



THE
I-81
CHALLENGE

Draft Final Summary of Technical Memorandum #1: Physical Conditions Analysis

DATE:

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PREPARED FOR:

New York State Department of Transportation



NYS Department of Transportation

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LIST OF ABBREVIATIONS

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ALPR	Automated License Plate Reader
BRT	Bus Rapid Transit
CBD	Central Business District
CENTRO	Subsidiary of Central New York Regional Transportation Authority
CNYRTA	Central New York Regional Transportation Authority
CLC	Community Liaison Committee
EIS	Environmental Impact Statement
EMS	Emergency Medical Services
ETC	Estimated Time of Completion; 2020
ETC + 20	Estimated Time of Completion + 20 years; Design Year, 2040
ETC + 30	Estimated Time of Completion + 30 years; Bridges Design Year, 2050
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GIS	Geographic Information System
HOI	Housing Opportunity Index
LOS	Level of Service
LRT	Light Rail Transit
MAC	Municipal Advisory Committee
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NBI	National Bridge Inventory
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Properties
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSM	New York State Museum
OPRHP	Office of Parks, Recreation and Historic Preservation
PIL	Priority Investigation Location
RTC	Regional Transportation Center
SAC	Study Advisory Committee
SEQR	State Environmental Quality Review
SEQRA	State Environmental Quality Review Act
SHPO	State Historic Preservation Officer
SMTC	Syracuse Metropolitan Transportation Council
SOCPA	Syracuse-Onondaga County Planning Agency
SUNY	State University of New York
TNT	Tomorrow's Neighborhoods Today

ADDENDA

January 2011 - Minor clarifications were incorporated per feedback received from the I-81 Study Advisory Committee (SAC) meeting held on November 30, 2010. Bridge condition definitions of Structurally Deficient and Functionally Obsolete along with example photos were included. Clarification on the pass through study, definitions on types of trips and a new figure was added. The I-81 Challenge process graphic was updated.

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1.0 INTRODUCTION

This report is a summary of the findings of the in-depth evaluation of existing physical conditions in the I-81 corridor primary study area along with the social, economic and environmental context that the project is located in as documented in Technical Memorandum #1 (TM #1) Physical Conditions Analysis. Copies of the TM #1 are available upon request from the New York State Department of Transportation, Region 3, 333 East Washington Street, Syracuse, NY 13202, Mr. Bill Egloff (315) 428-4102. The primary purpose of TM#1 is to perform a detailed review of the 12-mile segment of I-81 from the I-481 (Exit 16A) interchange on the south and the I-481 (Exit 29) interchange on the north and document the social, economic and environmental setting.

This overall study effort, *The I-81 Challenge*, is being developed in accordance with the New York State Department of Transportation (NYSDOT) Project Development Manual which integrates within its process conformance to the National Environmental Policy Act (NEPA) and the State Environmental Quality Review Act (SEQRA) processes.

Project Status: This document is the first of a series of documents that will eventually comprise the I-81 corridor study. This initial document is focused on the existing conditions along with consideration of what future conditions will be like if nothing is done to I-81 except routine maintenance. This information will provide the basis for the consideration of rehabilitation, reconstruction or system modifications, in the next phase of this study, that meet the long range needs of the I-81 corridor and the community. The next phase of the study begins the process of developing strategies (alternatives) for the I-81 corridor. Reconstruction alternatives would rebuild I-81 along the same general alignment with improvements balanced to address problem areas identified herein with community and environmental constraints. System modifications are expected to include such strategies as relocating I-81 over to I-481, removing the Viaduct section and replacing it with a boulevard and other system wide type recommendations from the public involvement effort.

The following outlines the basic steps of the corridor study process. It should be noted that this process is being supported by a comprehensive public involvement program. Further information is available in Section 1.7 Public Involvement Plan which follows latter in this document and provides more detailed information on how the project progresses with the Public Involvement efforts. The primary corridor study steps are as follows:

- Step 1 – Study Existing Conditions: Collect detailed existing condition information on the physical and operating conditions of I-81 in the Primary Study Area, overall information on the Interstate system, along with reference information on other transportation modes (i.e., transit, pedestrian and bicycle), and the Social, Economic and Environmental setting.
- Step 2 – Technical Analysis: Identify and evaluate development strategies (alternatives) in cooperation with the public and pertinent local, state and federal agencies.
- Step 3 - Final Corridor Study: Finalize the corridor study recommendations and documentation.

1.1 Project History and Context

During the mid twentieth century, President Eisenhower supported a federally funded highway system that would provide Americans with easy interstate travel, now known as the Interstate Highway System. Construction started in the late 1950's, after the Federal-Aid Highway Act of 1956. Interstate 81 was built in Central New York during this time for two main reasons: to carry through traffic between Pennsylvania and Canada, and to bring local traffic in and out of Syracuse. The idea of the proposed highway, particularly through downtown Syracuse, was controversial. Local residents, business interests, and leaders had differing opinions about the highway's design and location.

During this time, the City of Syracuse was experiencing urban flight with a large portion of the city's residents and many businesses relocating to the suburbs, as well as an urban renewal program to try to attract people and businesses downtown. The then current Mayor and city Engineer, as well as many of the city's residents, believed that the plan for an elevated highway through downtown Syracuse would not only deface the city and ruin the city's plans but also physically split Syracuse and limit the city's economic and community growth.

In the 1960's, portions of the highway had been completed both North and South of the city and the state waited no longer to resolve the issues about placement and design of the highway. Therefore, the two portions were connected by constructing I-81 as an elevated highway through the center of the city. Interstate 90, or the New York State Thruway, was also constructed during this time and connects to I-81 in the Syracuse metropolitan area, resulting in both North-South and East-West drivers traveling through the Syracuse area, not to mention air travelers from Syracuse International Airport, resulting in Syracuse being a major transportation



center for Central New York. I-481 was then later constructed providing an east side outer loop around the City of Syracuse.

I-81 through Onondaga County has two main roles:

- A major commuter corridor: I-81 provides direct access from suburban communities to downtown Syracuse and its hospitals, schools and universities. Of the 10 largest employers reported by the Greater Syracuse Economic Growth Council, 5 are located next to I-81.
- National and international travel route: For long-distance travelers and freight carriers, I-81 provides north/ south mobility from Tennessee to Canada. I-81 also provides an important connection to I-90 the Thruway, a major east-west route in the Syracuse area.

I-81 serves an important role on both national and regional levels. The highway and its many major bridges are now nearing the end of their useful service life which is typically in the neighborhood of 50 years. Of particular concern is the one-mile raised roadway section, or Viaduct, within the City of Syracuse and the adjacent I-81/I-690 interchange which has over 11,000 feet of major bridge structures. This area through downtown and the City has been found to have a combination of design deficiencies, accident problems and isolated traffic congestion problems.

The New York State Department of Transportation and the Syracuse Metropolitan Transportation Council (SMTC) began *The I-81 Challenge* in the fall of 2009. This study will assess the overall I-81 corridor and then follow up with a Project Scoping Report (in accordance with the NYSDOT Project Development Manual (PDM)) for the Viaduct section. A Project Scoping Report is a planning document that progresses a project or multiple projects to the next design phase following a planning study like *The I-81 challenge*.

1.2 Purpose of this Study

The purpose of this study, *The I-81 Challenge*, is to:

1. Collect data to identify the condition of the Region's transportation system and the environment in which it operates, focusing mainly on I-81; and,
2. Identify potential solutions that are worthy of detailed evaluation.

The development of the study will be supported by a comprehensive Public Involvement Program which runs in parallel with the study efforts.

1.3 Environmental Class and Lead Agencies

National Environmental Policy Act (NEPA) Classification and Lead Agency

This corridor study precedes the official initiation of the NEPA process. At the completion of the I-81 Corridor Study the official NEPA process will be initiated as a probable NEPA Class I action in accordance with 23 CFR771.115. NEPA Class I is an Environmental Impact Statement (EIS), which is the classification for the most complex type of project. This effort consists of a detailed

evaluation of the environmental effects of a federal undertaking and its alternatives on the environment (including social, economic and the natural environment). NYSDOT and Federal Highway Administration (FHWA) are assumed to be co-lead agencies for future action. The lead agency(s) is responsible for supervising the preparation of an environmental analysis.

State Environmental Quality Review (SEQR) Classification and Lead Agency

This corridor study precedes the official initiation of the SEQRA process. In subsequent phases of this study effort, the official SEQR process will be initiated as a SEQR non-Type II (EIS) action under 17 NYCRR Part 15. NYSDOT will be the SEQR Lead Agency. The lead agency(s) is responsible for supervising the preparation of an environmental analysis.

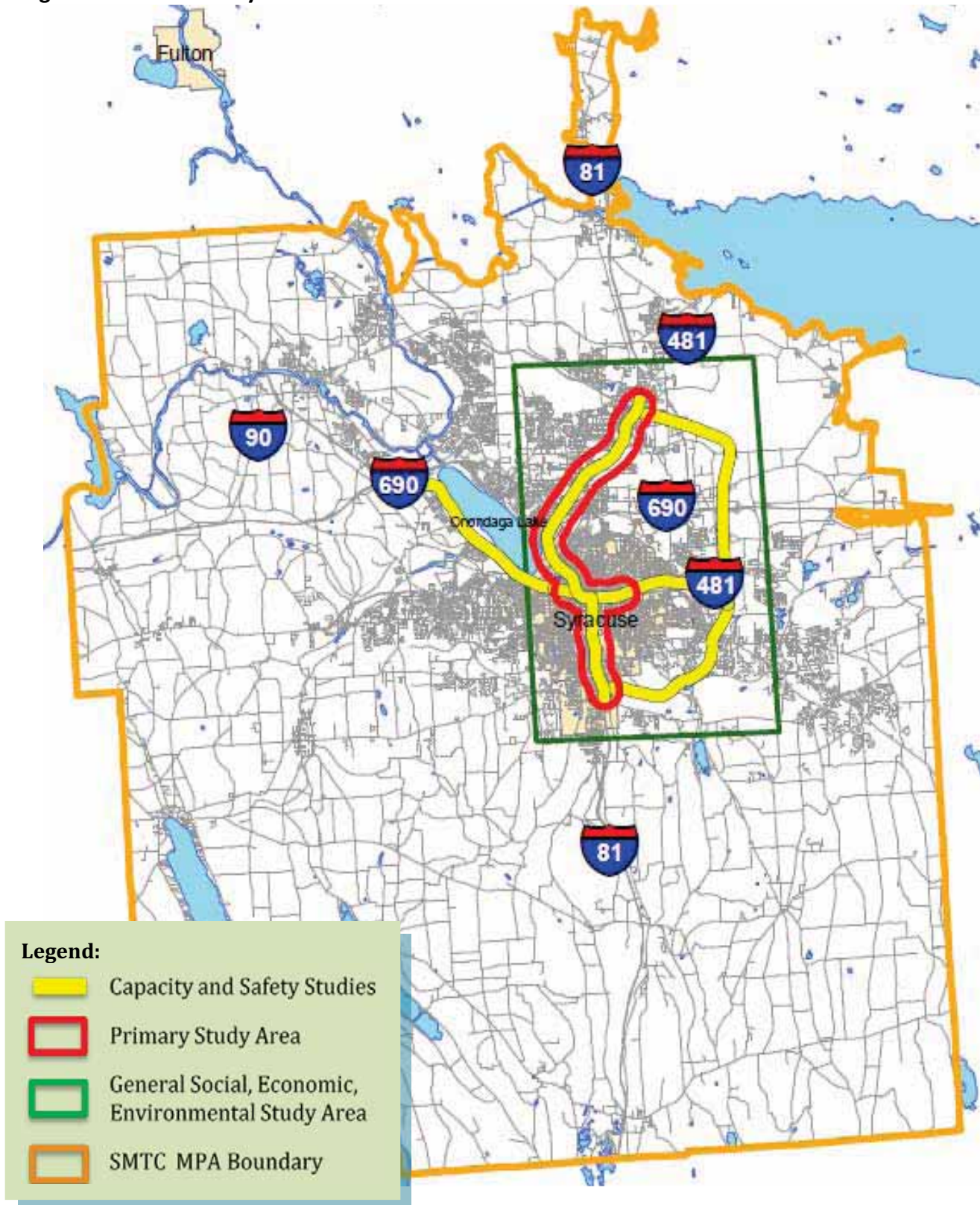
1.4 Study Area

The I-81 Challenge study area is comprised of a primary study area along I-81 as indicated in Figure 1 and an overall study area which expands to cover the SMTC Metropolitan Planning Area which includes all of Onondaga County and small portions of Madison and Oswego Counties. Also shown is the general study limits for the social economic and environmental features along with the limits of a general review of the adjoining Interstate System for capacity and safety. Resource data collection has been focused around the expressway facilities and areas of potential impact. These areas will be adjusted as necessary as study strategies are developed.

The following summarizes the overlapping study areas of the project and explains why the boundaries have been established.

- **Primary Study Area:** This study area is focused on I-81 from I-481 on the south to I-481 on the north along with the segment of I-690 from the West Street interchange to the Teall Avenue Interchange west and east of I-81, respectively. A detailed technical analysis of this segment has been performed and summarized herein. This considers infrastructure condition, capacity and safety along I-81.
- **Capacity and Safety Study Limit:** In order to be able to consider possible alterations to the I-81 Corridor in context of the Onondaga County interstate highway system a network of freeways was included in the study for their safety and capacity operations. These are indicated in yellow on the map and include I-81, I-481 around the east side of the county, I-690 (thruway to I-481) and the Thruway Exits 39, 36 and 34A.
- **General Social, Economic and Environmental Features Study Limit:** This initial documentation of the social, economic and environmental features was concentrated along the I-81 corridor and the adjoining municipalities, most prominently the City of Syracuse, the I-481 limits and then the adjoining towns on the north side of the corridor of Salina, Clay

Figure 1 – Overall Study Area



and Cicero. These limits vary somewhat by subject matter and available data and are so noted.

- **Syracuse Metropolitan Transportation Council Metropolitan Planning Area Boundary:** The boundary encompasses Onondaga County and portions of Oswego and Madison Counties. This area covers the limits of the public outreach efforts for this study and also provides the limits of the data used within the SMTC’s Regional Travel Demand Model. The Regional Travel Demand Model is based on household and employment data within this area and will be used in this study in developing future travel demand.

Figure 2 shows a closer look at the General Social, Economic and Environmental study area.

Figure 3 shows a close up of the City of Syracuse and Viaduct Area.

1.5 Corridor Deficiencies and Needs

This section presents the “Deficiencies and Needs” identified for the corridor in Technical Memorandum #1 – Physical Conditions Analysis. The needs and deficiencies are focused on I-81, the Primary Study Area, the condition of the infrastructure, the operations of the highway and its ability to serve both local and regional/interstate traffic. There are also social, economic and environmental issues that will need to be factored into future improvement strategies for I-81 in this corridor study. The data collection effort on social, economic and environmental conditions is important herein as a series of constraints and issues. The report also factors in initial public input that has identified draft community principles and draft comments on impact areas (or categories) to be considered. The needs and deficiencies address both the I-81 corridor’s physical condition; the communities initial input and the social, economic and environmental conditions of the project setting.

Safety: For most of the I-81 corridor area, accident rates are above the state-wide average for similar interstate systems. Accident rates through the I-690 interchange are four to five times the statewide average; and, the accident rate on the Viaduct portion of I-81 in the northbound direction is more than triple the statewide average. The non-standard design features in this area are contributing to above average accident rates.

Capacity: The overall expressway system is operating at acceptable levels of service (LOS) A, B or C with exception of the I-81/I-690 interchange and their approaches to the City. The I-81 mainline segments of the system from approximately Hiawatha Boulevard south to Harrison Street ramps and along I-690 from the State Fairgrounds east to Midler Avenue interchange are approaching capacity (level of service D or E) during the commuter peak periods. The interchanges of I-81/I-690 and the I-81 interchange with Harrison Street/Almond Street/East Adams Street is also operating at or near failing conditions (level of service D, E or F). Definition of levels of service is provided in section 2.8 Congestion – Level of Service and Mobility.

