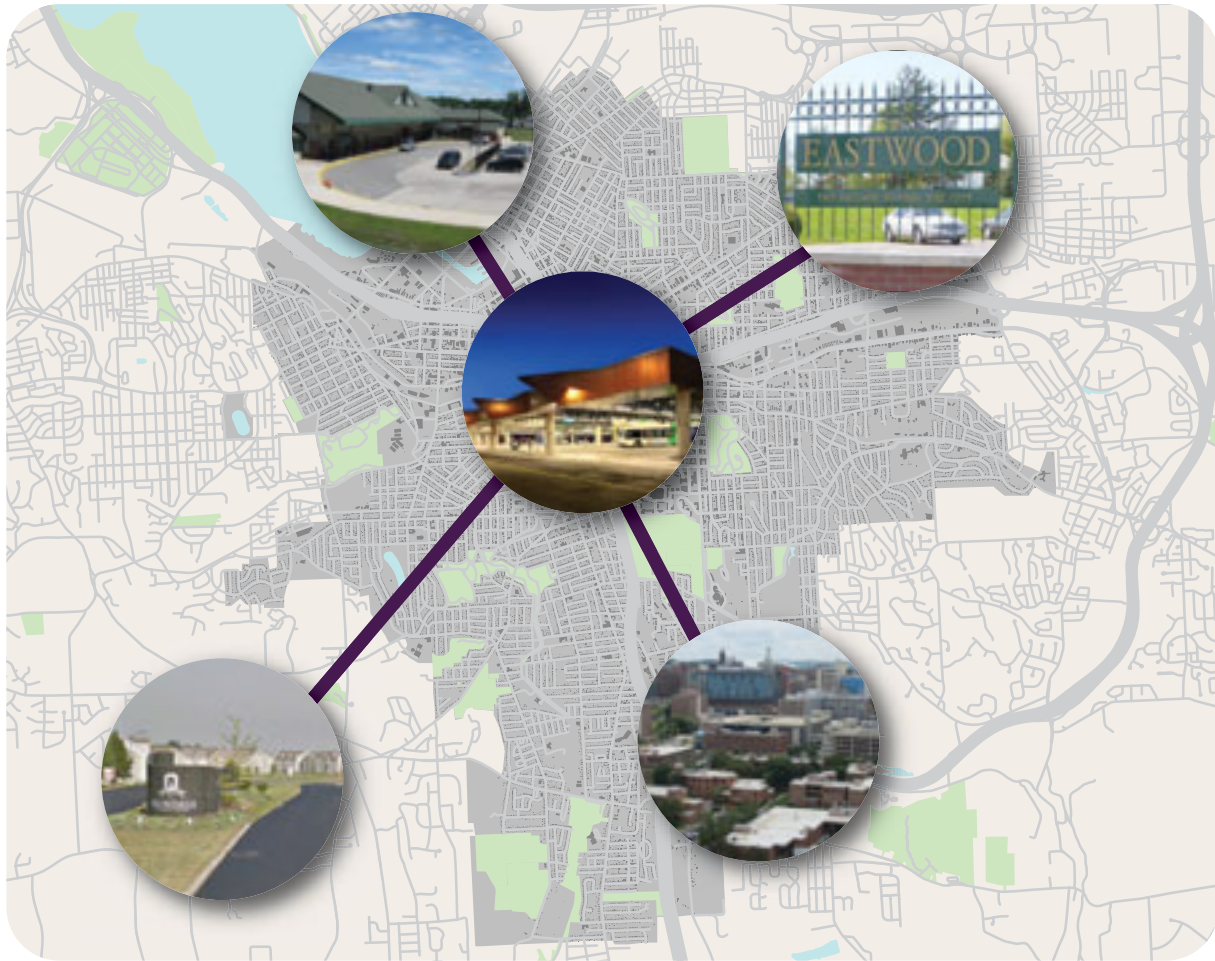


SMART1

syracuse metropolitan area regional transit study
phase 1



February 2018



Prepared for
Syracuse Metropolitan
Transportation Council



By IBI Group, with
EDR, CME

Syracuse Metropolitan Area Regional Transit Study Phase 1

Prepared by

IBI Group

for

Syracuse Metropolitan Transportation Council

February 2018

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Executive Summary

1 Overview

In 2015, on behalf of Centro, the Syracuse Metropolitan Transportation Council initiated an examination into the feasibility of enhanced transit for the Syracuse area, particularly the City of Syracuse. This examination, the Syracuse Metropolitan Area Regional Transit Study Phase 1 (SMART 1), builds upon the analysis and findings of the 2014 Syracuse Transit System Analysis (STSA) completed by the New York State Department of Transportation (NYSDOT) as a component of The I-81 Challenge. The goal of the STSA was 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 it serves. The STSA presented a series of short-term, mid-term, and long-term recommendations detailing how the Syracuse Metropolitan Area's transit system could be structured to meet identified needs in a cost-effective manner. The analysis identified six transit improvement corridors to evaluate enhancements (i.e., Bus Rapid Transit, Light Rail Transit and Commuter Rail) that could potentially meet the goals and objectives of the STSA.

Two transit improvement corridors identified in the STSA were selected for further analysis in the SMART 1 study: 1) the Regional Transportation Center (RTC) – Syracuse University (SU) corridor and 2) the Eastwood – Onondaga Community College (OCC) corridor. The STSA found that these corridors had the greatest potential to support enhanced transit service due, in large part, to relatively high existing ridership and the presence of significant ridership generators along the corridors.

The SMART 1 study completed an evaluation of modes, alignments, station locations, ridership, service plans, capital/maintenance/operational costs, economic development, land use, zoning, engineering feasibility and environmental factors associated with the key corridors to identify a Locally Preferred Alternative (LPA) for each corridor. Throughout this project, the SMTC engaged in a public outreach process in order to get as much input, feedback and community involvement as possible.

Goals, Objectives, and Purpose and Need statements were developed at the outset of the study to guide its development. Once these were established, an extensive existing conditions research was prepared for a number of categories. The first stage of analysis within the SMART 1 process was mode screening that examined various modes of transit potentially applicable in the study corridors. The mode screening recommended against several high capital cost alternatives (i.e., Light Rail Transit (LRT), modern streetcar, and Bus Rapid Transit (BRT) – Busway), which would be very difficult to fund and construct and would be unlikely to provide significant marginal benefit. The next step was to develop specific route and mode alternatives for each of the modes recommended for further consideration: BRT – Bus Lane, BRT – Mixed Traffic, and Existing Service Improvements. These alternatives are based on previous planning studies such as the STSA, existing conditions research, comments from the public and stakeholders, and transit operations analysis. The final element of this study was to develop criteria for selecting a LPA and applying them to arrive at a final recommendation. The SMART 1 document concludes with an Implementation Plan and Financial Plan that describe the steps required for financing and constructing the LPA.

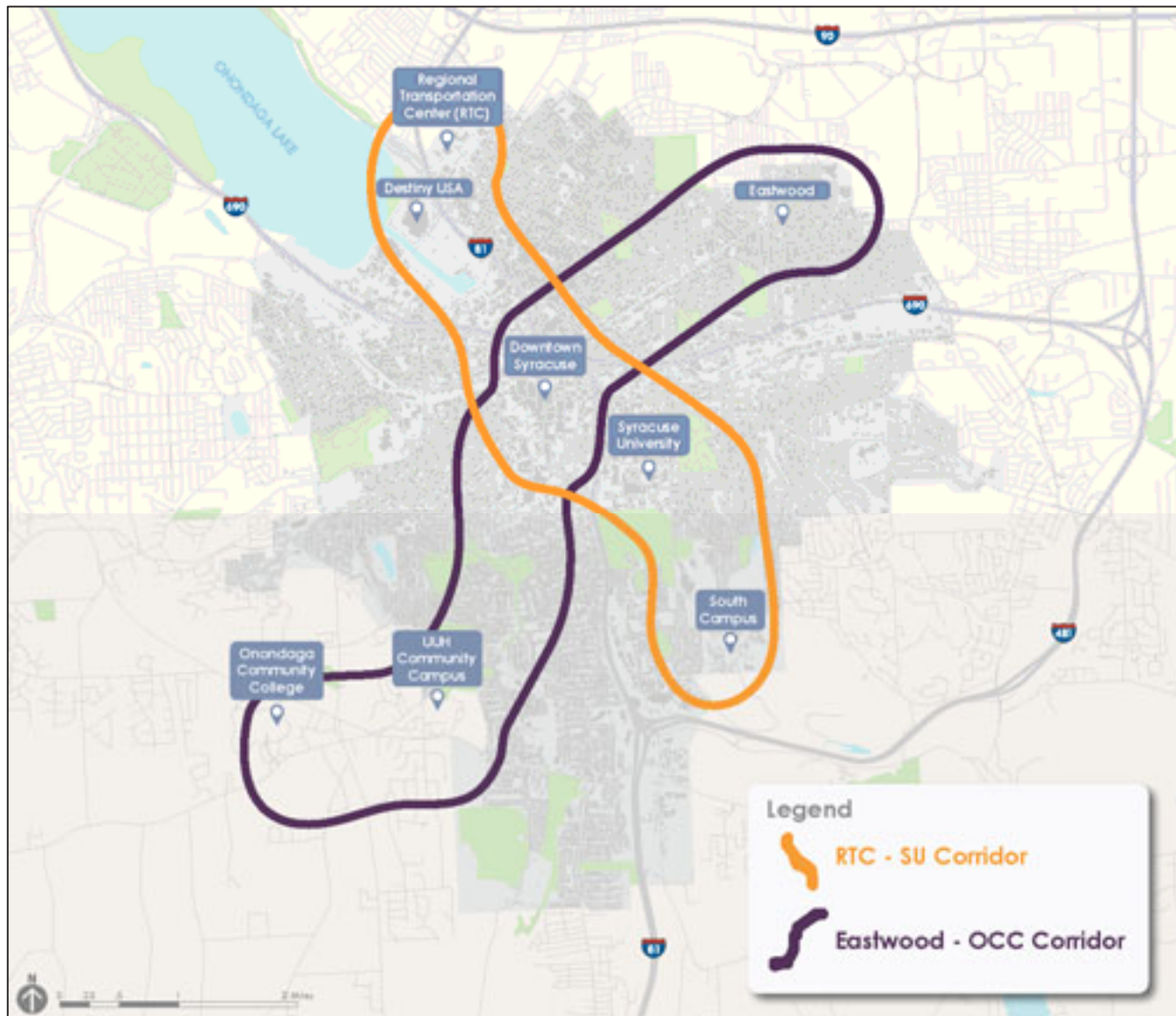
1.1 Public Outreach

As indicated, the SMTC engaged in a public outreach process in order to get as much input, feedback and community involvement as possible during the SMART 1 planning study. The public outreach program for this project was designed to be transparent and comprehensive assuring the opportunity for involvement in all phases and at all levels of the planning process. This was achieved by providing early and continuing involvement, complete information, full access to key decisions, and multiple avenues for sharing opinions and ideas. Public outreach efforts included a strong educational component, intended to exchange clear information about issues, challenges, and local priorities, with particular attention toward issues of transit access and connectivity. Three public meetings were held throughout the development of the SMART 1 study. The first meeting took place in February 2016 and the second in November 2016. The final public meeting occurred in November 2017.

Two rounds of focus groups occurred in the study process. The first round of focus group meetings included one meeting for each of three groups: major employers, social service providers, and

educational institutions. On February 6 and February 13, 2017, two additional focus group meetings were held with the Lakefront Area TNT and the Greater North Salina Business Association to elicit more specific feedback on the alignment alternatives that were being evaluated. Lastly, between April and May 2016, SMTC and the consultant team held 9 pop-up meetings where staff distributed SMART 1 brochures and spoke with members of the public.

SMART 1 study corridors



2 Mode Screening



At the outset of the SMART 1 study, five different “enhanced transit” mode options were under consideration including two rail options (i.e., LRT and modern streetcar) and three BRT options (i.e., BRT – Busway, BRT – Bus Lane, and BRT – Mixed Traffic). These were “screened” against a set of eligibility criteria to determine which ones were worth progressing into additional evaluation. The screening criteria were largely based on FTA Small Starts funding guidance.

The purpose of this stage of analysis was not to examine route or precise design alternatives or to determine funding qualification definitively, but to determine what general level of capital investment and improvement might be justified within the study corridors. Based on the FTA Small Starts program eligibility criteria the following screening criteria were developed and applied to the mode alternatives.

- The **Total Cost** criteria refers to a capital cost less than \$300 million.
- **Local Funding** represents the amount that the Syracuse region would have to raise from local and other non-federal sources. It is calculated by taking the Total Cost and subtracting the \$100M funding cap for the Small Starts program or calculating a minimum 20% local match if the project’s cost is below that level.
- **Existing Ridership** is the total current Centro ridership on all routes that travel for a significant distance within the specified SMART 1 study corridor.
- **Operating Cost Increase** compares the projected operating cost of a mode alternative to Centro’s total operating cost. The project operating cost is based on known operating costs of comparable existing systems. No reductions in local service were assumed because existing service in the corridors is generally relatively infrequent and it would be necessary to cover local stops even after rapid transit was implemented. FTA also imposes certain requirements about the extent to which local service budgets can be reduced after implementation of a funded project.
- In addition to the Small Starts based criteria, one other criterion was added to take into consideration the specific requirements of certain modes for **dedicated or at least substantially prioritized, rights-of-way**. Without them their performance characteristics are diminished to the point of not providing the high levels of speed, reliability and capacity required to justify their costs.

The matrices on the pages that follow show the results of applying the screening criteria to the RTC - SU and the Eastwood – OCC corridors. The eligibility screening analysis indicated that more capital intensive modes of transit, such as BRT – Busway and LRT, would not meet the eligibility criteria to be considered for FTA Small Starts funding, the primary source for transit capital funding for projects like this around the United States. This is due to three main factors: the projected high capital and operating cost of these modes, the lack of available ROW to take advantage of their benefits, and the relatively low ridership in the study corridors (as compared to transit systems throughout the U.S.). Two modes, BRT – Bus Lane and BRT – Mixed Traffic, as well as existing service improvements, were recommended for further analysis in the SMART 1 study.

RTC – SU Corridor Mode Assessment

		LRT 	Modern Streetcar 	BRT-Busway 	BRT-Bus Lane 	BRT- Mixed Traffic 
screening methodology	Dedicated ROW North Segment 	✓ Available	⊘ N/R	✓ Available	⊘ N/R	⊘ N/R
	Dedicated ROW South Segment 	✗ Not Available	⊘ N/R	✗ Not Available	⊘ N/R	⊘ N/R
	Total Cost (in millions) 	✗ \$457	✗ \$426	✓ \$190	✓ \$25	✓ \$10
	Local funding (in millions) 	✗ \$357	✗ \$326	✗ \$90	✓ \$5	✓ \$2
	Existing Ridership 	✓ 3,726	✓ 3,726	✓ 3,726	✓ 3,726	✓ 3,726
	Operating Cost Increase 	✗ 26%	✗ 22%	✗ 18%	✗ 6%	✓ 5%
	Further Study? 	✗ No	✗ No	✗ No	✓ Yes	✓ Yes

✗ indicates results that do not meet eligibility criteria. ⊘ not required
 ✓ indicates results that meet eligibility criteria.

Eastwood – OCC Corridor Mode Assessment

		LRT	Modern Streetcar	BRT-Busway	BRT-Bus Lane	BRT-Mixed Traffic
						
screening methodology	Dedicated ROW North Segment 	✓ Available	⊘ N/R	✓ Available	⊘ N/R	⊘ N/R
	Dedicated ROW South Segment 	✗ Not Available	⊘ N/R	✗ Not Available	⊘ N/R	⊘ N/R
	Total Cost (in millions) 	✗ \$526	✗ \$491	✓ \$219	✓ \$27	✓ \$11
	Local funding (in millions) 	✗ \$426	✗ \$391	✗ \$119	✓ \$5	✓ \$2
	Existing Ridership 	✓ 3,456	✓ 3,456	✓ 3,456	✓ 3,456	✓ 3,456
	Operating Cost Increase 	✗ 30%	✗ 25%	✗ 20%	✗ 7%	✗ 6%
	Further Study? 	✗ No	✗ No	✗ No	✓ Yes	✓ Yes

✗ indicates results that do not meet eligibility criteria. ⊘ not required
 ✓ indicates results that meet eligibility criteria.

3 Alternatives Development



The Mode Screening identified the transit modes (i.e., BRT – Mixed Traffic and BRT – Bus Lane) that are most likely to meet the eligibility criteria for the Small Starts funding program and, therefore, meet the transit needs of the Syracuse region through established funding programs. The next step was to define specific alternatives, with each alternative consisting of a specific mode on a specific route.

The Small Starts program requires an “alternative” to consist of the following features:

- Defined stations with shelters and schedule information meeting ADA requirements;
- Traffic signal pre-emption and queue jump lanes;
- Headways of at most 10 minutes during the peak and 20 minutes during off peak times, or 15 minutes for both peak and off-peak for at least 14 hours on weekdays; and
- Brand identification.

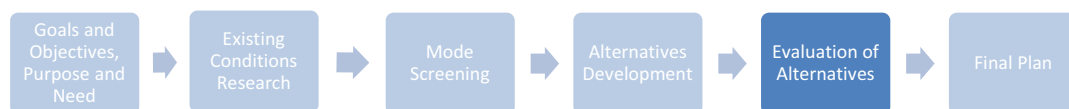
In addition to the above Small Starts program requirements, the characteristics of the alternatives include specific routings, station locations, transit priority locations, station characteristics, schedule frequencies, and calculated run times. In order to identify station locations, a specific route must be determined within each corridor. The combination of a specific route and a mode option can then be used to define individual alternatives. When conducting Alternatives Analysis, agencies are also required to study a “no-build” alternative to better understand what operational improvements could be made without the capital investment. Each corridor in this study also included an existing service improvements alternative to meet this requirement.

Characteristics that were considered in the development of alternative routes included directness, connections to important activity centers, accessibility for pedestrians, and use of main commercial streets where possible, both to provide access to these places and to avoid noise and traffic impacts on quieter residential or secondary streets. These characteristics provide the environment needed for fast and frequent BRT service while limiting any adverse effects. In most cases, this type of direct route existed along only one potential routing.

On both the Eastwood – OCC and RTC – SU corridors, Existing Service Improvements offers increased frequency, especially at off-peak hours, potential rationalization of peak-hour scheduling, and slightly increased span of service. Travel time would not be improved substantially over existing service, though riders would benefit from other improvements, including potential reduction of average wait times. The Existing Service Improvements represents a “no build” alternative for each corridor.

Two “build” alternatives were defined for each corridor, which offer substantial benefits in terms of travel time: a reduction of between 25 and 30 percent, or up to 20 minutes, compared to existing travel times and the Existing Service Improvements alternative. On both corridors, the BRT – Bus Lane alternative would offer slight (approximately 2 minute) travel time improvements over the alternatives without bus lanes. FTA requirements would mean the BRT – Mixed Traffic and BRT – Bus Lane alternatives would offer substantially improved frequency relative to existing service and the Existing Service Improvements alternative.

4 Evaluation of Alternatives



The Federal Transit Administration determines a Small Starts project’s rating, and therefore likelihood of funding, based on a number of factors grouped into Project Justification and Local Financial Commitment categories. The criteria are comprehensive and are meant to take into consideration the wide range of benefits that improved transit brings to a community.

The evaluation criteria for ranking the SMART 1 alternatives are based on these Small Starts rating categories. This provides both a sound basis for choosing between the alternatives and an understanding of how they are likely to perform relative to other projects currently in the Small Starts process. The Small Starts process is competitive, so projects that rank higher on the criteria are more likely to be funded. The 14 evaluation criteria take into account the SMART 1 project goals and objectives and are simplified from what FTA would require for a final submittal for Small Starts funding since the purpose of the Alternatives Analysis is to choose between them, not optimize the LPA for grant competition.

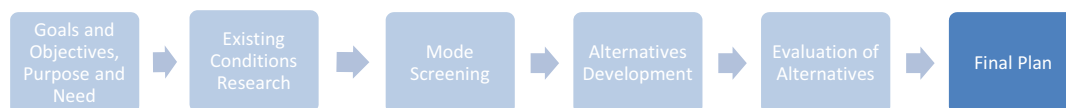
The result of the criteria analysis for each corridor are shown on the next page. The base alternative, or No-Build, in both corridors received the lowest score. Along the RTC – SU corridor, Alternative 1 scored 30 out of 42 points; the second highest score for the corridor. Alternative 2 scored the highest with 34 points, while Alternative 3 (27 points) tied for the lowest score. Alternative 2 scored the highest due to more significant benefits than the other options, such as reasonable cost, and general community support, which Alternative 3 lacked.

Relative to the Eastwood – OCC corridor, Alternative 1 scored 31 points making it the second lowest score on the corridor. Alternatives 2 and 3 both received 34 points and tied for the most points. Alternatives 2 and 3 tied for best score due to more significant benefits combined with reasonable costs. The two balanced

each other out with Alternative 2 having significant benefits at a lower cost and Alternative 3 having more benefits, but at a proportionately higher cost.

RTC – SU corridor		Eastwood – OCC corridor	
Alternative	Score	Alternative	Score
Base case	27	Base case	26
Alternative 1 (Existing Service Improvements)	30	Alternative 1 (Existing Service Improvements)	31
Alternative 2 (BRT – Mixed Traffic via Salina St)	34	Alternative 2 (BRT – Mixed Traffic)	34
Alternative 3 (BRT – Bus Lane via Solar St)	27	Alternative 3 (BRT – Bus Lane)	34

5 Locally Preferred Alternative



Based on the criteria analysis described in the Evaluation of Alternatives chapter, an LPA consisting of Alternative 2: BRT-Mixed Traffic was chosen for both corridors. Collectively, implementing both corridors at once will create a BRT system that increases the number of trips that can be made through connections, in effect creating four corridors rather than just two, and therefore increase ridership on both. Relative to capital and operating costs of the LPA, the following preliminary, planning level order-of -magnitude costs have been created. To implement both corridors at once, the capital cost would be approximately \$33.528 million.

Capital cost

BRT – Mixed Traffic	
RTC – SU Corridor	Eastwood – OCC Corridor
\$13.982 million	\$19.546 million

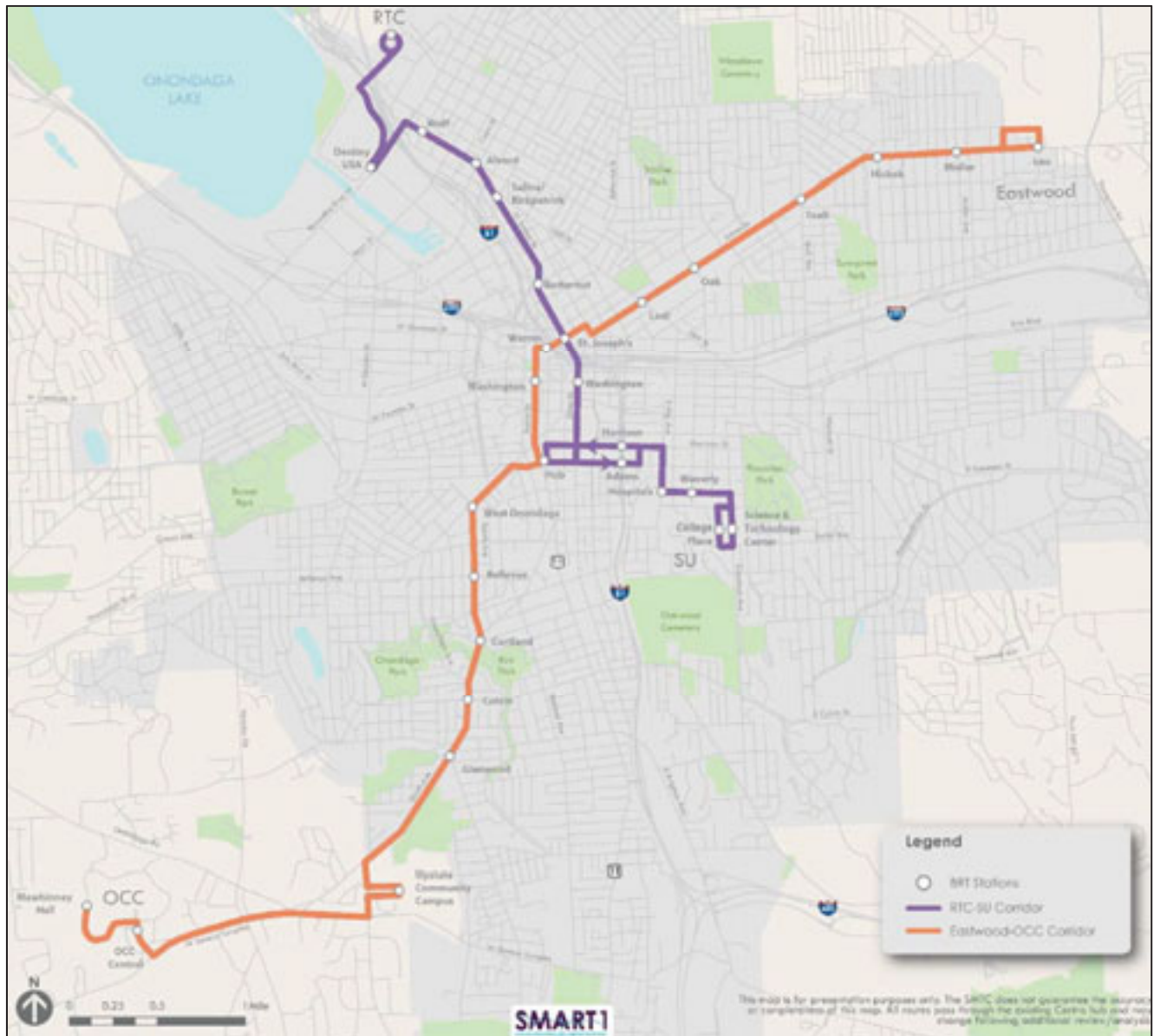
Operating cost (annual)

BRT – Mixed Traffic	
RTC – SU Corridor	Eastwood – OCC Corridor
\$3.481 million	\$4.751 million

The relative closeness of the evaluation criteria summation process indicated that the BRT - Mixed Traffic alternatives as developed met the technical requirements of the study goals. Additional analysis, however, was required to arrive at a clearer LPA recommendation for the area. Three additional factors beyond the Small Starts inspired criteria, were considered: intangible benefits, support for the goals of SMTC's LRTP, and support for economic development in Syracuse neighborhoods.

An enhanced transit system is critical to achieving these goals and inspiring people, businesses and institutions to support implementation and funding. With this support, regional leadership can decide to spend the money required to transform the transit system.

Locally Preferred Alternative



6 Implementation Plan and Financial Plan

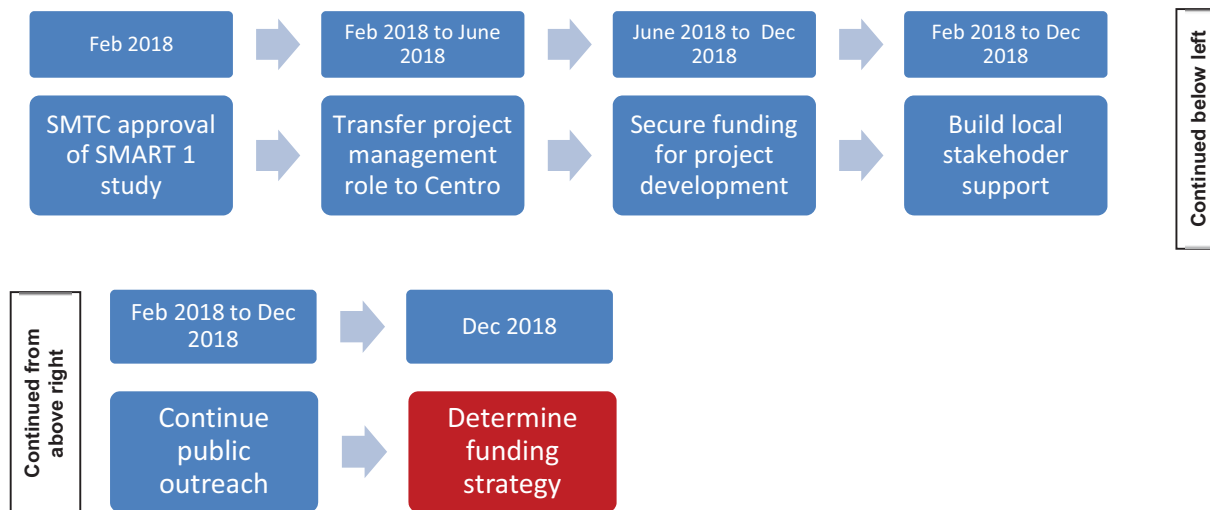
Implementation Plan

The LPA could, potentially, be funded through the FTA's Section 5309 Small Starts, but there are also alternatives to this funding source. The implementation and financial plan, therefore, describes a planning and implementation process that could move forward with or without the use of Small Starts funding. Each approach has its advantages and disadvantages, and the final decision on the preferred approach will be made in the next phase of work. This next phase will take the project through project development, which includes advanced planning, engineering, environmental assessment, and additional public outreach. This applies to both the Small Starts and non-Small Starts tracks.

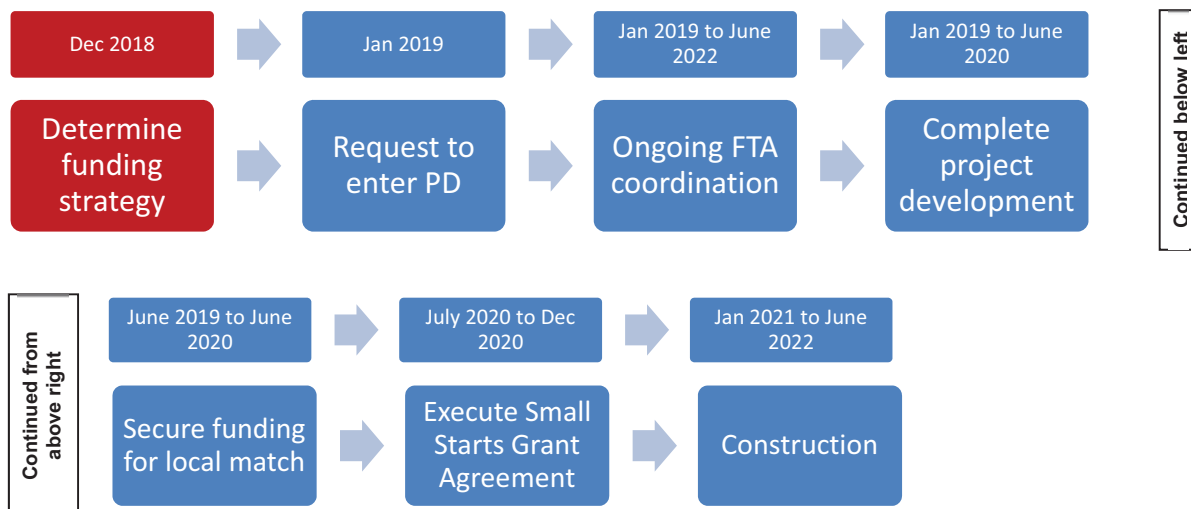
The Syracuse region has never used the Small Starts program. Stakeholders, project staff, and the public would need to be educated on the program's requirements and how it can be used to bring larger rapid

transit projects to fruition. Either approach (i.e., Tracks One or Two) would require a coordinated effort between SMTC, Centro, and other stakeholders to assemble project funding from multiple federal, state, and/or local sources. The graphic below provides a plausible approach to establishing next steps with the outcome being to determine a funding strategy to advance (Track One or Track Two).

Short-Term Next Steps



Track One – Small Starts



The Federal Transit Administration's Section 5309 Capital Investment Grant (CIG) program is one of the primary funding sources for new BRT, streetcar, LRT, heavy rail, and commuter rail projects in the U.S. The program consists of three main components, distinguished by the size and type of project: New Starts, Small Starts, and Core Capacity. The target CIG program for the SMART 1 LPA is the Small Starts program, which is oriented towards projects with a maximum total capital cost of \$300 million. Several New York State projects are currently in the Small Starts Project Development pipeline, including the Capital District Transportation Authority's River Corridor and Washington/Western BRT projects, and the New York City DOT Woodhaven Boulevard Select Bus Service.

Applying for Small Starts funding is a multi-step, and multi-year process, conducted in close coordination with FTA. The Small Starts evaluation process is designed to evaluate the effectiveness and benefits of the proposed project as well as the financial commitment and readiness of the project sponsor. The first step is to request entry into Project Development. This is the phase whereby a project sponsor completes project

design/engineering, environmental evaluation, and third-party agreements, and also secures necessary funding for construction. Projects are recommended for funding by FTA, but actual federal funding is appropriated by Congress in its Annual Budget. Once funding has been appropriated and the project sponsor has satisfied all necessary Project Development requirements, FTA executes a Small Starts Grant Agreement to authorize project construction.

A key requirement to enter Small Starts Project Development is the need for committed non-5309 funding to complete Project Development activities, including engineering, design and NEPA. This may be the most difficult practical hurdle for an agency seeking to pursue the Small Starts program, and suggests that advanced work to secure Project Development funds from non-5309 sources is an essential element of the project implementation and funding strategy. Funds expended on planning and design after permission to enter project development has been received are eligible for pre-award authority for reimbursement by FTA if the project is selected for funding.

Track Two – Non-Small Starts



The non-Small Starts funding approach would use a variety of other smaller grant programs, itemized in the Financial Plan section. Coordinating between these programs would then become a large part of the management of the implementation of the project. In this approach, the project would likely be implemented in steps as funding comes available for specific elements. A non-Small Starts process would allow Centro to phase implementation of BRT project elements over time based on available funding. For example, essential station elements, vehicles, related technologies (i.e., transit signal priority) could be deployed in an initial phase or multiple phases, with further project elements implemented at a later date subject to available funding. In this case, a critical aspect of the implementation plan will be defining what those essential elements are to activate the service on day one, and what amount of capital and operating funding is required to implement that opening day vision.

Financial Plan

Financial planning for transit capital projects is in a particularly dynamic state given policies and actions of the current federal administration. For example, FTA is currently rating candidate Small Starts projects as required by statute, but is not currently recommending rated projects for funding. The financial plan considers both capital and operating funding. A wide variety of capital funding sources are available on the Federal and State levels that could be used to fund the SMART 1 LPA. These sources include Small Starts, other Federal transit and highway programs, and State transit, highway, and economic development programs. Capital funding may also be available from local private sources, particularly for the construction of stations, where stakeholders may be interested in helping to fund the construction of a station at one or more of their facilities. While often requiring extensive application processes, the SMART 1 LPA provides significant mobility and economic benefits to the City of Syracuse and its residents and is likely to score well relative to other applicants for one or more of these programs.

Operating funding is a more significant challenge, both because it is a continuous, ongoing requirement and due to the limited sources available. The number of programs available to cover transit operating expenses in New York State consists primarily of the Mortgage Recording Tax and State Transit Operating Assistance (STOA). The Mortgage Recording Tax is fixed and STOA is a formula program tied to passengers carried and service miles operated. Both of these funding sources are already fully programmed by Centro. Federal funding for transit operations is only available to rural and other small communities and not available to the Syracuse region. This will require the exploration of innovative funding and revenue sources such as support from major institutions, increases in fare revenue, service operational efficiencies, and employer pass programs.

