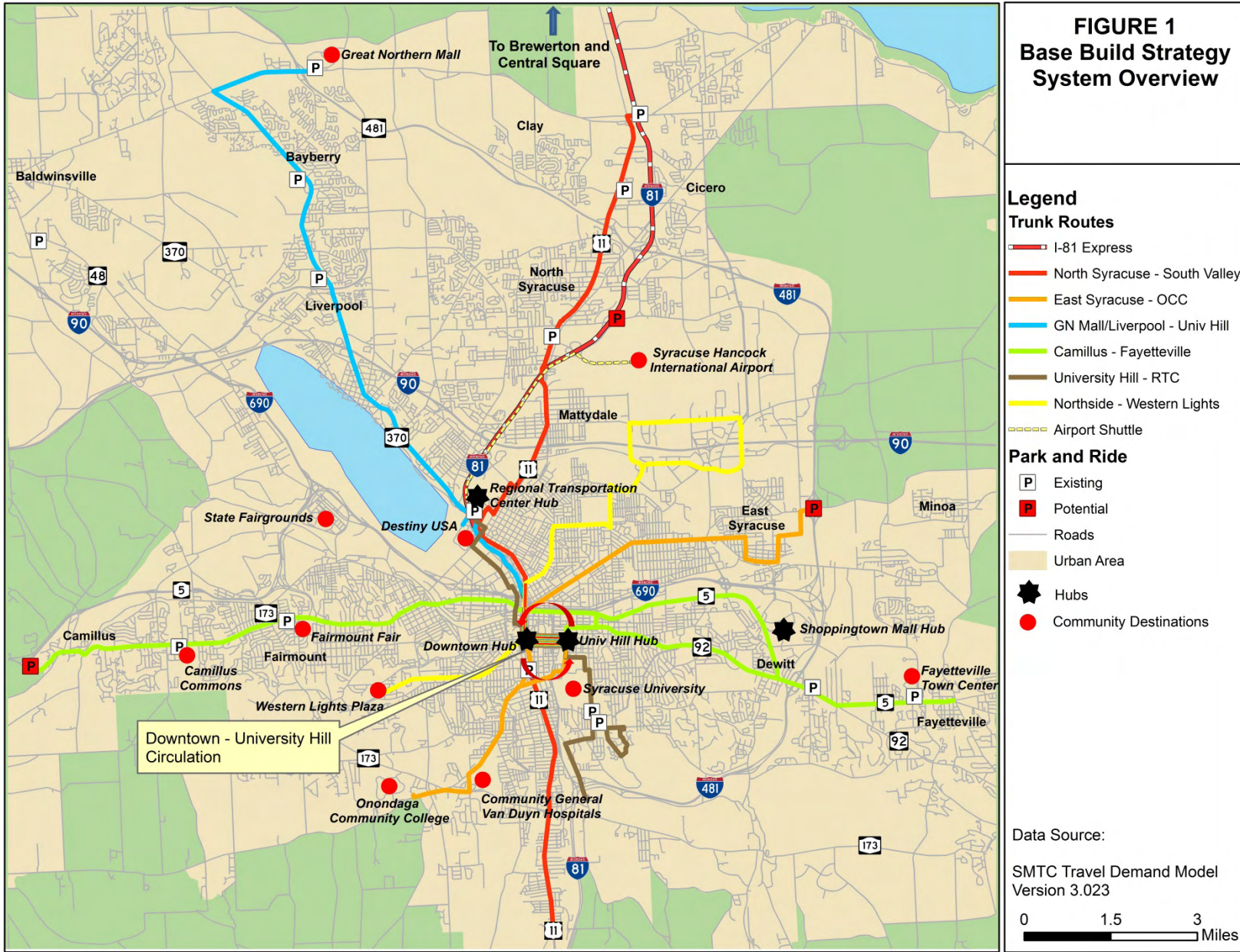
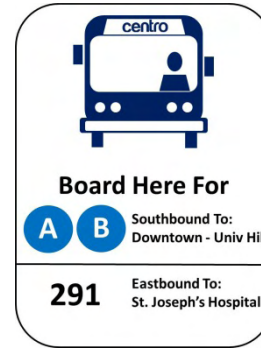