Figure 2 - General Social, Economic and Environmental Study Area

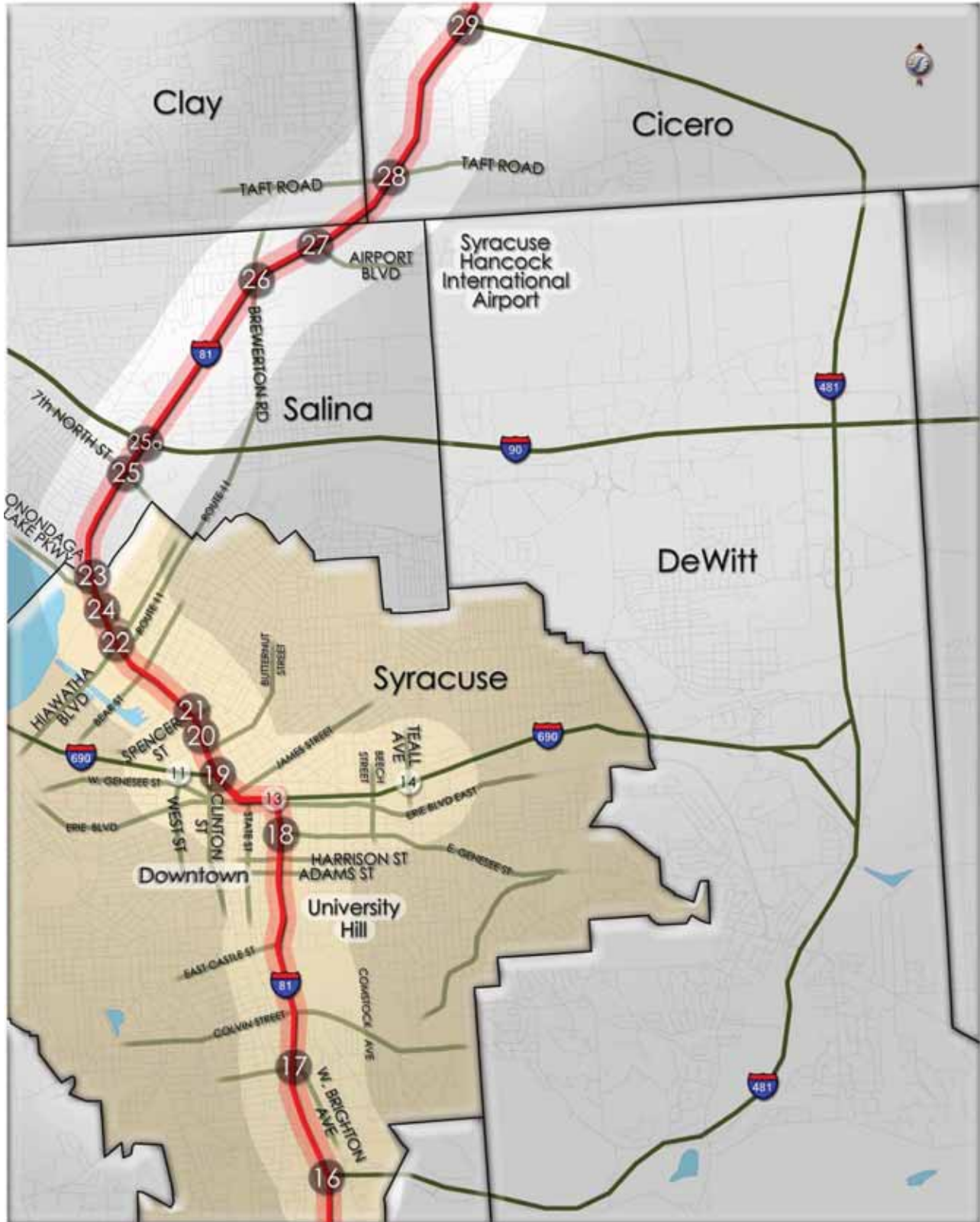


Figure 3 - City of Syracuse and Viaduct Area



Highway Design: When I-81 was constructed in the 1950s and 1960s, highway design standards were different from today. The primary study corridor geometrics represent areas where significant deficiencies are evident between past and present design standards. Non standard design features are particularly prevalent in and around or adjacent to the I-81/I-690 interchange that include mainline geometry, ramp design and spacing, interchange spacing and road widths (shoulders and medians). This includes I-81 from Hiawatha Boulevard down to the Harrison Street ramps and I-690 in the area between and including I-81 and the West Street interchange.

Operational Issues: The narrow shoulder width and high traffic volumes on the urban sections of I-81 pose significant operational challenges. It is difficult to conduct routine maintenance and when accidents occur, the limited shoulder width creates backups and hazards for traffic. These tight curves and narrow shoulders, on the Viaduct and the adjoining I-81/I-690 Interchange are also very difficult for emergency responders.

Structural Issues: There are 76 bridges in the primary study corridor, bounded by the I-81/I-481 Interchanges to the north and south. The majority of the bridges were built in the mid to late 1960's and of the 76 bridges, 7 are classified as "Structurally Deficient" and 47 are "Functionally Obsolete". Assuming only routine maintenance, such as bridge washing and maintenance painting of steel is performed in the future, the bridge conditions will continue to deteriorate until bridges need to be posted for reduced loads, and eventually closed. Based on the age of the bridges, by the year 2050 (ETC+30), over 80% of the bridges in the study corridor will have met or exceeded their expected service life. The definition of Structurally Deficient and Functionally Obsolete is provided in section 2.4 Highway and Bridge Infrastructure Conditions.

Community Resources: A considerable amount of community resources are located along, adjacent or directly next to the I-81 Primary Study Area. These include neighborhoods, historic resources, archeological resources; national, state and local heritage areas; medical facilities and major employers and businesses. Based on the initial public outreach efforts a series of community principles were developed and used to identify possible community impact areas including economic development, public safety, convenience of travel, regional land use patterns, resources, community character and quality /fairness of decisions. Consideration of these principles and potential impact areas is a need for the project as future strategies for I-81 are developed within *The I-81 Challenge*.

Environmental Resources: A considerable amount of environmental resources are located along, adjacent or directly next to the I-81 Primary Study Corridor. These include water resources (wetlands, water courses, floodplains and aquifers), general ecology, farmland, contaminated materials, air quality and highway noise. Based on the initial public outreach efforts several possible environmental impact areas have been identified including air quality, stormwater and water quality, noise and vehicle miles traveled. Consideration of these resources and potential impact areas is a need for the project as future strategies for I-81 are developed within *The I-81 Challenge*.

1.6 Project Partners

The New York State Department of Transportation (NYSDOT), the Federal Highway Administration (FHWA) and the Syracuse Metropolitan Transportation Council (SMTC) are partners in this project. *The I-81 Challenge* team has been designed to integrate three parallel efforts within the I-81 Corridor Study umbrella. These efforts include: the I-81 Corridor Study, the I-81 Public Participation Program, and the Regional Travel Demand Model Update. The I-81 Corridor Study, also referred to as *The I-81 Challenge*, is being led by the NYSDOT and represents the official planning document. The SMTC's Public Involvement Program (PIP) will run in parallel with the Corridor Study development and plan, facilitate and document the Public Involvement Program activities as the study progresses.

The Regional Travel Demand Model update has been integrated with the I-81 Corridor Study data collection, and an update of household and employment data. The Regional Travel Demand Model will be used as the basis for future travel demand (2035) and study of development strategies (alternatives) and their travel demand changes.

These agencies and the public are working together to determine the future of I-81 in the greater Syracuse region:

- As the highway's owner, NYSDOT is leading the study effort and will make the final decision about any improvements made to I-81. NYSDOT has assembled a comprehensive study team that has reviewed and documented the existing infrastructure conditions of I-81 and also researched the Social, Economic and Environmental setting. The study team will be developing, in cooperation with pertinent local, state and federal agencies and the public, strategies for improvements to the I-81 corridor as the study progresses into the strategy development phase.
- SMTC, the state-designated metropolitan planning organization (MPO), is leading the public participation efforts as well as the update of the Regional Travel Demand Model for the study. SMTC will also make decisions on the use of Federal transportation funds for any I-81 related strategies.
- Federal Highway Administration (FHWA): Federally funded transportation projects on the National Highway System, the responsibility for ensuring the NYSDOT complies with NEPA and federally adopted design guidance rests with the FHWA.

1.7 Public Involvement Plan

At the request of the NYSDOT, the SMTC is assisting with the public involvement program for *The I-81 Challenge*. Together, the SMTC and the NYSDOT plan to engage a broad cross-section of community members in developing and evaluating strategies for the future of I-81.

Both technical input and public input will be used to generate initial ideas for the I-81 corridor, develop evaluation criteria for future strategies, and narrow down the broad range of

strategies. After a series of development strategy review and refinement programs with the stakeholders, a small viable set of strategies will be advanced to the project development, design, and environmental review phase. The following graphic illustrates the overall process for *The I-81 Challenge*.

Over the course of *The I-81 Challenge*, the NYSDOT and the SMTC will use a variety of methods to raise public awareness about the project and gather public input. Outreach conducted under the I-81 Public Participation Project at the time that this Summary Report was written includes:

- An initial series of 20 focus groups with over 150 participants in September and October of 2009.
- A questionnaire about how people currently use I-81 and their concerns about the future of I-81 (approximately 80 participants).
- Three additional focus groups in February 2010 and June 2010 (approximately 30 participants).
- Numerous small-group meetings with existing community organizations to introduce *The I-81 Challenge*.

Through the focus groups, an initial and important list of emerging community principles and community impact areas surfaced, and provided in Appendix A of the TM #1. These emerging community impact areas describe types of impacts that focus group participants suggested should be used to evaluate possible strategies. The I-81 Challenge expects that as this preliminary list evolves, both impact areas and specific, measurable criteria will be vetted with a wider public audience. Initial emerging community principles and community impact areas are shown in Table 1.

Table 1: Draft Community Principles and Impact Areas for Evaluating Strategies

DRAFT PRINCIPLE	ENHANCE ECONOMIC OPPORTUNITY
Community Impact Area	Economic Development Impacts
Draft Specific Impacts To Be Evaluated	Economic conditions in downtown area/University Hill
	Economic conditions along I-81 corridor
	Economic conditions in the Central New York region
	Freight and through traffic mobility
	Employment and job creation
Community Impact Area	Financial Impacts
Draft Specific Impacts To Be Evaluated	Capital costs, affordability, fiscal responsibility
	Long-term operation and maintenance costs
DRAFT PRINCIPLE	ENHANCE PUBLIC SAFETY
Community Impact Area	Public Safety Impacts
Draft Specific Impacts To Be Evaluated	Highway safety (on I-81 and other regional highways)
	Safety of alternative modes of transportation (pedestrian, bicycle, transit)
	Access to emergency services such as: hospitals, service providers, public
	Ability to provide emergency services

DRAFT PRINCIPLE	ENSURE REGION-WIDE MOBILITY
Community Impact Area	Transportation Network/Ease and Convenience of Travel Impacts
Draft Specific Impacts To Be Evaluated	Travel times (to/from suburbs and within/across city)
	Access to key destinations (airport, hospitals, downtown businesses)
	Visitor access to the city and key visitor destinations
	Volumes and congestion on highway system, secondary roads, city streets
	Alternative transportation (bike, pedestrian, transit)
	Through and local traffic

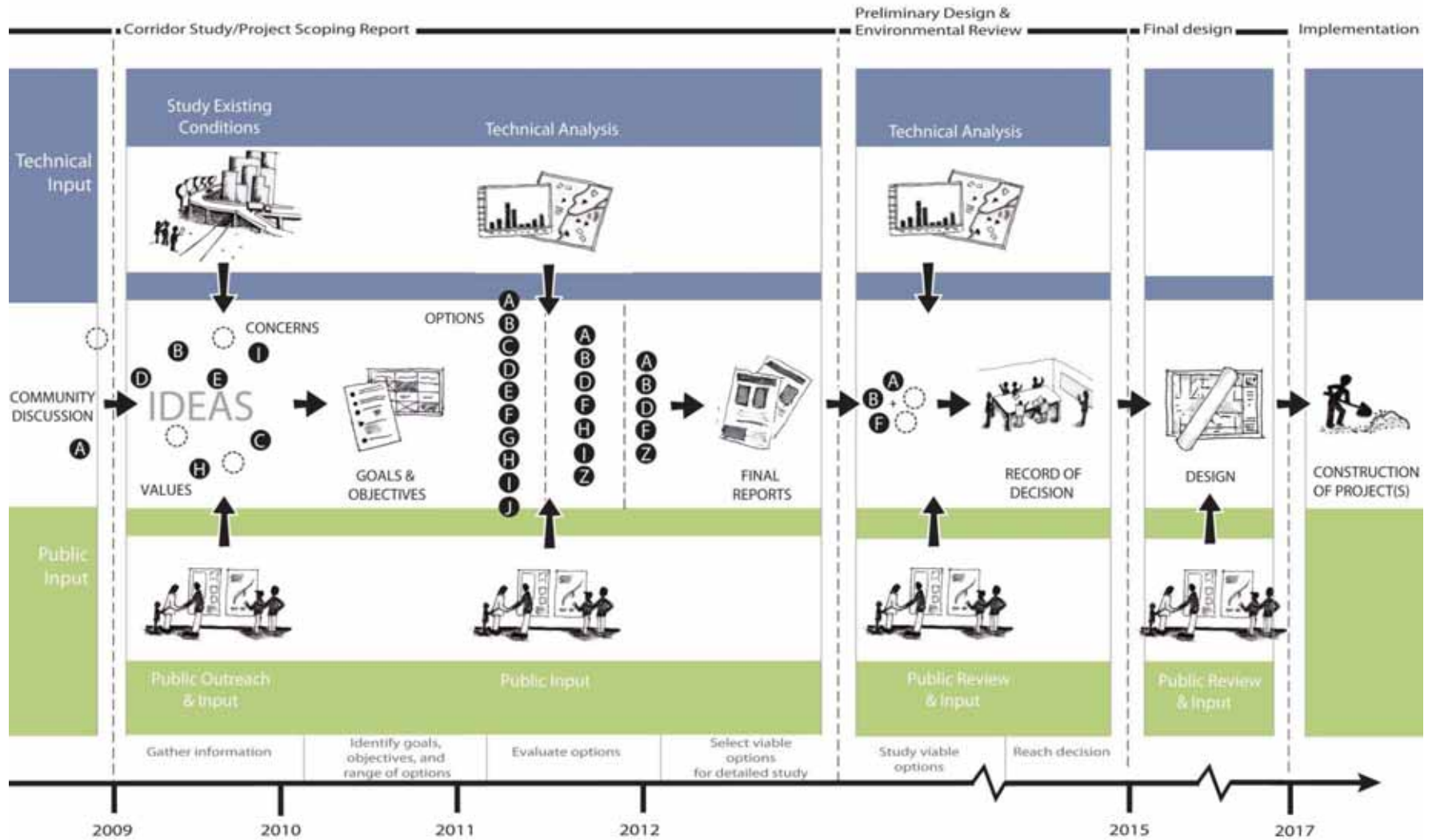
DRAFT PRINCIPLE	FIT WITHIN A REGIONAL VISION FOR LAND USE AND ECONOMIC DEVELOPMENT
Community Impact Area	Regional Land Use Patterns Impacts
Draft Specific Impacts To Be Evaluated	Local connectivity (linking University Hill with downtown)
	Land use and development within the city (open space, housing, business development)
	Land use and development in suburban areas
	Land use and development in currently undeveloped, rural areas

DRAFT PRINCIPLE	PRESERVE OR ENHANCE ENVIRONMENTAL HEALTH
Community Impact Area	Environmental Sustainability Impacts
Draft Specific Impacts To Be Evaluated	Air quality (overall emissions and odor)
	Stormwater and water quality
	Noise
	Vehicle miles traveled
Community Impact Area	Environmental Health Impacts
Draft Specific Impacts To Be Evaluated	Air quality and noise on adjacent neighbors (downtown and suburbs)

DRAFT PRINCIPLE	PRESERVE OR ENHANCE SOCIAL FABRIC AND COMMUNITY VITALITY
Community Impact Area	Social Fabric and Community Character Impacts
Draft Specific Impacts To Be Evaluated	Adjacent communities and neighborhoods
	Important community landmarks, historic resources, and icons
	Aesthetics
	Community vitality (downtown, adjacent neighborhoods, and the region)
	Community pride

DRAFT PRINCIPLE	SHARE BURDEN AND BENEFITS
Community Impact Area	Quality of Decision Impacts
Draft Specific Impacts To Be Evaluated	Distribution of the burden of impacts across stakeholders (suburbs, adjacent neighborhoods, low income communities, Onondaga Nation): During construction and Long-term
	Distribution of benefits across stakeholders (suburbs, adjacent neighborhoods, low income communities, Onondaga Nation)
	Other planning and development initiatives and visions (county, city, region)
	Social fabric and community character

The I-81 Challenge



* Note that these represent target dates only.