1 Overview of the SMART1 Study

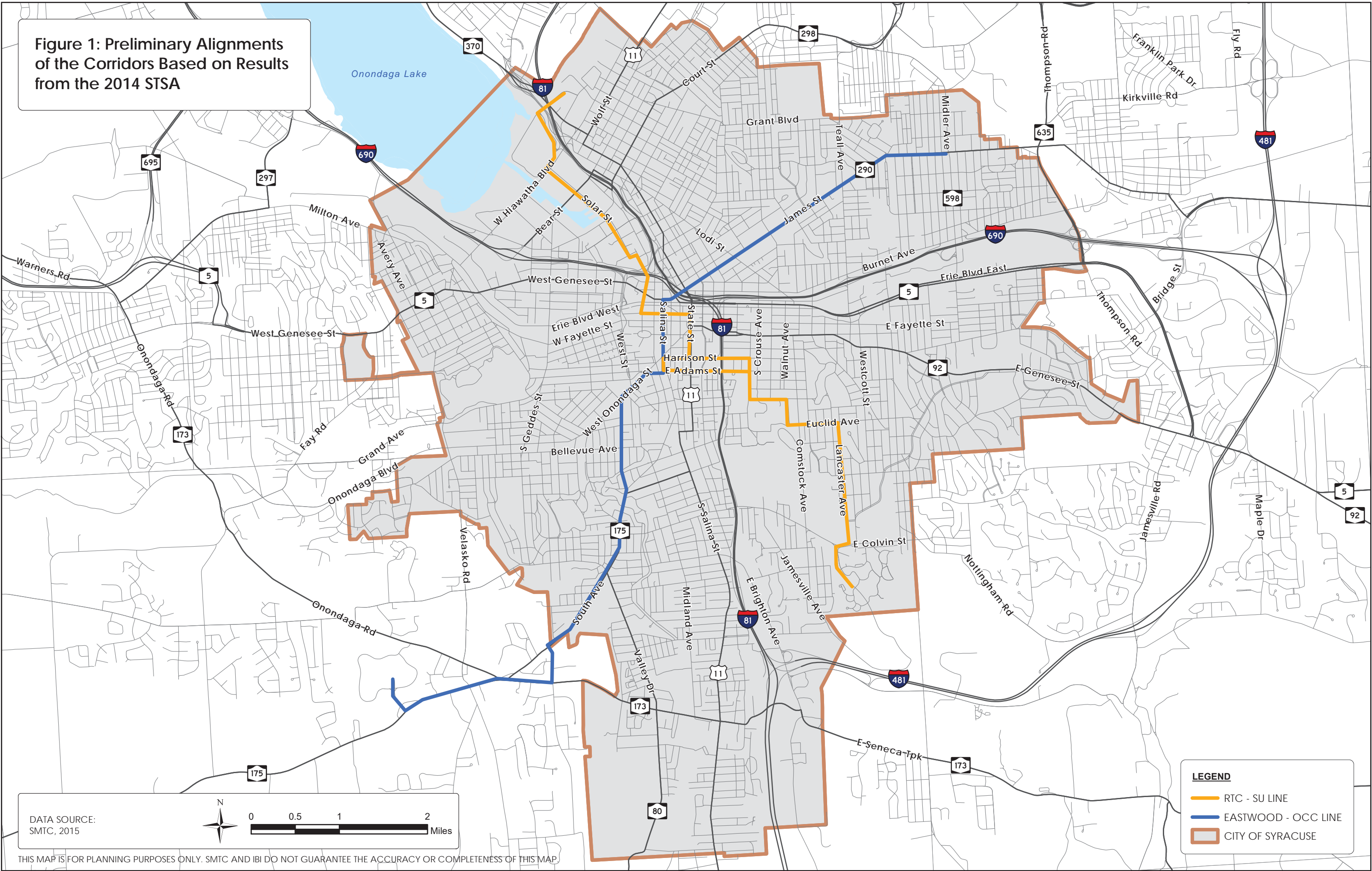
1.1 Introduction

On behalf of Centro, the Syracuse Metropolitan Transportation Council (SMTC) Syracuse Metropolitan Area Regional Transit Study Phase 1 (SMART 1) builds upon the analysis and findings of the 2014 Syracuse Transit System Analysis (STSA) completed by the New York State Department of Transportation (NYSDOT) as a component of The I-81 Challenge. The goal of the STSA was 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 it serves. The STSA presented a series of short-term, mid-term, and long-term recommendations detailing how the Syracuse Metropolitan Area's transit system could be structured to meet identified needs in a cost-effective manner. The analysis identified six transit improvement corridors to evaluate enhancements (i.e., Bus Rapid Transit, Light Rail Transit and Commuter Rail) that could potentially meet the goals and objectives of the STSA.

A transit improvement corridor in the STSA was defined as a general alignment of one or more major travel routes within the Syracuse Metropolitan Area. 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 consisted of both roadway and rail infrastructure. Two of the transit improvement corridors identified in the STSA were selected for further analysis in the SMART 1 study: 1) the Regional Transportation Center (RTC) – Syracuse University (SU) Corridor and 2) the Eastwood – Onondaga Community College (OCC) Corridor (Figure 1). The STSA found that these corridors had the greatest potential to support enhanced transit service due, in large part, to relatively high existing ridership and the presence of significant ridership generators along the corridors.

The SMART 1 study completed an evaluation of modes, alignments, station locations, ridership, service plans, capital/maintenance/operational costs, economic development, land use, zoning, engineering feasibility and environmental factors associated with the key corridors to identify a locally preferred alternative for each corridor. Throughout this project, the SMTC engaged in a public outreach process in order to get as much input, feedback and community involvement as possible.

Figure 1: Preliminary Alignments of the Corridors Based on Results from the 2014 STSA



1.2 Goals and Objectives

The following goals and objectives guided the SMART1 study process and the development of its recommendations. They were developed with the guidance of the project Study Advisory Committee.

1.2.1 Consensus Building Goals

These goals describe how the study was carried out and how it interacted with regional stakeholders.

- Involve a large and diverse mix of community members through an unbiased, transparent and meaningful outreach program.
- Support the planning goals of SMTC, Central New York Regional Transportation Authority (Centro), City of Syracuse, NYSDOT and other important stakeholders.
- Adopt a Locally Preferred Alternative (LPA) that is technically feasible, includes a sound financial plan, and has the broad support of Centro, SMTC, City of Syracuse and other key stakeholders.
- Follow standard Federal Transit Administration (FTA) procedures to facilitate the transition to the project development process and assure project competitiveness in the Small Starts program.

1.2.2 Transportation Goals

These goals guided the development and selection of alternatives and describe the desired transportation outcomes.

- Build on the analysis and conclusions of the Syracuse Transit System Analysis and confirm the selection of the preliminary corridors.
- Improve the utility of transit service for core riders by reducing travel time, improving headways, expanding route coverage, and generally increasing travel options.
- Develop a plan for a high-intensity transit investment that is preferred for trips to and within downtown Syracuse because it has:
 - Frequent service;
 - Convenient and accessible alignments and stops;
 - Comfortable vehicles; and
 - Seamless connections to other regional transit services.

1.2.3 Development Goals

These goals guided the way the alternatives will impact the communities that surround the proposed alternatives.

- Support revitalization of Downtown and other neighborhoods along the selected corridors by encouraging transit oriented development and infill.
- Utilize transit to improve connectivity between key locations in Syracuse supporting economic, cultural, social, and health-related development opportunities.

- Plan to increase the effectiveness of transit in Syracuse, providing a vision for how it could contribute to a vibrant, inclusive, and prosperous city.

1.3 Purpose and Need

1.3.1 Purpose

The purpose of the enhanced transit system in the RTC – SU and Eastwood – OCC corridors is to provide faster, more direct, more frequent, and more reliable transit service between major residential areas and activity centers in the Syracuse metropolitan area, at a reasonable capital and operating cost. These two transit corridors are the most heavily travelled in the Syracuse region. Both were identified for further study in the STSA and were developed in more detail in the SMART 1 study. The provision of improved transit service will enhance mobility for all, encourage economic development, alleviate environmental impacts of transportation, and improve the quality of life along the study corridors.

The major residential areas and activity centers along the two corridors are shown in Tables 1 and 2.

Table 1: Major residential areas and activity centers along the RTC - SU corridor

RTC-SU Corridor	
Neighborhoods Served	Key Destinations Served
Washington Square	Outer Comstock
Lakefront	Regional Transportation Center
Northside	Destiny USA Mall
Franklin Square	St. Joseph's Hospital-Health Center
Park Avenue	North Salina Street
Downtown	Downtown Syracuse
Prospect Hill	East Genesee Street
Hawley-Green	Crouse Hospital
Near Westside	Crouse-Marshall business district
Southwest	Upstate University Hospital
Southside	VA Medical Center
Near Eastside	SUNY ESF
University Hill	Syracuse University
Westcott	Westcott Street
University Neighborhood	Carrier Dome
South Campus	Goldstein Student Center

Table 2: Major residential areas and activity center along the Eastwood - OCC corridor

Eastwood-OCC Corridor	
Neighborhoods Served	Key Destinations Served
Eastwood	Brighton
Sedgwick	Elmwood
Lincoln Hill	Eastwood
Northside	St. Joseph's Hospital Health Center
Prospect Hill	Downtown Syracuse
Hawley-Green	Bryant and Stratton College
Downtown	Syracuse Community Health Center
Near Westside	Upstate University Hospital Community Campus
Southwest	Onondaga Community College
Southside	SRC Arena & Events Center

Connections to the intercity transportation system, including Amtrak, Greyhound, and Trailways, are made at the RTC.

The project's purpose is consistent with the SMTC's 2050 Long Range Transportation Plan (LRTP), the Onondaga County Sustainable Development Plan, the City of Syracuse Comprehensive Plan, and the STSA. An enhanced transit system is identified as a regional priority in the SMTC's 2050 Long Range Transportation Plan, adopted in 2015.

1.3.2 Need

Fast, efficient, and environmentally sound transit connections between major activity centers are needed throughout the study corridors. A key success factor for improved transit in the study corridors will be increasing ridership to, from, and between the existing and emerging centers along the route including Downtown Syracuse, Destiny USA Mall, Syracuse University, and OCC. The new transit service will directly link many centers along the corridors that have never been linked before by a frequent, all day, through service, which would result in reductions in overall trip time and transfer inconvenience. Improved access between the urban economic and cultural centers of Syracuse will support revitalization efforts and the development of efficient and sustainable land use patterns, and help reduce congestion.

Improved mobility for transit dependent populations throughout the study corridors is needed. The study corridors have a significant percentage of households that do not own automobiles, particularly students and lower income residents. Some sections of the study area, particularly those in proximity to the corridors, exceed 45% without access to an automobile, in contrast to 5.6% in the suburban parts of the region. These individuals and households would find improved access to jobs, shopping, schools and universities, medical services, and other key destinations throughout the corridors.

There is a need to encourage redevelopment and revitalization that is supported by public transit. In some parts of the corridors, 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 some areas, such as near OCC, development patterns are currently auto-centric and inefficient. Access to high quality transit will support redevelopment in a more sustainable, compact, and pedestrian-oriented way.

There is a need to alleviate parking problems and the costs associated with the provision of parking. Parking is a long standing problem in the study corridors particularly Downtown and at major institutions such as universities, colleges and hospitals. Surface parking in particular requires large areas of land that are costly to purchase, require on-going maintenance, create a variety of environmental problems, and discourage efficient development patterns. 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. This is true along the entirety of both corridors but especially in the densely developed University Hill area.

1.4 Study Process and Public Outreach Program

1.4.1 Study Process

The first stage of analysis within the SMART 1 process was mode screening which examined various modes of transit potentially applicable in the study corridors. The mode screening recommended against several high capital cost alternatives, Light Rail Transit (LRT), modern streetcar, and Bus Rapid Transit (BRT) – Busway, that would be very difficult to fund and construct and would be unlikely to provide significant marginal benefit. The next step was to develop specific route and mode alternatives for each of the modes recommended for further consideration: BRT – Bus Lane, BRT – Mixed Traffic, and Existing Service Improvements. These alternatives are based on previous planning studies such as the STSA, existing conditions research, comments from the public and stakeholders, and transit operations analysis. The final element of this study was to develop criteria for selecting an LPA and applying them to arrive at a final recommendation. The process for selecting the LPA for the SMART 1 study is shown in Figure 2.



Figure 2: Process for selecting the SMART 1 LPA

The Final Plan includes an Implementation Plan and Financial Plan that describe the steps required for financing and constructing the LPA.

1.4.2 Public Outreach Program

Engaging the public early and often in the planning process is critical to the success of any transportation plan or program. When people are involved in a decision-making process and can see how their input has influenced that process, they are more likely to adopt its outcomes. As the joint Federal Highway and Transit Administrations guidebook Public Involvement Techniques for Transportation Decision-Making states: “Through continued interaction with the entire community, agencies build community support and, more importantly, assure that the public has the opportunity to help shape the substance of plans and projects.”

The importance of public involvement is underscored by the fact that it is required by numerous state and federal laws. Metropolitan Planning Organizations (MPO) such as the SMTC must provide citizens, affected public agencies, businesses, local government, and other interested parties with a reasonable opportunity to comment on transportation plans and programs.

The public outreach program for this project was designed to be transparent and comprehensive assuring the opportunity for involvement in all phases and at all levels of the planning process. This was achieved by providing early and continuing involvement, complete information, full access to key decisions, and multiple avenues for sharing opinions and ideas. Public outreach efforts included a strong educational component, intended to exchange clear information about issues, challenges, and local priorities, with particular attention toward issues of transit access and connectivity. The community participation events scheduled for the SMART1 study were in keeping with the main purpose and objectives of the SMART 1 Public Involvement Plan (available in Appendix A) and the SMTC's umbrella Public Participation Plan (PPP), which can be found at the SMTC web site, www.smtcmpo.org.

1.4.2.1 Public Engagement Objectives

The goals and objectives for public engagement during the SMART 1 study were to:

1. Gather input on the successes and challenges of the existing transit system,
2. Educate and inform the Study Advisory Committee, key stakeholders, and the community at-large on the potential opportunities for bus rapid transit, or similar, system in Syracuse,
3. Inform the community at-large about the SMART 1 study's
 - a. purpose and need;
 - b. goals and objectives; and
 - c. alternatives under consideration; and
4. Provide a feedback loop through a variety of outreach methods for stakeholders and community members to share input throughout the project.

1.4.2.2 Study Advisory Committee

The SMART 1 Study Advisory Committee (SAC) met regularly during this planning initiative. The SAC's role was to advise the SMTC and consultant team on the technical content of deliverables and to provide needed input and guidance throughout the study, including:

- Defining the purpose and need statement, goals and objectives;
- Assisting with public outreach; and
- Reviewing draft sections of the SMART 1 document.

The SAC was comprised of representatives from the following agencies:

- Centro, a subsidiary of the Central New York Regional Transportation Authority
- City of Syracuse - Planning Division
- Downtown Committee Inc. of Syracuse
- New York State Department of Environmental Conservation (NYSDEC)
- New York State Department of Transportation (NYSDOT)
- Syracuse – Onondaga County Planning Agency (SOCPA)
- University Hill Corporation.

Several SAC meetings were held throughout the course of the study.

1.4.2.3 Stakeholders

Because of the broad scope of this transit analysis, all individuals within the SMTC database were considered stakeholders for this project. SMTC actively sought input throughout the course of the study regarding additional individuals interested in participating in this planning activity and provide valuable input and perspective. Public meeting notices were mailed to all stakeholders on the SMART 1 Stakeholder List.

1.4.2.4 Public Meetings

Three public meetings were held throughout the development of the SMART 1 study. The first meeting took place in February 2016 and the second in November 2016. The final public meeting occurred in November 2017. Below is a summary of the public outreach events. Notes from the meetings are available in Appendix B.

The purpose of the first meeting was to review the data, methodology and recommendations of the 2014 Syracuse Transit System Analysis, review the existing conditions within the two corridors, learn about enhanced transit modes and share information about the next steps of the SMART 1 study.

The purpose of the second meeting was to inform the public of the results of the mode screening analysis, as well as the initial selection of alternative routes to be evaluated and the criteria to be used during that evaluation process.

Input from the first two public meetings was used to analyze the possible corridor routes to arrive at a locally preferred alternative for each corridor. The purpose of the third and final meeting was to present the LPA to the public and solicit comments on its features.

Attendance at the meetings was good, with about 100 attendees at the first, 60 at the second and 50 at the third. Comments at all three meetings were generally positive about the alternatives developed and support was expressed for the LPA.

1.4.2.5 Focus group meetings

The first round of focus group meetings included one meeting for each of three groups: major employers, social service providers, and educational institutions. They were held on May 23 and May 24, 2016. Representatives within each focus group were identified by SMTC staff and the SMART 1 consultant team. Letters were mailed to individuals inviting them to attend a focus group and project team members completed follow-up phone calls and e-mails as necessary. Of the 29 organizations invited to participate in the focus group meetings, 17 participants were able to attend. Based on information provided during each of the focus group meetings, use of the local transit system varies along both corridors. Even though there are differences between riders (student, employee, parent) and the context in which they are using transit (work, school, access to professional health care), there appears to be a set of barriers commonly experienced by all (infrequency of service, language barriers, lack of accessibility for strollers and walkers, perceived lack of safety at stops and, poorly situated or maintained stops. It was also noted that transit riders would walk a little further for reliable, faster, more efficient transit. Additionally, enhancements that improve both the perception and reality of safety at bus stops, such as good lighting, would be welcomed.

On February 6 and February 13, 2017, two additional focus group meetings were held with the Lakefront Area TNT and the Greater North Salina Business Association to elicit more specific feedback on the alignment alternatives that were being evaluated. Based on information provided during each of the focus group meetings, use of the local transit system varies along both Solar Street and North Salina Street. In both locations, a BRT bus-lane was not preferred. Along North Salina Street, the on-street parking is currently too valuable to local business to be replaced with a bus lane. Along Solar Street, the functional value of a BRT bus-lane was not

significant enough to warrant the infrastructural investment. However, both groups indicated that an initial investment in BRT mixed traffic would be most successful along North Salina Street.

1.4.2.6 Pop Up Meetings

Between April and May 2016, SMTC and the consultant team held 9 pop-up meetings at the locations listed below. Staff distributed introductory SMART 1 study brochures and spoke with members of the public. Display boards were present at a few sites. The pop-up meeting locations included:

- James St/Lodi St intersection;
- James St/Oak St intersection;
- South Ave/Valley Drive intersection;
- S Salina St/Water St intersection;
- Syracuse University Student Center;
- College Place transit shelter on Syracuse University campus;
- Onondaga Community College;
- Destiny USA; and
- Centro Transit Hub.

1.5 Other Relevant Studies

The SMART 1 study built upon the previous work of the STSA and other existing transit plans and studies for the City of Syracuse. A summary of these additional plans and their relevance to the SMART 1 study are explored in this section. A total of eleven existing plans, policies and studies were reviewed to understand the background of research related to this study (see Table 3).

Table 3 Documents Reviewed

Document Title	Author(s)	Year
SMTC 2050 Long Range Transportation Plan	Syracuse Metropolitan Transportation Council	2015
Syracuse Transit System Analysis	New York State Department of Transportation	2014
City of Syracuse Comprehensive Plan 2040	City of Syracuse	2014
Coordinated Public Transit – Human Services Transportation Plan	Syracuse Metropolitan Transportation Council	2014
Environmental Justice Analysis – Syracuse Metropolitan Planning Area	Syracuse Metropolitan Transportation Council	2012
James Street Road Diet Study	Wendel Duchscherer Architects & Engineers, GTS Consulting for SMTC	2012
Downtown Syracuse Transportation Demand Management Study	UrbanTrans North America, IBI Group for SMTC	2011

Centro Park-and-Ride Study	ICF International/Central New York Regional Transportation Authority/New York State Department of Transportation	2010
University Hill Park & Ride Feasibility Study	C&S Companies, Solstice Transportation Consulting for SMTC	2009
University Hill Transportation Study	Alta Planning, Edwards and Kelcey for Syracuse Metropolitan Transportation Council	2007
Jobs Access and Reverse Commute Plan	Bergmann Associates for SMTC	2001
Regional Mobility Action Plan	MultiSystems for Centro	1999

1.5.1 SMTC's 2050 Long Range Transportation Plan (2015)

The SMTC adopted the new LRTP in September of 2015. The plan addresses transportation trends and investment needs for the coming 35 years in the areas of freight, safety, accessibility and mobility, with sections on congestion, transit riders, pedestrians and cyclists, and air travel. An enhanced transit system is identified as one of four regionally significant priority projects. The plan estimates that \$689.49 million will be needed for bus replacements, preventative maintenance, and transit capital improvements between now and 2050.

Within the 2050 LRTP, the SMTC examined how much of the population has access to Centro service at the existing urban and suburban service standards. Centro defines service standards as vehicle headways (the time between bus arrivals) and route spacing, based on population density. For this purpose, Centro classifies "urban" areas as having 3,600 people per square mile and "suburban" areas as having 1,800 to 3,600 people per square mile. There are large parts of the SMTC's official Urban Area (based on 2010 Census data) that do not meet the Centro definition of urban or suburban population density.

The SMTC determined that 77% of the population in "urban" areas are within a half-mile of a bus route with an average peak headway of up to 30 minutes, and 70% of the population in "suburban" areas are within one mile of a bus route with an average peak headway of up to 40 minutes.

Relevance to SMART 1: Enhanced transit is identified as a regionally significant project in the LRTP. The SMART 1 study will help the region get closer to making enhanced transit a reality.

1.5.2 City of Syracuse Comprehensive Plan 2040 (2014)

The City of Syracuse Comprehensive Plan 2040 (2014) lays out a vision of future growth by addressing a broad range of subject areas that relate to physical and economic development, as well as quality of life within city neighborhoods.

The Comprehensive Plan 2040 is an update to the Comprehensive Plan 2025 (2005) that provides additional components relating to bicycle infrastructure, historic preservation, land use and development, public art, and sustainability.

The Comprehensive Plan 2040 acknowledges the City's current reliance on automobile travel and the resulting strain on existing roads. The influx of vehicles into Downtown Syracuse has made parking a major land use issue within the core business district. The plan calls for development to be focused around mass transit stops by revising the zoning ordinance to allow for Transit Oriented Development (TOD) to maintain the density needed to support public transit operations and to promote sustainable modes of mass transit.

Relevance to SMART 1: The Comprehensive Plan is a useful guide for the SMART 1 study by promoting consistency with the City of Syracuse's goals and vision for the future of the City. A recommendation of the plan that aligns with SMART 1 is to explore the feasibility of sustainable modes of transit. Other policies that are relevant to SMART 1 include facilitating the revitalization of Syracuse's neighborhood business corridors, investigating more efficient transit options to ensure transportation networks that are fast, efficient and reliable, and calls for the implementation of a Complete Streets Policy to increase mobility for all residents. The City is in the process of revising the zoning code to be consistent with the Comprehensive Plan. This effort, called "ReZone Syracuse" calls for higher density, more transit supportive development along the corridors identified in the SMART 1 study, along with others in the city.

1.5.3 Coordinated Public Transit – Human Services Transportation Plan (2014)

The Coordinated Public Transit – Human Services Transportation Plan was first developed in 2008 to comply with a prior federal surface transportation authorization (i.e., SAFETEA-LU), which required MPOs to have a coordinated plan to improve services for elderly, disabled, and low-income populations through:

1. Identifying gaps and overlaps in service, and
2. Providing prioritized recommendations for service improvements.

The plan was updated in 2014 to account for various federal transportation funding changes included in MAP-21, the federal surface transportation bill at that time that provided funding for transit services. The Coordinated Plan covers the MPO planning area that includes all of Onondaga County and parts of Oswego and Madison counties.

Recommendations from the Coordinated Plan include, but are not limited to:

- Purchasing accessible buses or vans;
- Establishing a Mobility Management Center for scheduling and dispatching of various transportation trips;
- Expanding hours of transportation services for persons with disabilities, low-income individuals, and the elderly;
- Coordination with other service providers to improve service and cut costs through economies of scale; and
- Shifting agency trips to the regular transit route system, which operate on fixed schedules along specific routes with vehicles stopping to pick up and deliver passengers to specific locations.

Programs such as Rides to Work, which provided rides to low-income residents with jobs inaccessible by transit, were funded through this plan between 2008 and 2012. Services provided in the area range from Centro's fixed route service to dial-a-ride services that pick up elderly and disabled users and transport them to their destination. Some services have volunteer drivers and the time consumed for scheduling has been a barrier to the service.

Relevance to SMART 1: This plan identified gaps in transit service for the elderly, disabled and low-income populations. The populations are typically transit-dependent. SMART 1 should consider these populations and the recommendations of this plan in its study.

1.5.4 Environmental Justice Analysis, Syracuse Metropolitan Planning Area (2012)

The Environmental Justice Analysis, conducted by the SMTTC, evaluates the impacts of transportation planning and investments on low-income and minority populations in the Syracuse region. The area studied includes the entire SMTTC Metropolitan Planning Area (MPA).

Areas with 20 to 36% minority populations were identified as Concentration Areas, and areas with greater than 36% minority populations were identified as High Concentration Areas. No tracts outside the City of Syracuse were found to contain high concentration areas. The entire MPA has a minority concentration of 20%.

Low-income Concentration Areas were defined as tracts with less than 80% of the median income for the MPA as a whole. High Concentration Areas were defined as tracts with less than 50% of the median income for the MPA. Low-income high concentration areas were all found to exist in the City of Syracuse central core area.

For senior citizens, the threshold for a Concentration Area was 13% to 18%. Areas with over 18% were identified as High Concentration Areas. The majority of senior citizen high concentration areas were situated in suburban areas adjacent to or on the outskirts of the City of Syracuse.

In ranking priority areas, each tract was given a value corresponding to environmental justice. A concentration area had a value of 1 and a high concentration area was given a value of 2, each of the tracts were given corresponding values for each target group, then totaled up to a maximum score of six, resulting from a 2 in each of the three areas. Any tract receiving a zero (meaning they had no concentrations of the target populations) was excluded. The City of Syracuse had the highest concentration of high priority areas (with scores of 4, 5 and 6) on the west side and the city core. The northern half of the MPA is made up of all of the priority areas.

Relevance to SMART 1: This study provided demographic data on the SMART 1 study area. This study focuses on groups of low-income, elderly and persons with disabilities who often rely on public transit. The transit improvement corridors that are being analyzed for the SMART 1 project are located in medium and high priority areas.

1.5.5 James Street Road Diet Study (2011)

A road diet is a reduction in lanes or modification of lanes to serve all road users such as transit and bicyclists. The James Street Road Diet Study sought to calm traffic and improve the streetscape for everyone without adversely affecting automobile flows. The study area was James Street from Oswego Boulevard to Shotwell Park/Grant Blvd.

The five alternatives identified for James Street were:

1. No Build.
2. Pavement Reallocation – two travel lanes with center turn lane. Extra pavement would be turned into on-street parking or bike lanes. Bus pullouts would be needed.
3. Enhanced Transit – two travel lanes in center for cars, two travel lanes on outside, one in each direction for transit and bicyclists.
4. Roadway Reconstruction – three lanes with widening in spots for transit or street parking addition of green space and reduction of pavement, off-street, multi-use path on both sides and green storm water options.
5. Traffic Signal Coordination without Road Diet – optimization and coordination of traffic signals, pedestrian/transit improvements and streetscape elements like street trees.

The study concluded that Alternative 2 met all of the road diet project's objectives. However, the public strongly supported improving traffic flow through the corridor for motorists which they felt was best served by Alternative 5. The report recommended taking an incremental approach to implementing Alternative 2 while continuing the conversation with the public about which approach was best.

Relevance to SMART 1: James Street is a selected corridor area for rapid transit service implementation in the SMART 1 study. An Eastwood to OCC high-capacity transit line with a

James Street routing could benefit from an enhanced roadway that prioritizes transit and bicycles and improves the corridor's transit trip times to be competitive with private automobiles. A number of the James Street Road Diet Study goals are directly relevant to SMART 1 including: enhancing access and mobility for all users; balancing the needs of commuters and residents; and providing a healthy environment through the provision of sustainable transit options.

1.5.6 Downtown Syracuse Transportation Demand Management Study (2011)

The Downtown Syracuse Transportation Demand Management Study was conducted to assess the potential for a Transportation Management Association (TMA) to improve commuter and visitor access to Downtown Syracuse. A variety of different trip reduction methods were considered including teleworking, off-peak driving, carpooling, public transit and more. A majority of people who commute fully within the City of Syracuse are within 5 miles of the downtown study area. Bicycling and public transit could be viable alternative commute options for these commuters.

Downtown employees surveyed in the study revealed that driving alone was the predominant travel mode at 80% followed by carpooling at 10%. As many as 20% of employees said they would like to receive information on carpooling, walking, bicycling and public transit, and 22% said they would ride the bus four times a week or more if provided a free transit pass. Parking is perceived to be a concern; 47% of survey respondents were not aware of all their parking options and 72% thought they paid too much for parking. Employers surveyed showed high concern for bicyclist and pedestrian safety and lack of bicycle routes; 37% expressed interest in being a part of a TDM program and 47% were willing to contribute financially to support a TMA.

Creating a TMA was not recommended by the study due to lack of support and funding, but a Transportation Stakeholders Organization (TSO) is possible and recommended to help implement a plan to address transportation issues. TDM strategies that could be implemented by the TSO are partnering with NYSDOT's online carpool matching site and creating a guaranteed ride home program, which 41% of employees said would lead them to change their travel behaviors, tied with availability of public transit information tailored specifically to their commute needs. Coordinating with Syracuse University and other employers interested in TDM solutions is another recommendation.

Relevance to SMART 1: This study identifies and quantifies the demand for transportation alternatives, including public transit. The survey data provided by commuters and employers is critical background information to understand the needs and priorities of the area and will assist the study in tailoring those needs to ensure successful routing, service quality, and frequency that make public transit more attractive to its users.

1.5.7 Centro Park-and-Ride Study (2010)

The Centro Park-and-Ride study was an assessment of the existing Park and Ride facilities and an analysis of potential areas for future locations. The study looked at both existing and potential new locations for park-and-ride lots, all in suburban locations not near either of the two SMART 1 study corridors. Nineteen park-and-ride lots, currently in existence, are spread out across the county in mostly suburban locations.

Relevance to SMART 1: This study provided some background information on existing park-and-ride lot locations and their effectiveness but did not directly affect the two corridors under consideration in the SMART 1 study.

1.5.8 University Hill Park and Ride Feasibility Study (2010)

The University Hill neighborhood is a high-density development area which would benefit from reduced car traffic on congested area streets through the encouragement of active transportation, improvements to the streetscape, and development of a remote parking facility.

Two potential local sites for park-and-ride facilities were identified at the Syracuse Housing Authority and Kennedy Square. Potential regional sites were identified at Destiny USA/Inner Harbor, Teall Avenue and Brighton Avenue. As examples, a variety of medical/educational institution park-and-rides have already been implemented in areas such as Pennsylvania, Massachusetts and Texas. However, shuttle services, especially if operated at convenient frequencies, add significantly to the cost of parking. If garages are built on University Hill, the report recommended wrapped garages and mixed use structures which create a friendlier pedestrian streetscape and provide retail and residences in addition to needed parking.

Criteria for future park-and-ride site selection include:

- Size: To accommodate a garage, the site should be a minimum of 1.0 acre, a minimum of 7.5 acres is required for non-garage surface parking.
- Location: The site should be located near University Hill or in a suburban location.
- Location: The site should be located within a 10-15 minute shuttle ride and preferably a 10 minute walk from the Hill or in a suburban location.
- Location: The site should be located within easy access of I-81 or I-690.

All of the short term recommended areas require an expansion of Centro bus service.

Relevance to SMART 1: The two SMART 1 study corridors could potentially serve several of the sites identified in the University Hill Park & Ride Feasibility Study.

1.5.9 University Hill Transportation Study (2007)

University Hill is a thriving and rapidly developing neighborhood that has experienced increases in congestion. The key goal of the study is to reduce the growth in auto use without harming businesses.

Options identified to improve travel to the area include:

- Modifying the street network to add more route choices.
- Changing one-way streets to two-way streets to improve circulation and access.
- Improving the pedestrian connection between Downtown and the neighborhood by altering the I-81 viaduct which separates and isolates the neighborhood from Downtown.
- Expanding pedestrian and bicycle travel can reduce parking demand while supporting neighborhood retail.

Transit service provided in the area includes Centro bus routes and various shuttle services provided by the University and medical district.

The final study recommendations include:

- Implementation of a joint, mixed-use development program.
- Creation of a prioritized transit network including:
 - Implementation of a streetcar or BRT route from Downtown to University Hill via West, Harrison, and Irving/Crouse Streets.
 - Providing mobility hubs at key locations.

- Reconfiguration of the Almond Street corridor.
- Restoration of two-way streets.
- Establishment of a bike boulevard network.
- Adoption of an integrated parking strategy.

These recommended plans and investments will help achieve the goals of the University Hill neighborhood area while ensuring a high quality of life for all of the area users and a model for future growth areas and neighborhoods.

Relevance to SMART 1: The University Hill Transportation Study provides specific recommendations for improvements to the transit system between Downtown and University Hill including routes, station and mobility hub locations, and features of the service. These recommendations, as well as the lessons learned from implementing the Connective Corridor in the same alignment, can be applied to planning for the RTC-SU corridor.

1.5.10 Job Access and Reverse Commute Plan (2001)

The Job Access and Reverse Commute (JARC) program was established by the FTA to address the unique transportation challenges faced by welfare recipients and low-income persons seeking to obtain and maintain employment. The JARC program was discontinued in September of 2016.

Many new entry-level jobs are located in suburban areas, and low-income individuals have difficulty accessing these jobs from their inner city, urban, or rural neighborhoods. In addition, many entry-level jobs require working late at night or on weekends when conventional transit services are either reduced or non-existent. Several employment-related trips are complex and involve multiple destinations including reaching childcare facilities or other services. At the time, JARC Section 5316 funds were made available by the FTA for capital and operating costs of providing these transportation services in large urban areas.

The JARC plan identified the areas of employment services and worker locations, and gaps in the transportation network. Many services beyond Centro bus service such as volunteer transportation services, medical transport and paid transportation services were included in the analysis. Onondaga County had a 25% shift of people from the city to the suburbs from 1960 to 1990, while the percentage of Onondaga County employment sites located outside of the City of Syracuse reached 56% by 1990. This creates challenges in providing transit service to low-density areas due to inherent inefficiencies.

Gaps in transportation were identified in eleven areas with six chosen for further study:

1. Carrier Circle area.
2. Henry Clay Boulevard and Morgan Road Industrial area.
3. Erie Boulevard to Bridge Street/NYS Route 290/Manlius Center Road.
4. Taft Road.
5. Cicero/Route 11/South Bay Road/ Route 31.
6. Farrell Road/ Stiles Road.

Three areas were identified as needing more in-depth study: childcare transportation, rural services and the expansion of the Carousel Mall (Destiny USA). Access to childcare is a barrier for low-income parents trying to get off of welfare assistance programs. Many parents struggle to drop off their children at childcare facilities then make it to work in a reasonable period of time and on time. JARC transportation funding was specifically designed to fill this gap in the transportation system. Rural areas have similar challenges to the suburbs in that the large land area to low population ratio makes providing transit service fiscally unsustainable, and low-

income workers find it incredibly difficult to get to work. Wheels for Work was another program that helped rural people travel to and from employment centers for work. Dial-a-ride and flex route type service may also work in rural areas. The Carousel Mall expansion was expected to bring a large number of new jobs for Welfare-to-Work recipients and the JARC study suggested that Centro could modify its service to serve these new jobs.

Relevance to SMART 1: Even though the JARC program no longer exists, this study provides important data on low-income, transit-dependent families and identifies critical transit service needs for the area. Destiny USA is located on one of the two corridors studied in SMART 1 and familiarity with the needs of this population will help provide service that will enable Centro to expand the ridership base and fill service area gaps. Demographic data about shifts in the population is also relevant to the current study.

1.5.11 Regional Mobility Action Plan (1999)

The Regional Mobility Action Plan (ReMap) was developed to find efficiencies for operating public transit in Onondaga County.

ReMap had six overall objectives:

1. Provide the right service for the right market: urban, rural and suburban service.
2. Collaborate with private and non-profit service to increase efficiencies.
3. Introduce service tailored to specific markets.
4. Establish transit hubs at key locations throughout the region.
5. Introduce circulators and feeder services.
6. Strengthen the fixed route system through increasing the frequent service network.

Several service concepts were identified to help achieve a more efficient and effective system:

1. Urban core local route service.
2. Transit centers and park-and-rides.
3. Regional fixed route service.
4. Express commuter service.
5. Local feeder services.
6. Rural service.
7. Reverse commute service.

Service concepts were developed for two scenarios: a moderate- and a high-investment scenario. Different transit services were proposed for different vehicles based on service type: lower ridership routes would get shorter buses and service frequency will be higher on the trunk routes than on the feeder and suburban routes.

The annual costs for the moderate scenario were estimated from \$24.7 million in 2000 to \$31.2 million in 2009. In the high scenario, the range was \$25 million in 2000 to \$34.9 million in 2009. Some coordination strategies evaluated included shifting trips to Centro's fixed route system, purchasing trips in volume from vendors, grouping trips together to minimize service duplication and consolidating administrative and support services. The creation of a Regional Mobility Manager position was identified to help implement these strategies.

Relevance to SMART 1: ReMap provided an extensive analysis of route performance and cost effectiveness, and identified service needs for bus routes within the SMART 1 corridors. Although a bit dated, this plan provided a good basis of corridor analysis that the SMART 1 Plan considered. In particular, the plan's recommendations to create a mobility hub on University Hill

and to improve service along the James Street corridor fell neatly into the purview of the SMART 1 plan.

2 Existing Conditions



2.1 Data Documentation and Analysis

SMTC's 2050 LRTP identified that nearly 90% of commuters in the greater Syracuse Metropolitan Planning Area drive alone to work, with an average commute time of 19 minutes. Increasingly, the general public and the SMTC's member agencies have expressed an interest in getting more out of the transportation system. This includes more roads designed to accommodate bicyclists and pedestrians, upgraded and expanded transit service, and a more extensive system of off-road trails. For people who are unable to drive, cannot afford to own a vehicle, or who live outside of Centro's service area, mobility can be an obstacle to getting medical care, holding a job, attending school, buying groceries, or visiting friends. The greatest need for improved transit service is in the central city area, which has a high proportion of low-income and zero-vehicle households.

The SMTC LRTP determined that 77% of the population in the "urban" areas are within a half-mile of a bus route with an average peak headway of up to 30 minutes, and 70% of the population in the "suburban" areas are within one mile of a route with average peak headway of up to 40 minutes. The STSA indicated that major urban routes, specifically the James Street/East Syracuse, Syracuse University, and South Avenue/OCC routes, "experience the highest sustained ridership, even during traditional off-peak periods." Bus routes in the city serve the region's largest pool of transit-dependent residents.

This section provides an in-depth analysis of the existing conditions for both corridors and is organized by topic. In order to allow meaningful analysis of existing conditions, a ½ mile buffer was created around the proposed transit improvement corridor alignment using a geographic information system (GIS). GIS allowed for the visualization of data as well as the spatial analysis of existing conditions. The two corridors are discussed in conjunction with one another within each existing condition category to provide a comprehensive understanding of the conditions within the proposed transit corridors.