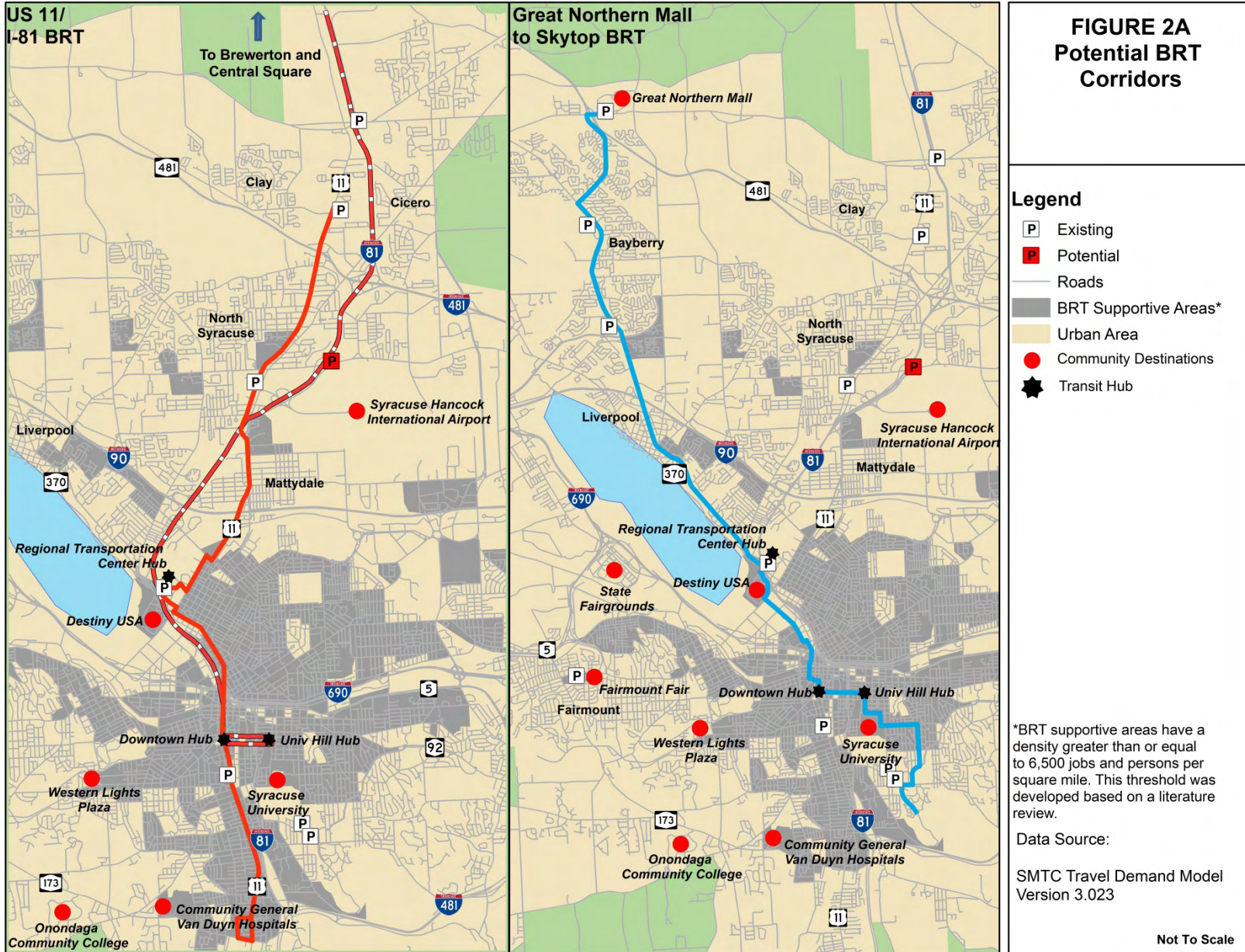