The SMTC has also published a variety of outreach materials and reports during the initial focus group meetings including:

- *The I-81 Challenge*: A brief transportation overview (six-page “fact sheet” providing an overview of the process and current conditions)
- Frequently Asked Questions
- *The I-81 Challenge* Focus Groups Summary Final Report
- Case Studies of Urban Freeways for *The I-81 Challenge*

The SMTC maintains a project website (www.theI81challenge.org) and a project-specific e-mail address (contactus@theI81challenge.org). The documents listed above can be downloaded from the project website.

As *The I-81 Challenge* progresses, the SMTC and NYSDOT will continue to engage the public through a variety of means. Additional questionnaires will be published and, in a later stage of the project, a statistically valid survey will be conducted. Newsletters, mobile displays, and website updates will be used to communicate with the public. The SMTC intends to produce an “educational series” of self-running DVDs concerning topics such as the history of I-81, the case studies, and regional land use and transportation planning issues.

Numerous large public meetings will be held at different stages in the project. An initial round of public workshops will be held once Technical Memorandum #1 – Physical Conditions Analysis is finalized. This initial round of workshops will be used to introduce the project to a large audience, present the physical conditions analysis, finalize evaluation criteria, and begin the public discussion about very broad, preliminary strategies for I-81. A second round of workshops will be held to narrow down the wide range of community ideas to approximately ten strategies that can be modeled and evaluated. These 10 strategies will then be further refined to the point where a handful of feasible strategies are identified. Three rounds of public “open houses” will be held throughout the strategy development phase to review the results of the analysis, gather public feedback, and refine them.

A Study Advisory Committee (SAC), consisting primarily of SMTC member agencies, has been formed to provide input and guidance throughout *The I-81 Challenge*. The SAC includes representation from:

- CenterState CEO
- Central New York Regional Planning and Development Board
- Central New York Regional Transportation Authority (Centro)
- City of Syracuse Common Council
- City of Syracuse Department of Engineering
- City of Syracuse Department of Public Works
- City of Syracuse Department of Neighborhood and Business Development
- City of Syracuse Department of Planning and Sustainability
- Empire State Development
- Federal Highway Administration
- New York State Department of Environmental Conservation

- New York State Department of Transportation
- New York State Thruway Authority
- Onondaga County Department of Transportation
- Onondaga County Legislature
- Onondaga County Physical Services
- Onondaga Nation
- Syracuse-Onondaga County Planning Agency

As the study progresses, two additional committees will be formed: a Community Liaison Committee (CLC) and a Municipal Liaison Committee (MLC). The CLC will be comprised of individuals representing community organizations and the MLC will be comprised of representatives of municipalities within the SMTC planning area (likely town supervisors and village mayors). Both committees will provide input on major study outcomes and serve as a conduit between the study and their constituents. The CLC and MLC are scheduled to meet three times over the course of the project, during major public outreach efforts.

1.8 Project Schedule

The following illustrates the planned schedule for the I-81 Corridor Study and the following Project Scoping Report for the I-81 Viaduct Area and identifies the following phases of the NYSDOT Project Development Process:

- I-81 Challenge Corridor Study: Fall 2009 to January 2012
- Project Scoping Report – I-81 Viaduct Area: January 2012 to August 2012
- (Future) Preliminary Engineering and Environmental Impact Statement: August 2012 to 2015/16 (estimated)
- (Future) Final Design: 2015/16 to 2017/18 (estimated)
- (Future) Construction: 2018 to 2020/2021 (estimated)

1.9 Next Steps

Over the next several months, SMTC and NYSDOT will be conducting public outreach meetings in study area communities to obtain input on project objectives and evaluation criteria along with obtaining the initial ideas, concepts and concerns for initiating the development of improvement strategies for the I-81 Corridor.

The NYSDOT study team will then be focusing on developing improvement strategies for the I-81 Corridor after receiving broad based input from the public and agencies as noted above. Input received from the public during outreach sessions will be integrated as strategies are developed. The NYSDOT study team will also be evaluating each strategy to determine the effects each would have on traffic, land use and neighborhoods, and environmental resources located within the study corridor.

To keep informed about the study, updated project information can be found on the project's web site www.thei81challenge.org.

2.0 TRANSPORTATION SYSTEM

This section includes a summary of current conditions for major components of the transportation system in the I-81 primary study area. It focuses on traffic, safety and the physical conditions of Interstate 81. This evaluation of the transportation system elements provides a baseline from which improvement strategies can be generated in the strategy development phase of *The I-81 Challenge*.

2.1 Who Owns the Roads?

The NYSDOT owns the highways evaluated and numerous arterials in the city and county. It has full responsibility for I-81, I-690 and I-481, including maintenance (except for highway lighting). NYSDOT also has ownership and responsibility for the highway ramp, ramp junctions and some of the traffic signals at these junctions. This is where the off- and on-ramps meet the local streets.

The New York State Thruway Authority owns and maintains I-90 as it traverses the area with major interchanges at I-81, I-481 and I-690. The City of Syracuse owns and maintains the local streets within the City limits. Local streets in the primary study area outside of the City of Syracuse are owned and maintained either by the municipalities where they are located or by Onondaga County.

2.2 Functional Classification and Design Speed of Roadways

In the United States, all roads are classified in groups based on intended use according to a standardized system. This functional classification system guides how roads should be designed; how many lanes, how much traffic they can be expected to carry, how far apart intersections with signals should be, and so forth.

This corridor study is focused on the Interstate Highway System in the Syracuse metropolitan area. The general function of the Interstate Highway System is to provide long range traffic service to both interstate and intrastate highways. Listed below are the interstates under study:

Interstates

- I-81 (Expressway)
- I-690 (Expressway)
- I-90 (Thruway) – Interchanges 39 (I-690), 36 (I-81) and 34A (I-481)
- I-481 (Expressway)

Design speeds are used for design of a new freeway structure, if that is the preferred option, and for determination of existing non-standard features. Design speed for a road is the maximum safe speed that can be maintained over a specified section of road. Factors involved

include its functional classification, its design, its operation, the actual operating speeds, the maximum speed limit allowed by law, and the traffic volumes. The posted speed limit is generally less than the design speed.

The following design speeds have been set for the primary study area Interstate highways for analysis of existing highway features and future development of study strategies as follows:

- I-81: 70 mph for areas currently posted at 65
- I-81: 60 mph for the areas currently posted for 55 mph or less
- I-690: 60 mph for the areas currently posted between 55 mph or less

This analysis compares what is there now to what the design features should be today, to present NYSDOT and American Association of State Highway and Transportation Officials (AASHTO) guidelines and standards. For example, if a mainline curve on I-81 is too “sharp” (turns too quickly) per the design standard then it has been identified and also reviewed in combination with accidents and capacity. I-81 has several mainline curves through the primary study area in particular at the I-690 interchange where the posted speed limit is reduced to 45 mph due to the “sharp” mainline curves.

2.3 Highway Features - Critical Design Elements

This section reviews the findings from Technical Memorandum #1 – Physical Conditions Analysis regarding the design and function of the roadways in the primary study area. The focus of the evaluation was on how the roads as they exist today conform to current standards in terms of safety, capacity and operations. There are two categories used for comparing how they conform to the NYSDOT standards.

- Non Standard Design Features: Primary roadway design elements that do not meet the accepted national engineering standards for design.
- Non Conforming Design Features: other design elements which have an influence on the existing system operations.

This section compares the primary design features of the highways in the primary study area with the minimum standards for roadway design and illustrates existing problem areas.

Areas with the most important non-standard design elements are summarized on Figure 4 – Non-Standard and Non-Conforming Design Features. The critical design standards considered were those for:

- Non-Standard Design Features
 - Horizontal Curve Radius
 - Grades (steepness)

- Sight-distance - ability of a driver to see far enough down the road for the conditions
- Super-elevation – roadway banking around curves
- Lane widths
- Shoulder Widths
- Median Width

Non-Conforming Design Features

- Ramp spacing
- Ramp Length
- Interchange spacing





The following summarizes key findings of this evaluation by location along the primary study corridor for the Non-Standard Design Features:

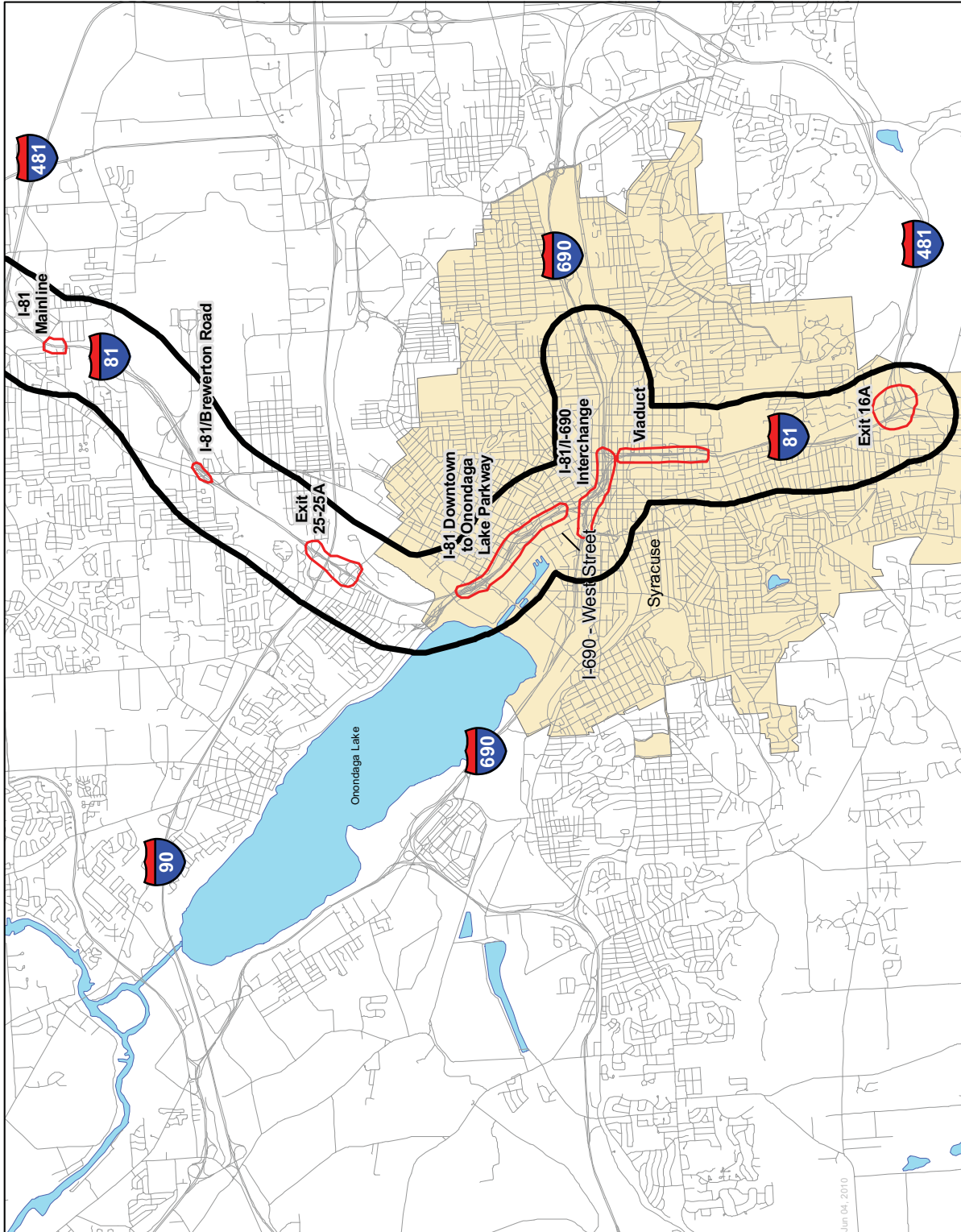
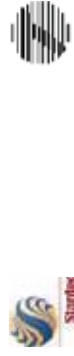
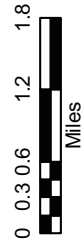
- **I-81 / I-481 South Interchange Area – Exit 16A:** two areas of non-standard curves, several areas with non-standard grades and super elevations, and poor sight distance.
- **I-81 Viaduct Area:** there are significant issues with non-standard shoulder and median widths here (not enough shoulder area or space in the middle of the roadway between opposing lanes). There is also one tight curve on the mainline highway. The sight distance on the highway going over the railroad and the ramp sight distance at Exit 18 are also non-standard.
- **I-81 / I-690 Interchange:** there are significant issues with non-standard shoulder and median widths here (not enough shoulder area or space in the middle of the roadway between opposing lanes). There are also issues with mainline horizontal curvature, sight distance, grades, ramp spacing and layouts, and inadequate super elevation.
- **I-81 Downtown to Onondaga Lake Parkway – Exit 23:** there are primarily super elevation issues here. There is also one mainline highway non-standard curve and ramp sight distance issues.
- **I-81 Exits 25 and 25A:** super elevation and ramp sight distance issues.
- **I-81 / Brewerton Road – Exit 26:** one main highway non-standard curve and super elevation and sight distance issues.
- **I-81 Mainline:** one main highway non-standard curve along with sight distance and super elevations issues just south of the I-481 Interchange (north).
- **I-690 / West Street:** issues for curves on-ramps along with nonstandard median width, sight distances, and super elevations.

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Figure 4 - Key Areas of Non-Standard or Non-Conforming Design Features

Legend

-  Primary Study Area
-  Waterways
-  City
-  Key Areas of Non-Standard or Non-Conforming Design Features



Non-Conforming design elements applicable to the primary study area relate to interchange and ramp operations in the areas noted below.

I-81 / I-690 Interchange Area: a majority of the ramp spacing and length issues on the highway are located in this area, including:

- Adams Street (Exit 18) on and off ramp just south of the interchange
- Exits 19 and 20 (Butternut Street, Salina Street, Clinton Street and Pearls Street) immediately north of the interchange
- the I-690 West Street Interchange (Exit 11) on the west
- I-690 Exit 13 (McBride / Townsend) on the east.

Overall there are significant sections where ramp spacing is below guidelines and there are acceleration and/or deceleration length issues for ramps. The interchange area also has two left-hand entrance ramps which are highly undesirable. These occur at I-81 North to I-690 West and I-81 South to I-690 East.