2.1.1 Study Corridors

The two corridors are expected to serve 23 of the 32 neighborhoods in Syracuse as well as a number of activity centers including major employment centers and educational institutions (Figure 3).

2.2 Demographic Characteristics

The RTC – SU and Eastwood – OCC corridors have a diverse population with varying transit needs. This section provides an overview of the socio-economic characteristics of the population within the corridors to better understand the mobility needs of residents and create transit improvements to address those needs.

2.2.1 Population

In 2014, approximately 76,000¹ people lived within the RTC – SU and Eastwood – OCC corridors. This accounts for about 50% of the City of Syracuse's population. There are just over 39,000 people living within the RTC – SU corridor with the majority of residents in close proximity to Syracuse University. There are approximately 45,000 residents within the Eastwood – OCC corridor, many of whom are concentrated in neighborhoods adjacent to James Street. There are also pockets of population density in Downtown Syracuse and South Avenue (see Figure 6). Population density was calculated by traffic analysis zone (TAZ). Neither corridor was initially proposed to directly serve residents in the Northside neighborhood, which is one of the largest contiguous areas with a high population density.

2.2.2 Race and Ethnicities

The ethnic make-up for the two corridors is representative of the ethnic profile of the City of Syracuse, with values for the White, African American, Asian, Hispanic and those identifying as other populations nearly the same (see Figures 4 and 5). The City of Syracuse and the two corridors are predominately White at 53% and 55%, respectively.

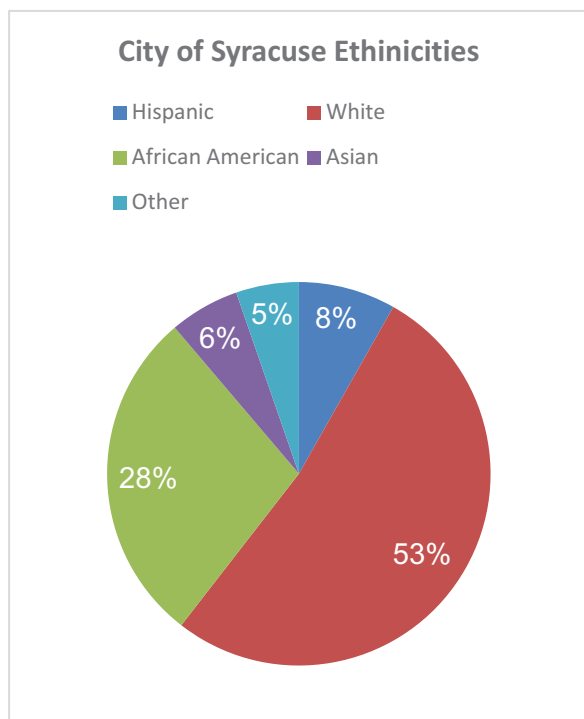


Figure 4: City of Syracuse Ethnicities

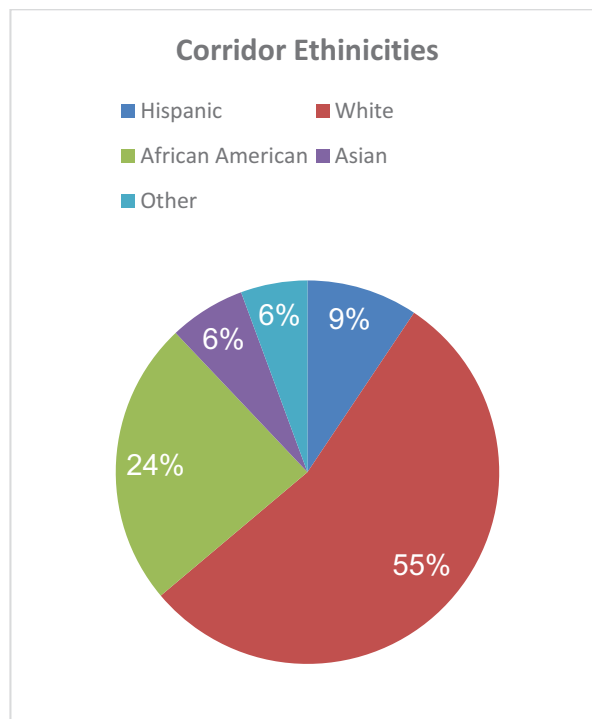


Figure 5: Study Corridor Ethnicities

Source: 2013 U.S. Census American Community Survey 5-year estimates Table B02001

¹ This number represents the number of people living in one or both corridors.

Figure 7 shows the geographic distribution of the minority population within the corridors. The minority population is primarily located in the northern portion of the RTC – SU corridor near N. Salina Street and the neighborhoods adjacent to South Avenue and S. Salina Street within the Eastwood – OCC corridor, in the communities southwest of the I-81 and I-690 interchange. There is large concentration of minority population along Erie Boulevard E. that will not be directly served by either corridor.

Figure 6: Population Density by TAZ (2014)

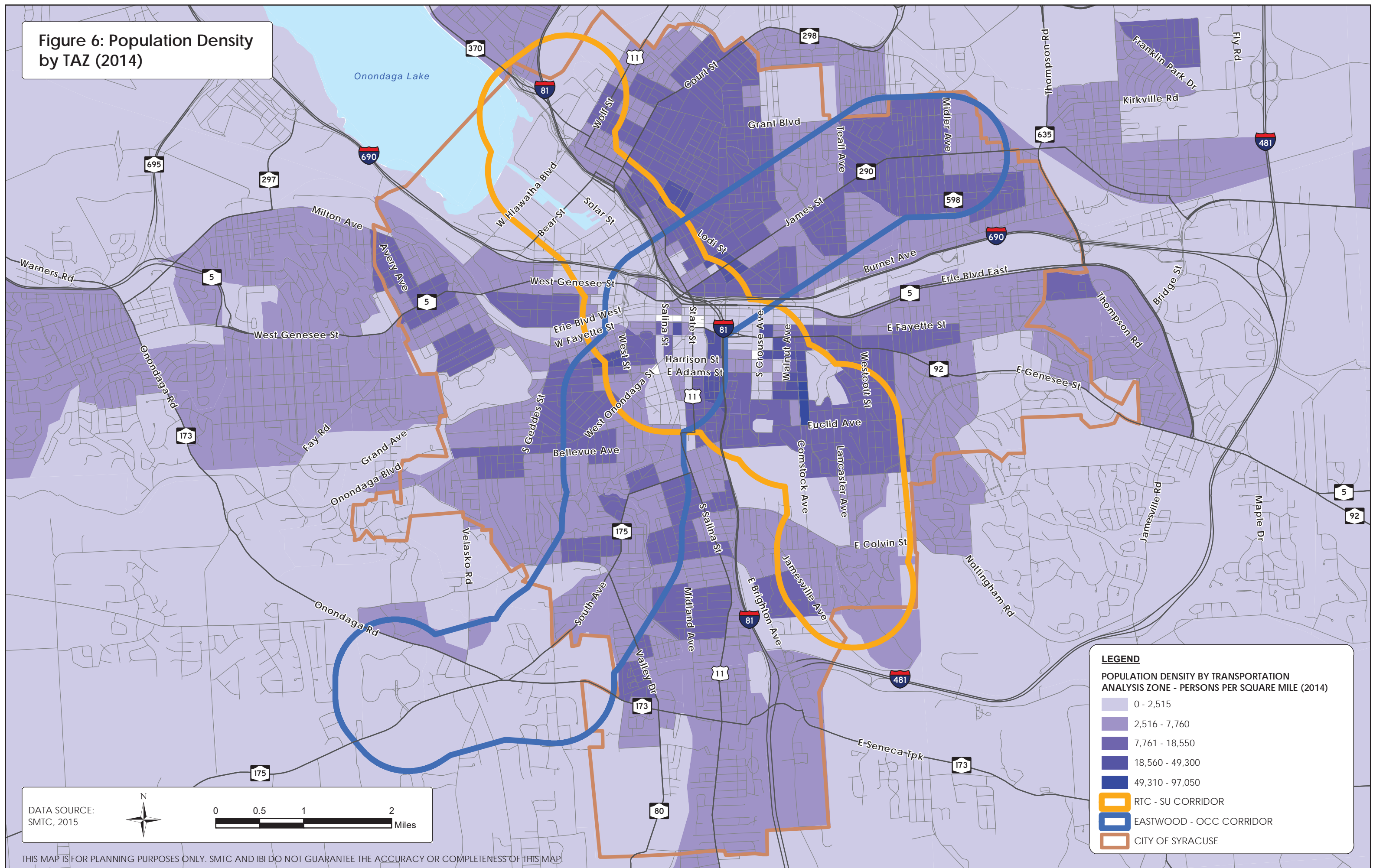
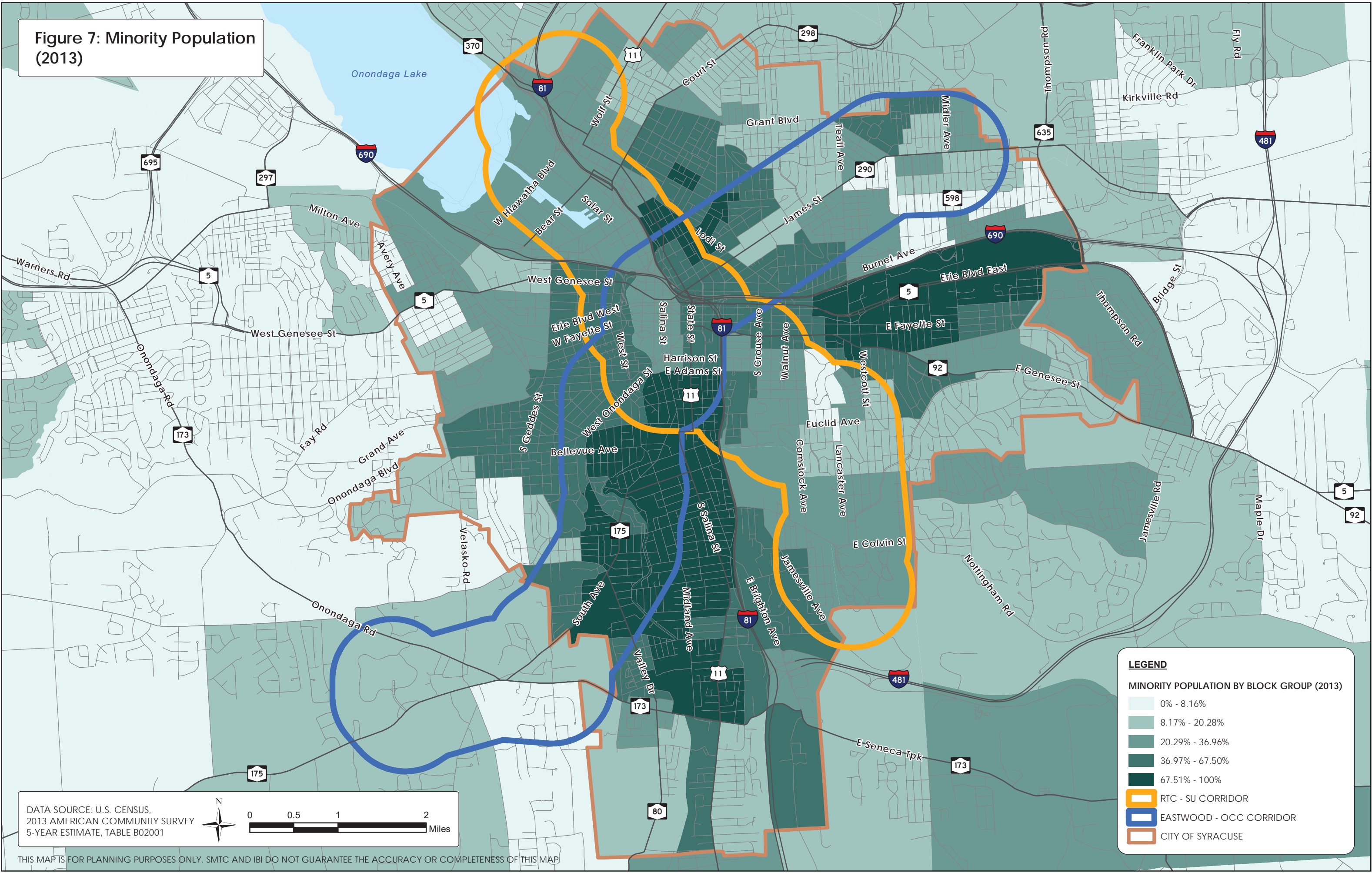


Figure 7: Minority Population
(2013)



DATA SOURCE: U.S. CENSUS,
2013 AMERICAN COMMUNITY SURVEY
5-YEAR ESTIMATE, TABLE B02001



0 0.5 1 2
Miles

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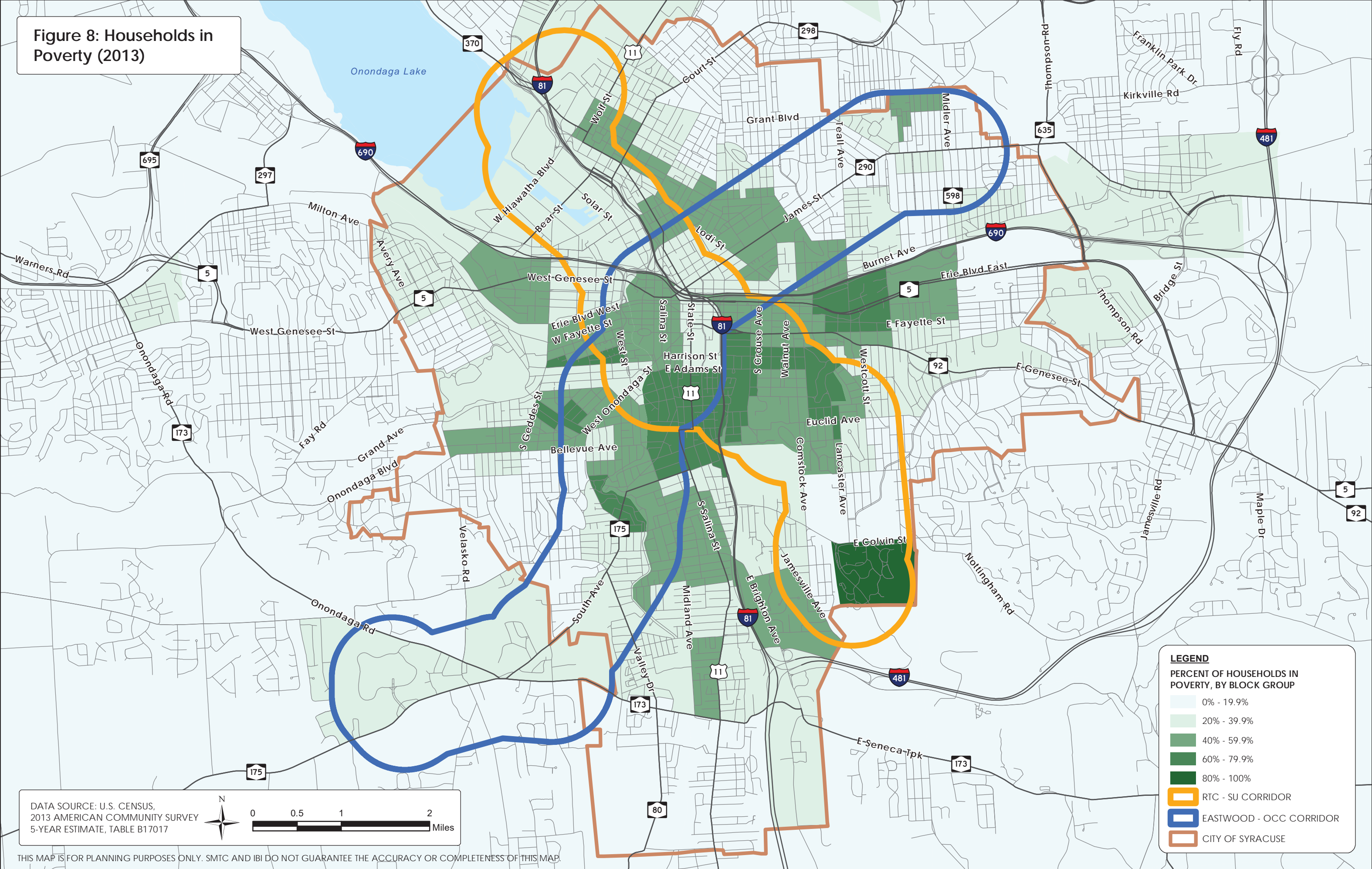
2.2.3 Households in Poverty

Despite the city's poverty rate declining since reaching its peak in 2012, Syracuse has the highest concentration of African-American and Latino residents living in poverty in the country,² a phenomenon that is strongly linked to its transportation system. Syracuse has nine extreme poverty neighborhoods, which are defined as census tracts where more than 40% of residents live below the poverty line. Figure 8 shows the distribution of the households living below the poverty line in 2013. Within the RTC – SU corridor, 44% of the population is living below the poverty line and is concentrated around downtown and Syracuse University. The high instances of poverty around the university are likely due to the large student population, many of whom have small incomes while attending school. Poverty within the Eastwood – OCC corridor is approximately 34% and is concentrated in the downtown area as well as the Southwest and Southside neighborhoods. There is often a correlation between high concentrations of minority populations and increased instances of household poverty in Syracuse.

These neighborhoods can be defined as “transit-dependent” populations because owning and operating a car is not financially feasible when basic shelter, food and clothing needs are the top budget priority. These residents must take transit, carpool, ride a bicycle or walk to meet every transportation need. Neither corridor will serve the area along Erie Boulevard East, which also has high rates of household poverty, without a very long walk. (See also the relationship of these neighborhoods to the number of households with zero vehicles in Figure 11).

² See http://www.syracuse.com/news/index.ssf/2015/09/syracuse_has_nations_highest_poverty_concentrated_among_blacks_hispanics.html as well as Alana Semuels' piece in the *Atlantic*, <http://www.theatlantic.com/business/archive/2015/11/syracuse-slums/416892/>

Figure 8: Households in Poverty (2013)



2.2.4 Zero-Vehicle Households

Increased rates of poverty are often correlated with low rates of household vehicle ownership, an effect evident within the study corridors. Households without access to personal vehicles rely heavily on public transit to access work, school, and daily activities.

In the City of Syracuse, 26% of households have no vehicle - the majority of these households are located in three pockets: (1) west of I-81, with a small section extending just east of I-81; (2) west of West Street and south of Erie Boulevard West; and (3) just north of the I-690 and I-81 junction. In the remainder of the MPA, 5.6% of households have no vehicle, with concentrations located in some of the villages, including East Syracuse, Camillus, Baldwinsville, and North Syracuse.

Figure 9 shows the distribution of households without access to a personal vehicle as a percent of total households. Many households Downtown and in the neighborhood of Hawley – Green do not have access to a personal vehicle. Both of these areas will be served by the RTC – SU and Eastwood – OCC corridors. Other areas with high instances of households without access to a vehicle are along James Street and W. Onondaga Street within the Eastwood – OCC corridor and along N. Salina Street in the RTC – SU corridor.

The most commonly occurring type of household in the MPA has one worker with one vehicle available, followed by households with two workers and two vehicles available. The majority of “car-light” households (where the number of vehicles available is less than the number of workers) are located in the City of Syracuse, with concentrations shown along I-690 and I-81. Most “car-light” households have either one worker and no vehicle, or two workers and only one vehicle. Workers in these households likely use some means other than a single-occupancy vehicle to get to work, such as transit, carpooling, walking or biking, or may work from home.

2.2.5 Renters

The percentage of household renters is often an indicator of a household’s financial stability and/or resident age. Residents who rent their housing are often either young (under 30) or not in a financial position to own a home. The majority of residents in Syracuse are renters as seen in Figure 10. Both the RTC – SU and Eastwood – OCC corridors will serve the vast majority of household renters including the areas surrounding Syracuse University, Onondaga Community College, Downtown, and along South Avenue, Solar Street and N. Salina Street. Renters and young people are more likely to be transit riders, particularly in densely developed urban areas.

2.2.6 Population under 25

Syracuse has a large youth population under 25 years old, many of whom live near Syracuse University and the Goldstein Student Center within the RTC – SU corridor (See Figure 11). This age cohort is often transit-dependent due to socio-economic factors such as low-incomes while attending schools and low rates of vehicle ownership. There is a high density of young residents in the Eastwood – OCC corridor in the communities southwest of Downtown, along the James Street corridor, and near Onondaga Community College. Student ridership will likely increase with the creation of high frequency transit routes that connect academic institutions with other activity centers in Syracuse.

2.2.7 Population over 65

A similarly transit-dependent age cohort is residents over 65 years old, whose distribution is shown in Figure 12. The senior population is heavily concentrated at the North end of the RTC – SU corridor near the Destiny USA Mall and towards the southern end of the Eastwood – OCC corridor in the vicinity of the Van Duyn Center for Rehabilitation. Car ownership can become a financial burden for seniors, many of whom live off of a fixed-income based on savings or social security. Driving can also become a dangerous activity for seniors. For these reasons, it is important for public transit to be designed to adequately serve these residents through accessible buses and transit stops, and 15-minute or less frequency on routes that serve hospitals and medical facilities.

Figure 9: Households with No Vehicles (2014)

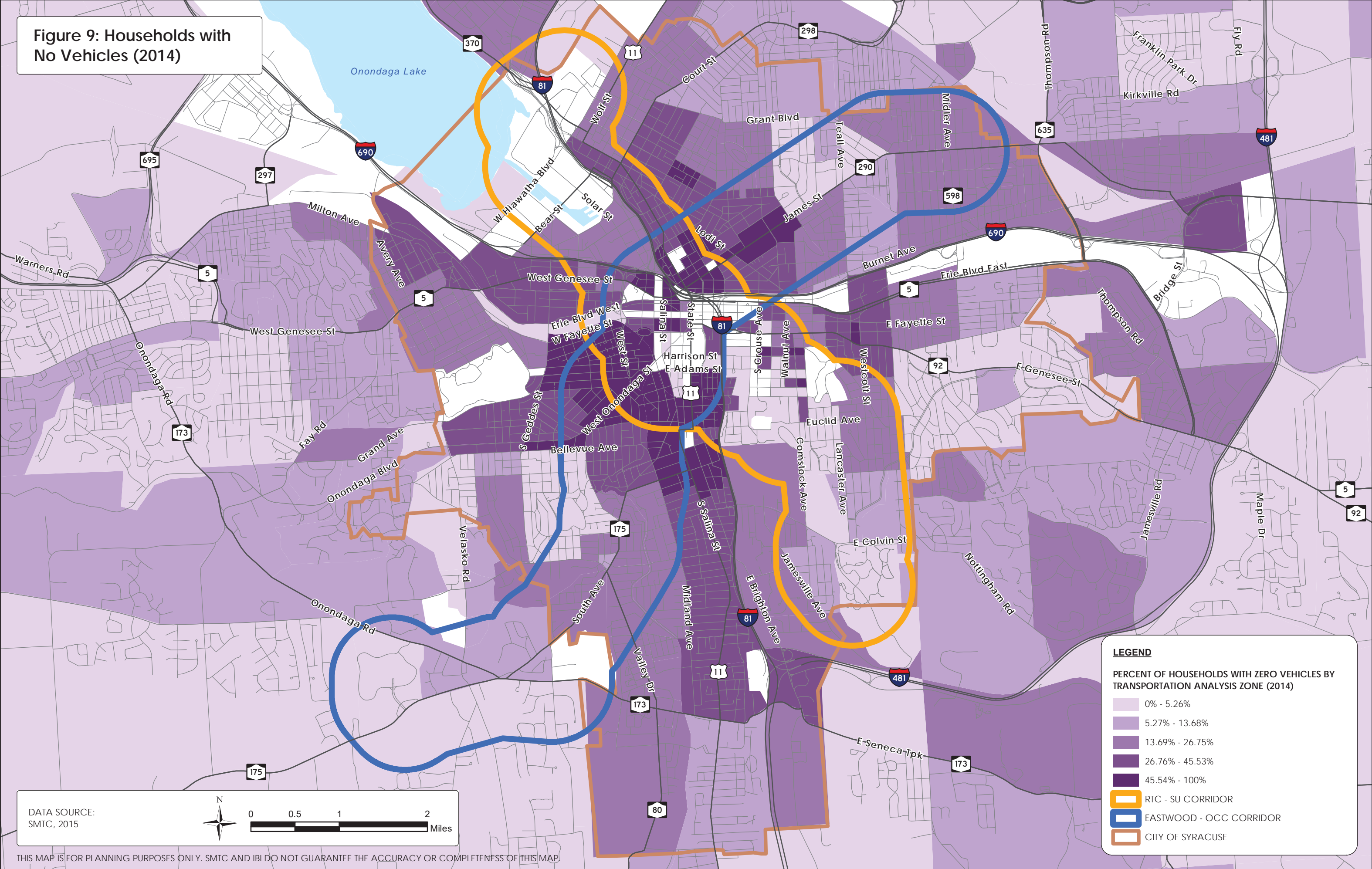


Figure 10: Household Renters (2013)

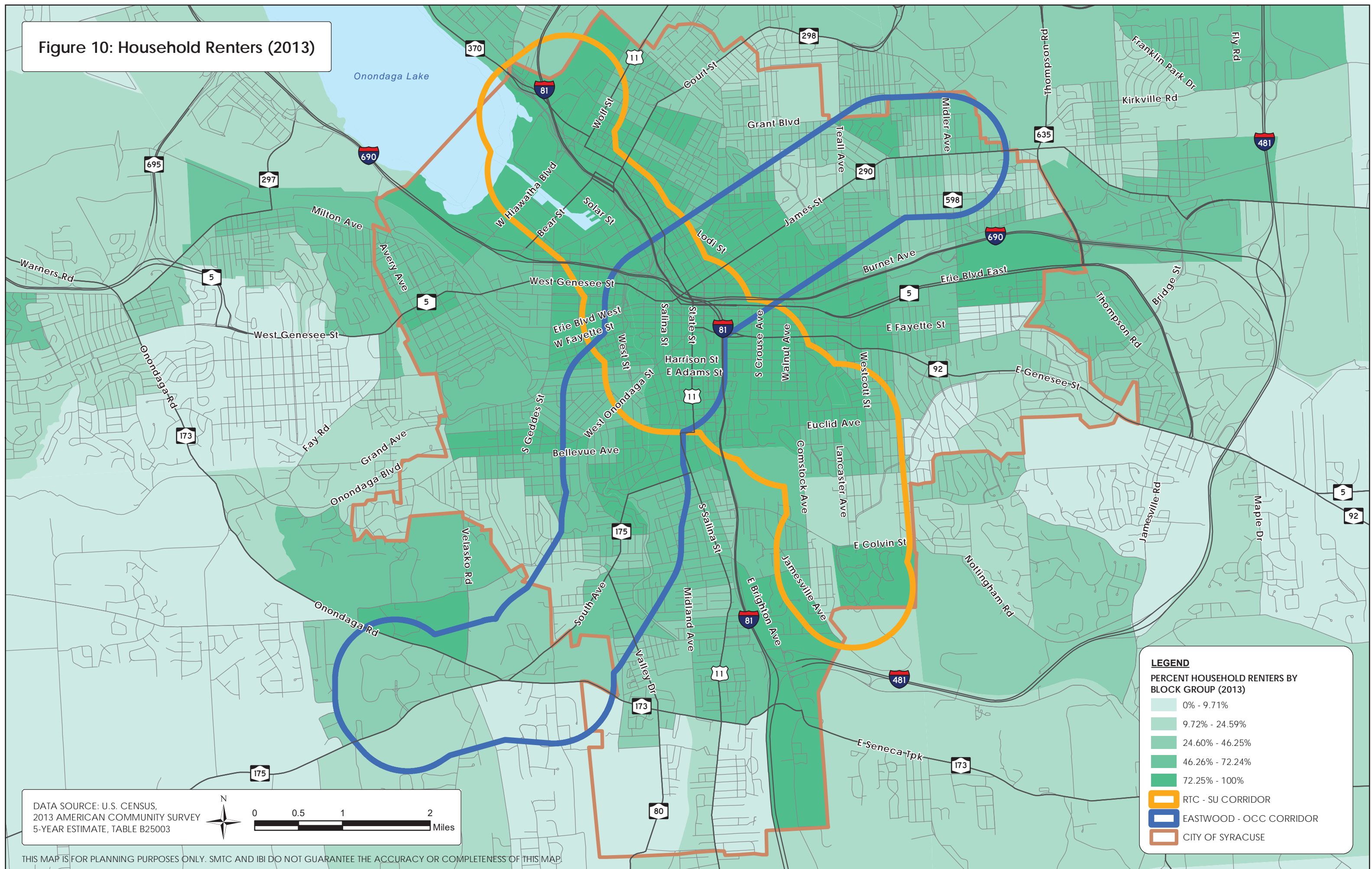


Figure 11: Population Under 25 Years Old (2013)

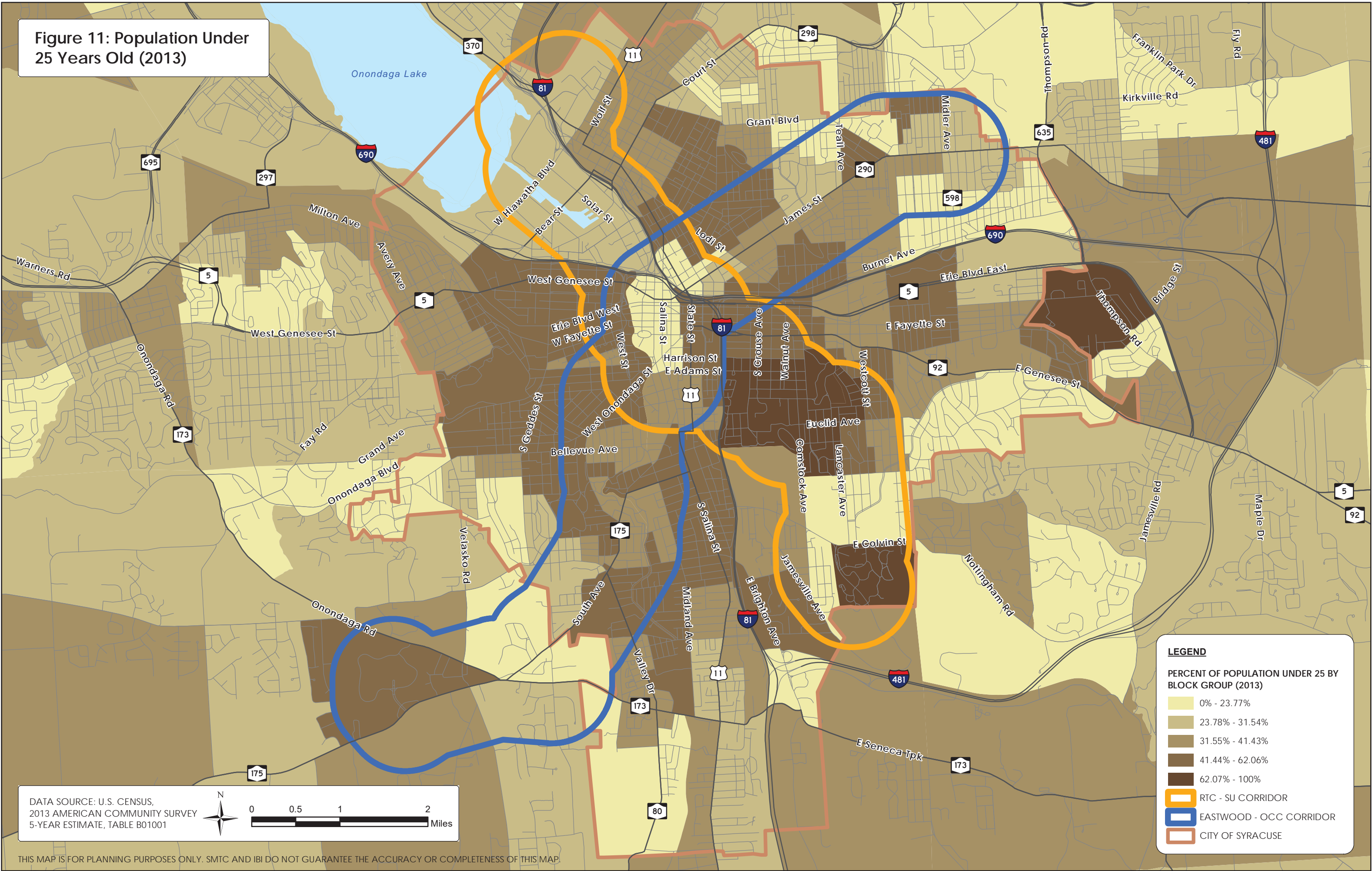
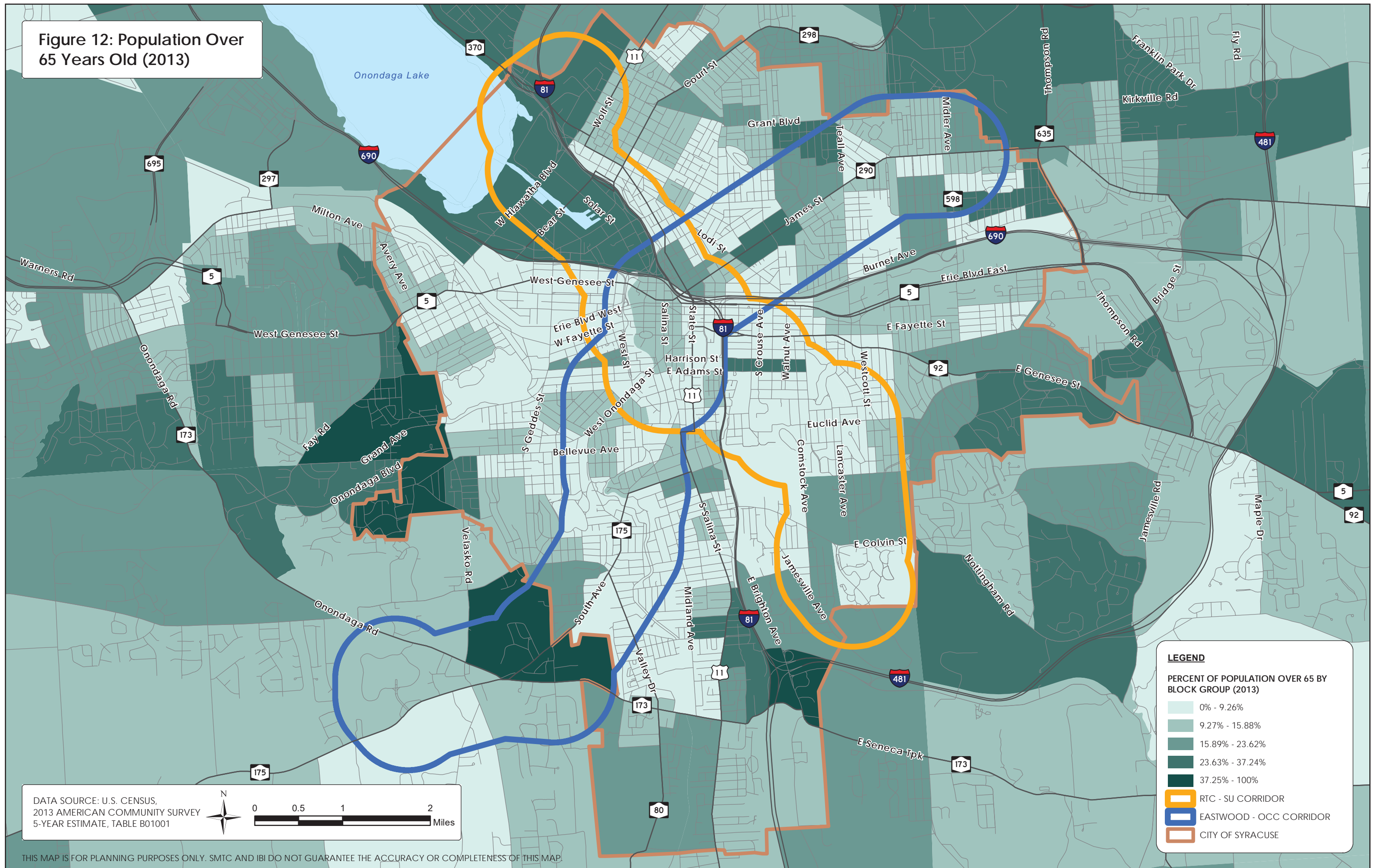


Figure 12: Population Over 65 Years Old (2013)



THIS MAP IS FOR PLANNING PURPOSES ONLY. SMTc AND IBI DO NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THIS MAP.

2.2.8 Mode Choice

According to Census statistics included in the SMTC 2050 LRTP, slightly less than 70% of Syracuse residents drive alone to work, and the percentages of City residents who take public transit (8%) or who walk or bike to work (12%) are notably higher than in the remainder of the MPA, as Figure 13 below shows.