TABLE 1: Base Build Strategy Features

Feature	Description
Vehicle Type	<ul style="list-style-type: none"> Existing CENTRO Buses
Travel-Way	<ul style="list-style-type: none"> Urban Core: Bus Lanes and Signal Priority Outside of Urban Core: Queue Jumpers and Signal Priority at Congested Intersections, Bus Pull-Outs
Stop Design	<ul style="list-style-type: none"> Corridor Branding of Trunk Routes Improved Pedestrian and Bicycle Connections New Bus Stop Signs: <ul style="list-style-type: none"> Direction of Travel Designation of Bus Routes Bus Shelters: <ul style="list-style-type: none"> Corridor Branding Posted Schedules Benches Bicycle Racks
Park-and-Ride	<ul style="list-style-type: none"> Enhance Existing Locations New Locations: <ul style="list-style-type: none"> NY 5 Bypass - Camillus Taft Road – North Syracuse I-481 – East Syracuse NY 49 – Central Square Guidelines: <ul style="list-style-type: none"> Enhanced Way Finding Adjacent to Freeway Interchanges (where feasible) Efficient Access for Transit Bus Stops on Roadway Highly-Visible Bus Shelters User Amenities (heated shelters, newspaper vending, Wi-Fi, etc.).
Station Spacing	<ul style="list-style-type: none"> Local Service Minimum: 0.2 Mile Express Service Minimum: 1.0 Mile
Operating Headways	<ul style="list-style-type: none"> 6:00 AM – 9:30 AM and 3:00 PM – 7:00 PM: 20 Minutes 9:30 AM – 3:00 PM: 30 Minutes Weekdays after 7:00 PM: 30 – 60 Minutes Saturday: 30 Minutes Sunday and Holidays: 1 Hour
Operating Hours	<ul style="list-style-type: none"> Monday – Friday: Extend Service to 2:00 AM Sundays and Holidays: Maintain Existing Operating Hours