Other areas with non-conforming ramps include:

- Exit 22 – ramp lengths
- Exit 23 to 22 - southbound ramp spacing
- Exit 25/25A - ramp lengths
- Exit 27 - on-ramp length
- Exit 28 - on-ramp length
- Exit 29 - on-ramp length
- Exit 14 (I-690) - ramp lengths

There are 18 interchanges in the primary study area. Of these, four are what is classified as a system interchange. A system interchange is considered to be a major juncture of two freeways where the traffic flows freely between them. The four system interchanges are: I-81/I-481 South, I-81/I-690, I-81/I-90 and I-81/I-481 North. These are all of special importance as “system” junction points. The remaining 14 interchanges are “service” interchanges where the interstate highway intersects with local arterials.

- Two of the system interchanges (I-81/I-481 South and I-81/I-690) have local service interchanges essentially embedded within the overall system interchange.
- I-81/I-690 is particularly complicated with the closely spaced interchanges on each leg.
- The I-81/I-690 system interchange is also not a fully directional layout. The southbound I-81 to westbound I-690 and vice versa connections are missing. Drivers are diverted to Bear Street.
- Interchange spacing for the primary corridor (I-81) is less than the recommended AASHTO guideline of one mile for almost all the interchanges. This issue is most prevalent in the downtown area.

Summary - Highway Design Features

The non-standard features combined with the non-conforming features need to be reviewed holistically with the other transportation conditions, deficiencies and engineering considerations in the TM#1 report. In particular this includes Level of Service and Mobility and Safety Consideration, Accident History and Analysis. As would be expected the areas of poor Level of Service and high accident rates coincides with the areas of geometric deficiencies which is concentrated in the general vicinity of the I-81/I-690 Interchange and the adjacent service interchanges of Exit 18, 19, 20 and 21 on I-81 and Exits 11 and 13 on I-690. These interchanges are all closely spaced and have a complex and unique layout for downtown ingress and egress. The basic I-81/I-690 Interchange layout has significant geometric deviations from its original layout in the 1960's. This is evidenced by the posted speed reductions on I-81 to 45mph and is also reflective of the physical constraints present when the roadway was first constructed.

2.4 Highway and Bridge Infrastructure Conditions

The physical condition of each highway section in the study area was determined by looking at pavement and bridge conditions.

Pavement Conditions

Pavement conditions are determined through the use of the NYSDOT surface rating survey. The pavement conditions of I-81, I-690 and I-481 were rated by NYSDOT in 2008. Pavements are rated on a scale of 1 to 10, with 10 being the best. A rating of 7 and 8 is considered good. The majority of the study area expressway surface condition is rated as "Good". Given the age of the roadway infrastructure, however, the majority of the highway will need either a major rehabilitation or reconstruction by the design year 2040. NYSDOT will continue to schedule and implement capital projects for pavement maintenance and rehabilitation along I-81 as it is the most important transportation facility in the Syracuse region.

Bridge Conditions

There are 76 bridges located in the primary study corridor. 47 bridges are along the I-81 corridor and 29 bridges are along the I-690 corridor. Bridge conditions are determined by periodic inspections conducted by NYSDOT. They are given an NYSDOT Condition Rating on a scale of 1-7, where "1" is the worst and "7" is the best. They are also labeled in terms of how deteriorated they are or how well they still carry traffic.




Figure 5 shows a regional view of the "Structurally Deficient" and "Functionally Obsolete" bridges in the study area, as defined by FHWA. Figure 6 shows a close-up of the "Structurally Deficient" and "Functionally Obsolete" bridges in the Viaduct area. It should be noted that these bridges are safe to drive on and that these classifications of bridges are used to prioritize repairs. For the Interstate related bridges, in particular, the NYSDOT has a long term commitment of funding for maintaining them in good repair.

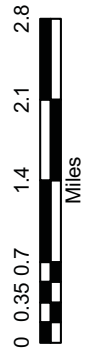
Interstate 81 Corridor Assessment Figure 5 - Structurally Deficient and Functionally Obsolete Bridges - Regional View

Legend

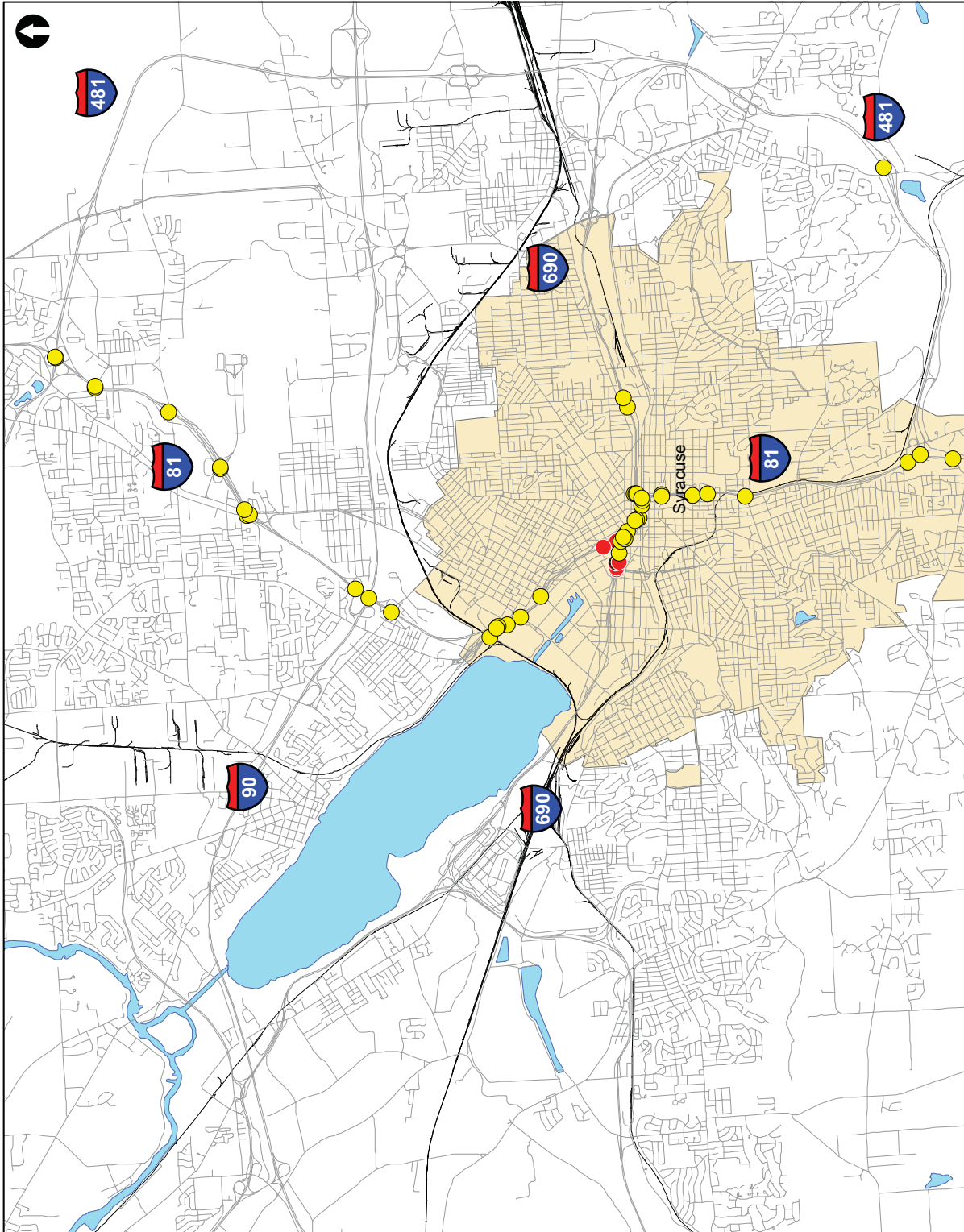
Bridge Conditions

- FHWA Functionally Obsolete (46)
- FHWA Structurally Deficient (7)

-  Railroad
-  Waterways
-  City



Original in Color Shading



June 04, 2010

Figure 6 – Structurally Deficient and Functionally Obsolete Bridges in the Viaduct area



The FHWA definition of a “Structurally Deficient” bridge is a bridge with a National Bridge Inventory (NBI) condition rating of 4 or less for the deck, superstructure or substructure; or an appraisal rating of 2 or less for structural condition or waterway adequacy. This means the bridge is seriously to totally deteriorated, or not able to convey the waterway passing below the bridge. By contrast, NYSDOT defines a “Deficient” bridge as a bridge with an NYSDOT Condition Rating less than 5. Visible examples of these types of bridges include pier and wall deterioration as seen in the examples below. Absent of maintenance and repairs, these bridges will eventually be posted or closed depending on severity of the condition.

Example Structurally Deficient Bridges



Pier and wall deterioration examples

A “Functionally Obsolete” Bridge, as defined by FHWA, is a bridge with an appraisal rating of 3 or less for the deck geometry, under clearance below the bridge, approach roadway alignment, structural condition, or waterway adequacy. Functionally Obsolete is a measure of the bridge geometry and its ability to safely convey traffic on the bridge or below the bridge, or its ability to pass water below the bridge without flooding in the case of a waterway crossing. For example, a bridge may be functionally obsolete if it has narrow lanes, no shoulders, or low clearances (see examples below). These bridges may not need any maintenance or repair, but may be posted for restriction or safety warnings. By FHWA policy, bridges that are both Structurally Deficient and Functionally Obsolete are categorized as only Structurally Deficient.

Example Functionally Obsolete Bridges



Vertical Clearance Posting and Narrow Shoulder examples

A summary of the conditions of the significant bridges (bridges exceeding 1000 ft. in length), or bridges deemed “Structurally Deficient” or “Functionally Obsolete” by FHWA standards, are shown in Table 2 – Bridge Condition Summary.

The need to repair, replace and/or modernize these bridges is one of the primary needs of this project.

Table 2 - Bridge Condition Summary – Significant Bridges

BIN	Bridge	Length (ft.)	NYSDOT Rating	FHWA	
				Structurally Deficient	Functionally Obsolete
I-81 Corridor Bridges					
1008489	I-81 NB & SB over North Salina Street	163	5.111	✓	
1008530	Ramp from I-81 SB to Route 11 over Route 11	950	4.906		✓
1031569	I-81 over East Adams Street (Viaduct)	4097	4.597		✓
1031671	I-81 SB over Route 11	1780	3.794	✓	
1031672	I-81 NB over Route 11	1780	4.972		✓
1053840	I-81 NB over Erie Boulevard (I-81/I-690 Interchange)	1169	4.472		✓
1053860	I-81 SB over North Townsend Street (I-81/I-690 Interchange)	1425	4.875		✓
1064590	I-81 NB over East Fayette Street (I-81/I-690 Interchange)	1723	5.083		✓
1071341	I-81 SB over Park Street, Bear Trap Creek and CSX Railroad	1928	5.451		✓
1071342	I-81 NB over Park Street, Bear Trap Creek and CSX Railroad	2176	5.521		✓
I-690 Corridor Bridges					
1050780	Ramp from West Street to I-690 WB over I-690	269	4.234	✓	
1050790	Ramp from I-690 WB to West Street over I-690	360	4.031	✓	
1050800	Ramp from N. Franklin Street to West Street over Onondaga Creek	200	4.208	✓	
1050840	Ramp from West Street to I-690 EB over Onondaga Creek	172	4.313	✓	
105080A	Ramp From I-690 WB to West Street over Onondaga Creek	116	4.875	✓	
1051000	I-690 over I-81 (I-81/I-690 Interchange)	3147	4.817		✓
10511139	I-690 over Beech Street	1522	4.406		

All the bridges in the primary study corridor are expected to deteriorate over time with no major reconstruction. This includes over 11,000 feet of bridges when you include the Viaduct

and major bridges in the I-81/I-690 Interchange. The NYSDOT also has a Capital Improvement Plan that is or will be addressing many of these structurally deficient bridges noted in Table 2. These include Butternut Street over I-81, I-690 over Beech Street and several of the bridges in the I-690/West Street interchange. If the bridges in the corridor only get routine maintenance, such as bridge washing and maintenance painting, they can be expected to decline or decay potentially to the point of closure. However, as noted previously, the NYSDOT has an interim program to keep them safe and useable until long term solutions are developed.

Summary – Highway and Bridge Infrastructure Conditions

Highway pavement conditions of I-81, I-690 and I-481, as rated by NYSDOT in 2008, are rated as “Good” for the majority of the study area expressway surface conditions. Given the age of the roadway infrastructure the majority of the highway will need either major rehabilitation or reconstruction for the design year 2040.

Assuming only routine maintenance, such as bridge washing, maintenance painting of steel and spot repairs is performed in the future, the bridge conditions would continue to deteriorate until bridges need to be posted for reduced loads, and eventually closed. However, the NYSDOT has an interim program to keep them safe and usable until long term solutions are developed. Using the NYSDOT 2008 Bridge Needs Assessment Model predictions, most deficient bridges in the corridor will be in a state of serious deterioration by 2020 (ETC); and by year 2050 (ETC+30), these same bridges will be in a state of total to very serious deterioration. Based on the age of the bridges, by year 2050 over 80% of the bridges in the study corridor will have met or exceeded their expected service life. This reinforces the importance of developing a long term plan for I-81 so these important components of the transportation system can be remodeled.

2.5 Parking

This information included herein on parking is reference data for use in developing and evaluating future development strategies in subsequent phases of *The I-81 Challenge*. Parking on the Interstate highway system (I-81, I-690) is restricted by law. There are areas regulated by parking restrictions within the City of Syracuse along the local roadway system in the project limits.

To determine the relationship between expressway interchanges and available parking in and around the Syracuse Downtown and the University Hill area, information on parking was gathered from various sources, mapped in GIS and summarized. These sources included:

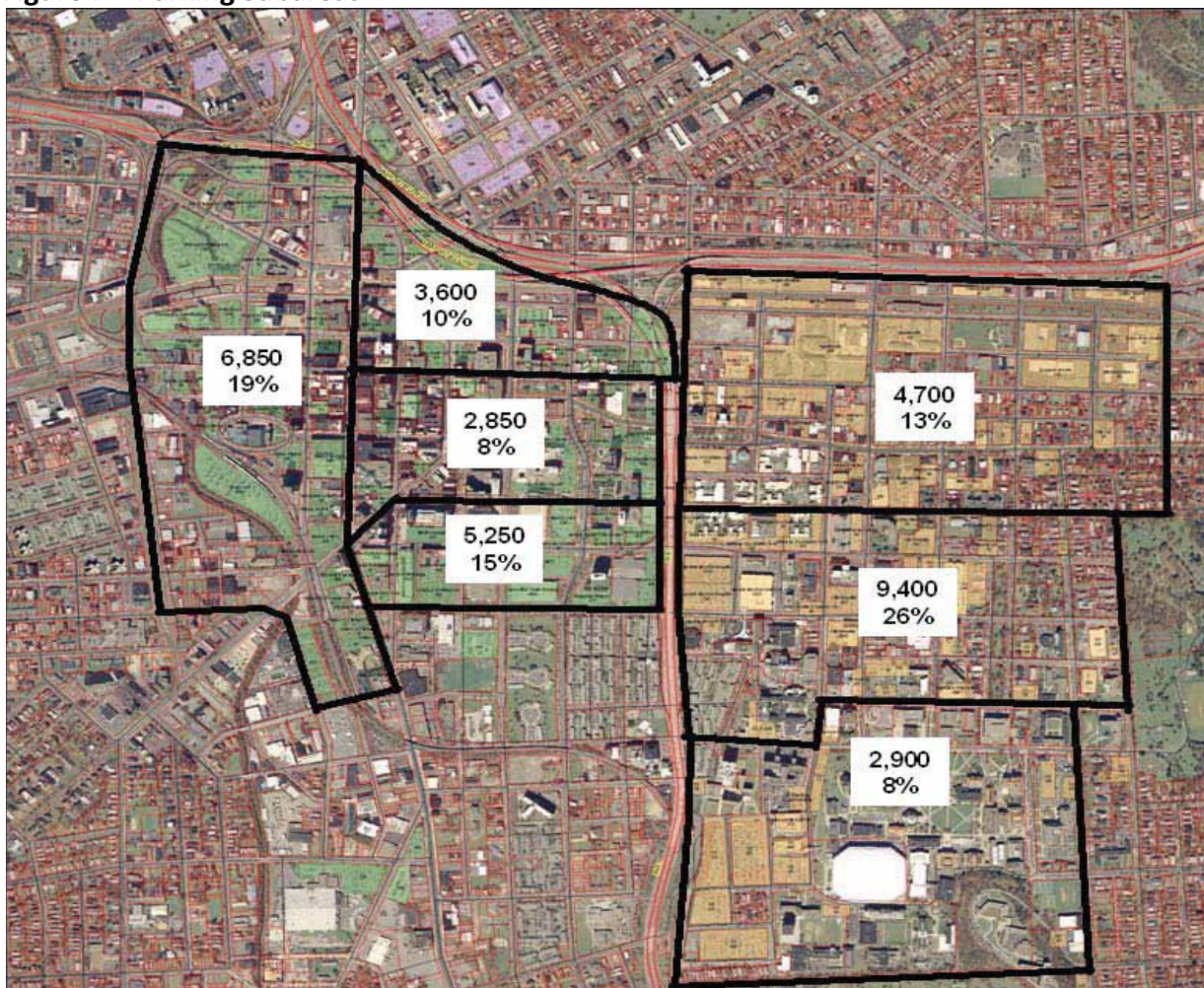
- Information from 2003 and 2006 contained in the SMTC GIS files;
- The “Downtown Syracuse Parking Study”, prepared for the Syracuse Industrial Development Agency, February, 2008;
- Estimates base on recent aerial photographs; and,
- Phone calls to various parking operators.