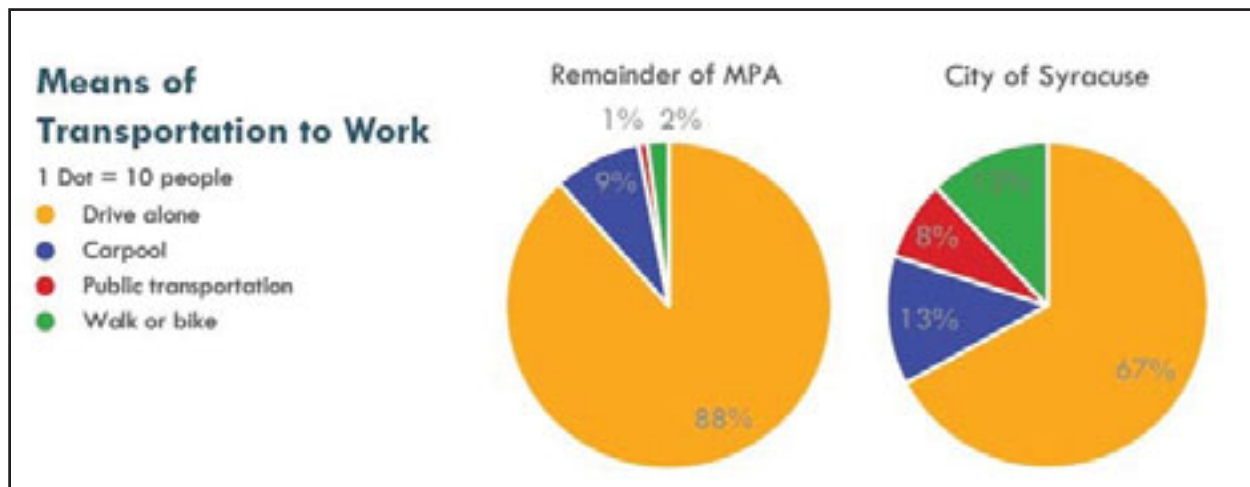


Figure 13: Means of transportation to work

The University Hill neighborhoods are home to colleges, hospitals, students, and families. Walking, biking, and public transit use are much more common in the University Hill neighborhoods than in other areas of the City. Concentrations of residents who carpool or use public transit are also evident in the Northside, Southside, and Near Westside areas.

2.2.9 Existing Transit Service

Centro operates 42 bus route variations within the RTC – SU corridor and 41 bus route variations within the Eastwood – OCC corridor. Route frequency and operating schedules vary.

The adult fare is \$2.00 and seniors, children and persons with disabilities ride for \$1.00. Centro also operates the Onondaga Senior Call-A-Ride Program (OSCAR) program, which provides ride services to senior residents of Onondaga County aboard Centro Specialized Transportation vehicles through funding from the Onondaga County Department of Aging and Youth. Call-A-Bus is another service for persons with disabilities, which coordinates ride-sharing transportation aboard Centro Specialized Transportation vehicles and specially marked vendor vehicles for individuals who have been deemed medically unable to ride Centro due to their disabilities. The Centro web site provides ridership statistics for their entire public transit system (as shown in Table 4).

Table 4 – Centro Ridership Demographic Statistics

Gender	
Male	46%
Female	55%
Ethnic Group	
African-American	36%
American Indian	6%

Asian	5%
Hispanic	6%
White	45%
No Answer	3%
Age	
Under 18	10%
18-24	30%
25-34	24%
35-54	26%
55-64	7%
65+	3%
Residence	
Single family home	37%
Apartment	58%
Senior community	4%
Campus dorm	1%
Other	1%
Income	
Under \$15,000	47%
\$15,000 - \$30,000	38%
\$30,000 - \$50,000	11%
\$50,000+	1%
No Answer	3%

Table 5 provides a summary of the bus line information for the lines that serve both the RTC – SU corridor and Eastwood – OCC corridor. Line information such as destinations, days of service, and peak and base headways are presented below for each Centro Bus Line. Peak hours coincide with typical commuter rush hour traffic, 7:00 a.m. – 9:00 a.m. and 4:00 p.m. – 6:00 p.m. Base hours are the hours outside of the morning and evening rush hours. All lines serve the downtown transit hub.

Table 5 – Corridor Bus Line Information – Source: CENTRO.Org

Line	Route Variations	Destinations	Headway (minutes)		Days of Service
			Peak	Base	
10	10, 110, 210, 310, 410, 410X	Salina St. / Nedrow (Downtown Syracuse, Valley Plaza, Destiny USA, SUNY E.O.C)	10-15	35-40	Mon-Sun
16	16, 116, 216, 316	N. Salina St. / Buckley Rd. (Destiny USA, NBT Bank Stadium, Walsh Regional Transportation Center, Lockheed Martin)	30-40	70-80	Mon-Sun
20	20, 120	James St. / Eastwood / Sunnycrest Rd. (Downtown Syracuse, Shop City Plaza, Bryant & Stratton College)	5-10	20-40	Mon-Sun
21	21, 121	James St. / Eastwood / Sunnycrest Rd. (Downtown Syracuse, Shop City Plaza, Bryant & Stratton College)	5-10	15-40	Mon-Sun
22	22, 122	Parkhill/ James St. / Rte. 298 (Carrier Circle, Downtown Syracuse)	20-35	80-140	Mon-Sun
23	23, 123, 223, 323, 323X	James St. / E. Syracuse – Minoa / Shoppingtown Mall (Walmart, Wegmans - Dewitt, Upstate University Hospital C.C., Onondaga C.C.)	10-25	70-80	Mon-Sun

Line	Route Variations	Destinations	Headway (minutes)		Days of Service
			Peak	Base	
26	26, 126, 226, 226X, 326	South Avenue (Upstate University Hospital C.C., Onondaga C.C., Van Duyn Hospital, Downtown Syracuse)	5-30	15-30	Mon-Sun
28	28, 128	South Avenue (Upstate University Hospital C.C., Onondaga C.C., Van Duyn Hospital, Downtown Syracuse)	5-30	15-30	Mon-Sun
30	30, 130, 230, 330, 530	Westcott Street (Shopping Town Mall, Menorah Park, Thornden Park, Syracuse University, Syracuse Stage, Downtown Syracuse)	30	75-80	Mon-Sun
36	36, 136, 236	Camillus / W. Genesee St. (Camillus Commons, Fairmount Fair, Wegmans – Fairmount, Westvale Plaza, TOPS Westvale, VA Health Center, Downtown Syracuse)	20-30	15-40	Mon-Sun
38	38, 138, 236	Auburn / Skaneateles – Elbridge / Syracuse (Weedsport, Marcellus, Jordan, Camillus Commons, Fairmount Fair, Downtown Syracuse, Destiny USA, Walsh Regional Transportation Center, University Hill / Hospitals)	60	60-70	Mon-Sun
40	40, 140, 240, 340, 340C	SU Hill / Hospitals (Syracuse VA Medical Center, Crouse Hospital, Upstate University Hospital, Downtown Syracuse, Loretto Health & Rehabilitation Center Syracuse University)	10-20	25-40	Mon-Sun
43		Syracuse University Main Campus (Crouse College, College Place, Bird Library)	15	15	Mon-Sun
44		Syracuse University Manley Field House (College Place, Comstock Art Facility, Manley Field House, Carmello K. Anthony Center, Lampe Athletics Complex)	4-8	5-8	Mon-Sun
45		Syracuse University – Destiny USA (Destiny USA)	-	-	Fri & Sat
46	46, 246	Liverpool / Route 57 (Route variation 46 Only) (Great Northern Mall, Seneca Mall, Wegmans – Rte. 57, Walsh Regional Transportation Center, Destiny USA)	15-55	30-110	Mon-Sun
		Oswego / Fulton – Phoenix / Syracuse (Route variation 246 Only) (SUNY Oswego, Oswego Hospital, Oswego County P.S.B., Great Northern Mall, Liverpool, Destiny USA, Walsh Regional Transportation Center, Downtown Syracuse, Upstate University Hospital)	120	60-120	Mon-Sun
48	48, 148, 248	Liverpool / Morgan Rd. (Wegmans – John Glen Plaza, Bayberry, Brookwood Village, OCM BOCES – Crown Rd., Walsh Regional Transportation Center)	30-40	145	Mon-Sun
50	50, 150, 550	Destiny USA / Regional Transportation Center (CNY Regional Market, Syracuse Inner Harbor, Franklin Square, Clinton Square, Downtown Syracuse)	20-30	15-25	Mon-Sun
52	52, 152	Court St. / Industrial Park (OCM BOCES, Shop City Plaza, St. Joseph's Hospital, Downtown Syracuse)	15-35	40	Mon-Sun

Line	Route Variations	Destinations	Headway (minutes)		Days of Service
			Peak	Base	
54	54, 154, 254	Midland Ave. / Valley Drive (Green Hills Plaza, Webster's Pond, Kirk Park, Downtown Syracuse)	20-25	65-85	Mon-Sat
58	58, 158	Parkhill/ James St. / Rte. 298 (Carrier Circle, Downtown Syracuse)	20-35	140	Mon-Sun
62	62, 162, 262, 262X, 362, 462	Fayetteville / Manlius (Northeast Medical Center, Fayetteville Town Center, Wegmans-Dewitt, ShoppingTown Mall, Downtown Syracuse)	35	30-45	Mon-Sun
64	64, 164, 264	Western Lights (The Centers at St. Camillus, Bishop Ludden, Emeritus at Bellevue Manor, Western Lights Shopping Center, Wegmans, NYS DMV, Providence House, Downtown Syracuse)	30-35	65-85	Mon-Sun
66	66, 166	Western Lights (Western Lights Shopping Center, Wegmans, NYS DMV, Providence House, Downtown Syracuse)	25-40	55-85	Mon-Fri
68	68, 168	Erie Blvd. E. / E. Fayette St. / Dewitt (ShoppingTown Mall, Downtown Syracuse)	20-35	40	Mon-Sun
72	72, 172	E. Colvin St. / Townsend St. (Loretto Health and Rehabilitation Center, SU Physical Plant, Downtown Syracuse, Manley Field House)	25-55	30	Mon-Sun
74	74, 274, 374	Solvay (Rosamond Gifford Zoo, Burnet Park, Public Service Leadership Academy, Downtown Syracuse)	25-60	80	Mon-Sun
76	76, 176	Salt Springs Rd. (ShoppingTown Mall, Jewish Community Center, Le Moyne College, Downtown Syracuse)	25-35	40	Mon-Sun
80	80, 180	Grant Boulevard (James St., Oak St., Park St., Butternut St., Shop City Plaza, Grant Village, Woodlawn, Downtown Syracuse)	15-45	65	Mon-Sun
82	82, 182	Baldwinsville / Lakeland (Indian Springs, Tri-County Mall, Seneca Knolls, NYS Fairgrounds, Destiny USA, Downtown Syracuse)	30-40	120	Mon-Fri
84	84, 184	Mattydale / Allen Rd. (Airport Plaza Park-N-Ride, Northern Lights Shopping Center, Orchard Estates, Downtown Syracuse)	25-35	80	Mon-Sat
86	86, 186, 286	Henry Clay Boulevard (Dominion Park, YMCA – Wetzel Road, Merrill Farms, North Medical Center, Downtown Syracuse)	30-45	180	Mon-Fri
88	88, 188, 288, 388, 388X	N. Syracuse / Cicero (Cicero Commons, Walmart, Wegmans Park-N-Ride, Airport Plaza Park-N-Ride, Destiny USA, Downtown Syracuse, Upstate University Hospital, Syracuse University)	5-25	110	Mon-Fri
		Central Square (Route variations 288, 388 & 388X Only) (Brewerton, Cicero, Wegmans Park-N-Ride, Downtown Syracuse, CENTRO Transit Hub, Upstate University Hospital, Syracuse University)	25-35	-	Mon-Fri

2.2.10 Existing Study Corridor Transit Ridership

Ridership data for each corridor are drawn from October 2015 counts provided by Centro.

Eastwood - OCC corridor

The Eastwood - OCC corridor contains lines 20-James Street and 26-South Avenue. Within these families are the following route variations:

- 20; 21; 121; 120; 122; 23; 123; 223; 323; 22; 122
- 26; 126; 226; 326; 28; 128.

Counts are provided at the line, rather than individual route variation, level. It is worth noting that, because of route variations, ridership reported here may include trips that will not be eligible for inclusion in the evaluation of alternatives (chapter 5), which will include only trips originating within a designated distance of the chosen corridor.

The average weekday ridership count on lines 20 and 26 is 3,456: 1,962 on 20-James, and 1,494 on 26-South Street. See table 6.

Table 6 - Eastwood - OCC Corridor Ridership per Weekday by Line

Line	2013 Data	2015 Data
20 James	2,005	1,962
26 South Ave	1,386	1,494
Total		3,456

RTC - SU Corridor

Counting ridership in the RTC - SU corridor is more complicated and requires significant subjective choice by the analyst. For the purposes of this analysis, the RTC-SU corridor is assumed to include lines 16-North Salina, 30-Westcott, 40 Drumlins-Nob Hill, 50 Destiny, 72 East Colvin Street/Townsend Street, and 82 Baldwinsville/Lakeland. Within these families are the following route variations:

- 16; 116; 216; 316
- 30; 130; 230; 330; 530
- 40; 140; 240; 340; 340c.
- 50
- 72; 172
- 82
- 84; 184

The average weekday ridership on these lines is 3,726. Some number of those trips, however, will ultimately fall outside of the final corridor for the purposes of FTA analysis because of route variations. See Table 7.

Possible additions to RTC - SU corridor

Freeway express lines - There are other lines that could potentially be considered part of the RTC - SU corridor. Lines 46, 48, 86, and 88 and their variations run express on I-81 between downtown Syracuse and Destiny USA or the RTC before heading to or from final destinations in the suburbs. Most ridership on these lines presumably originates well

beyond the parameters of the designated corridor, but a close analysis might reveal some trips that occur within the corridor and should therefore be counted.

University lines - While this analysis has excluded Syracuse University-funded lines from consideration in the RTC - SU corridor calculations, there is a case for including at least some university ridership. Route variation 443—Connective Corridor would be a likely candidate for inclusion for instance and Line 45 connects Destiny USA and SU, but runs only on Fridays and attracts only 45 riders per day.

Table 7 RTC – SU Corridor Ridership per Weekday by Line

Line	2013 Data	2015 Data
443/643	448	
16 North Salina	757	668
30 Westcott	471	520
40 Drumlins / Nob Hill	1,296	1,364
50 Destiny	603	519
72 E. Colvin St./Townsend St.	152	172
82 Baldwinsville/Lakeland	172	165
84 Mattydale/Allen Rd.	324	318
Total		3,726

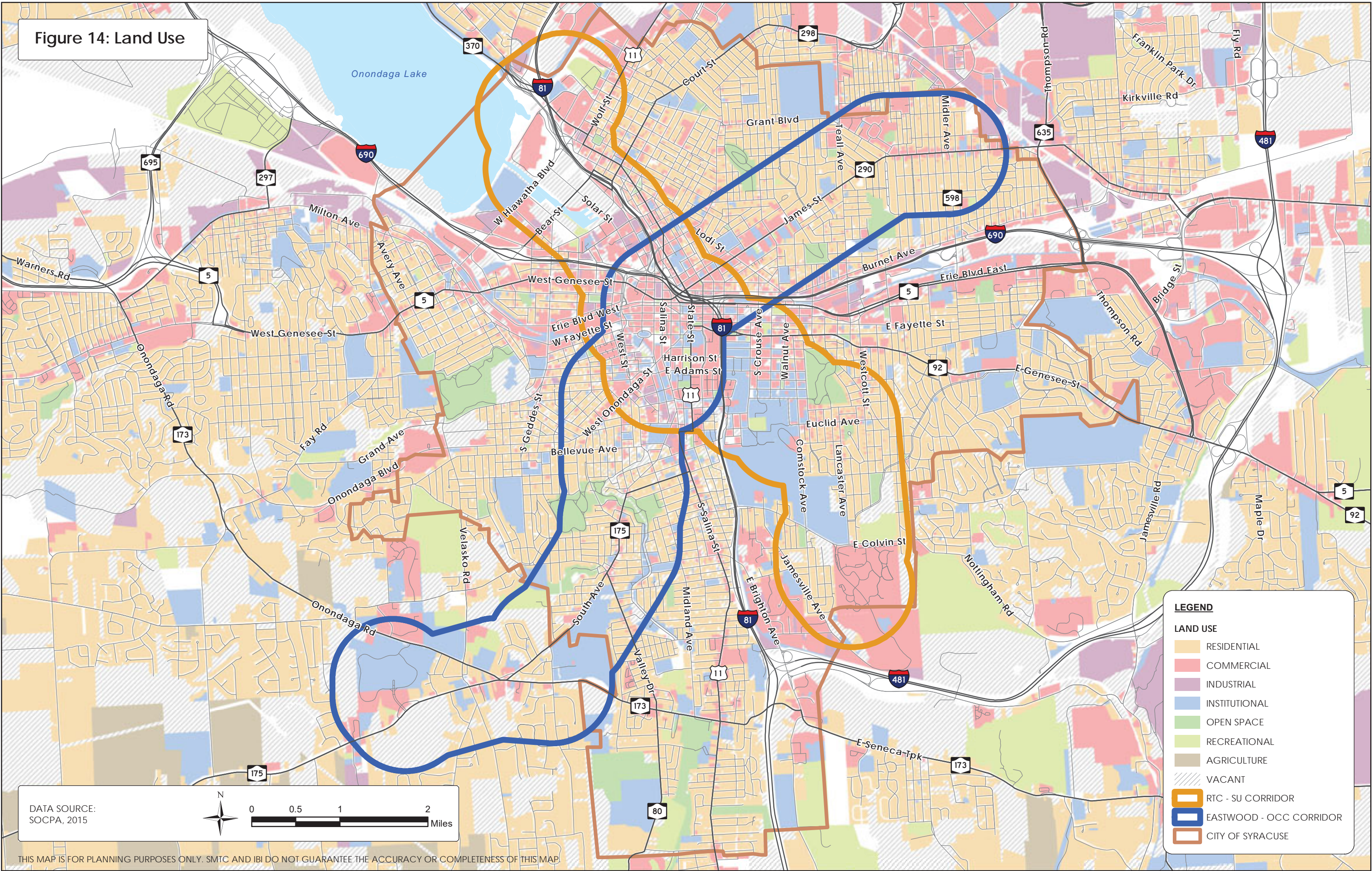
2.2.11 Existing Land Use

The RTC – SU corridor consists primarily of commercial parcels, which comprise 35% of the total land area (5.3 square miles) as illustrated in Figure 14. Institutional and residential parcels account for 22% and 18% of the total land area, respectively. Commercial parcels are located throughout the corridor with a concentration in the downtown core, while institutional parcels are concentrated near Syracuse University. Most of the housing stock found on residential parcels was constructed prior to 1950. Thornden Park is the largest green space in the corridor and is the second largest park in Syracuse. Residential properties are primarily located along N. Salina Street and in the neighborhoods of Westcott and University Neighborhood, east of Comstock Avenue. Land use patterns within the corridor are expected to change along with the growth of households expected by 2050. Infill development will convert vacant and commercial parcels to residential land. This land use conversion is expected to increase residential density within the corridor, which will ultimately increase the demand for public transit

The Eastwood – OCC corridor is comprised primarily of residential parcels, which account for 40% of the total land area (6.2 square miles). Residential properties are heavily concentrated in the northern portion of the corridor near James Street in the neighborhoods of Northside, Sedgwick, Lincoln Hill and Eastwood, as well as south of Downtown in Near Westside, Southwest, Strathmore, Southside, and Elmwood. Residential properties are also clustered outside the city limits between Onondaga Community College and Upstate University Hospital at Community General. Commercial parcels are concentrated in the downtown core, while institutional land is clustered around Onondaga Community College and Upstate University Hospital Community Campus. Commercial and institutional parcels make up 19% and 17% of the corridor, respectively. Most of the residential properties within the corridor were constructed prior

to 1950, which is consistent with residential building stock throughout the city. Upper Onondaga Park is the largest green space in the corridor and was placed on the National Register of Historic Places in 2002. Other green spaces in the corridor are Sunnycrest Park and Lincoln Park, which are both located near James Street. There is a substantial amount of vacant land in the vicinity of Onondaga Community College. Vacant land comprises nearly the same amount of land area as institutional land.

Figure 14: Land Use



2.2.12 Housing

In 2014, based on TAZ data provided by the SMTC, there were approximately 55,000 households in the City of Syracuse. The areas of the city with the highest residential density are the neighborhoods of University Hill, South Campus, and the City's northeastern neighborhoods adjacent to James Street. Just over one-third of the City's households are located within the RTC – SU corridor and are clustered around Syracuse University and the neighborhood of South Campus. The total number of households across Onondaga County is expected to increase by approximately 14,500 between 2014 and 2050, according to SMTC growth projections. Within the RTC – SU corridor pockets of growth in the number of households are forecast to occur in the Lakefront area, in Downtown Syracuse, east of Downtown between Erie Boulevard E. and E. Genessee Street, Syracuse University, and south of E. Colvin Street. The majority of growth is expected to occur within the RTC – SU corridor, although the growth projected in the South Campus area is not likely to occur due to changing plans for Syracuse University housing. Many of these apartment units are planned to be moved closer to the main campus increasing the rate of growth there. Beyond the RTC – SU corridor, the City of Syracuse is expected to decline in the number of households or remain the same as 2014. The forecasted household growth within the corridor indicates an increase in overall development density, which is important in supporting higher order transit and promoting sustainable modes of transportation.

Approximately 40% of the households in City of Syracuse are located in the Eastwood – OCC corridor according to the travel demand model data. An additional 1,550 households are located outside the city limits, but inside the study corridor boundary. This high residential population is concentrated in the neighborhoods along James Street and the neighborhoods surrounding Onondaga Park and along South Avenue. The demographics of the corridor's households is quite diverse and geographically separate with minority households being clustered in the southern portion of the corridor. Non-minority households are concentrated in the northern portion of the corridor. According to SMTC growth projections for 2014-2050, small pockets of household growth are expected for the James Street area and portions of downtown; however, the greatest increase in the number of households in the Eastwood – OCC corridor is expected to occur beyond the city limits in the hamlet of Onondaga Hill. Onondaga Hill lies within the Town of Onondaga and is served by a number of Centro bus lines. Growth in this area is most likely to be due to expansion of traditional residential subdivisions. The forecast household growth concentrated in the southern portion of the corridor indicates there will likely be increased demand for public transit lines serving downtown Syracuse and other parts of the city.

Figure 15 shows the 2014 number of households by TAZ and Figure 16 shows the anticipated change in number of households at the same geography from 2014 to 2050.

Figure 15: Number of Households (2014)

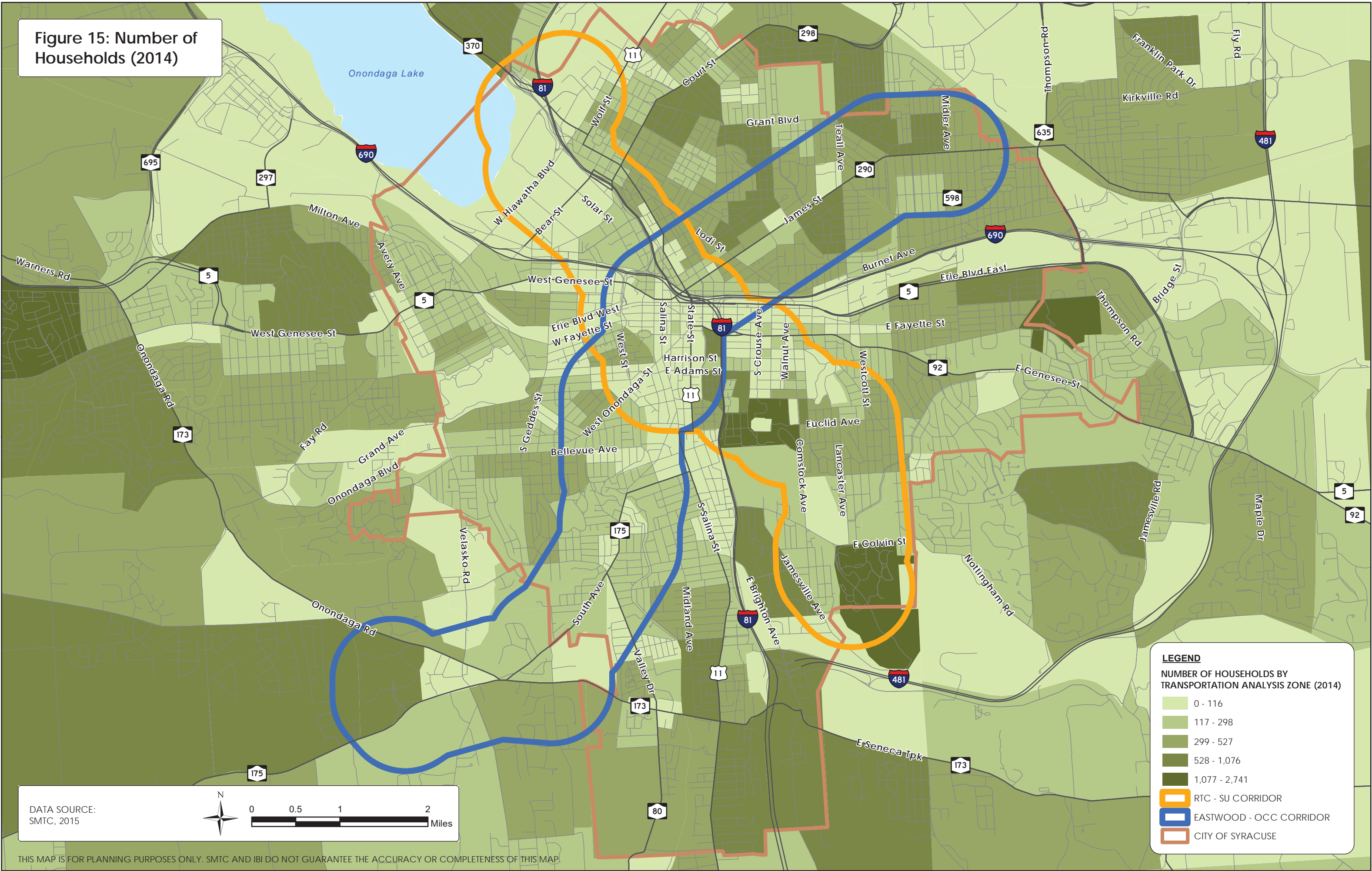
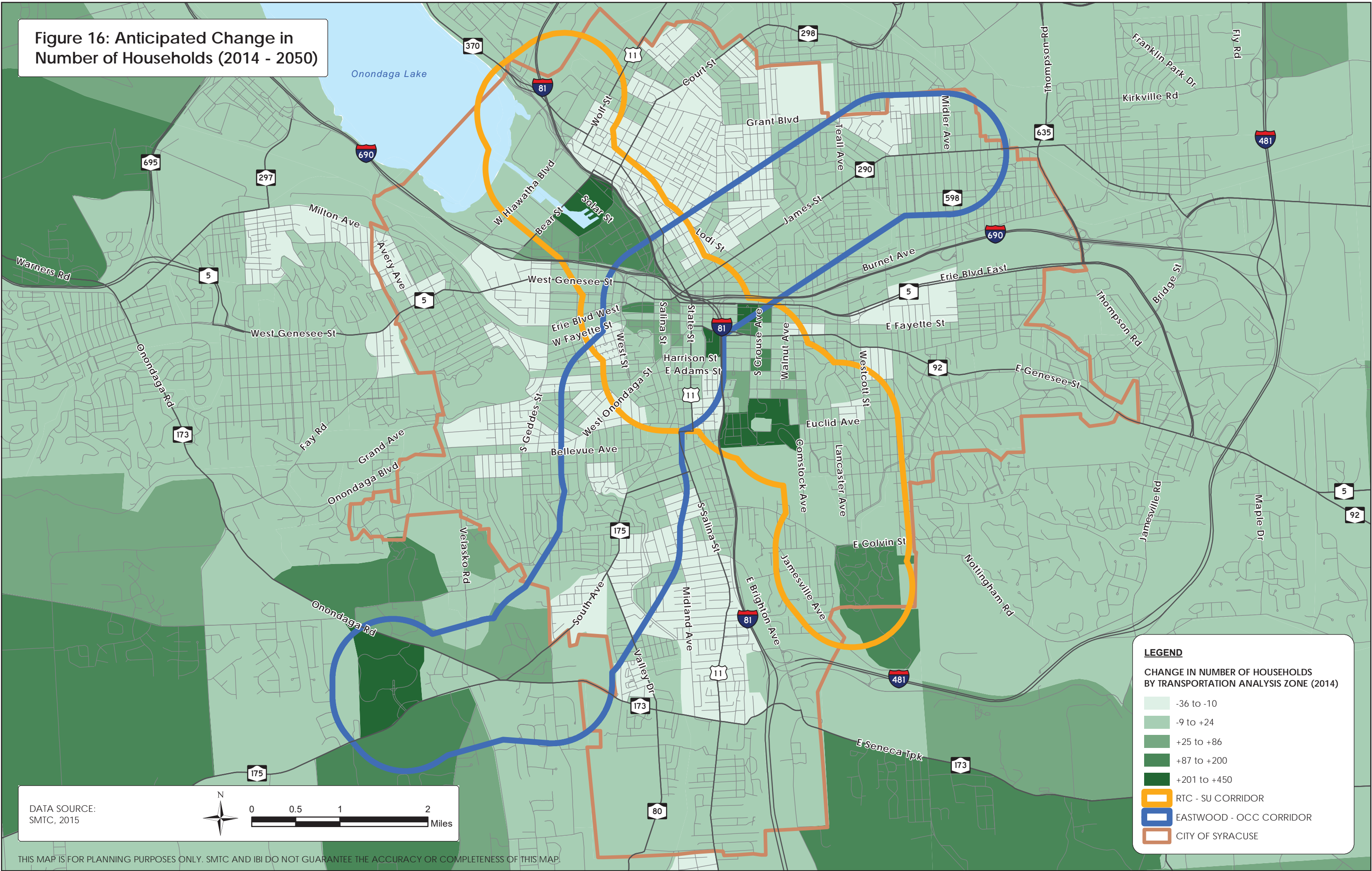


Figure 16: Anticipated Change in Number of Households (2014 - 2050)



2.2.13 Employment

According to the SMTC Transportation Atlas, seven of the ten largest employers in Onondaga County are located along the RTC – SU corridor: Upstate University Health System, Destiny USA, Onondaga County government, Syracuse University, St. Joseph's Hospital Health Center, and Crouse Hospital. The corridor currently contains approximately 72,000 jobs, or about 80% of the City of Syracuse's overall employment base of around 90,000 jobs. Data gathered for the SMTC's travel demand model indicated that Onondaga County is expected to gain 33,200 jobs between 2014 and 2050. Figure 20 shows where employment growth is forecasted for the RTC – SU corridor. Employment growth is likely to occur in the northern portion of the corridor in the vicinity of the Destiny USA Mall, north of the downtown core, and surrounding Syracuse University. Areas of employment growth loosely coincide with areas of forecasted housing growth shown in Figure 18. This could provide residents with the opportunity to have shorter commutes by living in close proximity to their places of employment. The creation of jobs within the corridor may also provide employment opportunities for low-income residents who have difficulty accessing jobs using the existing public transit system.

The Eastwood – OCC corridor serves two large employers in the area: St. Joseph's Hospital Health Center and University Upstate Hospital Community Campus, in addition to OCC, which is itself the 16th largest employer in the region. The corridor currently accounts for over 48,000 jobs, or approximately 20% of all employment in Onondaga County. The number of jobs in Onondaga County are expected to increase between 2014 and 2050 with most jurisdictions seeing their share of employment growth. Although the greatest pocket of employment growth within the City of Syracuse is forecasted to occur outside the Eastwood - OCC corridor, concentrations of jobs are expected for downtown. Beyond the city, growth is forecast to occur in the Onondaga Hill area surrounding the community college and the Upstate University Hospital Community Campus. The forecasted growth in employment coincides with the forecasted growth in households. This will provide the opportunity for residents to live closer to where they work and utilize public transit for affordable and sustainable commutes.

Figure 17 shows the 2014 number of jobs by TAZ and Figure 18 shows the anticipated change in number of jobs from 2014 to 2050.

Figure 17: Number of Jobs (2014)

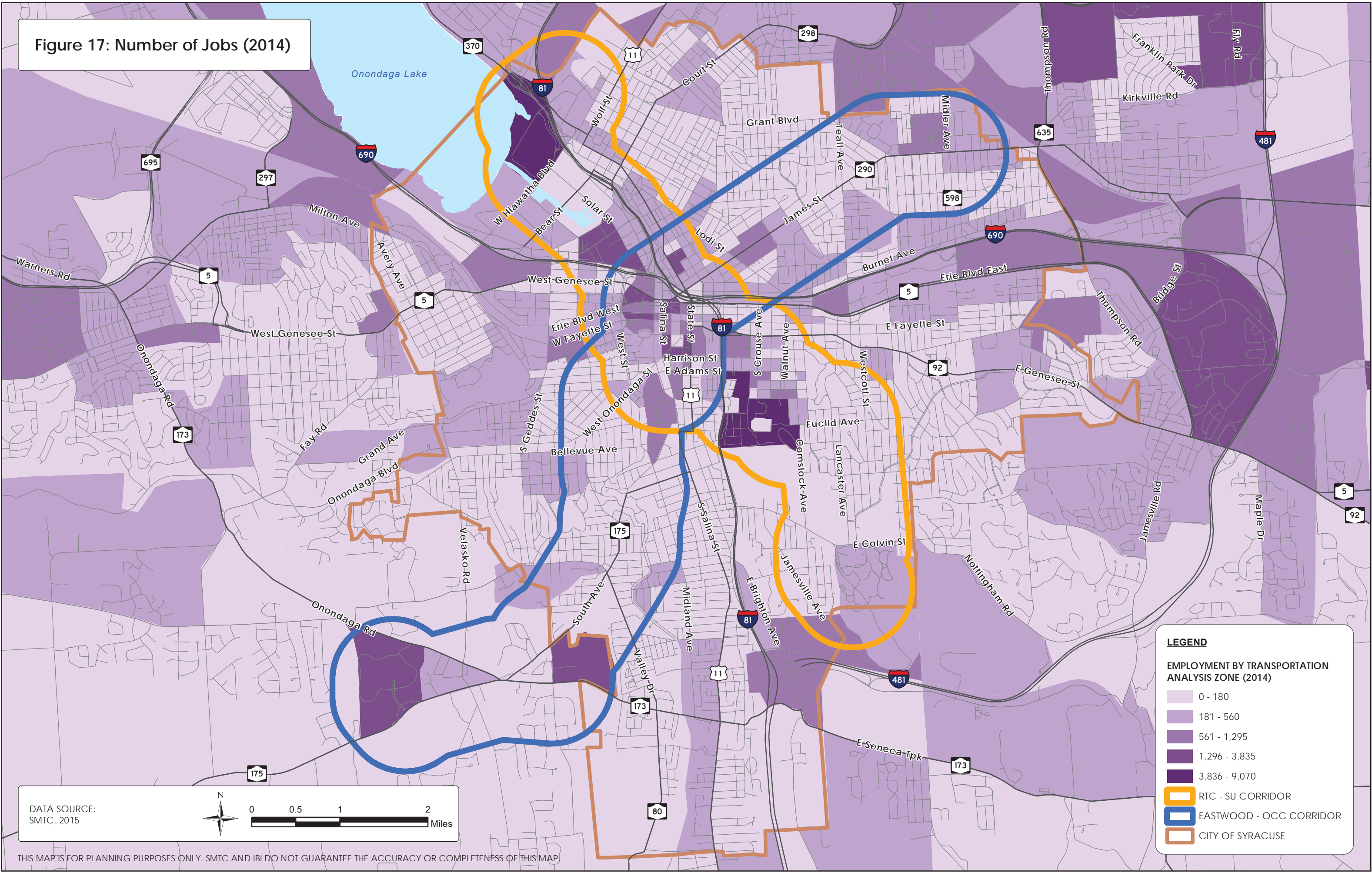
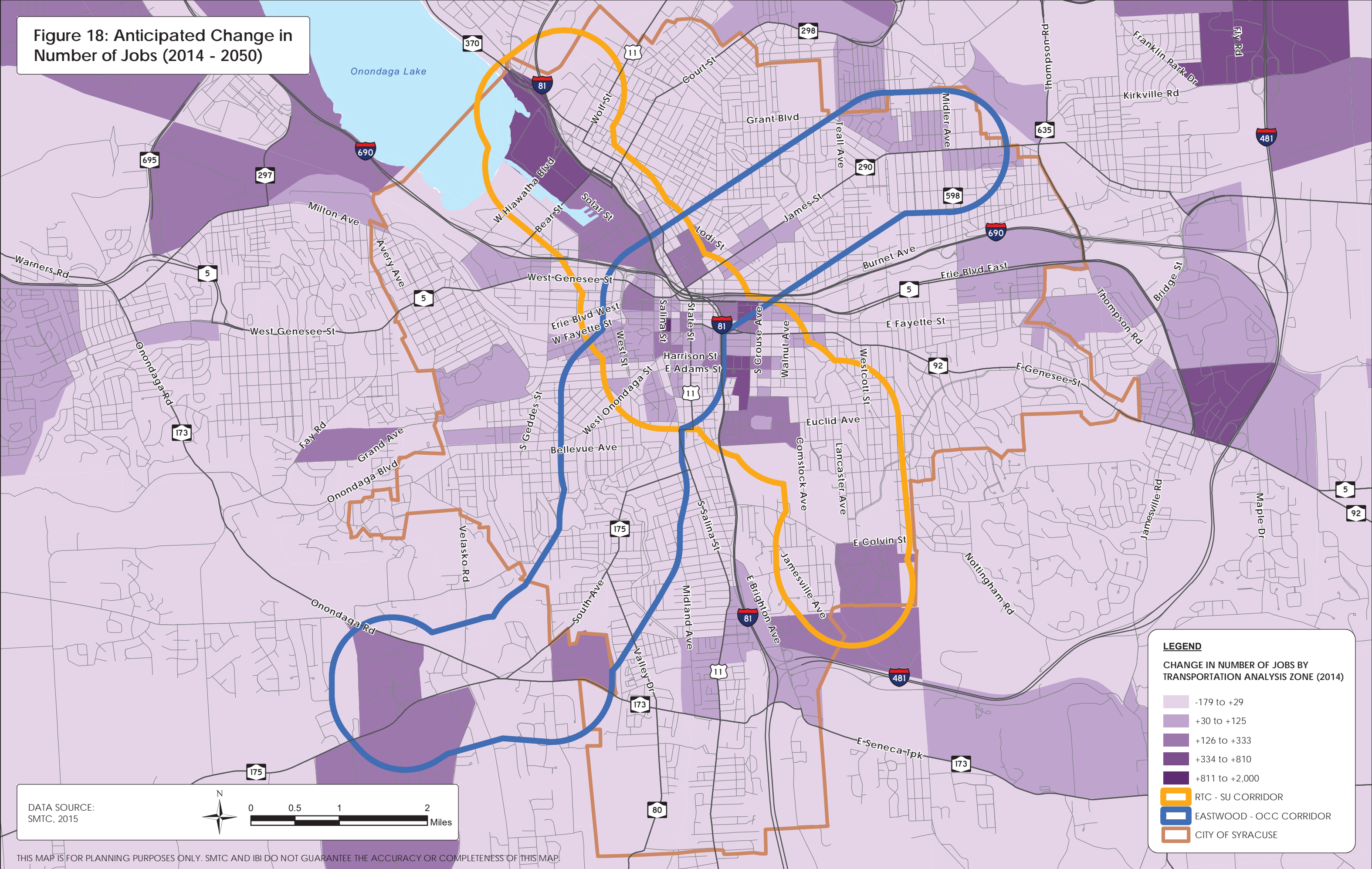


Figure 18: Anticipated Change in Number of Jobs (2014 - 2050)



3 Mode Screening



3.1 Screening Process

At the outset of the SMART study, five different “enhanced transit” mode options were under consideration including two rail options (light rail transit and modern streetcar) and three bus rapid transit options (BRT – busway, BRT – bus lane, and BRT – mixed traffic). These were “screened” against a set of eligibility criteria to determine which ones were worth progressing into additional evaluation. The screening criteria were largely based on FTA Small Starts funding guidance. This chapter examines the characteristics of each mode, describes how the screening criteria were developed, and presents the results of the eligibility screen for each mode in each of the study corridors.