Source: Sound Transit



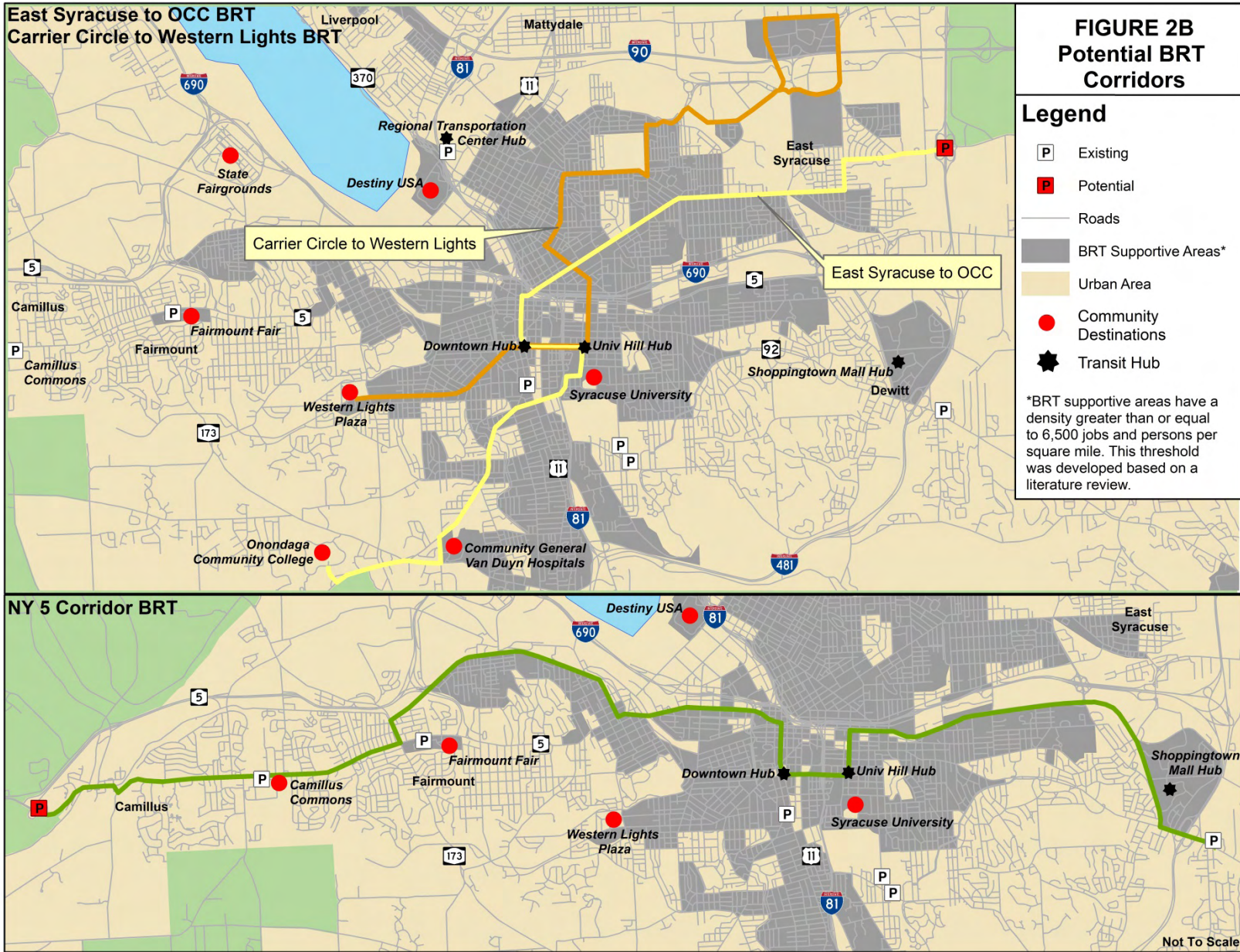


TABLE 2: Strategy 2: BRT System Features

Feature	Description
<p>Vehicle Type</p>	<ul style="list-style-type: none"> • New Low-Floor BRT Buses  <p>Source: edmonton.ca</p>
<p>Travel-Way</p>	<ul style="list-style-type: none"> • Urban Core: Bus Lanes and Signal Priority • Outside of Urban Core: Bus Lanes, Queue Jumpers, Signal Priority, and Bus Pull-Outs
<p>Stop Design</p>	<ul style="list-style-type: none"> • Branded Shelter • Large Sign • Benches • Bicycle Racks • Posted Schedule and Real-Time Arrival Information • Raised Platform (Heavily-Utilized Stops) • Off-Board Fare Collection (Optional)  <p>Source: inhabitat.com</p>
<p>Station Location</p>	<ul style="list-style-type: none"> • Preferred: Curbside, Far-Side with Bus Only Lane or Bus Pull-Out • Accepted: Curbside, Near-Side if Far-Side Cannot Be Provided
<p>Station Spacing</p>	<ul style="list-style-type: none"> • Syracuse City/Business Districts: 0.25 – 0.33 Mile • Higher-Density Suburbs: 0.5 – 0.75 Mile • Low-Density Suburbs: 1.0 – 2.0 Miles • Express Routes: >2.0 Miles
<p>Operating Headways</p>	<ul style="list-style-type: none"> • 6:00 AM – 9:30 AM and 3:00 PM – 7:00 PM: 10 Minutes • 9:30 AM – 3:00 PM and 7:00 PM – 9:00 PM: 15 - 20 Minutes • Weekday Evenings, Weekends, and Holidays: 20 - 30 Minutes
<p>Operating Hours</p>	<ul style="list-style-type: none"> • Monday – Friday: 6:00 AM – 10:00 PM • Saturday: 9:00 AM – 10:00 PM • Sundays and Holidays: 9:00 AM – 8:00 PM