There is a combination of private and public parking in the study area. The largest concentration of parking is in close proximity to the highway system between Downtown Syracuse and University Hill. These areas are significant as they straddle the I-81 Viaduct area.

Approximately 35,550 off-street parking spaces serve these two areas. There are approximately 18,550 parking spaces in the Downtown area; and in the University Hill area, there are approximately 17,000 off-street parking spaces. In addition, there are approximately 2,300 off-street parking spaces surrounding St. Josephs Hospital, north of the Downtown area and another 1,050 off-street parking spaces around the Manley Field House area south of Syracuse University Main Campus.

These 35,500 parking spaces were divided into various subareas along logical travel routes from the highway interchanges. This was done to gain a better understanding of how the supply of parking is distributed among the neighborhoods and land uses surrounding the highways. These subareas are shown in Figure 7.

Figure 7 – Parking Subareas



The University Hill area is served by approximately 17,000 off-street parking spaces (47% of the total). The primary access from I-81 is the East Adams and Harrison Street interchange. The highest concentration of parking within this area is 9,400 spaces (26%) along East Adams Street and Harrison Street, with the majority of these spaces supporting major medical institutions and university related services.

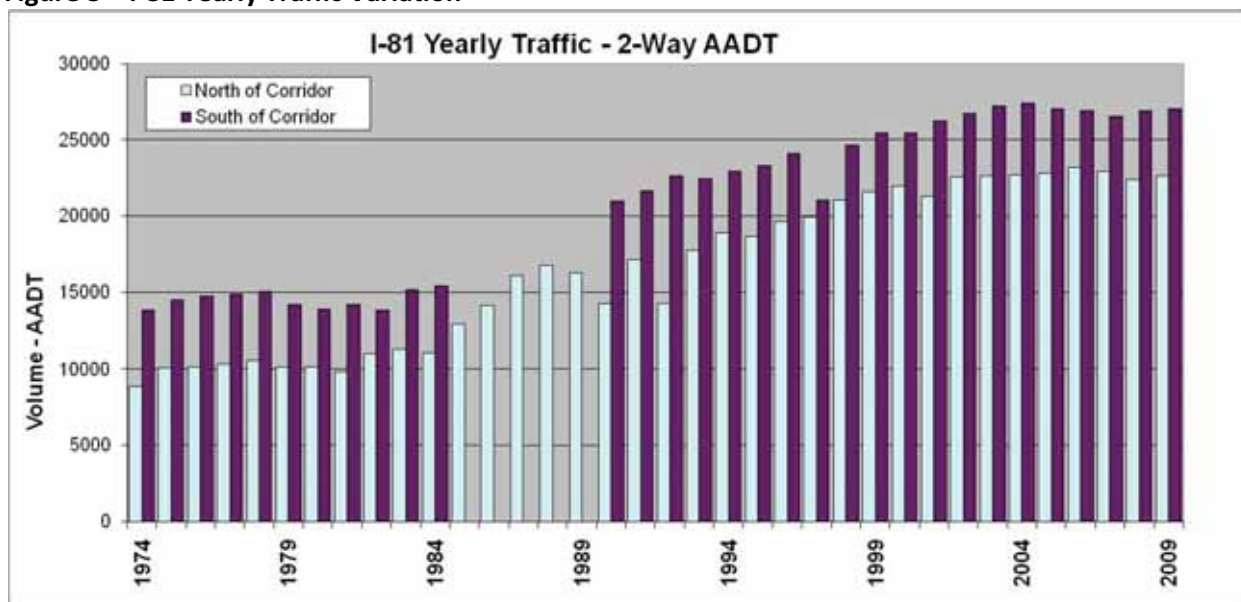
2.6 Traffic Volumes

NYS DOT traffic volume data was gathered from various count locations and time periods along the I-81 Corridor in Onondaga County to determine traffic volume trends and peak travel periods. The following summarizes the findings.

I-81 Traffic Trends Outside the Corridor Study Area

NYS DOT operates two permanent continuous traffic count stations along I-81. One station is located to the south between the Onondaga County Line and Route 80 (approximately 10 miles south of the primary corridor); the other station is located in Oswego County north of Central Square (between Route 49 and Route 69, or 15 miles north of the corridor). Historical Average Annual Daily Traffic (AADT) volumes were obtained from both stations to determine long-term volume trends. Both data sets show an upward trend. Traffic increased at a rate of 3.3-5.4% per year between 1974 and 2003. Both data sets, however, indicate growth *since* 2003 has remained flat (or 0% per year). Figure 8 shows the distribution of traffic over the past 35 years. Historical traffic volumes along the NYS Thruway from the I-690 interchange on the west to the I-481 interchange to the east were also obtained for comparison. Similar patterns were recorded on the Thruway, with traffic growth reaching a high in 2004 and slightly decreasing through 2009.

Figure 8 – I-81 Yearly Traffic Variation

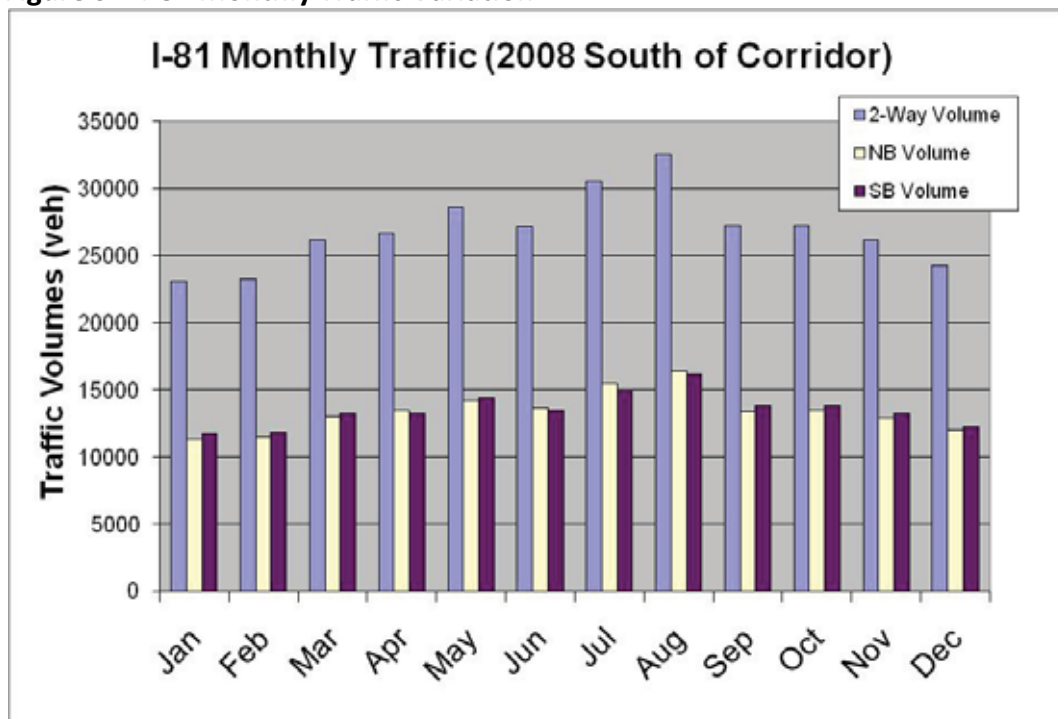


Note: no data available between 1985 and 1990 at the south station.

The information on traffic volumes from the permanent station south of the study area shows a common monthly variation in traffic. That is, July and August have the highest volumes of traffic while January and February have the lowest. Figure 9 shows the monthly variation recorded in 2008.

Note that while July and August are the highest travel months on the interstate system outside the study area, the data collection effort for this study was conducted during the fall of 2009 and spring of 2010. This is because this type of study focuses on analyzing traffic on busy urban sections of I-81 and I-690 during the peak commuter periods. In order to do this, data was collected during the fall and spring months, when typical commuter patterns occur and Syracuse University is in session.

Figure 9 – I-81 Monthly Traffic Variation



I-81 Traffic Trends within the Corridor Study Area

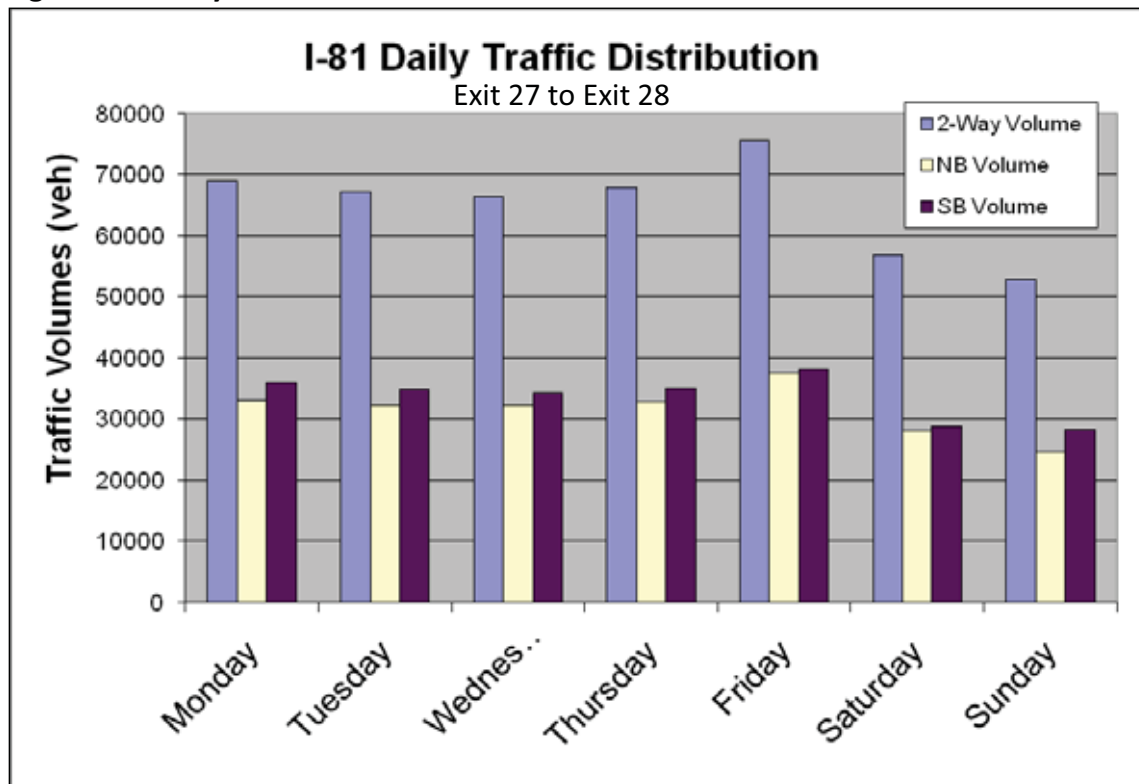
Weekly travel data was obtained from NYSDOT (2006 data) on I-81 between Exits 27 and 28 near the Airport. The data obtained was reviewed and indicates relatively consistent daily traffic volumes in this section of I-81, see Figure 10 for a summary Daily Traffic Volumes. The data also shows Friday as the highest travel day, while Saturday and Sunday are the lowest.

Heavy Vehicle Traffic

Heavy vehicle (trucks and busses) information was obtained in the same I-81 sections (north and south of Viaduct) and analyzed for the hourly traffic variation. The highest heavy vehicle traffic volume (traveling in both directions) occurred with 425 heavy vehicles per hour (8.8% of

total traffic) during the morning peak hour and 438 heavy vehicles per hour (7.5% of total traffic) during the evening peak hour.

Figure 10 – Daily Traffic Volume Variation



Corridor Average Daily Traffic

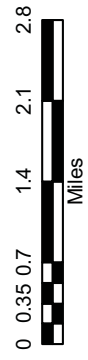
From a series of traffic counts taken along the highway, and ramp junctions, traffic flow volume diagrams for I-81, I-690 and I-481 were developed. Detailed hourly morning and evening peak hour volumes along with average annual daily traffic volumes are provided in the TM #1. Figure 11 provides a summary of the existing Average Annual Daily Traffic (AADT) on the overall expressway system in the Corridor study area.