3.2 Enhanced transit modes

3.2.1 Rail options

Light Rail Transit and modern streetcars describe a continuum of improvements from lower cost, speed and capacity to very high cost, capacity, and service levels. These modes require their own rail infrastructure, even when operating in mixed traffic, and so have a higher initial cost compared to bus modes, but where development densities and ridership levels warrant, this investment can be worthwhile.

Light Rail Transit (LRT). LRT requires its own tracks and runs on electric power drawn from overhead catenary wires. LRT generally operates in trains of two or three cars at speeds of 40 to 60 miles per hour. Typical LRT systems implemented in the U.S. and Canada provide high capacity, trunk line services where the passenger volumes merit the significant investment in rail infrastructure.



Figure 19: LRT train entering a station in Calgary, Alberta (Source: IBI Group)

LRT can operate in a shared ROW on city streets and on dedicated ROW as it travels between activity centers. Light rail systems serve dense population and employment corridors, at the higher end of what BRT systems typically serve, and achieve operating cost savings over BRT by having one driver per train, adding more cars without having to add more drivers. Although LRT systems are more expensive to build and less flexible in terms of changing routes than BRT systems, there is some evidence that they are better at attracting surrounding investment with the fixed nature of their tracks and stations.

Modern Streetcars. A modern streetcar system typically includes tracks inlaid into pavement, and vehicles that run on electric power drawn from overhead trolley wire wires. Streetcars are typically installed in existing shared vehicular lanes along local arterial or collector streets, and they operate at the speed of traffic. Streetcars typically act as a circulator system for high density employment and residential districts to connect residents and employees to jobs, restaurants and parking lots downtown. They cater to shorter trips with a greater emphasis on access (close stop spacing) than the longer distances and higher speeds of Light Rail Transit. Passenger volume of streetcars is typically lower than LRT, with capacities comparable to a 60' articulated coach of 100-120 passengers per vehicle.



Figure 20: Modern streetcar in Portland, Oregon (Source: railwaypreservation.com)

3.2.2 Bus options

Bus Rapid Transit can range from specially branded buses operating with limited stops in mixed traffic to a full-fledged grade-separated transitway, complete with off-board fare payment and all-door boarding akin to a subway or light rail. Within the BRT umbrella, a number of options are available to enhance the Eastwood – OCC and RTC – SU corridors. BRT alternatives considered include:

BRT – Busway. At the highest level of investment, BRT includes separate right-of-way (ROW) in the form of an on-road or off-road grade-separated busway. At this level of investment BRT begins to closely resemble light rail—and depending on design choices, construction prices can begin to approach those of light rail as well. Although these systems can be more expensive to build because of the cost of the dedicated right-of-way, buses operating in dedicated busways enjoy improved travel times that can compete with cars, attracting riders by choice. Examples of grade-separated busways include Hartford's CTfastrak, the Pittsburgh busways, and the Orange Line in Los Angeles.



Figure 21: BRT Busway in Hartford, Connecticut (Source: CT Transit)

BRT – Bus Lane. BRT can operate on the chosen transit alignment on arterial streets, with investments made in the transit route infrastructure to allow the bus to travel faster than other traffic, but without separated busways. This approach includes the enhancements of BRT – Mixed Traffic, but also introduces stretches of dedicated bus lanes on existing streets where congestion is a problem, or at chokepoints.

This framework can work well in areas where general congestion is low but there are a few stretches or chokepoints where protecting buses from interference can be highly beneficial. These bus lanes are generally placed at the side of the roadway, sometimes with a parking lane between them and the curb. Much of New York City’s Special Bus Service (SBS) network functions on these principles. Sometimes the bus lanes are reserved only at peak travel times, or allow right turns by general traffic, as in the Business Access and Transit lanes on Aurora Avenue in Seattle.



Figure 22: BRT bus lane in New York City (Source: nyc.gov)

BRT – Mixed Traffic. This style of BRT involves implementing a limited stop bus service within a particular corridor. Typically, the new service is given a special branding, and its stops are improved with modern shelters, arrival time prediction boards, and landscaping. Off-board fare payment is sometimes provided. Stops are often placed every half-mile or so and features to reduce travel time and improve reliability. Transit technology or physical features like transit signal priority (TSP), off-board fare payment, and queue jumpers, are often tools utilized to enhance the operation of the corridor. To serve local passengers, especially those in the disabled population, the BRT route supplements local service, although the local service may have its frequency reduced. Buses may be standard or articulated, as demand requires. This kind of service is typified by the Capital District Transportation Authority's (CDTA) Route 5 BusPlus BRT, which connects the downtowns of Albany and Schenectady and features limited stop service, more comfortable and specially branded stops but few other BRT enhancements (although more investment is planned to bring such enhancements in the future).



Figure 23: BRT mixed traffic in Albany, New York (Source: Metro Magazine)

Regardless of the type of BRT selected, significant blending and variation is common. In Pittsburgh and in Hartford, buses transition from grade-separated ROW to operate in completely mixed traffic through the downtown area. Numerous projects, including EmX in Eugene, Oregon and the planned Red Line in Indianapolis, Indiana include high-quality dedicated ROW in some places and fully mixed running in others. New York City's SBS branding includes some routes that run fully within dedicated lanes, some that have a mixture of dedicated and mixed ROW, and in the future some center-running BRT similar to light rail. Many BRT systems also begin at a lower level of investment and plan to ramp up to more intensive infrastructure as ridership and development build. The high degree of adaptability and relatively low capital costs have resulted in a proliferation of BRT systems in medium-sized cities comparable to Syracuse, such as Eugene, Oregon and Fort Collins, Colorado.

3.3 Screening Criteria Development

3.3.1 Small Starts Requirements

A common (although not the only) funding source for implementation of enhanced transit systems is the FTA's Section 5309 Capital Investment Grant program, also known as "Small Starts."

The Small Starts eligibility screening analysis adopts the FTA Small Starts screening and warrant criteria to examine the feasibility of various levels of investment in the study corridors. While there are other potential federal, state, and local funding sources for high capacity transit projects, virtually all Light Rail Transit and Streetcar projects are funded using Section 5309 Small Starts funds due to the significant capital costs of these modes. Therefore, Small Starts eligibility is a valuable screening tool to determine the feasibility of various modes.

The purpose of this stage of analysis was not to examine route or precise design alternatives or to determine funding qualification definitively, but to determine what general level of capital investment and improvement might be justified within the study corridors. According to current legislation and policy guidance, the FTA Small Starts program's project eligibility criteria are as follows:

- Total project cost is less than \$300 million;
- Total Small Starts funding sought is less than \$100 million;
- Small Starts funds can currently be used for up to 80% of project capital costs up to \$100 million, with the remainder coming from non-5309 federal, state, or local sources;
- The corridor must have existing daily transit ridership of 3,000 or more; and
- The improved transit corridor must not increase total system operating costs by more than 5% to be eligible for simplified financial evaluation.

The Small Starts program will fund transit of the following types:

- New fixed guideway systems (light rail, commuter rail etc.);
- Extensions to existing systems;
- Fixed guideway BRT systems (with at least 50% exclusive right-of-way such as busway or bus lanes); and
- Corridor-based BRT systems (mixed-traffic running, but with speed/reliability features and passenger amenities as prescribed by statute).

The FTA requires that potential applicants establish eligibility for Small Starts funds using a specified set of Project Justification criteria, which can be an onerous process. Therefore, the FAST Act (Fixing America's Surface Transportation), the current transportation bill, and policy guidance allows for the use of a simplified approach – known as the 'warrants' approach - to establish eligibility for Small Starts projects with a total capital cost below \$250 million. Similarly, projects that add no more that 5% to the sponsoring agency's annual operating & maintenance costs are eligible for a simplified financial evaluation. Warrants eligibility is based on existing corridor ridership as estimated using a methodology issued by FTA. The objective of the

Table 8: Small Starts warrants

Warrant Criteria to Achieve "Medium" Ratings for Mobility, Cost Effectiveness, Congestion Relief (BOTH criteria must be met)	
Total Proposed Small Starts Project Capital Cost	EXISTING Weekday Transit Trips in Corridor
\$0 to < \$50 million	3,000+
\$50 million - <\$100 million	6,000+
\$100 million - <\$175 million	9,000+
\$175 million - < \$250 million	12,000+

warrants approach is to reduce complicated and time-consuming ridership forecasting and technical analysis for corridors that have strong ridership, and which past experience shows are likely to be successful and cost-effective high capacity transit corridors. If warrants are met the project receives an automatic medium rating on three key Project Justification Criteria. The warrants levels are shown in Table 8.

3.3.2 Final Eligibility Screening Criteria

Based on the FTA Small Starts program eligibility criteria the following screening criteria were developed and applied to the mode alternatives.

- The **Total Cost** criteria refers to capital cost calculated using the table below.
- **Local Funding** represents the amount that the Syracuse region would have to raise from local and other non-federal sources. It is calculated by taking the Total Cost and subtracting the \$100M funding cap for the Small Starts program or calculating a minimum 20% local match if the project's cost is below that level.
- **Existing Ridership** is the total current Centro ridership on all routes that travel for a significant distance within the specified SMART 1 study corridor.
- **Operating Cost Increase** compares the projected operating cost of a mode alternative to Centro's total operating cost (\$42,887,863 in 2013 based on NTD). The project operating cost is based on known operating costs of comparable existing systems. No reductions in local service were assumed because existing service in the corridors is generally relatively infrequent and it would be necessary to cover local stops even after rapid transit was implemented. FTA also imposes certain requirements about the extent to which local service budgets can be reduced after implementation of a funded project.
- In addition to the Small Starts based criteria, one other criterion was added to take into consideration the specific requirements of certain modes for **dedicated or at least substantially prioritized, rights-of-way**. Without them their performance characteristics are diminished to the point of not providing the high levels of speed, reliability and capacity required to justify their costs.

3.4 Eligibility Screening Analysis: RTC – SU Corridor

The following matrix (Table 9) shows the results of applying the screening criteria to the Regional Transportation Center to Syracuse University corridor. The screening was based on pre-engineering planning-level analysis.

Table 9: RTC - SU Corridor Mode Assessment

screening methodology		LRT 	Modern Streetcar 	BRT-Busway 	BRT-Bus Lane 	BRT-Mixed Traffic 
	Dedicated ROW North Segment 	✓ Available	⊘ N/R	✓ Available	⊘ N/R	⊘ N/R
	Dedicated ROW South Segment 	✗ Not Available	⊘ N/R	✗ Not Available	⊘ N/R	⊘ N/R
	Total Cost (in millions) 	✗ \$457	✗ \$426	✓ \$190	✓ \$25	✓ \$10
	Local funding (in millions) 	✗ \$357	✗ \$326	✗ \$90	✓ \$5	✓ \$2
	Existing Ridership 	✓ 3,726	✓ 3,726	✓ 3,726	✓ 3,726	✓ 3,726
	Operating Cost Increase 	✗ 26%	✗ 22%	✗ 18%	✗ 6%	✓ 5%
	Further Study? 	✗ No	✗ No	✗ No	✓ Yes	✓ Yes

✗ indicates results that do not meet eligibility criteria. ⊘ not required
 ✓ indicates results that meet eligibility criteria.

To more accurately evaluate the Dedicated ROW criteria, the corridor was divided into two segments because each one has different ROW characteristics. The north segment (RTC to downtown) of this corridor has some realistic potential to provide dedicated ROW. Along Solar Street there are large areas of vacant land that could be used for transit. On the south segment, between Syracuse University and downtown, significant parts of the available ROW are—among other challenges—narrow, discontinuous, steeply graded, residential in character and generally not conducive to high capacity transit development. The modes requiring significant segments of dedicated ROW would not be practical.

Using the simplified existing ridership methodology developed for the Eligibility Screening based on the route-by-route data that was available, the RTC – SU corridor clears the threshold of 3,000 existing riders per day. The total of 3,726, however, is relatively close to the 3,000 required to qualify for the warrants approach for Small Starts. Careful attention to meeting this threshold will need to be taken when more detailed stop-by-stop data becomes available in future SMART phases.

According to current FTA Small Starts warrants breakpoints, a corridor with the established existing daily corridor ridership range could potentially be eligible for a project with up to \$50

million total capital cost. This makes the BRT - Bus Lane and BRT - Mixed Traffic options potentially competitive, but greatly reduces the feasibility of the significantly more expensive BRT - Busway, Streetcar, and LRT options. These modes may be eligible for the New Starts program, which funds more expensive transit projects, but since they would be competing with larger projects with much higher ridership and other benefits, it would be highly unlikely that they would be funded. Rail transit is also projected to lead to an increase in overall system operating costs that would exceed our FTA-based criteria. These modes are not recommended for further study.

The analysis indicates that BRT – Busway service would likely fall within the capital range supportable by Small Starts, although towards the more expensive end. However, adequate ROW is not available for the full corridor and BRT - Busway is projected to fall well above the operating cost increase criteria threshold and is not recommended for further study.

It appears that the modes with the greatest likelihood of meeting FTA’s requirements are BRT - Bus Lane or BRT - Mixed Traffic categories. The local funding burden of the BRT - Bus Lane and BRT - Mixed Traffic options is orders of magnitude less than the other options, further reinforcing the case for these modes, which are recommended for further study.

3.5 Eligibility Screening Analysis: Eastwood – OCC Corridor

The following matrix (Table 10) shows the results of applying the screening criteria to the Eastwood to Onondaga Community College corridor.

Table 10: Eastwood - OCC Corridor Mode Assessment

screening methodology		LRT 	Modern Streetcar 	BRT-Busway 	BRT-Bus Lane 	BRT-Mixed Traffic 
	Dedicated ROW North Segment 	 Available	 N/R	 Available	 N/R	 N/R
	Dedicated ROW South Segment 	 Not Available	 N/R	 Not Available	 N/R	 N/R
	Total Cost (in millions) 	 \$526	 \$491	 \$219	 \$27	 \$11
	Local funding (in millions) 	 \$426	 \$391	 \$119	 \$5	 \$2
	Existing Ridership 	 3,456	 3,456	 3,456	 3,456	 3,456
	Operating Cost Increase 	 30%	 25%	 20%	 7%	 6%
	Further Study? 	 No	 No	 No	 Yes	 Yes

 indicates results that do not meet eligibility criteria.  not required
 indicates results that meet eligibility criteria.

Like the RTC - SU corridor, the Eastwood - OCC corridor was divided into two segments to more accurately evaluate the Dedicated ROW criteria due to different ROW characteristics. The north segment of this corridor (Eastwood to downtown) has some realistic potential to provide dedicated ROW. Although it presents a variety of challenges, James Street could be reduced to one general purpose lane in each direction. In the south segment, between OCC and downtown, significant parts of the ROW are—among other challenges—narrow, discontinuous, steeply graded, residential in character and generally not conducive to high capacity transit development. The modes requiring significant segments of dedicated ROW would not be practical.

Using the simplified methodology developed for the Eligibility Screening, the Eastwood - OCC corridor clears the threshold of 3,000 existing riders per day. The total of 3,456 however is relatively close to the 3,000 required to qualify for the warrants approach for Small Starts. Careful attention to meeting this threshold will need to be taken when the data becomes available in future SMART phases.

As with the RTC - SU Corridor, implementing LRT or a modern streetcar would impose very high capital and operational costs in this corridor and is not recommended for further study.

Because this corridor is longer, the estimate for BRT – Busway service is higher, but still falls within an acceptable range for capital investment. However, ROW is not available on the southern section of the corridor. Estimated operational costs for BRT - Busway would exceed FTA thresholds as well, but again these costs are variable. This mode is not recommended.

As with the RTC-SU corridor, it would appear that some form of BRT, falling somewhere on the spectrum between mixed traffic “rapid bus” such as RIPTA’s R-Line and a BRT – Bus Lane such as Seattle’s Swift, would be the most logical choice for the Eastwood - OCC corridor. Such an approach would appear to stand a good chance of meeting FTA warrants.

3.6 Summary of Screening Results

This eligibility screening analysis indicated that more capital intensive modes of transit, such as Busway and LRT, would not meet the eligibility criteria to be considered for FTA Small Starts funding, the primary source for transit capital funding for projects like this around the United States. This is due to three main factors: the projected high capital and operating cost of these modes, the lack of available ROW to take advantage of their benefits, and the relatively low ridership in the study corridors (as compared to transit systems throughout the U.S.). Since the Small Starts program provides the majority of funding for fixed guideway transit in medium sized metro areas such as Syracuse, and no alternatives are in place, it was recommended that LRT, Modern Streetcar, and BRT – Busway be removed from further consideration. Two modes, BRT – Bus Lane and BRT – Mixed Traffic, as well as existing service improvements, were recommended for further analysis in the SMART 1 study.

4 Alternatives Development



4.1 Characteristics of an Alternative

The previous section identified the transit modes (i.e., BRT – Mixed Traffic and BRT – Bus Lane) that are most likely to meet the eligibility criteria for the Small Starts funding program and, therefore, meet the transit needs of the Syracuse region through established funding programs. The next step was to define specific alternatives, with each alternative consisting of a specific mode on a specific route.

The Small Starts program requires an “alternative” to consist of the following features:

- Defined stations with shelters and schedule information meeting ADA requirements;
- Traffic signal pre-emption and queue jump lanes;
- Headways of at most 10 minutes during the peak and 20 minutes during off peak times, or 15 minutes for both peak and off-peak for at least 14 hours on weekdays; and
- Brand identification.

In addition to the above Small Starts program requirements, the characteristics of the alternatives include specific routings, station locations, transit priority locations, station characteristics, schedule frequencies, and calculated run times. In order to identify station locations, a specific route must be determined within each corridor. The combination of a specific route and a mode option can then be used to define individual alternatives. When conducting Alternatives Analysis, agencies are also required to study a “no-build” alternative to better understand what operational improvements could be made without the capital investment. Each corridor in this study also included an existing service improvements alternative to meet this requirement.

Characteristics that were considered in the development of alternative routes included directness, connections to important activity centers, accessibility for pedestrians, and use of main commercial streets where possible, both to provide access to these places and to avoid noise and traffic impacts on quieter residential or secondary streets. These characteristics provide the environment needed for fast and frequent BRT service while limiting any adverse effects. In most cases, this type of direct route existed along only one potential routing.

4.2 Route Options

4.2.1 RTC – SU corridor route options

Two route options were identified for this corridor, although these options only vary on the RTC to Transit Hub segment of the corridor.

From the Transit Hub to SU, both route options would generally follow the path of existing bus services (such as route variations 40, 240, and 340). This segment of the corridor was shortened to terminate at the SU Main Campus rather than the South Campus based on SU’s long range plan that calls for moving most of the dormitories located there to the Main Campus. This would greatly reduce the need for transportation between the two campuses.

For the segment between the RTC and the Transit Hub, Solar Street and North Salina Street were identified as route options because they represent the two reasonably direct routes from the RTC and Destiny to Downtown and the Transit Hub.

The first route option would travel from the RTC to Destiny, along Solar Street to Franklin Square, and then to the Transit Hub via Salina Street. This route serves land available for redevelopment along Solar Street between Destiny and Franklin Square. Because Solar Street in this section includes on-street parking that is not heavily used and does not have any development along it that would prevent widening, bus lanes were included in this alternative. Since the roadway is about 38 feet wide and bus lanes would require at least 42 feet (assuming two 10 foot travel lanes and two 11 foot bus lanes) some widening would be necessary.

The second route option would travel from the RTC to Destiny, then along North Salina Street through the Northside neighborhood, along State Street to St. Joseph's Hospital, and continue along State Street to the Transit Hub. This route serves the urban neighborhoods between Wolf Street and St. Joseph's where many existing transit riders live. Bus lanes were considered on N. Salina Street, which is generally 55 feet wide (except between Catawba and Kirkpatrick where it is 70 feet wide). This would provide room for two 11 foot travel lanes, an 11 foot turn lane and two 11 foot bus lanes, but require the removal of most on-street parking. This would have a significant negative impact on businesses in the area without a commensurate benefit for transit riders (because N. Salina is not congested most of the day the bus lanes would not result in any travel time savings) and so was not considered a viable alternative. Only BRT in Mixed Traffic was considered along North Salina Street.

4.2.2 Eastwood – OCC corridor route options

The Eastwood - OCC route would start at the intersection of Leo Avenue and Lepage Avenue at the eastern edge of the Eastwood business district and travel along James Street, Willow Street to St. Joseph's Hospital, Downtown, and the Transit Hub.

From the Transit Hub, two possible route options were considered to reach Upstate University Hospital Community Campus and OCC. The first option considered would travel along West Onondaga Street and South Avenue. Another option was considered that would travel along South Salina Street and Cortland Avenue or Doctor Martin Luther King to South Avenue. This second option could provide a southern station for the revitalized East Adams Street Neighborhood outlined in the Syracuse Housing Authority's *East Adams Street Neighborhood Transformation Plan*. However, the South Salina Street/Cortland Avenue option was not developed further because it would not serve the Southwest Community Center, the businesses along West Onondaga Street, or the dense urban neighborhood along South Avenue. The higher density northern sections of the East Adams Street Neighborhood, on the other hand, would be well served by BRT stations at the Transit Hub and at Almond Street on the RTC – SU corridor. In addition, there is a good level of existing local service on S. Salina Street through the southern sections of the revitalized East Adams Street Neighborhood.

The Eastwood - OCC route serves high density residential areas along James Street and the neighborhoods along South Avenue that include a high proportion of transit riders. The two modes advanced for consideration, BRT-Mixed Traffic and BRT-Bus Lane, would both follow the same route in this corridor. The bus lane alternative is based on Alternative 3: Enhanced Transit from the James Street Road Diet Study Report (completed by the SMTC in 2011), which included bus lanes from Shotwell Park to State Street. James Street is 40 to 42 feet wide in most places in this section and the study assumed that minimum 10 foot lanes were generally acceptable for transit operations. This eliminates the need for widening. The exception would be at signalized intersections with higher left turn volumes. At these locations it was recommended to widen the road to include dedicated left turn lanes.

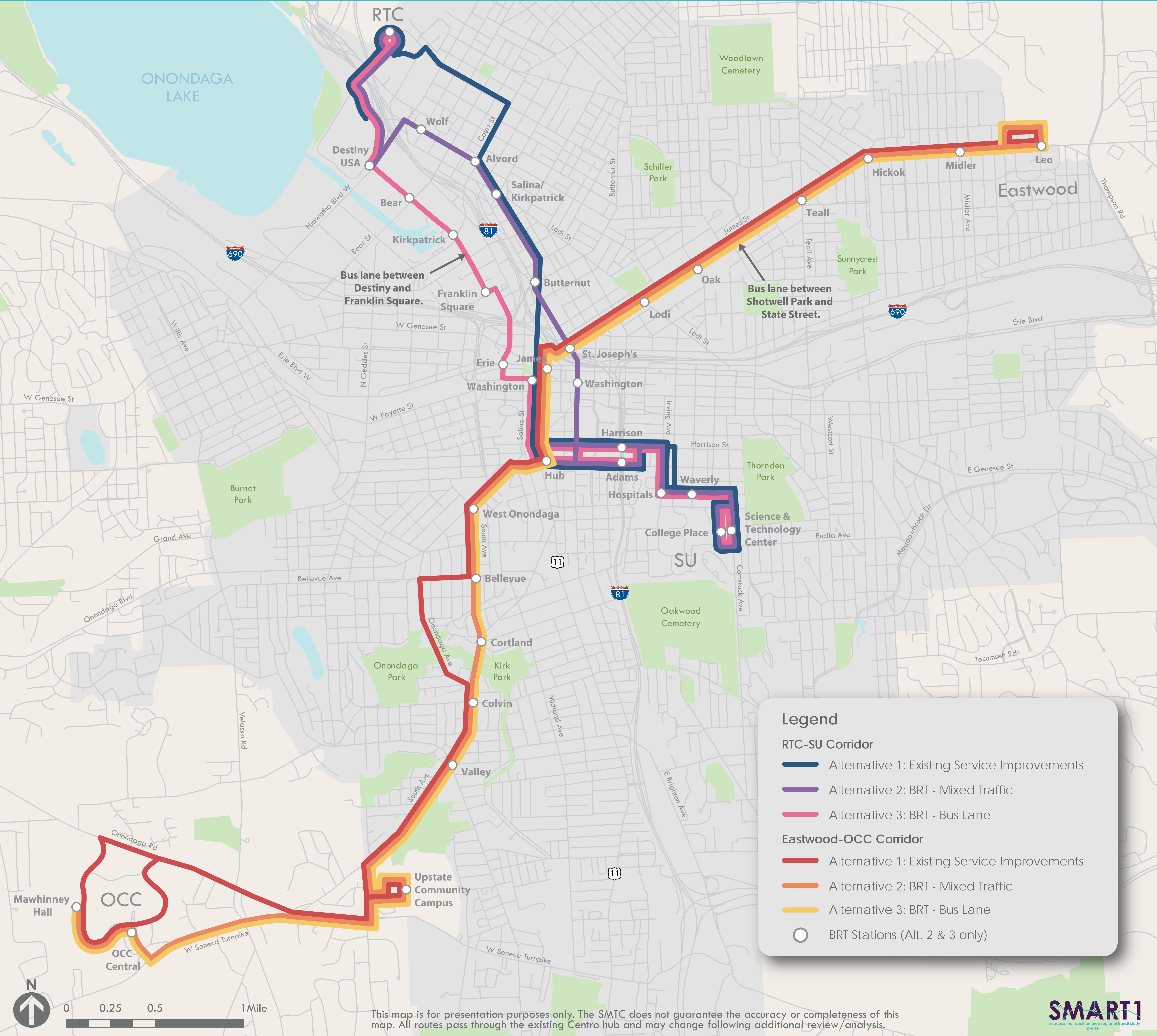
4.3 Description of Alternatives

With the mode and route options analyzed, a total of six specific alternatives, three in each corridor were identified (Table 11). All alternatives are described in detail below. Figure 24 shows all route/mode alternatives.

Table 11: Summary of Alternatives

Corridor	Alternative	Mode	Route
Eastwood - OCC	1	Existing Service Improvements	Via James and South
	2	BRT – Mixed Traffic	Via James and South
	3	BRT – Bus Lane	Via James and South
RTC - SU	1	Existing Service Improvements	Via 1 st North, N. Salina and Adams/Harrison, Irving, Waverly
	2	BRT – Mixed Traffic	Via N. Salina and Adams/Harrison, Irving, Waverly
	3	BRT – Bus Lane	Via Solar and Adams/Harrison, Irving, Waverly

Figure 24: Route | Mode Alternatives



4.3.1 RTC – SU Corridor

Three alternatives were defined for the RTC - SU corridor, representing the three different modes that were advanced through the eligibility screening (i.e., Existing Service Improvements, BRT – Mixed Traffic, and BRT – Bus Lane) combined with the two options determined feasible (i.e., North Salina or Solar Street). Each alternative is described below.

4.3.2 Alternative 1: Existing Service Improvements

This alternative would expand service in the corridor to make using transit easier and more convenient and increase ridership among both existing and new riders. It would include new or expanded shelters at key stops, consolidation of underused stops to improve travel time, and strategic application of transit priority such as signal priority and queue jump lanes. These would apply to route variations 116 N. Salina Street – 7th North Street – Destiny USA and 40 – SU, which would be through-routed all day and continue to follow their existing routings. Service improvements would include decreases in headways during the midday to 20 minutes and weekday evening and daytime Saturdays to 40 minutes.

4.3.3 Alternative 2: BRT – Mixed Traffic via North Salina Street

Route: This alternative is a BRT – Mixed Traffic service operating between the RTC and SU via Destiny USA and N. Salina Street. The route would be as follows:

- Exiting the loop at the RTC via a right turn onto Harborside Drive;
- South on Harborside Drive to a left turn onto Destiny USA Drive;
- East and south on Destiny USA Drive until a left onto Hiawatha Boulevard W.;
- North on Hiawatha Boulevard to a right turn onto N. Salina Street;
- South on N. Salina Street until its intersection with N. State Street, where buses would bear left onto N. State Street;
- South on N. State Street until a right turn onto Harrison Street;
- West on Harrison Street to a left turn onto Warren Street and a right into the transit hub;
- Exiting the transit hub via a right turn onto Warren Street and a left onto Adams Street;
- East on Adams Street to a left onto Sarah Loguen Street;
- North on Sarah Loguen Street to a right turn onto Harrison Street, avoiding the intersection of Adams and Irving and steeply sloped streets where buses can bottom out dangerously;
- East on Harrison Street to a right on Irving Avenue;
- South on Irving Avenue to a left turn onto Waverly Avenue;
- East on Waverly Avenue to a right turn onto Comstock Avenue;
- South on Comstock Avenue to a right turn on Euclid Avenue; and
- West on Euclid Avenue to a right on College Place, where the route would terminate at the Center for Science & Technology at SU.

The return route would be identical, except that buses towards RTC would:

- Depart College Place to a right turn onto University Place;
- East on University Place to a left onto Comstock Avenue;
- Northbound on Comstock Avenue, making a left onto Waverly Avenue;
- West on Waverly Avenue to right on Irving Avenue;
- North on Irving Avenue to left on Harrison Street;
- Continue west on Harrison Street past State Street to make a left onto Warren Street to reach the Transit Hub; and
- Exit the Transit Hub via a left turn onto S. Salina Street and a left onto Adams Street, to reach State Street, where they would again turn left to run north on State Street.

Capital Improvements: Alternative 2 would operate with branded low-floor buses and the designated stops would have upgraded shelters, real time passenger information, improved furniture, and a raised curb height to achieve near-level boarding and alighting. This alternative

would also have shared stops with the Eastwood - OCC corridor on N. State Street between Willow and James Streets. These stops serve St. Joseph's Hospital and also offer a convenient transfer point between the Eastwood - OCC and RTC - SU corridors for trips between points in the northeast and northwest. Given the availability of underutilized land, convergence of the corridors, and the resulting frequent service too many parts of Syracuse, the intersection of James Street and State Street could become a key node of TOD.

Stations: Preliminary station locations follow from north to south (nearby major destinations and transfers noted in parentheses):

- RTC (transfer to Amtrak and intercity buses);
- Destiny USA (mall, transfer to numerous local buses);
- Wolf Street;
- Alvord Street;
- Salina/Kirkpatrick Streets;
- Butternut Street;
- James Street (transfer to any alternative of the Eastwood-OCC corridor);
- Washington Street;
- Transit Hub (transfer to any alternative of the Eastwood-OCC corridor and numerous local buses);
- Almond Street;
- Hospitals (Upstate Medical University Hospital, Syracuse VA Medical Center);
- Waverly Avenue (Syracuse University);
- College Place (Syracuse University); and
- Science & Technology Center (Syracuse University).

Travel Times: The preliminary estimated travel times for this corridor are shown in Table 12. These times include a scheduled 1 minute at the Transit Hub to facilitate transfers, and include scheduled recovery time, the inclusion of which allows a more direct comparison to existing travel times. No provision for layovers at the ends of routes are included in these times; these will be developed for the purposes of estimating operating costs once a final alternative is selected.

This service is estimated to offer travel time savings over the existing local services as well as frequency improvement over both local and express services. Although no existing route exactly matches the Alternative 2 routing, the following travel time comparisons are offered for the AM peak period:

- Between Destiny USA mall and the Transit Hub: 19 minutes versus 27 minutes via existing route variation 116;
- Between the RTC and the Transit Hub: 19 minutes versus 21 minutes via existing route variation 116;
- Between Destiny USA Mall and SU: 24 minutes versus 26-31 minutes via route variations 50/550.

Schedule Frequency: Existing service from Destiny USA to downtown today is either fast via I-81, while not serving local travel markets, or slow via circuitous local route variations such as the 16 mentioned in this comparison. The proposed service would balance these two needs and also operate much more frequently than any of the present routes variations serving the corridor. Alternative 2 would operate every 10 minutes during peak hours, 20 minutes during the midday and early evening, and every 40 minutes during the evening. Daytime service on Saturday and Sunday would operate every 20 minutes. This would both reduce the average waiting time for passengers by several minutes and offer more convenient service that better fits riders' schedules.

4.3.4 Alternative 3: BRT – Bus Lane via Solar Street

Route: This alternative is a BRT – Bus Lane service operating between the RTC and SU via Destiny USA and Solar Street. Like the RTC - SU corridor via N. Salina Street, the southbound service would originate at the RTC and then travel to Destiny USA, as shown in Figure 33. The route would be as follows:

- Exiting the loop at the RTC via a right turn onto Harborside Drive;
- South on Harborside Drive to a left turn onto Destiny USA Drive;
- Making a stop at a principal entrance to Destiny USA via a dedicated bus-only intersection on Destiny USA Drive, then using an existing ramp to return to Destiny USA Drive. This improvement was included in the BRT bus lane option to form a clear distinction between the higher capital cost alternative and the lower capital cost alternative. It could eventually be included as a separate element in the BRT mixed traffic alternative;
- East and south on Destiny USA Drive, then continuing through on Solar Street;
- South on Solar Street until a left turn onto Plum Street at Franklin Square;
- East on Plum Street, turning right onto N. Franklin Street. If the Butternut Street Bridge is realigned as part of the I-81 project, this section could route via State Street as well, providing access to St. Joseph's;
- South on N. Franklin Street until a left turn onto Washington Street;
- East on Washington Street to a right turn onto Salina Street;
- South on Salina Street to a left turn into the transit hub;
- Exiting the transit hub via a right turn onto Warren Street and a left onto Adams Street;
- East on Adams Street to a left onto Sarah Loguen Street;
- North on Sarah Loguen Street to a right turn onto Harrison Street;
- East on Harrison Street to a right on Irving Avenue;
- South on Irving Avenue to a left turn onto Waverly Avenue;
- East on Waverly Avenue to a right turn onto Comstock Avenue;
- South on Comstock Avenue to a right turn on Euclid Avenue; and
- West on Euclid Avenue to a right on College Place, where the route would terminate at the Center for Science & Technology at SU.

The return route would be identical, except that buses towards RTC would:

- Depart College Place to a right turn onto University Place;
- East on University Place to a left onto Comstock Avenue;
- North on Comstock Avenue, making a left onto Waverly Avenue;
- West on Waverly Avenue to right on Irving Avenue;
- North on Irving Avenue to left on Harrison Street;
- Continue west on Harrison Street past State Street to make a left onto Warren Street to reach the Transit Hub; and
- Would depart the stop at Destiny USA via a left turn at the new bus-only intersection onto northbound Destiny USA Drive.