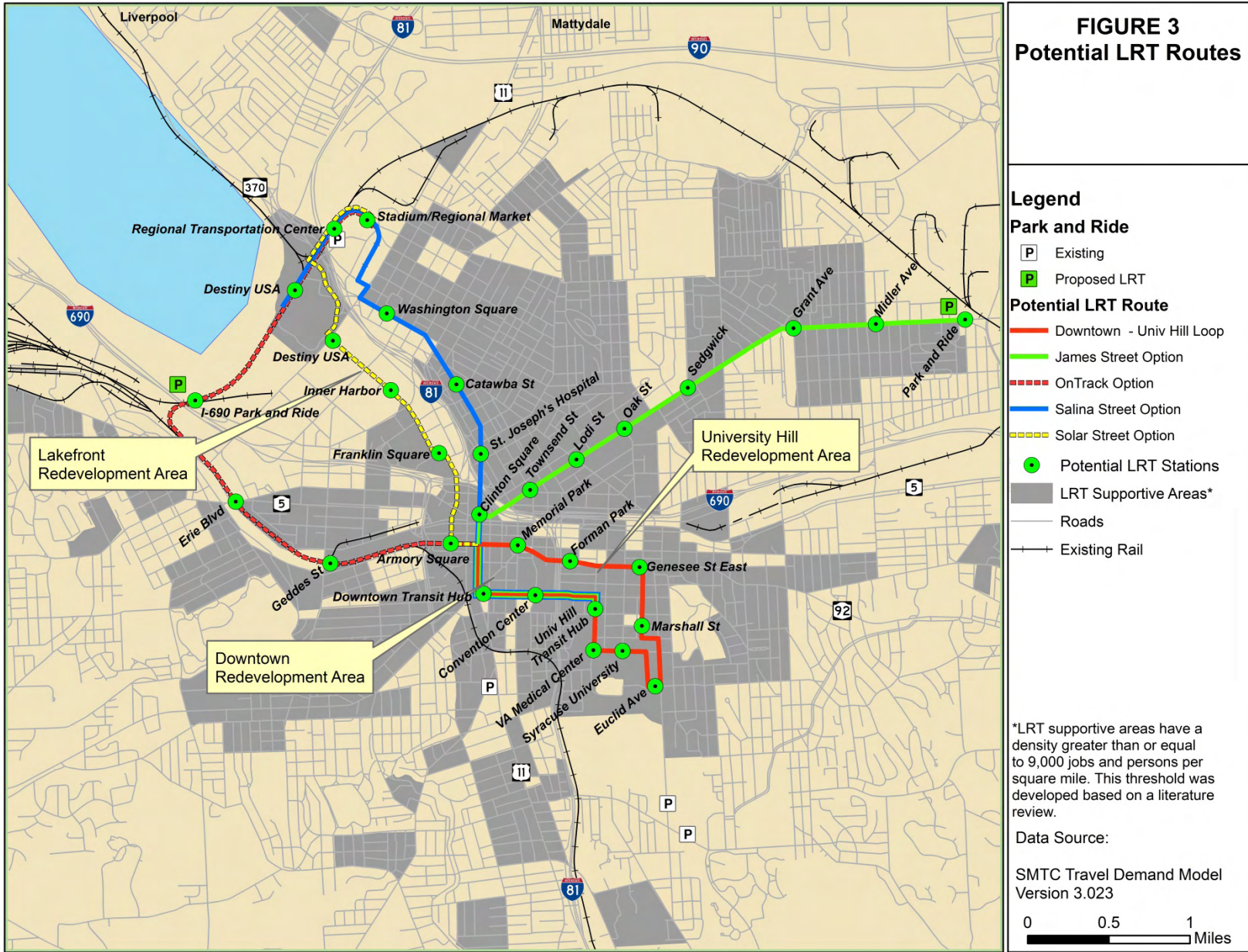


FIGURE 3
Potential LRT Routes

- Legend**
- Park and Ride**
- P Existing
 - P Proposed LRT
- Potential LRT Route**
- Downtown - Univ Hill Loop
 - James Street Option
 - OnTrack Option
 - Salina Street Option
 - Solar Street Option
 - Potential LRT Stations
 - LRT Supportive Areas*
 - Roads
 - Existing Rail

*LRT supportive areas have a density greater than or equal to 9,000 jobs and persons per square mile. This threshold was developed based on a literature review.

Data Source:
SMTC Travel Demand Model
Version 3.023

0 0.5 1
Miles

TABLE 3: Strategy 3: LRT System Features

Feature	Description
<p>Vehicle Type</p> <ul style="list-style-type: none"> • Modern Design • Single-Unit with Articulation • Low-Floor 	 <p>Source: lightrail.nl</p>
<p>Propulsion</p> <ul style="list-style-type: none"> • Electric with Overhead Catenary 	
<p>Travel-Way</p> <ul style="list-style-type: none"> • Preferred: Dedicated Transit Lanes • Accepted: Rail in Travel Lane 	
<p>Station Design</p> <ul style="list-style-type: none"> • Branded Shelter • Benches • Bicycle Racks • Posted Schedule and Real-Time Arrival Information • Raised Platform • Off-Board Fare Collection (Optional) 	 <p>Source: futureplans.jtafla.com</p>
<p>Station Location</p> <ul style="list-style-type: none"> • Near-side if LRT in travel lane. • Far-side if LRT in dedicated transit lane. 	
<p>Station Spacing</p> <ul style="list-style-type: none"> • Downtown Core/Business Districts: 0.25 – 0.33 Mile • Syracuse City: 0.5 – 1.0 Mile • Suburban: > 1.0 Mile 	
<p>Operating Headways</p> <ul style="list-style-type: none"> • 6:00 AM – 9:30 AM and 3:00 PM – 7:00 PM: 10 Minutes • 9:30 AM – 3:00 PM and 7:00 PM – 9:00 PM: 15 - 20 Minutes • Weekday Evenings, Weekends, and Holidays: 20 - 30 Minutes 	
<p>Operating Hours</p> <ul style="list-style-type: none"> • Monday – Friday: 6:00 AM – 11:00 PM • Saturday: 7:00 AM – 11:00 PM • Sundays and Holidays: 8:00 AM – 9:00 PM 	