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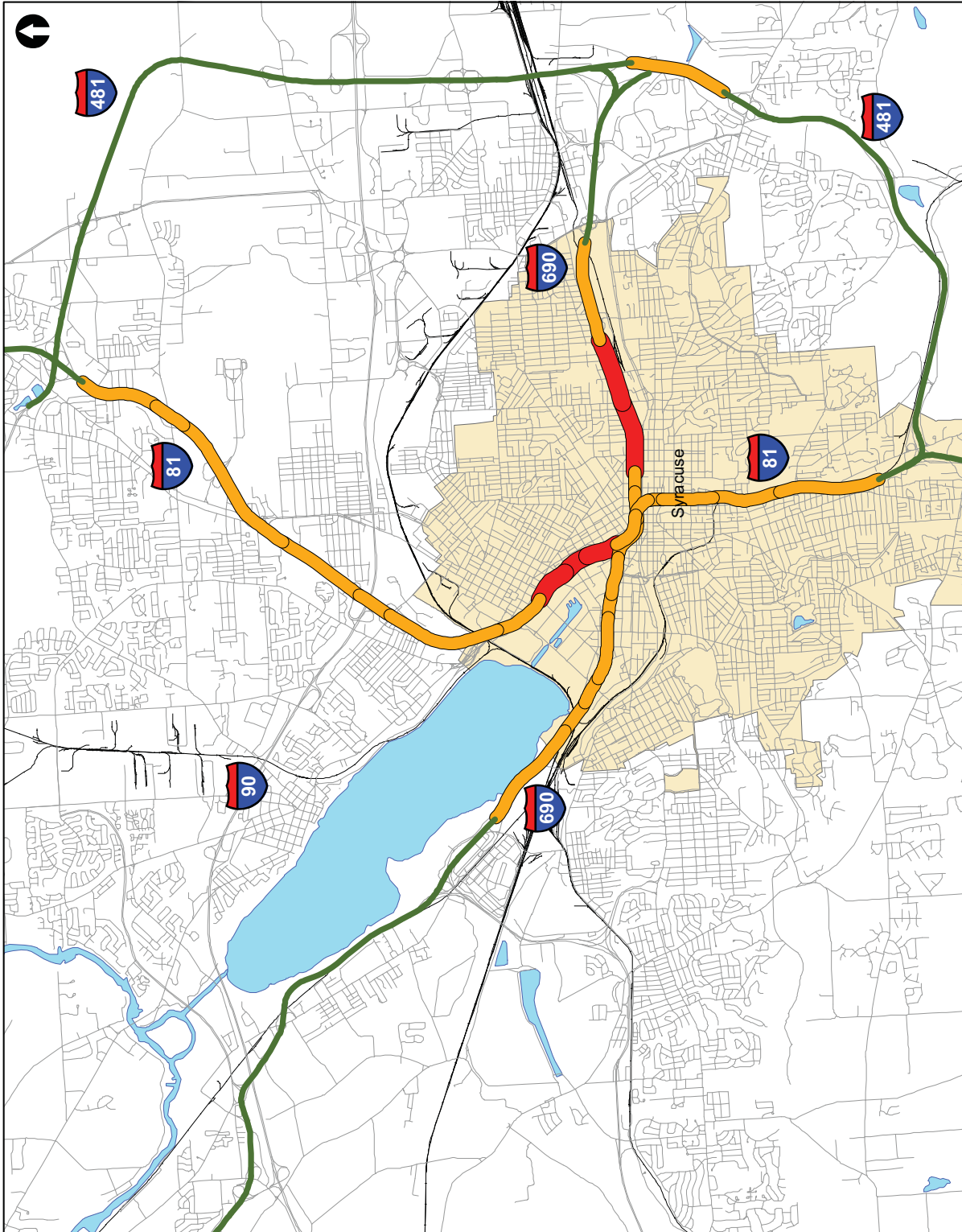
Figure 11 -
Average Annual
Daily Traffic

Legend

- Combined AADT**
- 10,000 - 50,000
 - 50,001 - 85,000
 - 85,001 - Plus
- Railroad
 Waterways
 City



Engineered in Color Statistics



June 04, 2010

2.7 Pass Through Study

There are multiple types of pass through vehicles and studies that can be performed. There are:

- *Internal to External* trips – vehicles with internal study area origins and with external study area destinations. For example, a Liverpool resident traveling to Cortland.
- *External to Internal* trips – vehicles with external origins and with internal destination (i.e., Cortland resident traveling to Carousel Center).
- *External to External* trips – vehicles with external origins and destinations. These trips are longer in nature and represent regional, intrastate, interstate or international traffic (i.e., Watertown resident traveling to Binghamton).

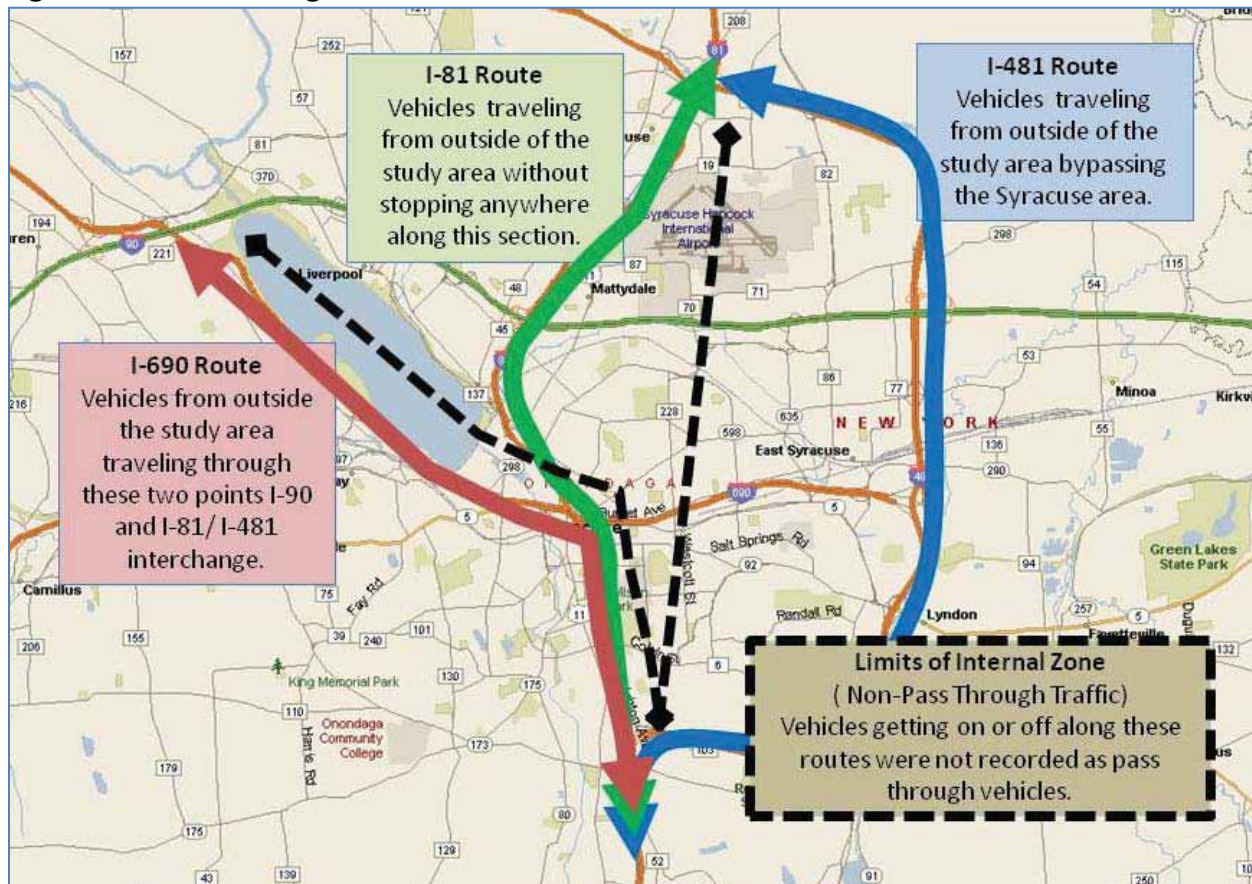
The purpose of the data collection effort undertaken for *The I-81 Challenge* was to determine how many vehicles over a 24-hour period, travel through or around Syracuse without an internal origin or destination. These trips are referred to as “external to external” traffic and can traverse the area using three primary routes as follows:

- Traffic using I-81 between the I-481 northern interchange (Exit 29) and the I-481 southern interchange (Exit 16A);
- I-81 external traffic by-passing the Syracuse area by using I-481;
- Thruway (I-90) traffic traveling between the I-690 Interchange (Exit 39) to I-81 south of the southern I-481 interchange (Exit 16A).

For the purposes of *The I-81 Challenge*, the pass through study obtained “external to external” trips. The pass through study has definitive objectives and is not intended to be an origin/destination study for other internal/external trip patterns along I-81. Figure 12 displays the three routes observed to determine the “external to external” travel patterns. This traffic is referred to as “pass through traffic” in this study. Knowing the pass through volume provides an understanding of how much traffic is or could use I-481 to by-pass the Syracuse area and how much traffic on the I-81 Viaduct (see figure 13 for location) are “external to external” trips.

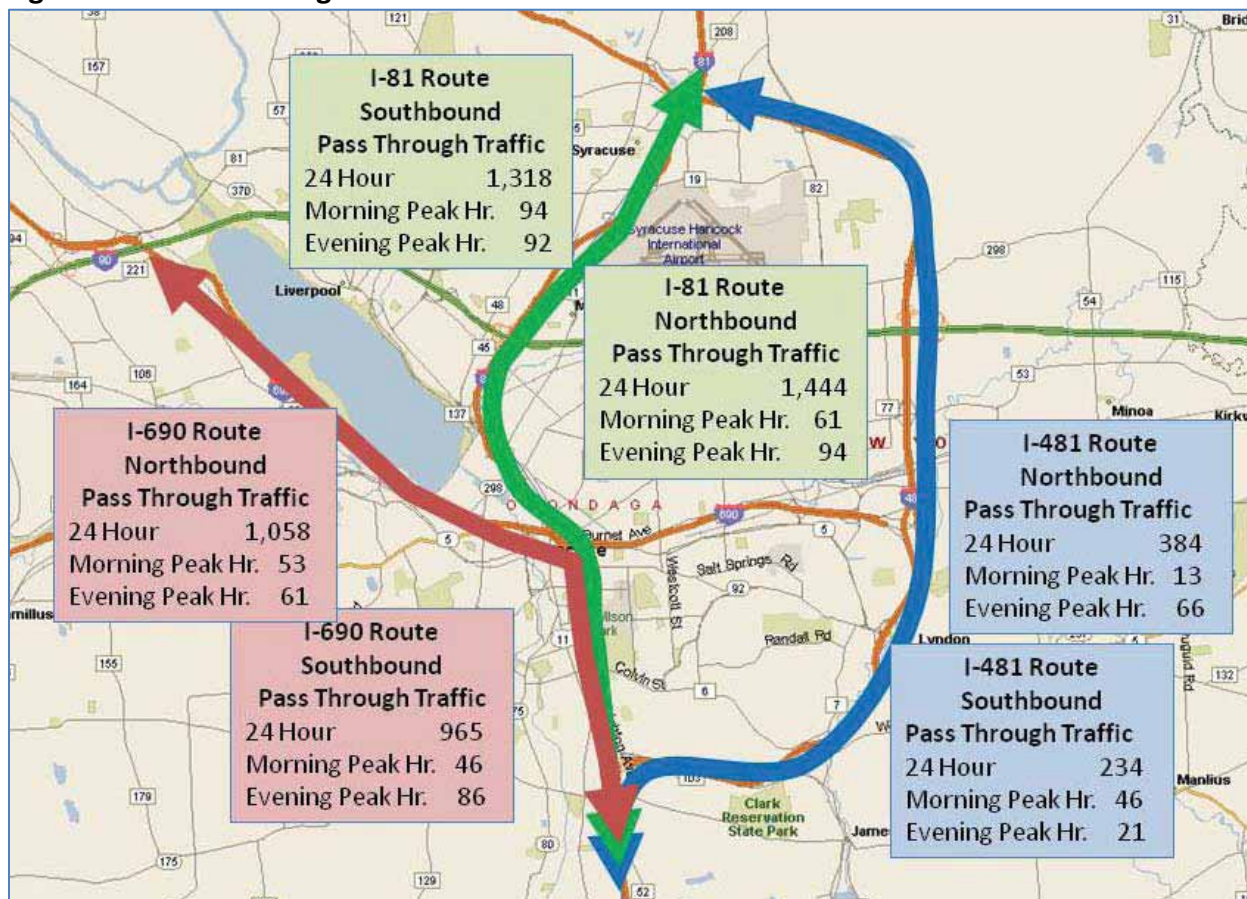
This study assumed that because of the additional travel time and Thruway tolls, that the majority of pass through traffic using the Thruway from the east side of Syracuse will use I-481 and from the west side will use I-690. Based on this assumption and knowing the number of pass through trips in the I-81 Viaduct section, it can also be assumed that the majority of other trips traveling in the Viaduct section have an origin, a destination or both within the study limits and for the purpose of this study, are referred to as “local trips”.

Figure 12 – Pass-Through Routes Defined



The data was collected by placing Automated License Plate Reader (ALPR) cameras on I-81 both north and south of the I-481 interchanges, on the I-690 ramps to and from the Thruway and on the I-481 ramps with I-81. Data was collected on a weekday (Tuesday, April 13, 2010) for 24 hour period. It should be noted that lane closures on I-81 were in effect during the time of this survey. Additional delays associated with these lane closures, however, would most likely not be known to most pass through traffic and as such most likely did not affect their route choice. At each of these sites, automatic traffic recorders (tube counters) were installed to obtain total traffic volumes to assist in normalizing the license plate data. As each vehicle passed the camera locations, the license plate number and the time was recorded. The license plates entering the area were then matched at each of the exit locations to determine the volume of pass through traffic. Travel times for the pass through traffic were calculated based on the entry/exit times recorded. The license plates of 86% of the 112,476 vehicles counted entering or exiting the area on that day were captured and recorded. Figure 12A shows the results of the survey after all pass through traffic volumes were factored to reflect 100% of the entering or exiting volume.

Figure 12A - Pass Through Traffic



In total, approximately 5,400 vehicles per day are traversing these corridors as “external to external” trips. It is anticipated that seasonal and daily variations do occur, however, the study was to determine typical peak travel when Syracuse University is in session. The results show that on an average weekday in April:

- Of the 44,000 vehicles per day on I-81 just south of the I-481 southern interchange, 12% (5,400 vehicles per day) are “external to external” trips using I-81, I-690 or I-481; and,
- Of the 5,400 “external to external” trips, 38% is traffic to/from the Thruway via I-690, 51% pass directly through the City of Syracuse using I-81 and 11% bypass Syracuse using I-481.

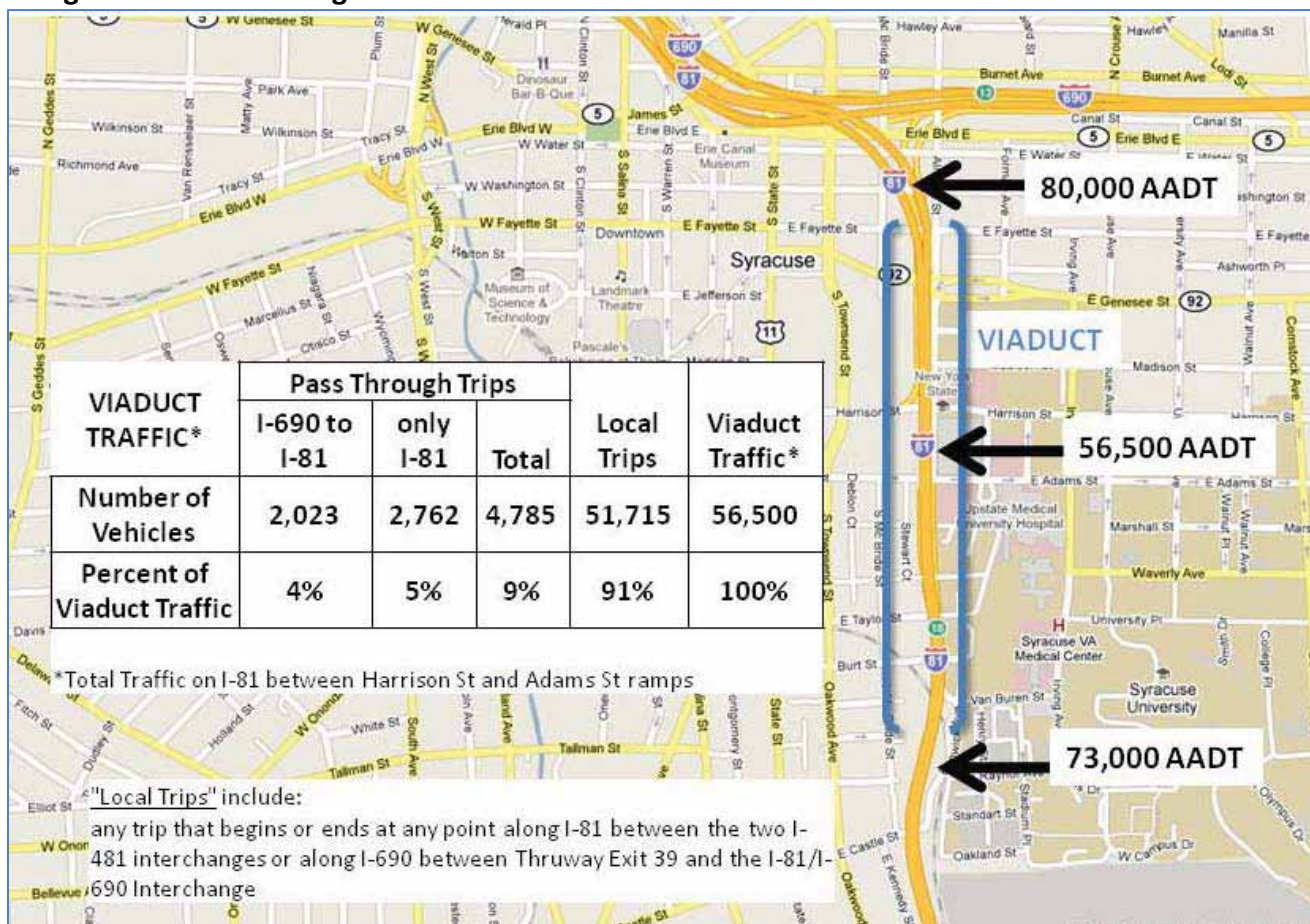
I-81 Viaduct Section

The I-81 Viaduct (between Harrison Street and East Adams Street) carries approximately 56,500 vehicles per day based on recent traffic counts by NYSDOT. The pass through traffic using this section of I-81 is approximately 4,785 vehicles per day or approximately 8.5% of total traffic. Based on this, over 91% of the daily traffic in the Viaduct section has an origin, destination, or both in the study limits, and is not traffic passing through the Syracuse area. Some of this local traffic could be diverted to other routes, and will be explored further during future alternative assessments. During the commuter travel periods, “external to external” trips using the I-81

Viaduct are 7% or less of the peak hour volume. Figure 13 presents the pass through traffic using the I-81 Viaduct.