Capital Improvements: Capital improvements for this alternative would be the same as for Alternative 2 (BRT – Mixed Traffic via North Salina Street), with the addition of curbside bus lanes on the portion of Solar Street between Hiawatha Boulevard and a point just north of Franklin Square. An example of a curbside bus lane is shown in Figure 25. Improvements would include the modifications to intersection geometry, signals, street width, and station layout required to accommodate the bus lanes. Total length of the bus lanes would be a little less than a mile. Given the 40-foot width of Solar in this stretch, the street could be widened by 10-11 feet to accommodate bus lanes if parking were to be preserved, or only 4-6 feet if parking is removed. General traffic would be allowed to use the bus lanes for short distances to make right turns.



Figure 25: BRT Bus Lane on 34th Street in New York City (Source: IBI Group)

Stations: Preliminary station locations follow from north to south (nearby major destinations and transfers noted in parentheses):

- RTC (transfer to Amtrak and intercity buses);
- Destiny USA (mall, transfer to numerous local buses);
- Bear Street;
- Kirkpatrick Street;
- Franklin Square;
- Erie Boulevard;
- Washington Street (transfer to any alternative of the Eastwood/OCC corridor);
- Transit Hub (transfer to any alternative of the Eastwood-OCC corridor and numerous local buses);
- Almond Street;
- Hospitals (Upstate Medical University Hospital, Syracuse VA Medical Center);
- Waverly Avenue (Syracuse University);
- College Place (Syracuse University); and
- Science & Technology Center (Syracuse University).

Travel Time: The preliminary estimated travel times for this corridor are shown in Table 12. These times include a scheduled 1 minute at the Transit Hub to facilitate transfers, and include a schedule recovery allowance so as to make times comparable to present timetable times. No provision for layovers at the ends of routes are included in these times; these will be developed for the purposes of estimating operating costs once a final alternative is selected.

This service is estimated to offer travel time savings over the existing local services as well as frequency improvement over both local and express services. Although the route length is very close to that of the alternative via Salina, it is estimated to save 1 or 2 minutes because of the exclusive bus lanes, and perhaps a little more southbound during the AM rush. Although no

existing line exactly matches Alternative 3, the following travel time comparisons are offered for the AM peak period:

- Between Destiny USA Mall and the Transit Hub: 12 minutes versus 17 minutes via existing route variation 550;
- Between the RTC and the Transit Hub: 16 minutes versus 21 minutes via route variation 550;
- Between Destiny USA Mall and SU University Place: 19 minutes versus 26-31 minutes via route variations 50/550.

Schedule Frequency: Service frequency would be the same as Alternative 2, every 10 minutes during peak hours, 20 minutes during the midday and early evening, and every 40 minutes during the evening. Daytime service on Saturday and Sunday would operate every 20 minutes.

It is important to bear in mind that the frequency of transit service to Franklin Square and along Solar Street is presently very low, with only a single route variation 550 departure for downtown Syracuse before 11:00 am on weekdays. Introduction of this service, operating every 10 minutes in peak periods, would be a very substantial increase in accessibility. Ultimately, the choice between the N. Salina Street and Solar Street corridors is a question of serving an existing developed corridor (N Salina) versus promoting development of a new corridor (Solar) with the added factor of being able to provide a (slightly) faster travel time via Solar Street because of the exclusive bus lanes. One factor to consider is that bus lanes may be seen as having the permanence that developers like to see in infrastructure and giving potential new riders a level of comfort that they might not have with general on-street operation.

4.3.5 Eastwood – OCC Corridor

Three alternatives were defined for the Eastwood - OCC corridor, representing the three different modes that were advanced through the eligibility screening (Existing Service Improvements, BRT – Mixed Traffic, and BRT – Bus Lane) combined with the one route option determined most feasible (James Street and South Avenue). Each alternative is described below.

4.3.6 Alternative 1: Existing Service Improvements

This alternative would expand and rationalize service in the corridor and would include new or expanded shelters at key stops, consolidation of underused stops to improve travel times, and strategic application of signal priority and queue jump lanes. These improvements would make using transit easier and more convenient, resulting in increased ridership among both existing and new riders. The improvements would apply to lines 20 James Street – Lamson Street and 226 South Avenue – OCC, which would be through-routed all day and continue to follow their existing routings. Service improvements would include decreases in headways during the midday to 20 minutes and weekday evening and daytime Saturdays to 40 minutes, and potentially rationalization of scheduling to follow a clock face or near-clock face pattern. A clock face schedule helps passengers remember when buses will arrive by scheduling them at the same number of minutes past every hour. For example, with 20 minute frequency a transit vehicle could arrive at 10, 30, and 50 past the hour throughout the day.

4.3.7 Alternative 2: BRT – Mixed Traffic

Route: This alternative would operate by a direct BRT – Mixed Traffic route as follows from the present westbound Lepage Place/Leo Avenue stop just off of James Street (using the existing Line 20 layover location) to the main entrance to Mawhinney Hall on the campus of Onondaga Community College (OCC). The basic route would be:

- Lepage Place westbound to a left turn on Lamson Street;
- Lamson Street southbound to a right turn on James Street;
- James Street westbound to a right turn onto Townsend Street;

- North on Townsend Street to a left turn onto E. Willow Street;
- West on E. Willow Street to a left onto N. Salina Street;
- South on N. and S. Salina Street to a left into the Transit Hub;
- Left out of the Transit Hub onto S. Salina Street;
- South on S. Salina Street to a right onto W. Adams Street;
- West on W. Adams Street to a left onto W. Onondaga Street;
- Southwest on W. Onondaga Street to a left onto South Avenue;
- South and southwest on South Avenue to a left onto Broad Road;
- South on Broad Road to a left onto County Home Road and a loop at Upstate University Hospital's (UUH) Community Campus;
- From the loop at the UUH Community Campus west on County Home Road to a left onto the main campus road, and ultimately a right onto West Seneca Turnpike;
- West on West Seneca Turnpike to right onto OCC Drive; and
- North on OCC Drive to a left via the traffic circle, continuing west and north on OCC Drive until reaching Mawhinney Hall.

The return route would be identical, except that on the approach to the eastern terminus the buses would loop via Leo Avenue and Lepage Place as Line 20 buses do today. The stops for St. Joseph's Hospital would be shared with Alternative 2: North Salina BRT – Mixed Traffic for the RTC - SU corridor described below.

This routing via State and Willow was chosen for several reasons. In Downtown Syracuse, the left from James to Salina is prohibited at certain times of day; the routing passes near St. Joseph's Hospital; and this routing provides a convenient connection with the RTC-SU N. Salina alternative.

Capital Improvements: Capital improvements for this alternative would include branded low-floor buses, designated stops with upgraded shelters, real-time passenger information, improved furniture, and a raised curb height to achieve near-level boarding and alighting. Stops would have shelters and a level of amenities comparable to CDTA's BusPlus Red Line in Albany or Grand Rapids' Silver Line (see Figure 26).



Figure 26: BRT station and bus in Grand Rapids, Michigan (Source: downtowngr.org)

Stations: The stations for Alternatives 2 (BRT – Mixed Traffic) and 3 (BRT – Bus Lane) would be the same. Station spacing is set at a basic level of approximately ½ mile for all alternatives on both corridors for purposes of the current analysis. TCRP Report 118, the *Bus Rapid Transit Practitioner's Guide*, suggests this spacing as the ideal in most situations for high-performing BRT lines. The following station locations, from east to west (nearby major destinations and

transfers noted in parentheses) are preliminary and may change as more detailed design is completed in future phases of the project:

- Leo Avenue;
- Midler Avenue;
- Hickok Ave;
- Teall Avenue;
- Oak Street;
- Lodi Street;
- St. Joseph's (St. Joseph's Hospital);
- James Street (at State Street);
- Washington Street (transfer available to Solar Street alternative of the RTC-SU corridor);
- Transit Hub (transfer available to all alternatives of RTC-SU corridor and all local buses);
- W Onondaga Street;
- Bellevue Avenue;
- Cortland Avenue;
- W Colvin Street;
- Valley Drive;
- Upstate (Upstate University Hospital);
- OCC Central (OCC); and
- Mawhinney Hall (OCC).

Travel Times: The preliminary estimated travel times for this corridor are shown in Table 12. These times include a scheduled 1 minute at the Transit Hub to facilitate transfers, and include a schedule recovery allowance so as to make times comparable to present timetable times. No provision for layovers at the ends of routes are included in these times; these will be developed for the purposes of estimating operating costs once a final alternative is selected.

Currently Line 20 is scheduled at 25 minutes between Leo Avenue and the Transit Hub during the AM peak. Line 26 trips that do not divert to the Van Duyn Home and Hospital are scheduled for 30 minutes to reach Coyne Hall at OCC. Through buses now lay over for 5 minutes at the Transit Hub. Therefore, end-to-end improvements could save 17 to 19 minutes out of 60, or over 25%.

Service Frequency: The BRT – Mixed Traffic service would operate every 10 minutes during peak hours, 20 minutes during the midday and early evening, and every 40 minutes during the evening. Daytime service on Saturday and Sunday would operate every 20 minutes. These peak and midday headways are required by the FTA to qualify for Small Starts funding. Though existing peak period headways on James Street may average lower than this number when all route variations are taken into consideration, headways currently tend to be irregular. Thus, a more organized, clock face schedule would both reduce the average waiting time for passengers by several minutes and save them further time by allowing them to travel at times closer to the ideal for their purposes. Travel time savings would be even greater during off-peak hours.

4.3.8 Alternative 3: BRT – Bus Lane

Route: This alternative would follow the same route as Alternative 2 (BRT – Mixed Traffic) between Lepage Place/Leo Avenue and Mawhinney Hall on the campus of OCC. The difference would be the addition of continuous curbside bus lanes along a segment of James Street.

Capital Improvements: Capital improvements for this alternative would be similar to Alternative 2 with the addition of curbside bus lanes between Shotwell Park and State Street. Capital improvements for the lanes would include modifications to intersection geometry, signals, street width, and station layout. Total length of the bus lanes would be a little less than two miles; given the generally 40-foot width of James Street in this stretch and the current lack

of parking, the street could accommodate the lanes without widening between intersections if 10-foot lanes are acceptable to the stakeholders. Left turn lanes would need to be constructed at intersections to avoid excessive congestion. General traffic would be allowed to use the bus lanes for short distances to make right turns.

Stations: The stations would be the same as Alternative 2 noted above.

Travel Times: The preliminary estimated travel times for this corridor are shown in Table 12. These times include a scheduled 1 minute at the Transit Hub to facilitate transfers, and include a schedule recovery allowance so as to make times comparable to present timetable times. No provision for layovers at the ends of routes are included in these times; these will be developed for the purposes of estimating operating costs once a final alternative is selected.

These times generally represent an additional 2-minute travel time savings over the savings achieved in Alternative 2, or about a 30% on-board travel time savings over existing travel times.

Schedule Frequency: Service frequency would be the same as Alternative 2, every 10 minutes during peak hours, 20 minutes during the midday and early evening, and every 40 minutes during the evening. Daytime service on Saturday and Sunday would operate every 20 minutes.

4.4 Alternatives Summary

On both the Eastwood - OCC and RTC - SU corridors, Alternative 1: Existing Service Improvements, offers increased frequency—especially at off-peak hours—potential rationalization of peak-hour scheduling, and slightly increased span of service. Travel time would not be improved substantially over existing service, though riders would benefit from other improvements, including potential reduction of average wait times. The Existing Service Improvements represents a “no build” alternative for each corridor.

Two “build” alternatives were defined for each corridor, which offer substantial benefits in terms of travel time: a reduction of between 25 and 30 percent, or up to 20 minutes, compared to existing travel times and the Existing Service Improvements alternative. On both corridors, the BRT - Bus Lane alternative would offer slight (approximately 2 minute) travel time improvements over the alternatives without bus lanes. FTA requirements would mean Alternatives 2 (BRT – Mixed Traffic) and 3 (BRT – Bus Lane) would offer substantially improved frequency relative to existing service and the Existing Service Improvements alternative.

The physical configuration and service characteristics for all alternatives are summarized in Table 12.

Table 12: Physical Configuration and Service Characteristics

Alternative	RTC - SU				Eastwood - OCC			
	Current	1: Existing Service Improvements	2: BRT - Mixed Traffic via N Salina St	3: BRT – Bus Lane via Solar St	Current	1: Existing Service Improvements	2: BRT – Mixed Traffic	3: BRT – Bus Lane
Physical Characteristics								
Route length	5.6 miles	5.6 miles	5.5 miles	5.0 miles	10.5 miles	10.5 miles	9.8 miles	9.8 miles
2/3-lane mixed traffic	3.8 miles	3.8 miles	3.7 miles	2.9 miles	6.8 miles	6.8 miles	5.3 miles	5.3 miles
4/5-lane mixed traffic	1.2 miles	1.2 miles	1.2 miles	0.6 miles	3.7 miles	3.7 miles	4.5 miles	4.5 miles
Bus lanes	0	0	0	0.9 miles	0	0	0	2.0 miles
Right-of-way ownership	City, Destiny, SU	City, Destiny, SU	City, Destiny, SU	City, Destiny, SU	City, County, State, OCC	City, County, State, OCC	City, County, State, OCC	City, County, State, OCC
Number of Stations	n/a	n/a	13	12	n/a	n/a	19	19
Type of Vehicles	Low-floor 40-ft standard bus	Low-floor 40-ft standard bus	Low-floor 40-ft BRT	Low-floor 40-ft BRT	Low-floor 40-ft standard bus	Low-floor 40-ft standard bus	Low-floor 40-ft BRT	Low-floor 40-ft BRT
Terminal locations	Destiny, SU	Destiny, SU	Destiny, SU	Destiny, SU	OCC, Leo Ave	OCC, Leo Ave	Mawhinney Hall, Leo Ave	Mawhinney Hall, Leo Ave
Service Characteristics								
Travel time, AM peak (minutes)	35 (2)	35 (2)	28	26	60 (2)	60 (2)	42	40
Headway (minutes) (1)	5-40/ 40/ 15-60/ 80	5-20 (3)/20/20/40	10/20/20/40	10/20/20/40	3-40/25-40/15-60/80	3-20 (3)/20/20/40	10/20/20/40	10/20/20/40
Last departure from Hub	11:40 p.m.	12:20 a.m.	12:20 a.m.	12:20 p.m.	11:40 p.m.	12:20 a.m.	12:20 a.m.	12:20 a.m.
Service hours	5:30 a.m. – 12:30 a.m.	5:30 a.m. – 12:30 a.m.	5:00 a.m. – 1:00 a.m.	5:00 a.m. – 1:00 a.m.	5:30 a.m. – 12:30 a.m.	5:30 a.m. – 12:30 a.m.	5:00 a.m. – 1:00 a.m.	5:00 a.m. – 1:00 a.m.

(1) Peak/Midday/Early Evening/Evening

(2) Includes 5 minute layover or connecting time at Hub.

(3) Peak service in existing service improvement alternative will be increased to a minimum of 20 minutes.

5 Evaluation of Alternatives



5.1 Evaluation Criteria

FTA determines a Small Starts project's rating, and therefore likelihood of funding, based on a number of factors grouped into Project Justification and Local Financial Commitment categories. The Project Justification categories are Mobility Improvements, Environmental Benefits, Congestion Relief, Cost-Effectiveness, Economic Development, and Land Use. The Local Financial Commitment categories are Current Condition, Commitment of Funds, and Reliability and Capacity. The criteria are comprehensive and are meant to take into consideration the wide range of benefits that improved transit brings to a community.

The evaluation criteria for ranking the SMART1 alternatives are based on these Small Starts rating categories. This provides both a sound basis for choosing between the alternatives and an understanding of how they are likely to perform relative to other projects currently in the Small Starts process. The Small Starts process is competitive, so projects that rank higher on the criteria are more likely to be funded. The 14 evaluation criteria take into account the SMART1 project goals and objectives and are simplified from what FTA would require for a final submittal for Small Starts funding since the purpose of the Alternatives Analysis is to choose between them, not optimize the LPA for grant competition. The evaluation process consisted of applying a numeric score (i.e., 1, 2, or 3 points) to each criterion. For ease of understanding, the points were then symbolized with the following approach. The complete results summary tables for the 2 corridors are found at the end of this section.

- 1 point = Less positive
- 2 points = Positive
- 3 points = More positive.

5.1.1 Mobility Improvements

Existing Transit Ridership Along Proposed Route

Existing transit ridership is a gauge of the potential benefit of improvements along a transit route. Since the proposed system improvements would result in shorter travel times, existing riders can be expected to save valuable time while they are commuting. The more riders there are, the more people benefit from the improvements and the better the project scores on cost effectiveness. Existing ridership also tends to be a gauge of the transit orientation of adjacent development.

Methodology - This criterion was based on stop by stop ridership data provided by Centro using their Automatic Passenger Counters. The standard FTA methodology was used that tabulates ridership at a) stops along the study corridor as well as stops on parallel routes within one-quarter mile of the corridor and b) through ridership from beyond the corridor destined for stops on the corridor. Note that this methodology arrives at a slightly more accurate measure of ridership in the corridor than the whole route method used in Chapter 2, Existing Conditions.

Scoring - The two corridors have similar levels of existing ridership with the RTC – SU corridor being slightly higher. Given that the difference was not large, all alternatives were given the same score on this criterion.

Estimated Ridership

Ridership is estimated to determine the number of riders on a transit service after improvements are made. In sketch level modeling, the total number of new and existing riders on a transit service are lumped into one number. This gives a measure of the total benefit of the project and an idea of how many people will benefit from travel time improvements.

Methodology - Ridership was estimated for each of the alternatives using a sketch level model that takes into consideration travel time improvements, frequency improvements, and increased span of service and applies it to existing ridership in the corridor. See Appendix C for a detailed description of the methodology.

Results - RTC to SU Corridor – The estimated demand for each alternative is shown in Table 13 below. Some notes on factors that affected the outcome:

- Line 40 - SU already operates at a high frequency during peaks and there is some service on other routes (line 30 and route variation 443) between SU and downtown). The potential for significant time savings is limited over such a short distance.
- Destiny USA is the predominant source of boardings for lines 16 and 50, so improvements to one tend to draw riders from the other.
- There is very limited existing demand on Solar Street.

Table 13: RTC - SU Demand Estimates

RTC - SU			Alt 1 - Existing Service Improvements			Alt 2- BRT - Mixed Traffic			Alt 3 – BRT - Bus Lanes		
INBOUND ONE-WAY	Exist. Board		Est. Board	Change	Change (%)	Est. Board	Change	Change (%)	Est. Board	Change	Change (%)
Line 16 North Salina Street	318		553	235	74.1%	676	358	112.6 %	290	-28	-8.8%
Line 30 Westcott	278		278	0	0.0%	278	0	0.0%	278	0	0.0%
Line 40 SU	625		644	19	3.1%	652	27	4.3%	652	27	4.3%
Line 50 Destiny USA	221		228	7	3.2%	162	-59	-26.7%	395	174	78.7%
Line 52 Court Street	593		651	58	9.8%	575	-18	-3.0%	593	0	0.0%
CORRIDOR SUBTOTAL	2,035		2,355	320	15.7%	2,343	308	15.1%	2,207	172	8.5%
Weekday Total (Both Directions)	4,070		4,710	640		4,685	615		4,415	345	

Eastwood to OCC Corridor – The estimated demand for each alternative is shown in Table 14 on the next page. Some notes on factors that affected the outcome:

- Line 26 responds better to existing service improvements than line 20, because line 20 has generally higher existing frequency.
- BRT growth for line 26 is lower than existing service improvements because BRT is routed via South Avenue rather than Onondaga and Bellevue which today has much lower ridership.
- Bus lanes along James Street do not result in significant ridership increases because they do not result in significant travel time improvements.

Table 14: Eastwood - OCC Demand Estimation

Eastwood - OCC			Alt 1 - Existing Service Improvements			Alt 2- BRT - Mixed Traffic			Alt 3 - BRT - Bus Lanes		
INBOUND ONE-WAY	Exist. Board		Est. Board	Change	Change (%)	Est. Board	Change	Change (%)	Est. Board	Change	Change (%)
Line 20 James Street	854		1,024	170	19.9%	1,080	226	26.5%	1,122	268	31.3%
Line 26 South Avenue	634		999	365	57.6%	909	275	43.4%	909	275	43.4%
Line 80 Grant Boulevard	330		332	2	0.6%	332	2	0.6%	339	9	2.7%
CORRIDOR SUBTOTAL	1,818		2,355	537	29.5%	2,321	503	27.7%	2,370	552	30.4%
Weekday Total (Both Directions)	3,636		4,710	1,074		4,643	1,007		4,740	1,104	

Scoring – Estimated percentage increases in ridership are higher for the Eastwood – OCC corridor alternatives since the route is longer and has more opportunity to reduce running time, and therefore encourage more ridership. Percentage increase varied considerably from 8.5% (BRT - Bus Lane on Solar Street) to 30.4% (BRT- Bus Lane on James Street). Since none of the non-baseline alternatives varied significantly from the others, all were given the same score.

Travel Time Improvement

One of the primary benefits of transit improvements is reduction in travel time for system users. Travel time savings is a key element of the cost effectiveness criteria for FTA programs. Reducing travel time for existing riders is the most effective way of scoring well on this criterion.

Methodology - Travel time improvements were based on a comparison of existing scheduled travel time on Centro routes with an estimate of travel time via each of the alternatives. New travel times for the alternatives were estimated based on the existing scheduled peak hour travel time modified based on the changes proposed in each alternative. Reduction in the number of stops, shortening of layover times at the Hub, addition of TSP, and implementation of bus lanes were considered.

Scoring - In this criteria the existing service improvements alternatives tended to score lower because they include fewer time saving improvements and the bus lane BRT improvements tended to do better since they include TSP and bus lanes, which tend to reduce running time.

5.1.2 Environmental Benefits

Change in VMT

By luring travelers away from automobiles, transit improvements can reduce regional Vehicle Miles Traveled (VMT). Reducing VMT is a key metric for environmental benefits, as reductions result in cleaner air, less congestion, and lower vehicular threat to pedestrian safety.

Methodology - This criterion was calculated by entering each alternative's service characteristics into FTA's VMT calculator. The calculator takes existing ridership, the increase in vehicle hours, average auto share of the travel market, and auto occupancy and uses an algorithm to estimate the change in auto use with the implementation of the transit improvement.

Scoring – The Eastwood - OCC corridor alternatives all resulted in significant reductions in VMT, primarily due to the longer length of the corridor, so all were given high scores. The RTC - SU corridor alternatives 1 and 2 were estimated to reduce VMT to a lesser extent and were ranked medium. RTC – SU alternative 3 had the lowest estimated effect on VMT and was ranked low.

5.1.3 Congestion Relief

New Riders

One of the key benefits of investment in improved transit services is their ability to attract new riders who had not previously considered transit as an option, or who had not been well served by existing services. Every rider attracted from an automobile trip reduces local and regional congestion, with the accompanying pollution and safety benefits.

Methodology – The demand estimation model included a formula that estimates new riders to transit based on the proportion of choice riders on the current system. Centro provided information on the number of riders with autos available for the trip from surveys they previously completed.

Scoring - The Eastwood – OCC corridor alternatives all scored well on this criterion and were giving the highest scores. RTC – SU corridor alternatives 1 and 2 scored lower and were given medium scores. RTC – SU corridor alternative 3 scored the lowest and was given a low score.

5.1.4 Cost Effectiveness

Capital Cost

Capital cost includes the cost of design and construction for all of the physical elements of the improvement project, including stations, parking, roadway elements, and the cost of vehicles. The higher the capital cost relative to expected benefits, the more difficult a project is to justify and fund. To be viable, an alternative must be both fundable, in the sense that existing or proposed funding sources must provide enough revenue to cover the costs, and provide reasonable benefit relative to its cost.

Methodology - Unit costs for each type of corridor capital feature were compiled and checked against other peer system implementations. Capital features included everything from the transit vehicle, communication technology and trash cans at stations. For each of the alternatives, the cost estimates followed three steps.

First, the capital requirements for each alternative were determined through an analysis process. The key capital elements are stations, transit priority, ITS, and vehicles. Stations are divided into three levels or typologies, based on the number of riders expected. Each typology has its own set of features, more extensive improvements for those with higher boardings and lower cost improvements for those with fewer boardings.

Second, the station typology automatically populated a sheet that calculated the total number of station amenities or corridor improvements and their costs for each alternative.

Third, the unit costs are totaled and provided in a summary sheet.

Table 15 includes a capital cost summary table of the three alternatives for each of the corridors.

Table 15: Capital costs for corridor alternatives

Cost Category	RTC-SU via Salina		RTC-SU via Solar	Eastwood-OCC		
	Alt: 1 Service Improvements	Alt 2: BRT-Mixed Traffic	Alt 3: BRT-Bus Lane	Alt 1: Service Improvements	Alt 2: BRT-Mixed Traffic	Alt 3: BRT-Bus Lane
Guideway Improvements	N/A	\$1,308,000	\$4,394,000	N/A	\$1,636,000	\$4,446,000
Amenities	\$764,400	\$2,256,500	\$2,074,500	\$764,400	\$3,655,000	\$3,655,000
Technology and Comm	\$2,243,360	\$4,567,280	\$4,293,640	\$2,243,360	\$6,454,680	\$6,454,680
Vehicles	\$1,650,000	\$5,850,000	\$4,800,000	\$2,200,000	\$7,800,000	\$7,150,000
TOTAL	\$4,657,760	\$13,981,780	\$15,562,140	\$5,207,760	\$19,545,680	\$21,705,680

Scoring - The total cost of each alternative was compared and the lower costs assigned higher scores. The existing service improvement alternatives scored higher because of their less extensive infrastructure programs. The BRT - Bus Lane alternatives scored lower because of their higher costs, especially for the construction of bus lanes and associated infrastructure.

Operating Cost Increase

The following provides an overview of the assumptions and calculations that informed the annual operating and maintenance (O&M) cost estimates for the alternatives analyzed. O&M costs are often the costliest aspect of a capital project over the lifecycle of the investment. For that reason, great care must be taken to develop operational and cost estimates for Alternatives Analysis.

Methodology - A spreadsheet model was employed to calculate O&M costs for vehicle operations, stations and other facility and infrastructure maintenance. The spreadsheets are included in the Appendix D. This approach provides a comprehensive look at the cost of providing service for each of the alternatives and allows for precise costing of each feature included. A detailed service plan was required to calculate service hours and miles, boarding rides and fleet size on which operating costs are based.

The operating cost estimates, shown in Tables 16 and 17, are intended for planning purposes for evaluating alternatives. The cost estimates first list the service O&M costs or the costs of actually operating the vehicles themselves. The second table lists facility O&M costs and the third table is a combined cost for O&M for the three alternatives.

Scoring – Estimates of operating cost were made for each alternative based on the service plan created for each one. The operating costs for the RTC – SU corridor alternatives were considerably lower than for the Eastwood – OCC corridor. This was mainly due to its shorter length that allows the same frequency to be maintained with fewer buses and fewer hours. The substantially higher service level offered by the BRT alternatives is associated with a substantial increase in operating costs, and some maintenance costs for infrastructure that is not constructed for the improved service alternatives.

Table 16 - Operations and Maintenance Cost Estimates for the RTC - SU Corridor Alternatives

Service Operations and Maintenance					
Alternative	Annual Miles	Annual Hours	Passenger Boardings	Passenger Miles	O&M Cost
1 - Existing Service Improvements	88,032	10,480	188,160	563,727	\$ 889,366
2 - BRT Mixed N. Salina	240,735	27,650	1,377,390	4,126,660	\$ 2,805,768
3 - BRT Bus Lane via Solar	218,850	23,200	1,298,010	3,888,838	\$ 2,453,688
Facilities Operations and Maintenance					
Alternative	Facility O&M Expense (annual)				
1 - Existing Service Improvements	\$ 106,368				
2 - BRT Mixed N. Salina	\$ 674,800				
3 - BRT Bus Lane via Solar	\$ 619,650				
Combined Service and Facility O&M Costs					
Alternative	Total O&M Cost				
1 - Existing Service Improvements	\$ 995,734				
2 - BRT Mixed N. Salina	\$ 3,480,568				
3 - BRT Bus Lane via Solar	\$ 3,073,338				

Table 17 - Operations and Maintenance Costs for the Eastwood - OCC Corridor Alternatives

Service Operations and Maintenance					
Alternative	Annual Miles	Annual Hours	Passenger Boardings	Passenger Miles	O&M Cost
1 - Existing Service Improvements	165,060	15,720	315,756	946,005	\$ 1,399,681
2 - BRT Mixed via James	428,946	37,790	1,365,042	4,089,666	\$ 3,669,211
3 - BRT Bus Lane via James	428,946	36,260	1,393,560	4,175,106	\$ 3,551,121
Facilities Operations and Maintenance					
Alternative	Facility O&M Expense (annual)				
1 - Existing Service Improvements	\$ 106,368				
2 - BRT Mixed via James	\$ 1,082,170				
3 - BRT Bus Lane via James	\$ 1,082,170				
Combined Service and Facility O&M Costs					
Alternative	Total O&M Cost				
1 - Existing Service Improvements	\$ 1,506,049				
2 - BRT Mixed via James	\$ 4,751,381				
3 - BRT Bus Lane via James	\$ 4,633,291				

5.1.5 Economic Development

Transit Supportive Plans and Policies

One of the most important elements of a transit improvement project is its ability to benefit from public policies already in place. A Small Starts application that can score highly on this measure will benefit from the existence of land use, transportation, and economic development plans that encourage walkable, dense, and mixed-use development, as well as zoning codes that minimize parking provision and encourage pedestrian- and transit-friendly built environments.

Methodology - This criterion was based on a qualitative review of existing and in-progress City of Syracuse plans and zoning. Each corridor was divided into segments and the transit supportiveness of the new zoning in each assigned a score. The scores for all of the segments for each of the alternatives were added to arrive at a score for the alternatives as a whole.

Scoring – The existing service improvement alternatives score lower on this criterion due to their lower ability to influence land use and their more circuitous routings that take them off of main streets with more transit supportive zoning. RTC – SU alternative 3, which serves more auto oriented zoning around Destiny but more transit support zoning in other segments of the corridor scores medium. The other alternatives all serve Syracuse’s new mixed use high density zoning along main streets for most of the routes and score high.

Serves Existing Commercial Nodes

Commercial nodes make natural gathering places for people who live in the surrounding neighborhoods and good places for stations. Having retail next to transit stops makes trip chaining by walking and transit much easier. It also tends to be easier to redevelop properties to higher transit supportive densities and mixes of uses in commercial districts.

FTA considers transit’s positive influence on land use densification and mixing of uses to be critical to its long term success in terms of efficiency, environmental protection and economic development.

Methodology - This criterion was based on the identification of main commercial and other activity centers within one-quarter mile of the 2 corridors. The number of centers served was counted and a score applied based on the relative number compared to other alternatives.

Scoring – All alternatives except RTC – SU alternative 3 served 7 activity centers within one-quarter mile and received more positive scores. RTC – SU alternative 3 served 5 centers and was given a score of positive.

5.1.6 Land Use

Population and Employment Density

The concentration of population and commercial activity around transit stations is a strong indicator of the future success and efficiency of the service. Areas with denser concentration of residents and employees provide more potential for ridership, so a line that serves denser areas will receive a higher score from FTA.

Methodology - This criterion included an estimate of the population and employment within one-half mile of each station, as specified by the FTA.

Scoring – The population and employment per square mile was higher for the shorter and more urban RTC – SU corridor and all alternatives were given a more positive score. The Eastwood – OCC corridor which does not serve the high density student neighborhoods around SU and continues out to suburban Town of Onondaga to serve OCC, has a lower overall density and was given a positive score.

Affordable Housing

FTA’s scoring criteria include analysis of concentrations of legally designated affordable housing in the region and in the study corridors to assure that federal funds are being fairly distributed to transit projects. Lower income residents are also among the most likely demographic groups to ride transit. A higher concentration of affordable housing within the study corridors than in the region generally will result in higher scores.

Methodology - This analysis was completed using existing GIS data on the percentage of total affordable housing units in the region that are within one-half mile of each of the alternatives.

Scoring— All of the alternatives except for RTC – SU alternative 3 had similar percentages of affordable housing and were scored the same, more positive. RTC – SU alternative 3 scored positive.

5.1.7 Local Financial Commitment and Non-Section 5309 Match

Ability of Region to Fund Capital and Operating Cost

Small Starts funding does not pay the full cost of a project, and regional partners must match a percentage of the costs. A project sponsor must demonstrate to FTA that they will be able to secure the regional matching share of capital construction costs. They must also demonstrate that the operating agency will be able to absorb the (presumably) increased operating costs of the improved system, without negatively impacting existing service to too large an extent. Projects that show significant financial backing on both capital and operating budgets will score well with FTA.

Methodology - A qualitative estimate of future transit funding resources by Centro and the City of Syracuse was applied.

Scoring – Since securing significant new capital and operating funding for a transit project would be a significant challenge in the current funding environment for any of the alternatives, they were all scored as less positive for this criteria.

5.1.8 Other

Roadway Suitability and Pedestrian Environment

Most options studied in the Alternatives Analysis process utilize existing road right-of-way. Roadway suitability refers to whether the characteristics of the roadway right-of-way along the proposed corridors are amenable to the operation of higher-order transit in a reasonably efficient and reliable way or, if they are able to be retrofitted without significant difficulty. Generally, wider roads with lighter traffic and fewer traffic signals are best from an operational standpoint for higher-order transit. This criterion only applies where public streets are used.

This criterion also applies to a number of important Small Starts funding considerations including time savings and capital cost since more suitable roadways will support shorter travel times and lower cost improvements.

Methodology - This criterion was calculated by breaking each corridor into character segments and providing a qualitative assessment of each segment's ability to accommodate the alternative. Factors considered were percent of route equipped with sidewalks, percent with four lanes, percent commercial or multifamily, and percent with existing transit. All segments were then totaled and a score for the entire alternative arrived at.

Scoring – All of the alternatives were mostly located in urban areas with good pedestrian and transit service. Both corridors also included more auto oriented areas, RTC – SU in the north section near Destiny and Eastwood – OCC in the south section near OCC, for example. Given the similarities all alternatives were scored as more positive

Comments of Stakeholders

The comments, suggestions, and observations of stakeholders and the public are critically important to any transportation project. They represent the users of the transportation infrastructure and the adjacent community who are intimately familiar with how they are used, what currently works well, and what can be improved.

The FTA encourages strong stakeholder and public outreach throughout any capital project planning process and outreach is required as part of NEPA. The SMART1 project included three public and numerous other meetings and comments were recorded and considered for the criteria.

Methodology – Comments were reviewed and scores developed based on the general direction of the comments.

Scoring – Stakeholders generally supported the more intensive alternatives, BRT - Mixed Traffic and BRT - Bus Lane, with the exception of along Solar Street in RTC – SU alternative 3, where there was not support for the impact of bus lanes. For this reason, the BRT alternatives were scored more positive and other alternatives including the RTC - SU alternative 3, were scored less positive.

5.2 Evaluation of Alternatives Summary

The result of the criteria analysis for each corridor are shown in Table 18. The base alternative, or No-Build, in both corridors received the lowest score. Along the RTC - SU corridor, Alternative 1 scored 30 out of 42 points; the second highest score for the corridor. Alternative 2 scored the highest with 34 points, while Alternative 3 (27 points) tied for the lowest score. Alternative 2 scored the highest due to more significant benefits than the other options, such as reasonable cost, and general community support, which Alternative 3 lacked.

Relative to the Eastwood - OCC corridor, Alternative 1 scored 31 points making it the second lowest score on the corridor. Alternatives 2 and 3 both received 34 points and tied for the most points. Alternatives 2 and 3 tied for best score due to more significant benefits combined with reasonable costs. The two balanced each other out with Alternative 2 having significant benefits at a lower cost and Alternative 3 having more benefits, but at a proportionately higher cost.

Table 18: Locally Preferred Alternative Scoring Summary Matrix

RTC - SU corridor		Eastwood - OCC corridor	
<u>Alternative</u>	<u>Score</u>	<u>Alternative</u>	<u>Score</u>
Base case	27	Base case	26
Alternative 1 (Existing Service Improvements)	30	Alternative 1 (Existing Service Improvements)	31
Alternative 2 (BRT Mixed Traffic via Salina St)	34	Alternative 2 (BRT Mixed Traffic)	34
Alternative 3 (BRT Bus Lane via Solar St)	27	Alternative 3 (BRT Bus Lane)	34

Figures 27, 28, 29, and 30 show the matrices that were created to arrive at a complete score on all of the criteria for each alternative. The matrices for each corridor are divided into two sections for clarity. The symbols used are a full circle for a most positive score (3 points), a half filled circle for positive score (2 points), and an empty circle for a less positive score (1 point).

Figure 27: RTC - SU Alternative Scoring Matrix Criteria Group 1
































		Existing Service Improvements 	BRT- Mixed Traffic 	BRT- Bus Lane 
evaluation criteria	Existing Ridership (daily) 	 4,070	 4,070	 4,070
	Estimated Future Total Ridership (daily) 	 4,710	 4,685	 4,415
	Travel Time Improvement (minutes) 	 no change	 12 to 17 mins.	 17 to 22 mins.
	Change in VMT 	 -93,496	 -88,239	 -45,000
	Riders New to Transit (annual) 	 38,400	 36,900	 20,700
	Capital Cost 	 \$4.1m	 \$14m	 \$15.6m
	Operating Cost Increase 	 \$970,000	 \$3.1m	 \$2.8m
Sub total score:		15	15	13

Figure 28: RTC - SU Alternative Scoring Matrix Criteria Group 2
































		Existing Service Improvements	BRT-Mixed Traffic	BRT-Bus Lane
				
evaluation criteria	Transit Supportive Plans & Policies 			
	Serves Existing Activity Centers 			
	Population & Employment Density 	 23,814	 24,084	 23,105
	Affordable Housing 	 32%	 30%	 21%
	Ability of Region to Fund Capital & Operating 			
	Roadway Suitability & Pedestrian Environment 			
	Stakeholder Comments 			
Sub total score:		15	19	14
Total score:		30	34	27

Figure 29: Eastwood - OCC Alternative Scoring Matrix Criteria Group 1































































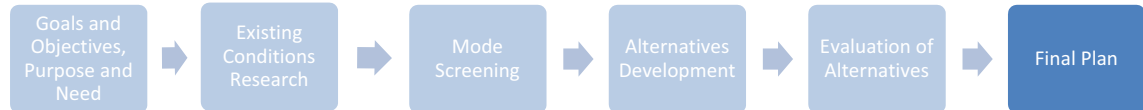
		Existing Service Improvements	BRT-Mixed Traffic	BRT-Bus Lane
				
evaluation criteria	Existing Ridership (daily) 	 3,636	 3,636	 3,636
	Estimated Future Total Ridership (daily) 	 4,710	 4,643	 4,740
	Travel Time Improvement (minutes) 	 no change	 17 to 19 mins.	 19 to 21 mins.
	Change in VMT 	 -294,183	 -257,442	 -282,240
	Riders New to Transit (annual) 	 64,440	 60,420	 66,240
	Capital Cost 	 \$4.7m	 \$19.5m	 \$21.7m
	Operating Cost Increase 	 \$1.5m	 \$4.7m	 \$4.6m
Sub total score:		17	16	16

Figure 30: Eastwood - OCC Alternative Scoring Matrix Criteria Group 2

		Existing Service Improvements	BRT-Mixed Traffic	BRT-Bus Lane
				
evaluation criteria	Transit Supportive Plans & Policies 			
	Serves Existing Activity Centers 			
	Population & Employment Density 	 14,652	 15,257	 15,257
	Affordable Housing 	 28%	 28%	 28%
	Ability of Region to Fund Capital & Operating 			
	Roadway Suitability & Pedestrian Environment 			
	Stakeholder Comments 			
Sub total score:		14	18	18
Total score:		31	34	34

6 Locally Preferred Alternative



Based on the criteria analysis described above, a preliminary LPA consisting of Alternative 2 – BRT - Mixed Traffic was chosen for both corridors. Collectively, implementing both corridors at once will create a BRT system that increases the number of trips that can be made through connections, in effect creating four corridors rather than just two, and therefore increase ridership on both. The relative closeness of the evaluation criteria summation process indicated that the BRT - Mixed Traffic alternatives as developed met the technical requirements of the study goals. Additional analysis, however, was required to arrive at a clearer LPA recommendation for the area. Three additional factors beyond the Small Starts inspired criteria, were considered: intangible benefits, support for the goals of SMTC’s LRTP, and support for economic development in Syracuse neighborhoods.

Intangibles are elements of transit design, such as reliability, comfort, and clarity of service that cannot be easily quantified. These are critical to the long term success of expanded service with new modes. This is due to the fact that people respond very differently to certain qualities of transit service beyond travel time and accessibility.

Interest in an improved rapid transit system has been high in Syracuse and SMTC’s 2050 **Long Range Transportation Plan (LRTP)** includes an “enhanced transit system” as a regionally significant priority project. The LPA would clearly serve this function given its high level of service and extensive coverage of the City of Syracuse, as well as expandability to other parts of the region in the future.

The LRTP goals call for a transportation system that is:

- **Safe** – Per person-mile traveled, public transit is safer than auto travel. If more people are attracted to use public transit after the LPA is implemented, then the regional transportation system will be safer overall.
- **Integrated** – The LPA integrates modes, stations, bicycle racks, walking access, connections to other transit routes and presumably integration with taxis and ride hailing services.
- **Sustainable** – Transit is more energy efficient than auto travel and alternative bus propulsion systems like CNG, hybrids, and battery electric can reduce environmental impacts even more.
- **Reliable** – With fewer stops and features to make boarding and alighting faster, the LPA will be more reliable than standard transit service.
- **Equitable** – All residents of Syracuse will benefit from the improved service, faster commutes, and more convenient travel throughout the city.

An enhanced transit system is critical to achieving these goals and inspiring people, businesses and institutions to support implementation and funding. With this support, regional leadership can decide to spend the money required to transform the transit system.

Show investment in economic development in Syracuse neighborhoods. The LPA meets this factor by providing a higher level of improved service that will increase ridership, a level of branding that will convince a broad cross section of the population that it is a worthwhile service,

and provide substantial new stations that will contribute to the built environment and infrastructure of the neighborhoods it passes through at a level that will lead to new investment.

6.1 Elements of a BRT System

Additional detail on elements typically found in connection with any BRT service, such as vehicles and stations are noted below to provide an approach that must be planned, funded, designed, and constructed. Further details regarding funding and implementation approaches are found in the next chapter.

6.1.1 BRT Service Levels

The BRT is anticipated to provide a high quality of service in terms of frequency, reliability, and hours/days of service, consistent with an enhanced transit investment in these regionally-significant corridors.

Headways, the time between buses on a route, are one of the most important influences on the level of ridership achieved. Shorter waiting times represent a major improvement in convenience. The schedule for the LPA routes is based on a criterion that the FTA requires for BRT projects funded by Small Starts. This criterion calls for a maximum of either service every 15 minutes all day or every 10 minutes during peak hours and 20 minutes off peak for 14 hours per day on weekdays. This represents a major improvement in frequency compared to most Centro lines which currently operate every 20 to 40 minutes and sometimes with headways as long as 80 minutes. Even on James Street, where the combined headway of the different route variations average less than 10 minutes today, the introduction of 10 minute headways would result in an improvement in average waiting times and perceived reliability.

If it is decided to not use Small Starts as a funding source, Centro will have more freedom in setting headways, and longer but still attractive headways could be implemented, in the range of 12 to 15 minutes during rush hour. These headways would reduce the number of buses required to operate the schedule, which would in turn reduce capital and operating costs.

6.1.2 Stations

Off-board amenities are an important component of the passenger experience and quality of service of a BRT system. Simple and efficient stations that both convey the quality and branding of BRT, but also serve their purpose well and without high cost, are proposed. Physical configuration of stations within the public right-of way will be determined through future project development. Station amenities may vary by location based on anticipated ridership and site constraints, but may include: weather-protected, well-lit shelters; real-time and static information displays; emergency call boxes; security cameras; benches; trash cans; and bike racks. Level-boarding stations will reduce vehicle dwell time and contributes to the ADA accessibility of the stations. The riding public now expects a high level of real time information which provides a higher level of convenience and reliability. Wait time, a necessary aspect of transit service, is judged to be more onerous than travel time largely because of its uncertainty. Real-time information displays (and other means of providing bus arrival times) and other off-board amenities that improve passenger comfort and convenience help to overcome this perception.

A “kit of parts” approach to station design is proposed in order to convey a consistent look and feel across the BRT system, while also allowing for flexibility to adapt to site conditions. Standardized components also help to reduce spare parts requirements and long-term maintenance costs. BRT stations should be integrated into the public realm around them and ideally be places that people do not mind, and maybe even enjoy, waiting in. The provision of retail and services adjacent to the station, for instance, can make waiting for a bus an easy and convenient time to pick up dry cleaning or do some quick shopping.

BRT stations can also encourage and support redevelopment nearby by making the location more accessible and investing in street infrastructure. Station area plans were developed for a select number of stations to show what might be possible in terms of redevelopment.

Three renderings showing typical BRT stations for different location types and levels of ridership (i.e., medium or high) are shown in Figures 31, 32, and 33.

Figure 31: High usage station typology for higher density development



List of Amenities

- | | |
|---|---------------------------------------|
| ① Flag Marker | ⑨ Security Camera |
| ② Backlit Panel | ⑩ Trash Receptacles |
| ③ Pedestrian Lighting | ⑪ Bicycle Rack |
| ④ ADA Accessibility | ⑫ Real-time Passenger Information LCD |
| ⑤ Communication and Power Conduit Cabinet | ⑬ Bus Shelter (Large size) |
| ⑥ Tech. Pylon | ⑭ Shelter Seating |
| ⑦ Real-time Display | |
| ⑧ Cellular Router | |

Figure 32: High usage station typology where existing shelter is available



List of Amenities

- | | |
|---|---------------------------------------|
| ❶ Flag Marker | ❾ Security Camera |
| ❷ Backlit Panel | ❿ Trash Receptacles |
| ❸ Pedestrian Lighting | ⓫ Bicycle Rack |
| ❹ ADA Accessibility | ⓬ Real-time Passenger Information LCD |
| ❺ Communication and Power Conduit Cabinet | ⓭ Stand-alone Seating |
| ❻ Tech. Pylon | |
| ❼ Real-time Display | |
| ❽ Cellular Router | |

Figure 33: Medium usage station typology for lower density location



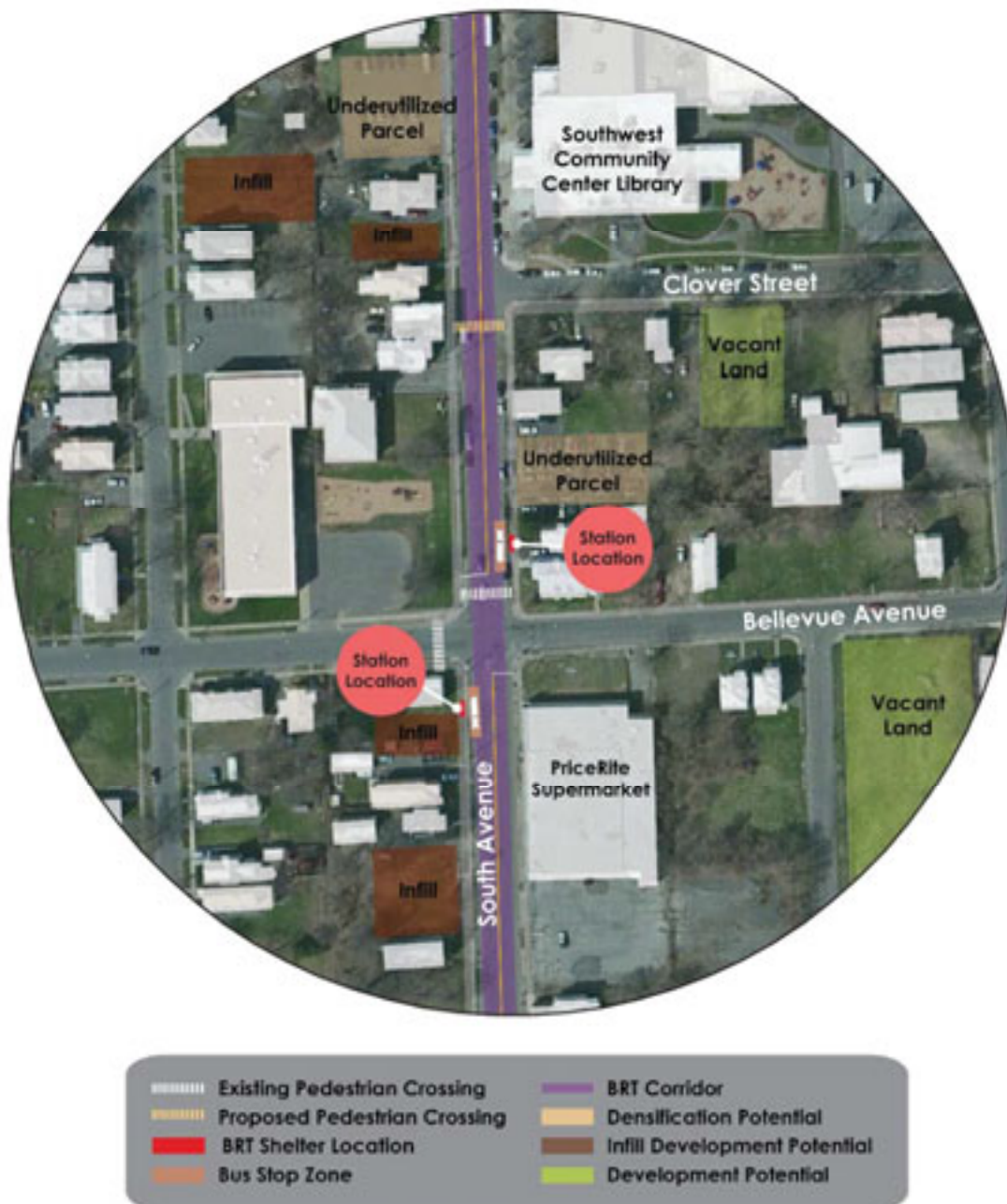
List of Amenities

- | | |
|---|-----------------------------|
| ❶ Flag Marker | ❹ Security Camera |
| ❷ Backlit Panel | ❺ Trash Receptacles |
| ❸ Pedestrian Lighting | ❻ Bicycle Rack |
| ❹ ADA Accessibility | ❼ Bus Shelter (Medium size) |
| ❺ Communication and Power Conduit Cabinet | ❽ Shelter Seating |
| ❻ Tech. Pylon | |
| ❼ Real-time Display | |
| ❽ Cellular Router | |

Station Area Plans

Station area plans were developed for a number of the proposed BRT stations. Four key locations are shown below. Each plan shows how the station would be situated in the street right-of-way, any new pedestrian connections required, and how it would relate to the development around it. They also identify potential development parcels near the station. All conceptual station area plans are found in Appendix E.

Figure 34: Station Area Plan for Bellevue Station



Bellevue Station – The station area plan for Bellevue focuses on this developing neighborhood center along South Avenue, including the Southwest Community Center and the new PriceRite Supermarket. The station is situated in a location that balances access to both attractors.

Bellevue provides good access by foot or bicycle to adjacent neighborhoods. A number of vacant and underutilized parcels are noted that could provide good locations for infill residential or small scale mixed use development.

Figure 35: Station area plan for Hickok



Hickok Station – This station serves the western end of the Eastwood business district, a relatively high-density, pedestrian and transit-oriented retail district that provides a wide variety of retail and service opportunities. The platforms are located near side to Hickok Street. The inbound platform is next to a row of commercial buildings lining the sidewalk and the station could be provided by a large awning on one of the buildings. The outbound platform is next to a

small parking lot and would be provided by a free standing shelter. The primary development opportunity at this site is provided by two large parking lots behind the buildings on the north side of James Street located on Eastwood Road.

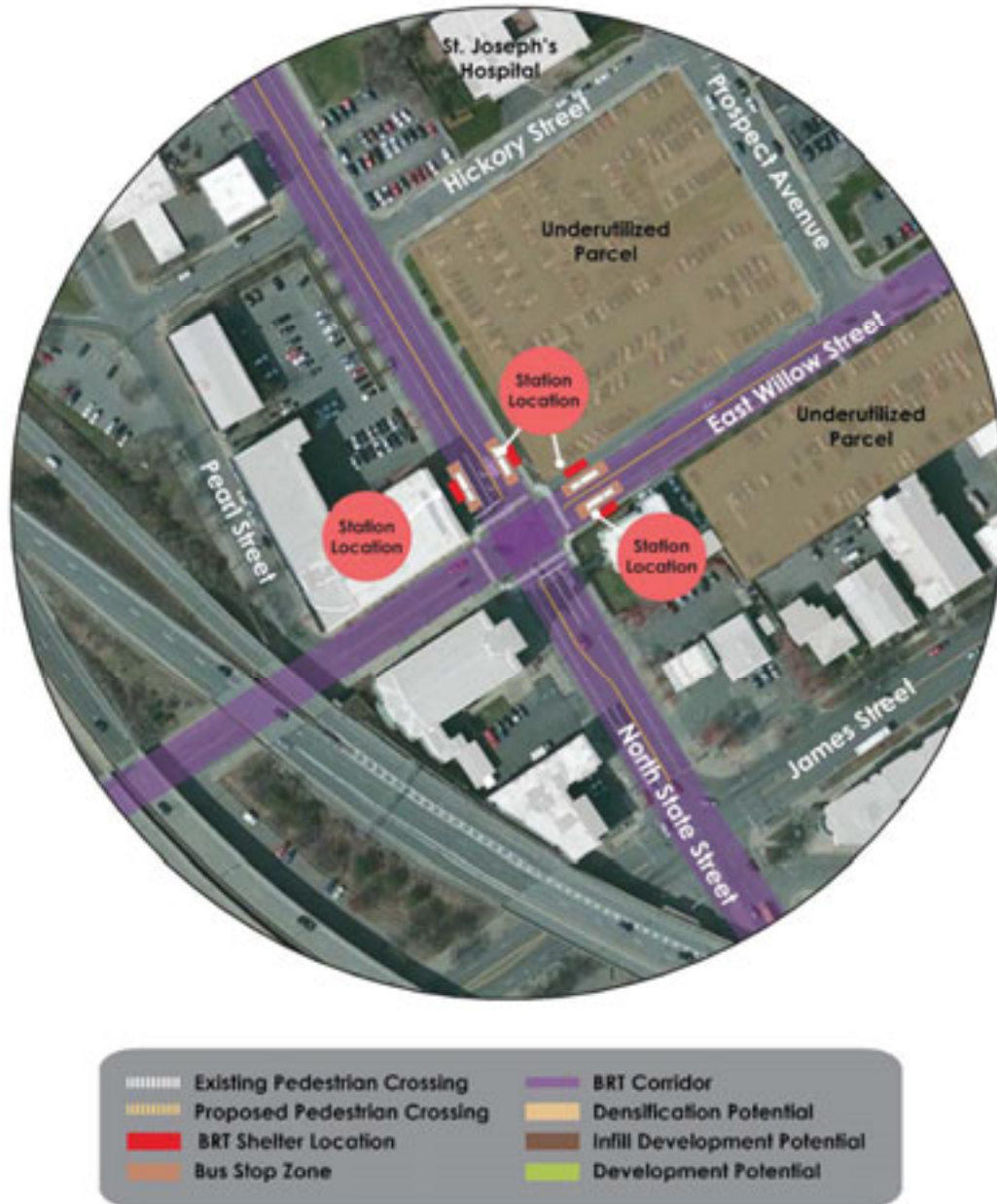
Figure 36: Station Area Plan for Salina/ Kirkpatrick Station



Salina/Kirkpatrick Station – This station is located toward the north end of the North Salina business district, taking advantage of the small park there to provide a pleasant waiting environment. New crosswalks would provide access from all directions serving both the commercial uses along North Salina and the residential uses on either side. This is a highly transit-supportive area which will likely lead to good usage of BRT at this station. The historic urban fabric is largely intact within the station area plan radius and so there are no opportunities for new infill or transit-oriented development, although renovation of adjacent structures would be strongly encouraged. The City of Syracuse’s proposed new zoning code allows and

encourages high-density mixed use development and redevelopment along North Salina and other main streets in the City.

Figure 37: Station area plan for St. Joseph's stations.



St. Joseph's Station – This station is located at the major activity center of St. Joseph's Hospital and is a major transfer point between the two BRT lines. The four BRT station platforms (two for each corridor) are located to the north side of the intersection on State Street and the east side on East Willow Street to reduce the number of times people visiting the hospital would need to cross the street. The south side of the intersection on State Street was avoided because traffic patterns there discourage pedestrians and lack space for stops. The large surface parking lots on either side of East Willow Street provide opportunities for transit-oriented development.

6.1.3 Vehicles

The type of vehicles used depends on the demand and characteristics of a transit service. Given that the initial demand is expected to be on the low side for BRT, 40 foot buses will be sufficient to provide needed capacity for the SMART 1 LPA, unlike higher-volume BRT systems that sometimes use 60 foot articulated buses. Forty foot buses will fit into Centro's maintenance procedures more efficiently and will be less expensive to maintain. Forty foot buses will also be able to use existing bays in the Hub without modification.

Branding, including BRT vehicle styling, is a common feature of BRT service. A number of manufacturers offer BRT-styled buses in 40 foot models. These buses can have streamlined end caps, more comfortable seats, wi-fi, bike racks on board, TSP, parcel racks, and other features that set them apart from standard local buses.

Electric buses (see Figure 38) could be considered for the two LPA routes, to set them apart from other services and provide quieter, more attractive service and environment to passengers and people living along the routes. Peer battery-electric BRT projects in cities like Indianapolis, Reno, Stockton, Spokane, Albuquerque, and Los Angeles offer precedents to inform future project development decisions regarding the vehicle fleet.



Figure 38: Electric bus in operation in Stockton, California (Source: Fleets and Fuels Magazine)

6.1.4 Branding

Branding communicates the idea of BRT to the public as a distinctive, premium service. It includes developing a unique name for the service, creating a logo, and developing graphic standards and liveries for buses, stations, and other infrastructure. Branding can be very important to the success of a BRT service, conveying the nature of the service, how it works, and where it goes. Branding can also contribute to an innovative and elevated image of the BRT that opens it up to a larger market than the local bus service.

Branding elements can be incorporated into stations, vehicle graphics, marketing literature, signage, uniforms, and other public elements of the project. Because of the importance of branding to BRT success, FTA requires distinctive and consistent branding as part of projects funded by Small Starts.

6.1.5 Transit Signal Priority (TSP) and Other Service Reliability Measures

ITS components such as TSP and Computer Aided Dispatch provide real-time situational awareness to support the efficient and reliable operation of transit service. TSP is integrated into traffic signal systems along the alignment to reduce delays and variability in BRT travel time. As previously mentioned, the FTA requires that TSP be included in a BRT project funded through the Small Starts program. The LPA would include TSP at intersections where it would benefit transit without undue negative effects on general traffic. A specific plan for TSP implementation would be developed at a future stage in project development.

Queue jumpers are another approach to reducing the impact of corridor congestion on BRT reliability and speed. Queue jumpers are physical lanes that allow BRT vehicles to bypass stopped traffic at congested intersections. They could be included where appropriate conditions exist such as available right-of-way width, the ability to remove parking/general purpose lanes, suitable intersection geometry, and proportionate benefits and costs.

6.1.6 Other Infrastructure Improvements

A key advantage of the mixed-traffic alternative is the relatively low level of infrastructure improvements and reconfiguration required to accommodate BRT. For example, the large-scale reconfiguration of roadway cross-sections to accommodate exclusive transit lanes is not required, nor are there new roadways or exclusive running ways envisioned in the LPA.

The majority of infrastructure improvements are anticipated to be targeted in the vicinity of stations, such as shelters, platforms, bulb-outs, bus pads, technology/communications, drainage, etc. ADA accessibility improvements at adjacent intersections/crosswalks may be triggered by federal requirements.

Potential additional infrastructure improvements that may be included in the LPA, subject to further project development and engineering design, may include:

- Roadway improvements/resurfacing, especially in BRT running lanes;
- Targeted traffic mitigations such as lane reconfiguration, geometric modifications, and queue jumps. to ensure BRT reliability and/or accommodate stations;
- Utility/drainage relocations or improvements, if not otherwise avoidable;
- First/last mile access improvements, such as sidewalk/crosswalk improvements or bicycle access;
- Lighting, streetscape, or other public realm improvements; and
- Power/communications infrastructure, including conduit, fiber, and/or cabinets.

Figure 39 shows how these elements look when implemented in one location. Because a majority of the affected infrastructure and right-of-way is owned by the City of Syracuse, and to some extent Onondaga County, or NYSDOT in limited locations outside of the City of Syracuse, there is an opportunity to coordinate infrastructure improvement decisions with these agencies and to explore cost sharing. Based on overall project costs, timing, and funding sources, it may be advantageous to include these elements as non-federal match to the BRT project, or to exclude them to simplify implementation coordination and reduce project cost.

Note that addition of the above elements to the project through future project development may impact the total estimated project capital cost.



Figure 39: C-TRAN "The Vine" BRT station in Vancouver, WA showing mixed-traffic configuration with targeted infrastructure improvements including station, sidewalk, bus pad, and pavement/ADA ramp improvements. (Source: IBI Group)

6.1.7 Maintenance and Support Facilities

The proposed BRT system is anticipated to use existing Centro maintenance, vehicle storage, and operations support infrastructure (e.g. dispatch and non-revenue fleet). The anticipated growth in Centro's vehicle fleet to accommodate BRT may be offset at least partially by reductions in peak hour frequencies on existing local routes serving the future BRT corridors. Both fleet requirements and suitability/capacity of existing Centro facilities should be evaluated in future project development.

As noted previously, the use of 40-foot BRT vehicles, consistent with Centro's existing fleet, would eliminate the need for specialized maintenance equipment such as lifts and service bays designed for 60-foot articulated vehicles. Introduction of electric vehicles for the BRT service might require additional depot charging or possibly field charging equipment. The set of ongoing electric bus pilot projects nationwide will inform decisions in this regard by identifying the most promising arrangements.

6.2 Environmental Impact Information Regarding the Proposed Action

The SMART 1 project will be required to follow the requirements of the National Environmental Policy Act (NEPA) and State Environmental Quality Review Act (SEQR). The anticipated project classification is a NEPA Class II Categorical Exclusion per Code of Federal Regulations (CFR) Title 23 Section 771.118(c) and a SEQRA Type II Action. While the outcome depends upon the final alternative selected for funding, construction and operation, based on the initial findings of the environmental review, it is anticipated that the proposed project will have no significant adverse effect on environmental resources. The initial environmental screening is summarized in Table 19. Each of the 23 environmental impact categories are further detailed in Appendix F.

Table 19 – Summary of Initial Environmental Screening

Environmental Impact Category	<i>Preliminary Finding for RTC – SU Corridor</i>	<i>Preliminary Finding for Eastwood – OCC Corridor</i>
Land Acquisitions and Relocations Required	Likely no adverse effect (Alt.1 & 2). Consideration for any right-of-way for bus-only lane (Alt.3).	Likely no adverse effect (Alt.1 & 2). Consideration for any right-of-way for bus-only lane (Alt.3).
Land Use and Zoning	Likely no adverse effect.	Likely no adverse effect.
Noise Quality	Likely no adverse effect. Further analysis recommended.	Likely no adverse effect. Further analysis recommended.
Water Quality	Likely no adverse effect.	Likely no adverse effect.
Air Quality	Likely a positive effect through transit benefits. Further analysis recommended.	Likely a positive effect through transit benefits. Further analysis recommended.
Wetlands	Likely no adverse effect.	Likely no adverse effect.
Flooding/Surface Water, Groundwater	Likely no adverse effect (Alt.1 & 2). Potential groundwater impact (Alt.3).	Likely no adverse effect.
Navigable Waterways and Costal Zone	Likely no adverse effect.	Likely no adverse effect.
Ecologically Sensitive Areas	Likely no adverse effect.	Likely no adverse effect.
Endangered Species	Likely no adverse effect.	Likely no adverse effect.
Traffic and Parking	Further analysis recommended.	Further analysis recommended.
Energy	Likely a positive effect.	Likely a positive effect.
Historic Properties and Parklands (Section 106)	Likely no adverse effect. (Alt.1 & 2). Consideration for any right-of-way for bus-only lane. (Alt.3).	Likely no adverse effect.
Construction	Likely only a temporary impact.	Likely only a temporary impact.
Visual	Likely no adverse effect.	Likely no adverse effect.
Community Disruption	Likely only a temporary impact.	Likely only a temporary impact.
Safety and Security	Likely a positive effect.	Likely a positive effect.
Secondary Development	Likely a positive effect.	Likely a positive effect.
Consistency with Local Plans	Likely no adverse effect.	Likely no adverse effect.
Environmental Justice	Likely no adverse effect.	Likely no adverse effect.
Hazardous Materials	Further analysis recommended.	Further analysis recommended.
Asbestos	Likely no adverse effect.	Likely no adverse effect.
Vibration	Likely no adverse effect.	Likely no adverse effect.

7 Implementation and Financial Plan

7.1 Implementation Plan

The LPA could, potentially, be funded through the FTA's Section 5309 Small Starts, but there are also alternatives to this funding source. This implementation and financial plan, therefore, describes a planning and implementation process that could move forward with or without the use of Small Starts funding. Each approach has its advantages and disadvantages (see Financial Plan section, below), and the final decision on the preferred approach will be made in the next phase of work. This next phase will take the project through project development, which includes advanced planning, engineering, environmental assessment, and additional public outreach. This applies to both the Small Starts and non-Small Starts tracks.

The Syracuse region has never used the Small Starts program. Stakeholders, project staff, and the public would need to be educated on the program's requirements and how it can be used to bring larger rapid transit projects to fruition. Either approach would require a coordinated effort between SMTC, Centro, and other stakeholders to assemble project funding from multiple federal, state, and/or local sources.

7.1.1 Short-term Next Steps

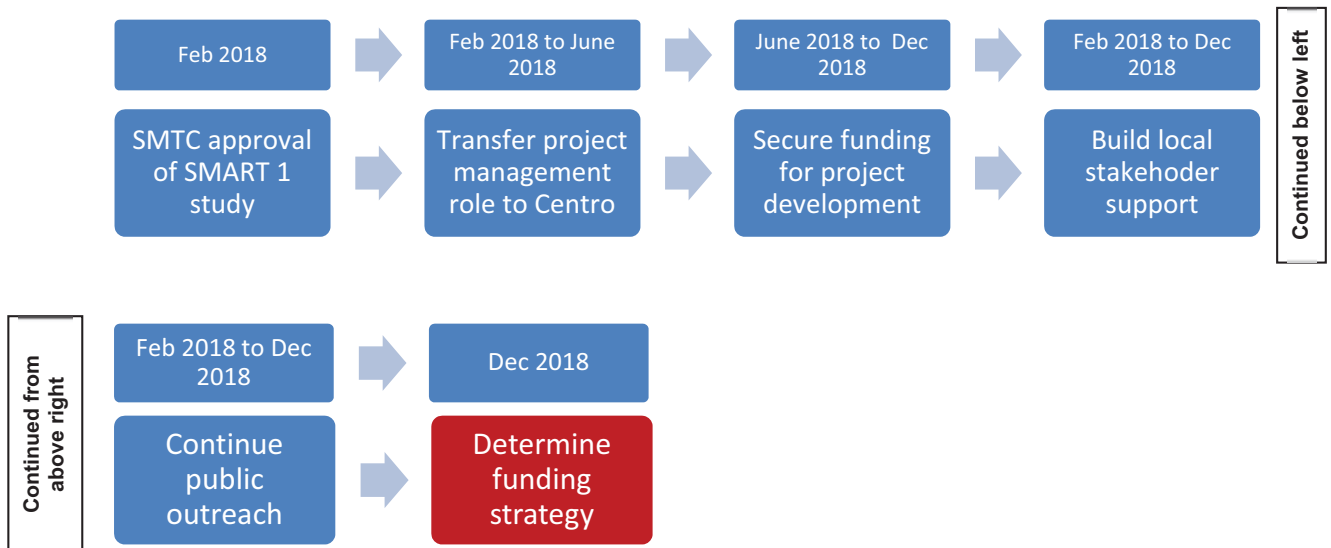


Figure 40: Short-term Next Steps flow chart (red box indicates critical decision point)

Inclusion in Long Range Transportation Plan – SMTC lead - As with all major transportation projects, the SMTC will have a central role in planning and approvals for the SMART 1 LPA. If it is decided to pursue Small Starts funding, following the completion of SMTC's efforts in completing the SMART 1 enhanced transit feasibility study, the SMTC will need to approve the LPA and include a timeline with the Request to Enter Project Development that indicates when SMTC intends to add the project to the regional fiscally constrained Long Range Transportation Plan. This action would have to take place before any grant funding can be distributed from the Small Starts program, if awarded.

Transition Project Management to Centro – SMTC lead – As the transit operator in the Syracuse region and the designated recipient of FTA funding, Centro will ultimately be responsible for implementing the SMART 1 LPA. Transitioning the project from SMTC management to Centro management would logically occur before project development begins so that all detailed planning and preliminary engineering is completed by the same agency that will implement the

BRT project. Centro would be responsible for acquiring funding, hiring any design consultants required, and managing the construction of the SMART 1 LPA project.

Secure PD Funding – Centro lead – The next phase of planning for the LPA is the completion of project development (PD). Centro, with SMTTC's help, will have to identify this funding through existing grant sources or new sources including Federal discretionary grants, NYS economic development funds, or local public and private sources. Small Starts project development can cost for a project of this scope anywhere between several hundred thousand dollars and a million or more dollars depending upon the complexity of the final project and the number and type of issues that arise during PD. Project development for a non-Small Starts project will likely cost less, given that the grant application procedures for smaller individual grants will likely be less extensive.

Identify local advocates and build local support – Centro lead – Projects of this sort require champions among local leaders to express the vision for the project and explain it to other stakeholders and the general public. One of the first things for Centro to do after the completion of SMART 1 is to identify potential champions and meet with them to discuss the interest in taking on a larger role in the project's future. This will be key to developing political support for funding. Possible champions are large employers, local elected officials, large institutions like SU and OCC, local business leaders, or local community advocacy groups, especially those with a focus on transportation and/or anti-poverty initiatives. This task would be ongoing through the implementation of the SMART 1 LPA.

Public Outreach – Centro lead – Centro should develop a comprehensive public outreach plan for the project that can be put into action as soon as the SMART 1 planning study is done. This will build on the extensive public and stakeholder outreach that was completed in the SMART1 study, broadening participation through the use of public meetings, web sites, and other outreach tools. This task will continue through project development and construction. This task would be ongoing through the implementation of the SMART 1 LPA.

Determine Funding Strategy – Centro lead – This is a critical step in the implementation process which determines all subsequent steps. While the basic structure of both tracks are similar including PD, securing funding, final design, and construction, the details of how these steps are carried out will be quite different. Making the decision will take a detailed analysis of the impacts of the two different approaches on Centro finances in the long term and extensive discussions with stakeholders to determine their level of commitment to funding the project and preferred means to provide that funding. Once the funding approach is decided, work on other tasks, especially project development, can begin.

7.1.2 Track One – Small Starts

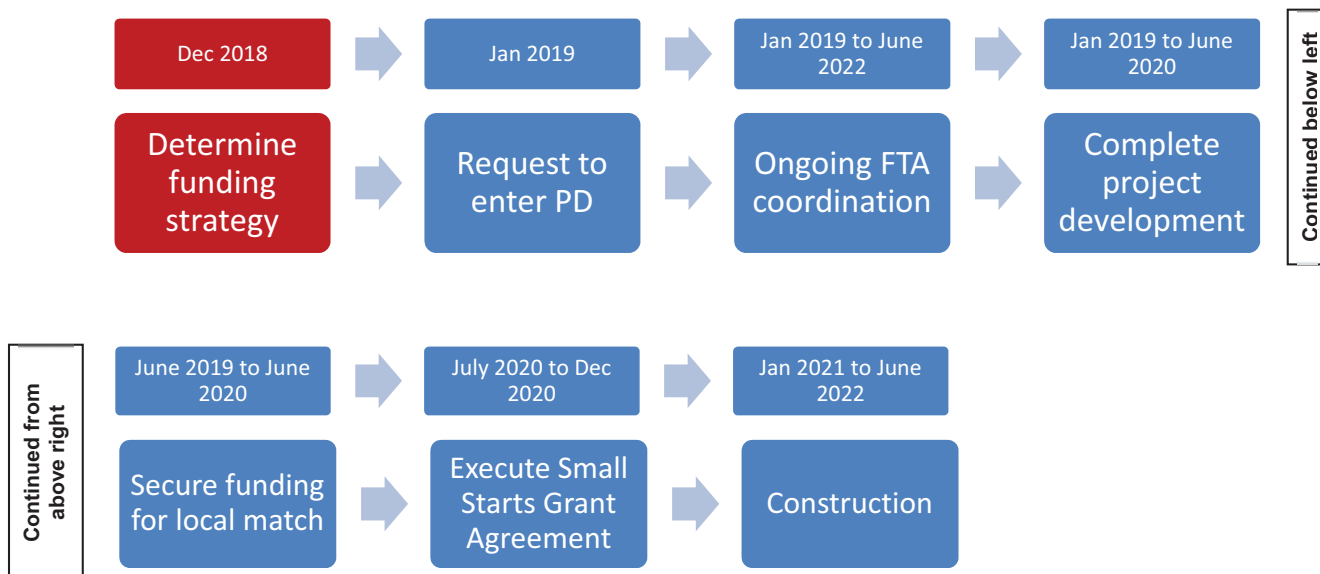


Figure 41: Track 1 Small Starts process flow chart (red box indicates critical decision point)

Small Starts Program Background

The Federal Transit Administration's Section 5309 Capital Investment Grant (CIG) program is one of the primary funding sources for new BRT, streetcar, LRT, heavy rail, and commuter rail projects in the U.S. The program consists of three main components, distinguished by the size and type of project: New Starts, Small Starts, and Core Capacity. The target CIG program for the SMART 1 LPA is the Small Starts program, which is oriented towards projects with a maximum total capital cost of \$300 million. Several New York State projects are currently in the Small Starts Project Development pipeline, including the CDTA's River Corridor and Washington/Western BRT projects, and the NYCDOT Woodhaven Boulevard Select Bus Service.

The Small Starts program can fund up to 80% of the project capital cost, up to a total of \$100 million. The program criteria are set up to reward projects that can provide more than 50% of the project from non-5309 funding sources (an "overmatch").