With over 91% of the Viaduct traffic being classified as local trips, diverting the 7-9% “external to external” trips to I-481 or finding alternative routes for Thruway traffic would have little notable impact on traffic volumes or operations in the I-81 Viaduct.

Figure 13 - Pass Through Traffic in the I-81 Viaduct Section



Route Travel Times

The ALPR’s recorded when each vehicle entered and exited the area along each of the routes. Using this information, the average travel time to travel each of these routes was calculated for matched license plates. Figure 14 presents the average passenger car travel times found for each of the three routes by time of day. Travel time during the 9 PM to 10 PM travel hour are included in the figure and provide an indication as to what the typical free-flow un-congested travel times would be along each of these corridors.

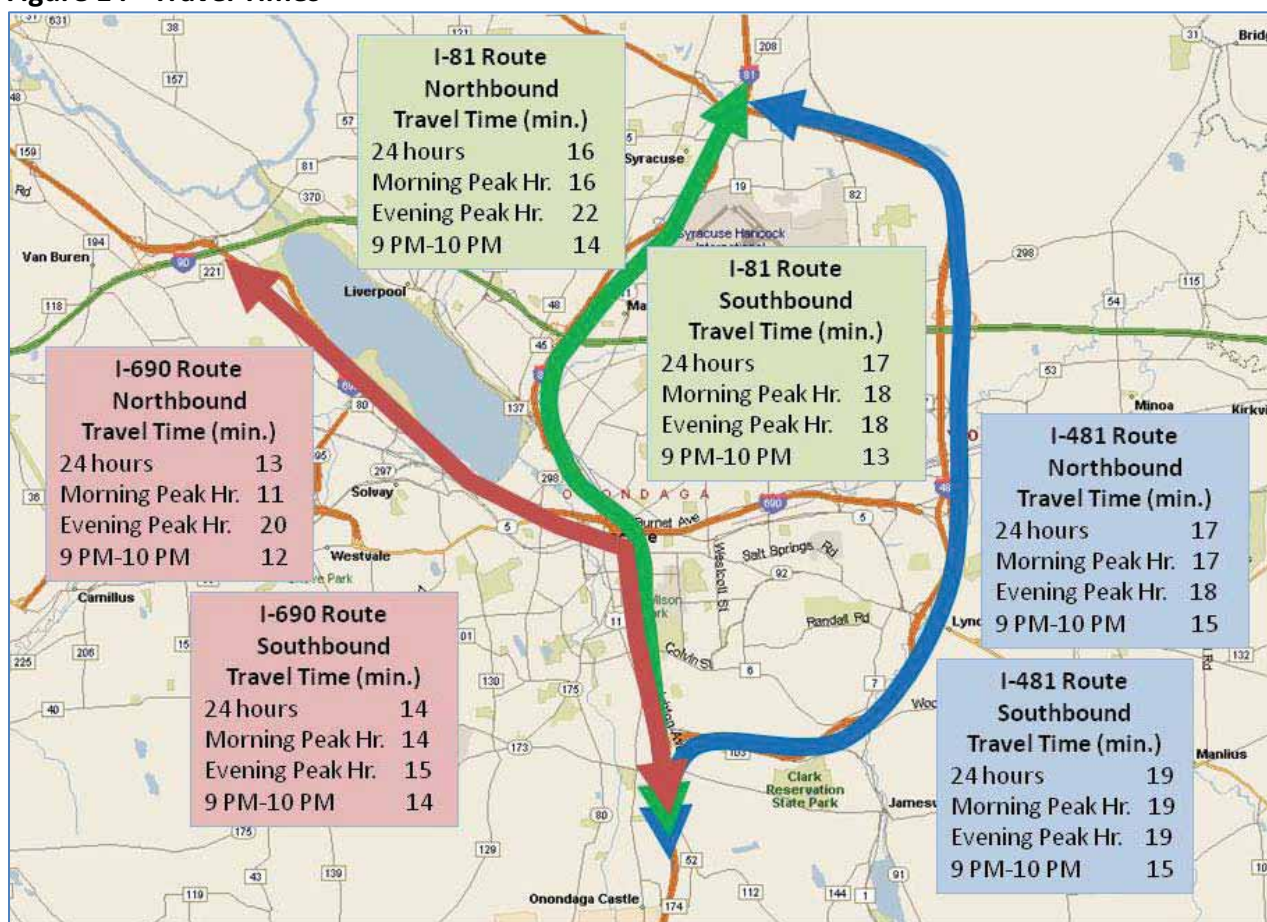
I-81 versus I-481

Using I-481 to bypass Syracuse is approximately 4.3 miles longer, has a posted speed of 65 MPH for its entire length, and traffic congestion and construction is relatively light in comparison to

the I-81 corridor through Syracuse. In addition, signing on I-81 at both north and south ends directs the use of I-481 to bypass the City of Syracuse. Review of the pass through data, indicates that of the 3,380 vehicles per day that could use either I-81 or I-481 to pass through Syracuse, only 18% of traffic (passenger vehicles and trucks) choose the I-481 route over I-81. During the evening peak hour, 32% of the pass through traffic uses I-481 versus I-81 through Syracuse.

Review of the travel times for each route shown on Figure 14, provides an indication as to why I-81 is the chosen route during most times of the day. In spite of higher traffic congestion levels, construction, and lower posted speeds, I-81 is a generally faster route than I-481.

Figure 14 - Travel Times



Summary - Pass Through

The following conclusions can be drawn from the data and analysis related to the I-81 corridor and the I-81 Viaduct section. They are:

- Over 91 percent of the traffic travelling in the I-81 Viaduct section has an origin or destination in the Syracuse area and is not considered “external to external” trips.

- Using the I-81 corridor through Syracuse even with congestion, construction and lower speed limits, is generally faster than using I-481.
- Forcing “external to external” trips to use I-481 will have little notable impact on traffic operations in and around the I-81 Viaduct.
- If all “external to external” traffic was forced to use I-481, the additional traffic would have a minor impact on I-481 operations, but would experience an increase in travel time of one to two minutes.

There may be additional travel patterns impacting the viaduct that could be diverted to other routes. This will be investigated as part of the future alternatives analysis.

2.8 Congestion - Level of Service and Mobility

Level of Service (LOS) is an indicator of congestion on road segments and at intersections. LOS is a measure of the delay experienced by drivers at an intersection or road segment on a scale of A to F. At intersections, a rating of A indicates very short waiting times while a rating of F indicates very long delays (failing operations). Along a freeway segment, a rating of A indicates low vehicle density traveling at free flow speeds, while a rating of F indicates congestion, high vehicle density traveling at low speeds. The design criteria from the NYSDOT Highway Design Manual indicate that Interstate highways should function at LOS C or better. LOS E is at capacity.

Expressway - Congestion

Figure 15 and 16 shows 2009 Existing LOS for the morning and evening peak periods throughout the entire network as developed using the Highway Capacity Manual and the Highway Capacity Software methodology. As can be seen in the figure, the majority of the highway system outside the general downtown area is shown as “green” levels of operation which reflects Levels A, B or C. Approaching capacity areas are shown in “yellow” which indicates LOS D-E operations. Over capacity areas are shown in “red” which indicates Level F, failing conditions. Figure 17 and 18 provide a close up of the Viaduct area and I-81/I-690 Interchange during the morning and evening peak periods. The expressway system mainline analysis indicates areas of approaching capacity (LOS D/E) along I-690 and I-81 in the downtown area and isolated locations of failing operations (LOS F) in either the weekday morning or evening peak travel periods. A number of merge/diverge traffic spots and on/off-ramps are also operating at failing levels.

The analysis of current travel conditions on the expressway system serving Syracuse indicates that most of the current (and likely future) traffic concerns are concentrated on I-81 from north of Hiawatha Boulevard to East Adams Street ramps. On I-690, current capacity issues start around the Rte 695 interchange by the State Fairgrounds and end near the Midler Avenue interchange. The only traffic operational issue related to I-481 was during the evening peak hour at the southbound I-481 off-ramp to eastbound East Genesee Street. The off ramp has sufficient capacity; however, the issue relates to the merging movement with East Genesee

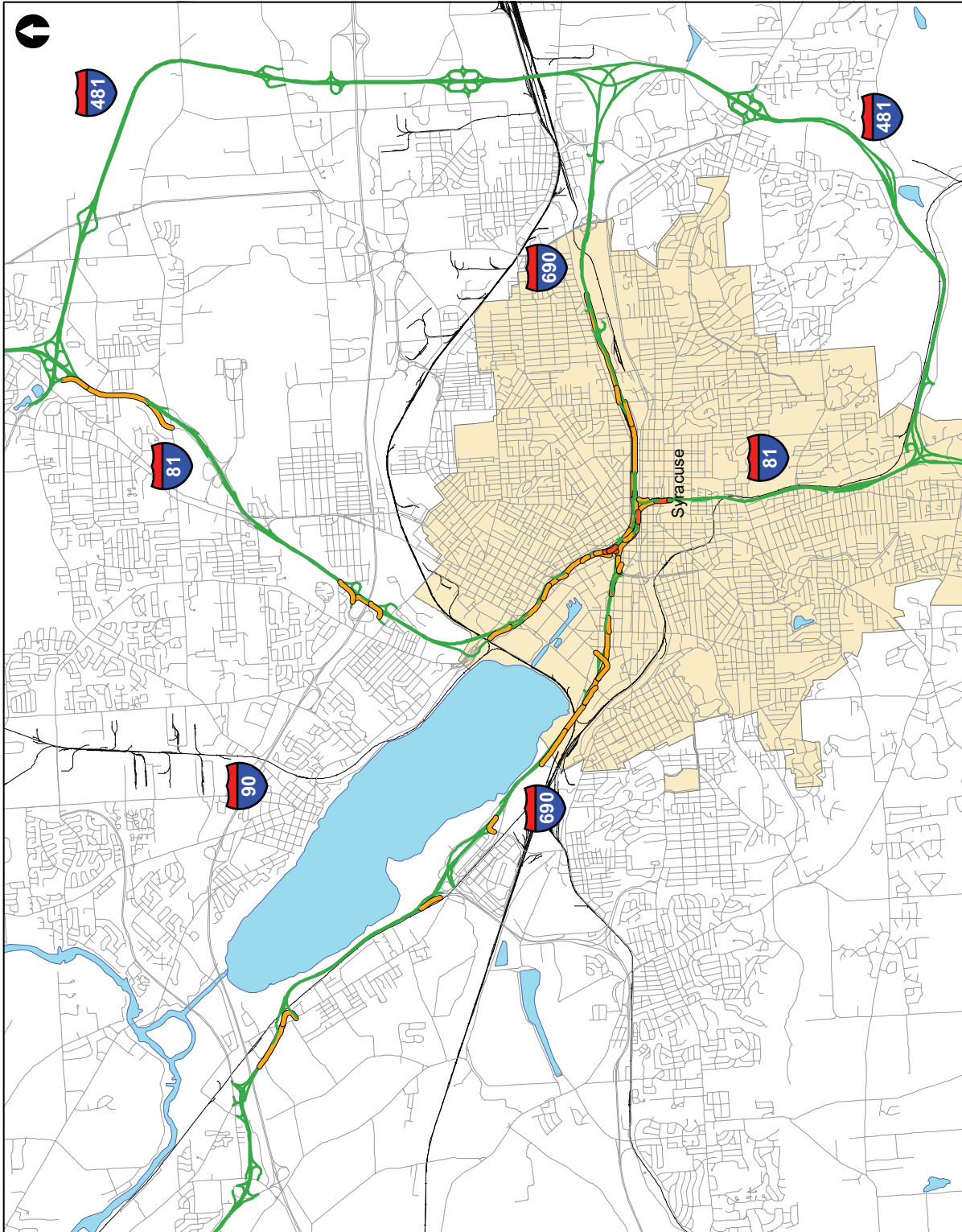
**Interstate 81
Corridor Assessment**
Figure 15 -
Overall Level of Service -
Morning Peak Hour

Legend

Level of Service

- Over Capacity
- Approaching Capacity
- Good
- Railroad
- Waterways
- City

0 0.35 0.7 1.4 2.1 2.8
Miles



June 2008 - 2/2010

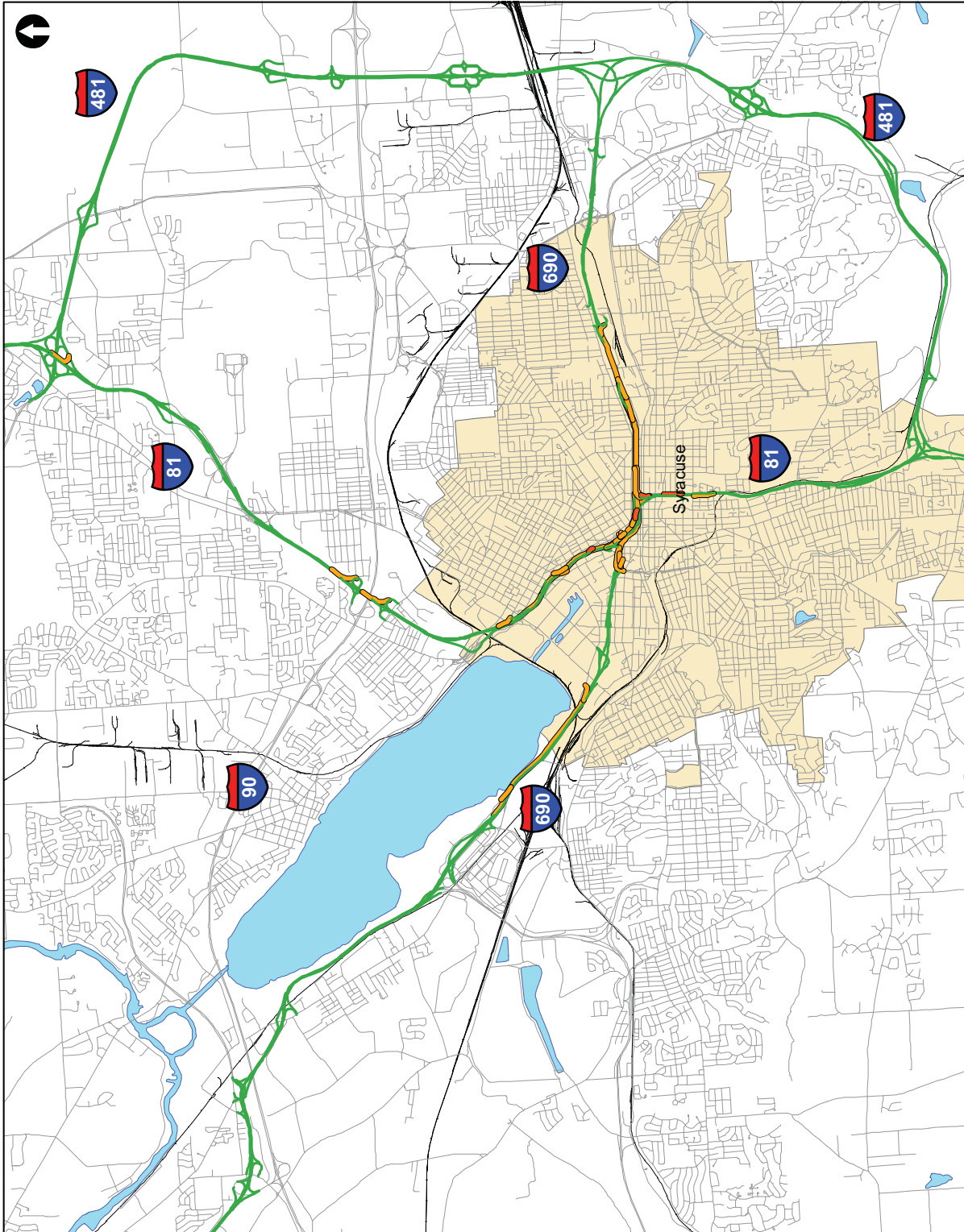
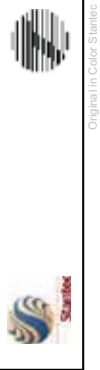
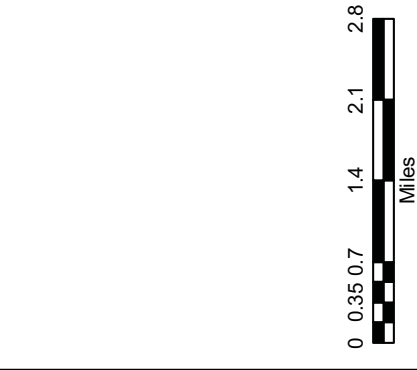
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**Interstate 81
Corridor Assessment
Figure 16 -
Overall Level of Service -
Evening Peak Hour**