Small Starts is a highly competitive, discretionary grant program where projects are evaluated annually by FTA in terms of "Project Justification" and "Local Financial Commitment" criteria (each worth 50% of a project's overall rating). Projects must obtain a rating of "Medium" or higher in both Project Justification and Local Financial Commitment to advance through the process. See diagram in Figure 42.

Applying for Small Starts funding is a multi-step, and multi-year process, conducted in close coordination with FTA. The Small Starts evaluation process is designed to evaluate the effectiveness and benefits of the proposed project as well as the financial commitment and readiness of the project sponsor.

Project sponsors must also comply with federal policies and regulations for environmental analysis and urban transportation planning (e.g. consistency with federal planning requirements through the Syracuse region's Metropolitan Planning Organization, SMTC).

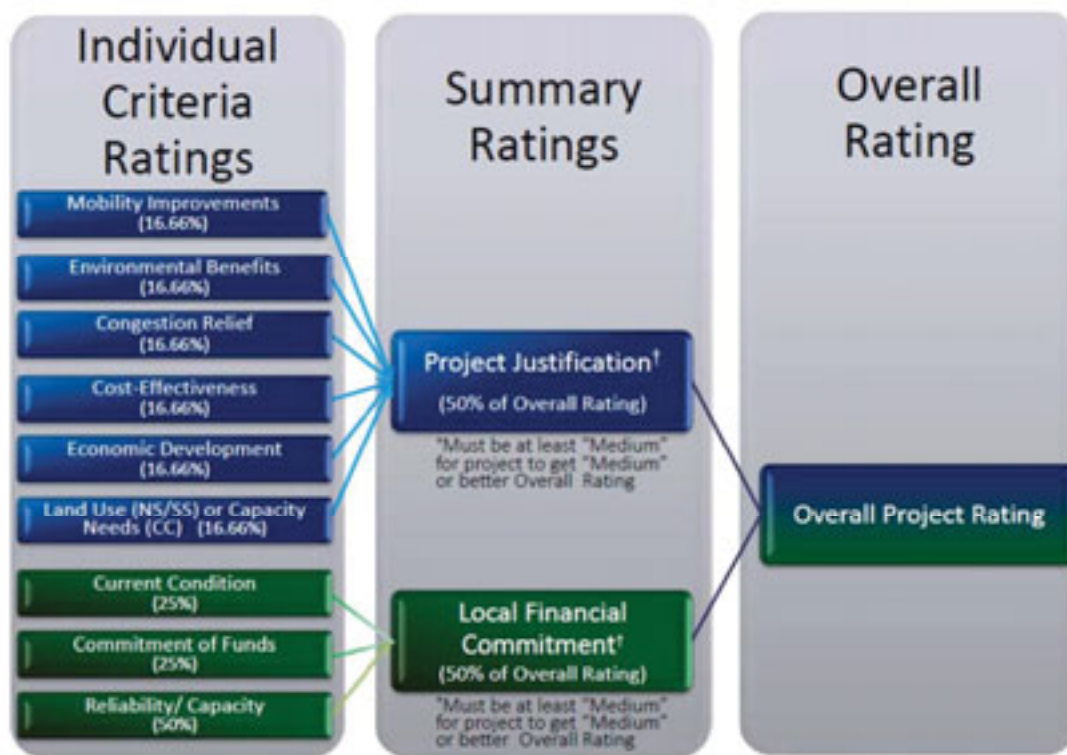


Figure 42: FTA Small Starts Project Evaluation and Ratings Framework (Source: FTA)

Small Starts Eligibility of the LPA

The Syracuse BRT LPA is eligible for Small Starts as a “Corridor-Based BRT,” which is a BRT system that does not operate in exclusive right-of-way but has other “rail like” quality of service features.

According to FTA policy guidance, a Corridor-Based BRT is required to have a certain set of elements. These define minimum features that need to be included in the engineering design, service concept, fleet, and capital/operating costs for the project to remain eligible. A list of the elements can be found in Section 4.

Current FTA policy favors Small Starts projects in corridors that demonstrate existing transit ridership rather than the potential for future ridership as a result of unrealized land use development or transit service enhancement.

Small Starts Warrants

In its August 2015 Final Interim Policy Guidance, FTA established Project Justification Warrants to simplify technical evaluation for projects that can demonstrate sufficient existing corridor ridership relative to the project capital cost. Projects are not required to use these Warrants, but it can be more difficult for smaller projects in smaller metropolitan areas like Syracuse to evaluate favorably within the conventional evaluation framework (which favors higher ridership projects in large, dense urban environments). More detail on Project Justification Warrants can be found in Section 3.2 of this report.

Local Financial Commitment and Project Sponsor Financial Condition

The financial commitment of the proposed project and the financial health of the project sponsor are key factors in Small Starts eligibility and competitiveness. The Local Financial Commitment

rating process is designed to evaluate both the project costs realism and risk, as well as the project sponsor's current and past financial condition.

Factors considered in the ratings process include but are not limited to:

- Realism and conservativeness of project capital and operating cost estimates;
- Level of commitment of local match/non-5309 project funds for construction and operation;
- Percentage of project cost requested from the 5309 project (with less than 50% of total capital cost favorably recognized as an "overmatch");
- Ability of the project sponsor to absorb cost overruns (which accrue to the project sponsor, not FTA, once the Small Starts Grant Agreement is signed); and
- Current and past financial condition of the project sponsor, such as current ratio, state of good repair (e.g. fleet age), debts, audit findings, and other factors.

Entering the FTA Small Starts Program

The FTA Small Starts program requires that a specific multi-step process be followed to apply for funding, shown in Figure 43. The first step is to request entry into Project Development. This is the phase whereby a project sponsor completes project design/engineering, environmental evaluation, and third-party agreements, and also secures necessary funding for construction. Projects are rated against Project Justification and Local Financial Commitment criteria defined in statute (FAST Act) and FTA policy guidance³. Projects are recommended for funding by FTA, but actual federal funding is appropriated by Congress in its Annual Budget. Once funding has been appropriated and the project sponsor has satisfied all necessary Project Development requirements, FTA executes a Small Starts Grant Agreement to authorize project construction.

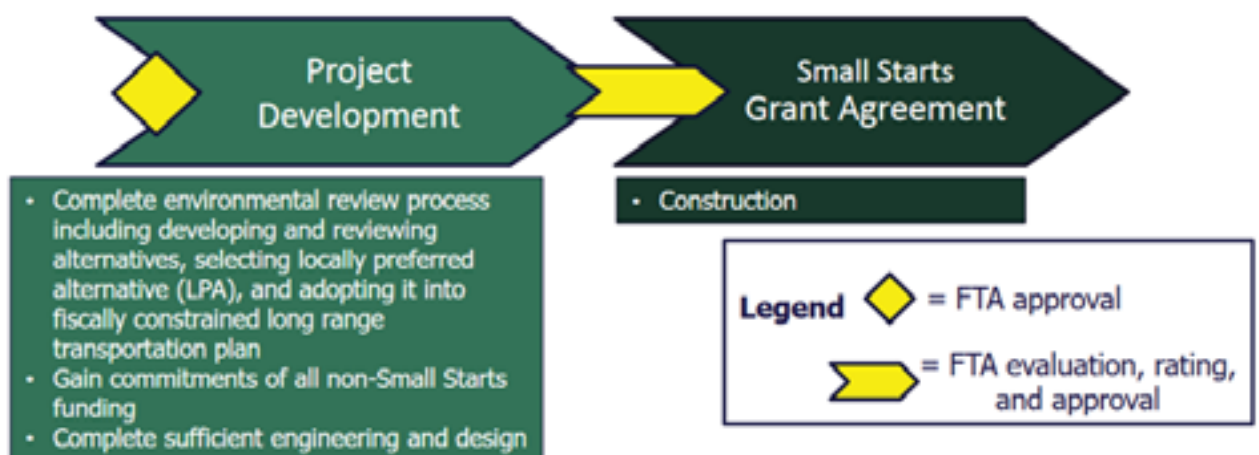


Figure 43: Typical Small Starts Process (source: FTA)

Tasks

Request to Enter Small Starts Project Development – Centro lead - It is at this point that the FTA becomes formally involved in moving the project forward. Centro's initiation package must include:

- Information on the project sponsor;
- A brief description and map of the project;

³ See *Final Interim Policy Guidance, Federal Transit Administration Capital Investment Grant Program*, FTA, June 2016

- A description of the transportation problem being solved;
- A description of existing transit service levels in the corridor;
- Planning-level project cost estimates;
- Identification of committed non-5309 funding to complete PD; and
- Project timeline, including completion of NEPA.

The FTA will use this information to determine whether Centro and the project are ready to enter Project Development.

A key requirement to enter Small Starts Project Development is the need for committed non-5309 funding to complete Project Development activities, including engineering, design and NEPA. This may be the most difficult practical hurdle for an agency seeking to pursue the Small Starts program, and suggests that advanced work to secure Project Development funds from non-5309 sources is an essential element of the project implementation and funding strategy. Funds expended on planning and design after permission to enter Project Development has been received are eligible for pre-award authority for reimbursement by FTA if the project is selected for funding.

Ongoing FTA Coordination – Centro lead - Regular coordination between the FTA (local Region 2 and headquarters Office of Project Development staff) and Centro throughout the life of the project leads to a smoother, more efficient process for all participants. Specific milestones requiring coordination and beyond are anticipated to include:

- Discussion of the appropriate environmental classification for the project before beginning NEPA;
- Approval to begin design once environmental clearance is obtained;
- Approval of the use of Project Justification Warrants as discussed above;
- Small Starts application for rating; and
- Once rated, coordination to complete project sponsor readiness activities and readiness to execute a Small Starts Grant agreement.

Project Development – Centro lead – Beginning Project Development, including preliminary engineering (PE) and final design is the first step in the Small Starts planning and engineering process. During the course of Project Development, the project is developed to the level necessary for the FTA to develop a project rating. Tasks include completing NEPA review, developing the project scope to the point where cost estimates and timelines can be established, reviewing local land use characteristics and future plans, and completing a financial plan including identifying at least 50% of local match.

In PE the project will gain enough added detail to finalize decisions on alignment, station locations and other physical features. Centro would lead this process with extensive involvement of other agencies whose facilities, operations, financing, or other aspects will be affected. Agencies include SMTC, the City of Syracuse, NYSDOT, OCC, SU and other private stakeholders.

The NEPA environmental process will be completed in Project Development and will include an expanded scoping process for each project component, consideration of impacts on the natural environment, the man-made environment, and environmental justice issues. The NEPA process will be completed either through a Categorical Exclusion, Environmental Assessment, or a full Environmental Impact Statement. Given the lower level of infrastructure improvements in existing right of way and minor impacts on the natural/human environment, as previously noted in Section 6.2, a Categorical Exclusion or Documented Categorical Exclusion class of action

may reasonably be expected. This would be confirmed in consultation with FTA. Final written concurrence is required from FTA to satisfy NEPA requirements.

Funding for Local Match – Centro lead - Centro should begin identifying the required match funding as soon as possible. The FTA requires that 50% of matching funds be identified before the submittal for FTA evaluation, rating, and approval and that 100% be identified before a construction grant agreement can be signed. Internal Centro funds, FTA formula programs, FHWA programs, State DOT other state agencies such as the Empire State Development Corporation (ESDC) and Office of General Services (OGS), and the institutions and major private businesses in the corridor may be sources of funds or in-kind assistance. More information is provided in the Financial Plan section.

The products of Project Development, NEPA review, and identification of match funding will be included in a submittal to FTA that is used to determine whether to recommend funding in the *Annual Report on Funding Recommendations*.

Execute Small Starts Grant Agreement (SSGA) – Centro lead – This last element of Project Development completes the detailed engineering design (i.e., final design) of the project and brings it to the point where the FTA negotiates a SSGA with the project sponsor. With an executed SSGA, construction can begin. The commitment of all non-Small Starts funding is required at this point as well as finalization of all third-party agreements (e.g. with the City of Syracuse for construction of shared infrastructure). Furthermore, FTA also expects completion of other project sponsor readiness activities such as risk review and project management planning.

Note that once an SSGA is executed, based on final project designs, cost estimates, and schedule, the project sponsor is responsible for any construction cost overruns. This incentivizes the project sponsor to deliver the complete project on time and on budget.

Construction – Centro lead – Centro would coordinate with the City of Syracuse and NYSDOT (in reference to State Highway 175 and any issues related to their I-81 project) to hire contractors and begin construction of the BRT infrastructure throughout the two LPA corridors. OCC, Destiny, and other private stakeholders would also be involved in the planning and design of stations and other elements on their property. Some elements of the project may be implemented by partner agencies, such as the TSP that may be best implemented by the City of Syracuse, which owns the vast majority of the traffic signal system along the suggested corridors. In these cases, Centro, as the designated recipient of the federal funding, would still be responsible for funding and project management. Centro staff or its contractors would be required to provide overall construction management and coordination, as well as administration of the Small Starts grant and associated financial management.

7.1.3 Track Two – Non-Small Starts



Figure 44: Non-Small Starts process flow diagram (red box indicates critical decision point)

The non-Small Starts funding approach would use a variety of other smaller grant programs, itemized in the Financial Plan section. Coordinating between these programs would then become a large part of the management of the implementation of the project. In this approach, the project would likely be implemented in steps as funding comes available for specific elements. A flow diagram for this approach is shown in Figure 44.

As noted above, the Small Starts program is a common approach for a transit capital infrastructure project of this scale, but the program contains significant and stringent requirements of the project sponsor, including commitment of funds up front to complete Project Development, and specified standards for project sponsor financial condition and readiness.

A non-Small Starts process would allow Centro to phase implementation of BRT project elements over time based on available funding. For example, essential station elements, vehicles, related technologies (i.e., TSP) could be deployed in an initial phase or multiple phases, with further project elements implemented at a later date subject to available funding. In this case, a critical aspect of the implementation plan will be defining what those essential elements are to activate the service on day one, and what amount of capital and operating funding is required to implement that opening day vision.

Implementation and Finance Plan – Centro lead with support from SMTC – Centro, working in close cooperation with SMTC and other stakeholders would develop a detailed implementation and finance plan for the SMART 1 LPA. This would include specific tasks required to implement the plan through to construction paying close attention to how elements could be phased as funding becomes available. Exploring what funding sources might pay for which elements would provide a step by step process to bring the full project to fruition. Certain roadway infrastructure elements such as TSP, queue jumpers and pull outs may be fundable through highway programs. This could happen directly through roadway rehabilitation funds provided by Federal or State programs or through “flexing” funds from FHWA programs to transit programs. Vehicle purchases may be able to be funded through reprogramming or reprioritizing regular Federal formula programs. More detail is provided in the Financial Plan section.

Project Development (Scoping) – Centro lead – Project Development and PE will have to be completed in the non-Small Starts approach in much the same way it is competed in the Small Starts approach, but the process will follow a different path. Rather than follow the specific FTA process for Small Starts using the mandated set of BRT components, the process will be more open and flexible and would start with the confirmation of the various infrastructure components of the SMART 1 LPA.

The FTA will likely still be involved in funding the project on some level, most likely through the use of formula funding, and so will still have a role to play in its planning and implementation. Regular coordination with FTA will lead to a smoother, more efficient process for all participants.

During the course of Project Development, the project scope will gain enough added detail to finalize decisions on alignment, station location and design, TSP, vehicles and other physical features.

As with Track One, the NEPA environmental process will be completed in Project Development and will include an expanded scoping process for each project component, consideration of impacts on the natural environment, the man-made environment, and environmental justice issues.

Final Design – Centro lead – Final Design completes the detailed engineering design of the project and brings it to the point where construction can begin. As with other aspects of the non-Small Starts approach, final design may not happen all at once but in phases that respond to grant funding as it becomes available from various sources.

Construction – Centro lead with support from infrastructure owners such as the City of Syracuse and NYSDOT - Construction in the non-Small Starts approach might not be on the entire project at once but rather on individual or groups of elements as they are funded and brought through final design. Stations may be funded first through one program, such as one of the State economic development programs, while dedicating funding for new vehicles might take longer to accomplish. It may not be practical or desirable to leave funding dormant while other funds are identified and as long as each phase in BRT development is distinct and represents a clear

improvement in service to the general public, there is no reason to wait. Each phase will then result in an increase in ridership and will serve to build support for future phases.

7.2 Timeline

It is difficult to estimate with precision how long it will take to implement a rapid transit project like the BRT LPA due to all of the unique organizational, technical, political, and funding factors that come into play. Based on peer project examples, a 3-5 year timeline from current stages of planning to opening day is a reasonable timeline. However, this timeline can vary considerably depending on the pace of planning/design activities and the ability of Centro and its partners to secure project development, design, and operational funding. The Small Starts and non-Small Starts approaches will have different timelines and take different amounts of time to implement.

A critical schedule driver in the near term for both Small Starts and non-Small Starts approaches is securing sufficient funding to advance project planning and Project Development in 2018-2019. Other key near-term factors for timely project implementation is additional outreach to build a coalition of project “champions” to spearhead Project Development around a common vision. This will provide an improved sense of the total capital and operating requirement for the project and the likely construction schedule for a Small Starts approach or a non-Small Starts (and potentially multi-phase) implementation.

7.3 Financial Plan

Financial planning for transit capital projects is in a particularly dynamic state given policies and actions of the current federal administration. For example, FTA is currently rating candidate Small Starts projects as required by statute, but is not currently recommending rated projects for funding. Other federal grant programs like TIGER (Transportation Investment Generating Economic Recovery) have been proposed for significant changes or elimination. At the same time, new infrastructure, smart cities, or economic development programs may create opportunities previously unavailable to past projects.

Capital and operating

The financial plan considers both capital and operating funding. A wide variety of capital funding sources are available on the Federal and State levels that could be used to fund the SMART 1 LPA. These sources include Small Starts, other Federal transit and highway programs, and State transit, highway, and economic development programs. Capital funding may also be available from local private sources, particularly for the construction of stations, where stakeholders may be interested in helping to fund the construction of a station at one or more of their facilities. While often requiring extensive application processes, the SMART 1 LPA provides significant mobility and economic benefits to the City of Syracuse and its residents and is likely to score well relative to other applicants for one or more of these programs.

Operating funding is a more significant challenge, both because it is a continuous, ongoing requirement and due to the limited sources available. The number of programs available to cover transit operating expenses in New York State consists primarily of the Mortgage Recording Tax and State Transit Operating Assistance (STOA). The Mortgage Recording Tax is fixed and STOA is a formula program tied to passengers carried and service miles operated. Both of these funding sources are already fully programmed by Centro. Federal funding for transit operations is only available to rural and other small communities and not available to the Syracuse region. This will require the exploration of innovative funding and revenue sources such as support from major institutions, increases in fare revenue, service operational efficiencies, and employer pass programs.

Peer projects in New York State and elsewhere can provide examples of potential strategies, though the current environment requires flexibility and adaptability that is unlikely to exactly

match the strategies of other peer projects. Still, a funding strategy combining multiple sources drawn from the federal, state, and local levels, and perhaps a combination of transportation and non-transportation programs (such as energy, sustainability, or economic development) may be anticipated as part of the SMART 1 LPA funding strategy.

For purposes of this analysis, it is assumed that due to the scale of the project and recent precedent in New York State, that federal funding will be a key (and perhaps majority) element of the funding strategy, whether Small Starts or other programs. Therefore, there is significant emphasis in this section on federal funding sources.

Small Starts vs. Non-Small Starts – Summary of Financial Approaches

From a Financial Plan perspective, the key decision factors in pursuing a Small Starts or a Non-Small Starts approach are summarized in Table 20 below.

Table 20 – Summary of Initial Environmental Screening

Criteria	Small Starts Approach (Track One)	Non-Small Starts Approach (Track Two)
LPA Project Eligibility	Corridor based BRT – requires certain characteristics and service levels to meet definition	Varies by funding source and project characteristics to determine eligibility/competitiveness
Key Advantages	<ul style="list-style-type: none"> Primary FTA program for transit capital investment, including BRT. Peer projects/examples funded in New York State using federal and state funds. Syracuse BRT LPA appears eligible for simplified “Warrants” Project Justification analysis. Typically has been a stable and reliable funding source for projects that are favorably rated. 	<ul style="list-style-type: none"> Increased flexibility to define an “enhanced bus” BRT project without being held to Small Starts Corridor-Based BRT requirements. Increased flexibility to phase project as funding becomes available. Less stringent eligibility/readiness requirements for project sponsor. Less emphasis on transit-supportive land use and other factors outside of Centro control. Avoids risk associated with uncertainty about the future of the 5309 CIG program. Many funding sources familiar in the region.

Disadvantages	<ul style="list-style-type: none"> Requires 100% commitment of Project Development funds to enter program. Favorable rating requires commitment of funding sources, transit-supportive land use policies, conservative project cost estimates, clean agency financial condition, and demonstrated sponsor readiness. Uncertainty in future Small Starts project funding in current federal environment. Once SSGA is signed, project cost overruns are borne by the project sponsor. 	<ul style="list-style-type: none"> Piecemeal approach to securing sufficient funding from multiple sources. Requirements, eligibility vary by funding source. Additional resources to secure and administer funding. Funding may have to be redirected away from existing used (e.g. STP, CMAQ, Sections 5307 or 5339 funds).
Local Match Requirements	<ul style="list-style-type: none"> Minimum 20% non-5309 match. Project can receive more favorable rating with "Overmatch" greater than 50% non-5309 funds. 	<ul style="list-style-type: none"> Varies by funding source.

A wide variety of federal, state, and local funding sources have been applied to fund transit capital projects and operations across the United States. The following highlights some key candidate funding sources for the SMART 1 LPA as alternatives or complements to the FTA Section 5309 Capital Investment Grant Program discussed previously. Included with each potential funding source is its identification for use of "Capital" or "Operating" purposes.

Non-Small Starts Candidate Federal Funding Sources

FTA Bus and Bus Facilities Grants Program - Capital

(<https://www.transit.dot.gov/funding/grants/bus-bus-facilities-infrastructure-investment-program>)

The FTA Bus and Bus Facilities Grants Program (Section 5339) was expanded under the FAST Act. The FAST Act also re-established a competitive Bus Discretionary Program (Section 5339(b)). This program funds replacement for existing fleets and facilities, but may also be an alternative to Section 5309 Capital Investment Grants for smaller capital projects like BRT in Syracuse. The competitiveness of a new capital project versus replacement projects upgrading aging assets is yet to be determined, though it may be possible to leverage the project to acquire BRT fleet vehicles as part of routine replacement of Centro fixed-route vehicles.

FTA No/Low Emissions Vehicles Grants - Capital

A number of BRT programs nationally, and a much larger number of fixed-route systems, are deploying low or no-emissions transit vehicles at a pilot or full-scale implementation. In FY 2016, approximately \$55 million of the Bus Discretionary Program was set aside to fund Low or No

Emissions transit vehicles and infrastructure. The program exists as a discretionary portion of the 5339 Bus and Bus facilities program.

Should Syracuse pursue these technologies for future BRT programs, low-no grants could be a potential source for SMART 1 LPA funding. The program, however, has proven to be highly popular and competitive, with demand exceeding available grant funding to date. Keys to a successful application include: 1) putting together a proven team, including the bus equipment manufacturers of which there are several in Upstate New York, 2) overmatching the 15% minimum, which can be done using Section 5307 funds, and 3) long term commitment to low-no technology, something that Centro has done with CNG buses.

Urbanized Area Formula Grants (Section 5307) – Capital

(<https://www.transit.dot.gov/funding/grants/urbanized-area-formula-grants-5307>)

FTA Urbanized Area Formula Grants are awarded by the federal government on a formula basis to urban areas with a population over 50,000, which includes the Syracuse region. Funds may be used for a variety of transit capital purposes, including: planning, engineering, design and evaluation of transit projects; capital investments in bus and bus-related activities such as replacement; overhaul and rebuilding of buses; construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems including rolling stock; and other uses. Any funds used for the SMART 1 LPA from this program would be reprogrammed from other transit projects in the Syracuse region.

USDOT TIGER Discretionary Grants – Capital

(<https://www.transportation.gov/tiger>)

The USDOT's Transportation Investment Generating Economic Recovery (TIGER) grant program is a discretionary funding program for multi-modal surface transportation capital projects. The program was formed in 2009 and has anticipated funding of \$500 million in the current FY 2017 round (for which applications were due in September, 2017). Transit projects are eligible for TIGER grants, and applications may include a single application and project or a joint application with multiple project components. The current minimum award for urban projects is \$5 million (requiring a minimum 25% local match).

A drawback of the TIGER program is its highly competitive nature, with funding applications typically far exceeding available funds.

Surface Transportation Program (STP) Block Grant Program (23 USC 133) - Capital

(<https://www.fhwa.dot.gov/fastact/factsheets/stbgs.cfm>)

This FHWA program provides formula funding that may be used by states and localities for a wide range of projects to preserve and improve the conditions and performance of surface transportation, including highway, transit, intercity bus, bicycle and pedestrian projects. States and Metropolitan Planning Organizations can dedicate "Flex" funds to any transit project. This would include any BRT project.

As a formula-based program, the Syracuse region receives STP funding that can be allotted to a range of transit infrastructure or highway purposes. The characteristics of the proposed mixed traffic BRT suggest that an STP funded-program might simultaneously address a combination of transit, roadway, bicycle, pedestrian, and safety needs in the corridor.

As a New York State example, the Capital District Transportation Committee (CDTC) in Albany used STP "Flex" funds to create a "BRT set-aside." CDTA is able to access this set-aside each fiscal year for funding of BRT related efforts, including professional services and construction related expenses. The BRT set-aside was also used to fund Small Starts Project Development for CDTA's River Corridor BRT, enabling the agency to demonstrate full non-5309 funding

commitment for the Project Development Phase as a condition of entering the Small Starts program.

Congestion Mitigation and Air Quality Program (CMAQ – 23 USC 149) and Transportation Alternatives Program – Capital

(<https://www.dot.ny.gov/tap-cmaq>)

CMAQ is a funding program that can be used to fund transit capital projects with a demonstrable air quality benefit. CMAQ is a popular (and often competitive) program due to the flexibility of the funds. TAP is a program aimed at improving the transportation system in a locality for all users including transit users, pedestrians, bicyclists, and motorists. The CMAQ and TAP programs are both funded by the FHWA and administered by NYSDOT in New York State. They are applied for using a common application. Both programs require a 20% local match.

Innovative Funding Programs – TIFIA Loans - Capital

(<https://www.transportation.gov/buildamerica/programs-services/tifia>)

The Build America Bureau of USDOT promotes innovative funding for transportation projects such as public-private partnerships, loans, and private activity bonds. The Transportation Infrastructure Finance and Innovation Act (TIFIA) has been used by transit agencies, such as Sound Transit in Seattle and the Chicago Transit Authority, to secure funding for capital projects in recent years. According to the Bureau, eligible transit projects include the design and construction of stations, track, and other transit-related infrastructure, purchase of transit vehicles, and any other type of project that is eligible for grant assistance under the transit title, Chapter 53 of title 49 of the U.S. Code (49 U.S.C.).

The key distinction of TIFIA from many other programs discussed in this section is that TIFIA is a *loan*, not a *grant*, and therefore requires a revenue source (taxes, farebox revenues, etc.) for repayment as well as establishment of creditworthiness of the sponsor agency. Programs funded to date are considerably higher in total and loan value than the Syracuse BRT LPA, with costs running from the hundreds of millions into the billions.

State Funding Sources

Consolidated Funding Application - Capital

New York State's Regional Economic Development Councils (REDC) were established to replace a traditional top-down approach to economic development. In 2011, each region developed five-year strategic plans which have served as roadmaps that to guide them toward their economic vision. A total of \$800 million was made available in 2017 to support the economic development priorities of each of the regions and create jobs.

The Consolidated Funding Application consists of eight funding categories:

- Direct Assistance to Business and Other Organizations;
- Community Development;
- Waterfront Revitalization;
- Energy;
- Environmental Improvements;
- Sustainability Planning and Implementation;
- Education/Workforce Development; and
- Low Cost Financing.

The only program that appears to have promise for this project is the Climate Smart Communities Grant Program under the Sustainability Planning and Implementation Category.

Eligible objectives include the Reduction of Vehicle Miles Travelled, with activities that include the implementation of transit improvements that have the potential to substantially increase ridership.

In 2017, there was \$9.5 million available. However, the maximum award is \$2 million.

Other transportation related projects in the Central Region have included:

- Syracuse Hancock International Airport Emergency Operations Center;
- Skaneateles Aerodome Taxiway Replacement, Hangar Construction and Electrical Feed;
- Auburn Transload Terminal Improvement; and
- Cortland Transload Terminal.

The regional strategic plans were developed 5 or 6 years ago and are due for updating. Within these plans, including the Central Region, there are only a handful of references to transit and mobility as the primary focus appears to be from the business perspective. A successful application for transit may need to include some type of partnership to highlight job creation, business growth, community development, workforce training, or economic development.

URI – Upstate Revitalization Initiative - Capital

The Upstate Revitalization Initiative is a specific element of the REDC process that focuses on the revitalization of Upstate New York cities and regions.

The Central New York region recently won a \$500M grant from the URI program. \$30 million of this is programmed for an anti-poverty program called the Alliance for Economic Inclusion administered by Onondaga County. Given the connection between access to jobs and education and the ability to escape poverty, there is an argument that using some of the money to fund the LPA would meet the goals of the program. The SMART 1 LPA would link people living in a number of low income neighborhoods in Syracuse substantially improved access to jobs, educational opportunities, training, community resources, recreation, and medical facilities, all of which would lead to long term improvements in their quality of life. Syracuse has one of the highest rates of no car households in the country, nearly 25%, so alternatives are critical to provide adequate access to all. This case should be made to Onondaga County as part of the funding tasks for either project track.

Other aspects of the ULI program, such as urban revitalization, economic development, and infrastructure development are also areas that the LPA would support, and would provide multiple reasons to fund it.

NYSERDA – New York State Energy Research and Development Authority - Capital

NYSERDA regularly introduces new funding programs for a wide variety of activities related to energy efficiency and technology development. They may be considering programs to support the purchase and operation of energy efficient and low or no emissions vehicles for transit agencies. If so, this funding could be used to complement the FTA's new No/Low Vehicle grant program.

Accelerated Transit Capital Program - Capital

This program is administered by NYSDOT and provides \$20 million for agencies to rehabilitate, restore and modernize public transit assets.

The capital projects must have a service life of at least 10 years and can include vehicle rehabilitation and/or replacement, fleet enhancement, deployment of new technologies, passenger amenities and maintenance facilities.

State Transit Operating Assistance (STOA) - Operating

Securing a reliable source of on-going operating funding for the LPA will be a significant challenge to its implementation. The primary source of operating funding in New York State is the STOA program. This program is formula-based and provides transit operators with a set payment per passenger and per vehicle mile. The implementation of the LPA will result in increases to both statistics but likely not in proportions to the increase in operating costs that will be incurred. Still, the program is a key source of operating funds and would form an important contribution to the success of the project.

Private Sources and Value Capture – Capital and Operating

Recent FTA policy and the FAST Act encourage innovative project delivery and finance through public-private partnerships and non-conventional funding sources. In this environment, significant contributions to capital and/or operating costs by private entities in the Syracuse BRT LPA corridors may be a viable source of funding or local match for other federal or state grants.

As a significant corridor for regional employment and education, corridor stakeholders have a shared strategic interest in preserving and expanding transportation mobility in the corridor. This may introduce the potential for private-sector partnerships and third-party contributions to the capital and/or operating costs of the future BRT project.

Capital

One benefit for businesses, employers, and institutions may be the reduced costs to supply parking (particularly expensive structured parking) to provide alternative shuttle services when high-quality transportation alternatives are available.

Higher education institutions may be willing to contribute right-of-way or capital funds to support improvements on campus or to enhance connectivity between their campus and other destinations like student housing, services, shopping, and amenities (e.g. Armory Square).

Monetizing this private-sector benefit through direct contributions, tax increment financing (TIF), special assessment districts, or other strategies could provide an alternative funding source, and one which may be leveraged as match to secure additional State or Federal dollars.

Once a Tax Increment Financing District is established, often bonds are sold to make improvements, in this case enhanced transit. The difference between the tax revenue generated prior to the creation of the district and the taxes generated after the creation of the district can be used to paying back the bond. Properties around the new transit investment could be assessed taxes or fees based on the property's proximity to the project, existing use or land use designation for a specified number of years to generate capital funds.

Operating

Private sources of operating funds generally depend upon making the case to institutions and employers that subsidizing passes provide benefits to their employees, resulting in lower turnover, or to the organization itself through lower costs. Colleges and Universities are often attracted to Upass type programs where all students receive a regional transit pass for a nominal fee through their student fees. This provides them with a useful service travel to and from home and their school and to travel throughout the region for other purposes. It also discourages drinking while driving when used to access evening entertainment off campus. Since all students receive the passes but not all need them for regular transportation, they can be offered at a considerable discount while still resulting in a considerable increase in revenue for the transit provider. The same program can be offered to employers and other groups that require regular transportation services.

Another option is for organizations to contribute directly to the transit agency in exchange for free or discounted transportation for their constituents between two specific points. SU today contracts with Centro for free student transportation between the South and Main Campuses. Similar arrangements could be arranged for SU, OCC, or for University Hill employers to transport people from their homes or park-and-ride lots along the SMART 1 LPA to their schools or employers.

And finally, improved service in terms of speed and frequency will result in an increase in revenue from day to day riders who will be attracted to ride more often or to buy passes when they formerly rode infrequently. This increased revenue will generally not cover the marginal increase in costs but, along with a package of other revenue enhancements, can contribute to covering the cost increases.

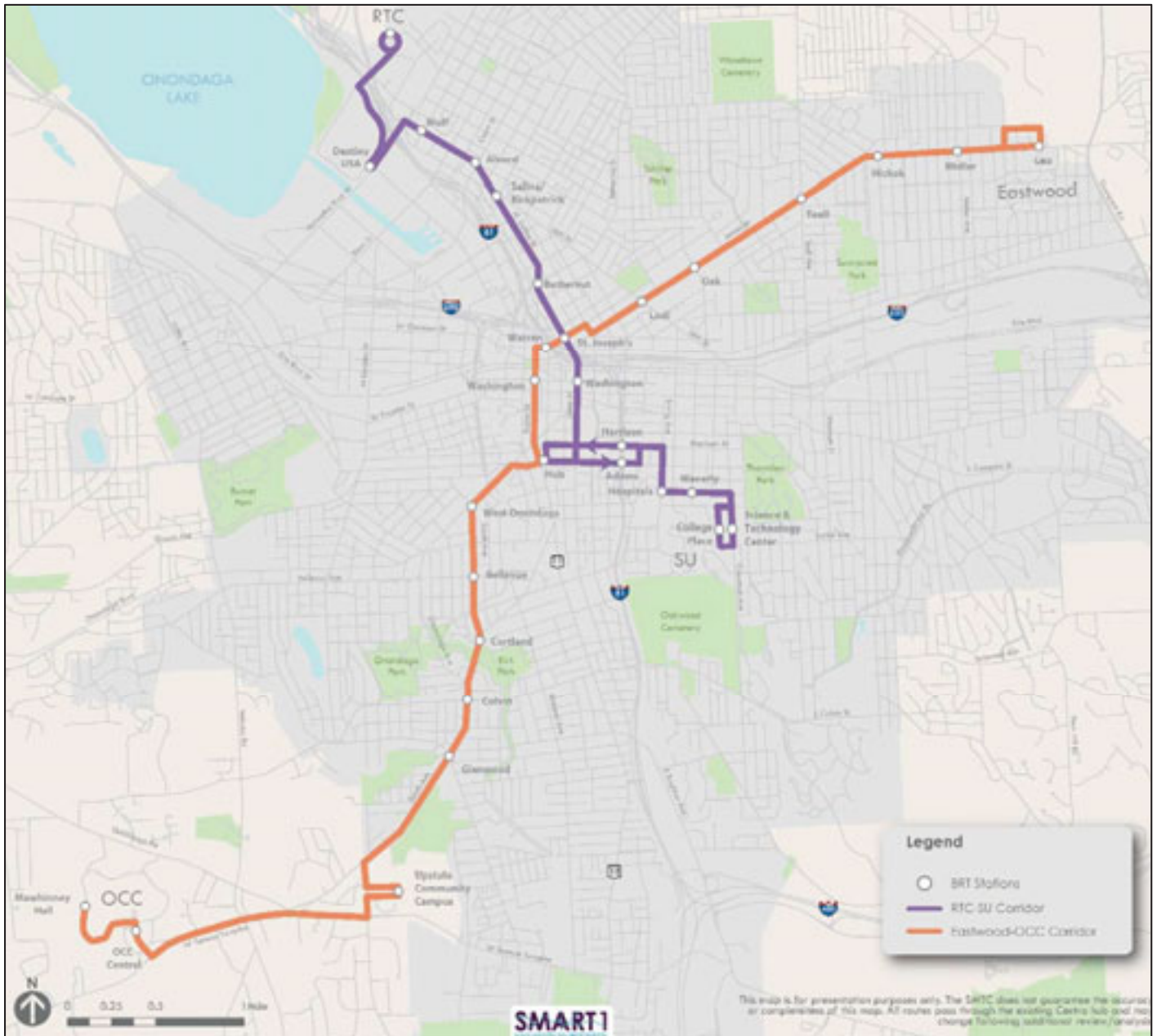


Figure 45 – Locally Preferred Alternative