Legend

Level of Service

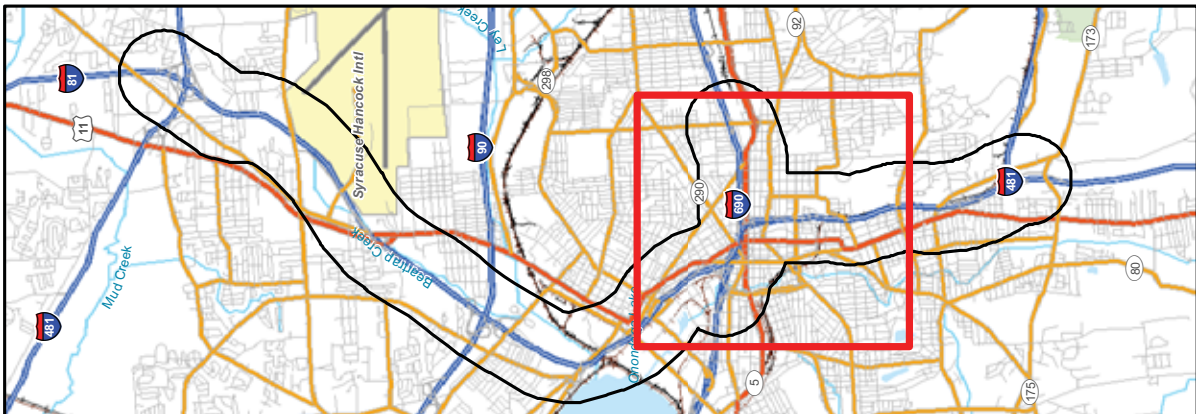
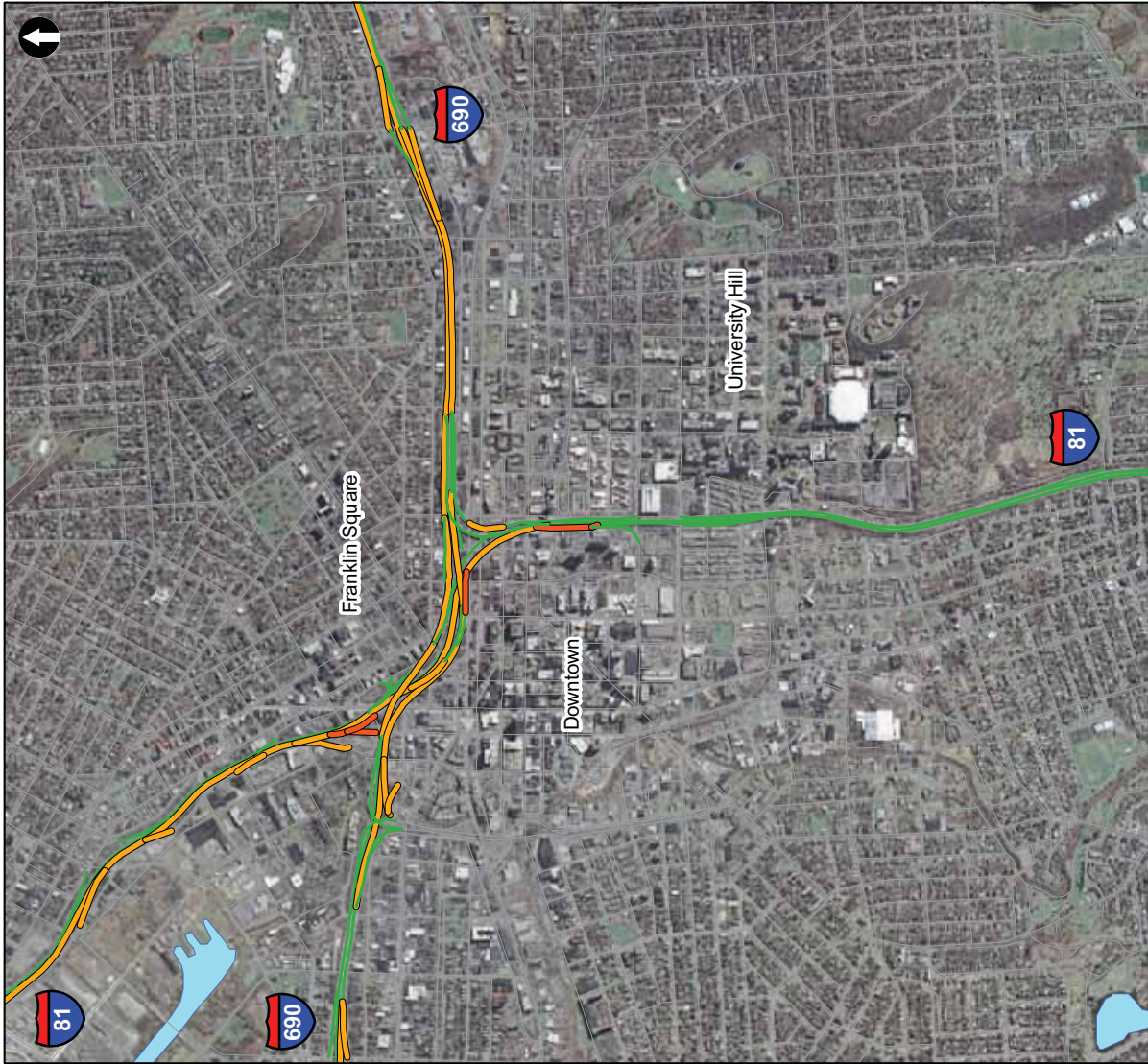
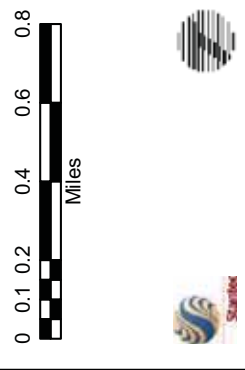
- Over Capacity
- Approaching Capacity
- Good
- Railroad
- Waterways
- City



June 04, 2010

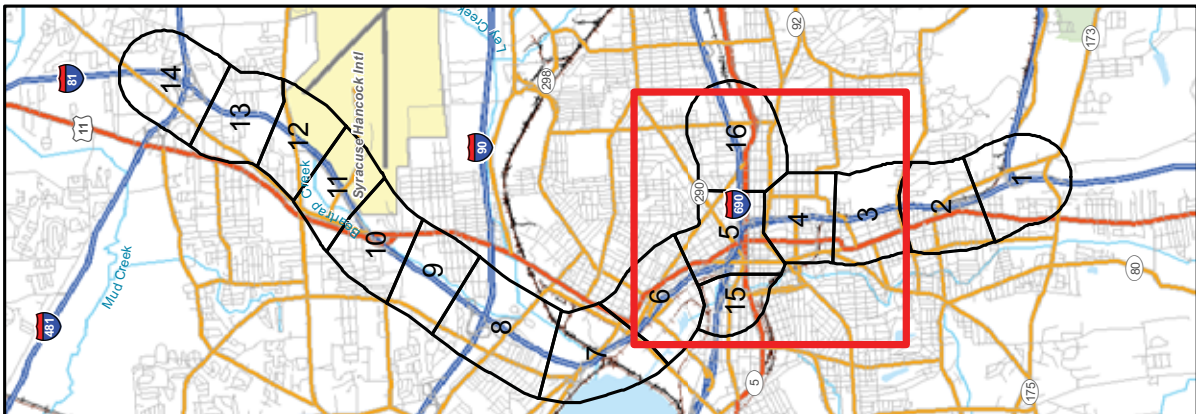
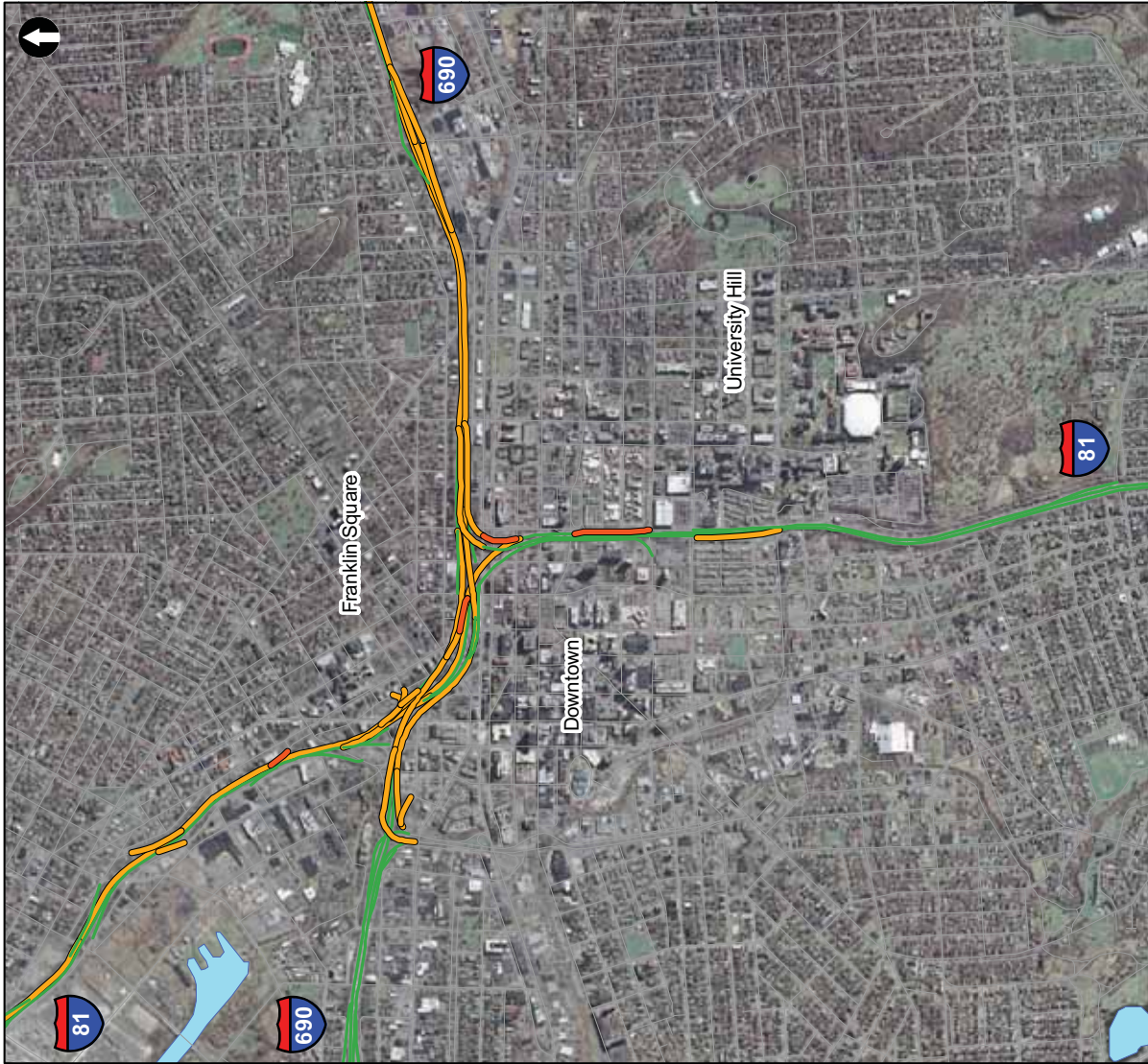
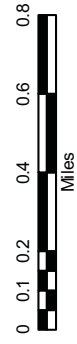
**Interstate 81
Corridor Assessment**
Figure 17 -
Level of Service -
Morning Peak Hour
Viaduct Area

- Legend**
- Level of Service**
 - Over Capacity
 - Approaching Capacity
 - Good
 - Waterways



**Interstate 81
Corridor Assessment**
Figure 18 -
Level of Service -
Evening Peak Hour
Viaduct Area

- Legend**
- Level of Service**
 - Over Capacity —
 - Approaching Capacity —
 - Good —
 - Waterways —



Original in Color Statistics

05/08/2010

Street and therefore has not been illustrated in Figure 15 which illustrates interstate highway and ramp operations.

Local Road System – Level of Service

Intersection turning movement volumes were counted and analyzed for 79 intersections serving the Syracuse Central Business District (CBD), the University Hill Area and north of the CBD near St. Joseph Hospital. This information is reference data for subsequent phases of this study when I-81 strategies are developed.

Nearly all of the signalized intersections were found to be operating very well overall. They had Levels of Service (LOS) at “C” or better during peak hours. The exceptions were the following intersections which had either overall, approach or movements operating at poor or failing LOS:

Intersection Operations - Weekday Morning Peak Hour

- Almond Street @ I-81 Southbound off-ramp- ramp approach is Failing
- Almond Street @ East Adams Street – movements at Level E and F
- East Adams Street @ Sarah Loguen Street – eastbound approach Level D
- West Genesee Street @ North Clinton Street – southbound traffic – Level E
- Butternut Street @ I-81 Southbound off-ramp – ramp approach Level E

It should be noted that problems with stacking of vehicles were observed along the Almond Street corridor among the below noted intersections.

Intersection Operations - Weekday Evening Peak Travel Hour

- Almond Street @ East Adams Street – movements at Level D and E
- Almond Street @ Harrison Street - westbound approach - Level E

An analysis of the roadways capacity to handle existing traffic indicates that most intersections in the central business district and the Hill are providing very good levels of operation. The analysis also indicates most of the morning and evening operational issues are generally associated with the Almond Street intersections under the I-81 Viaduct section.

Summary - Traffic Volumes and Congestion

The analysis shows that most of the main expressway sections and ramps are operating well, including all of I-481. Along I-81, most of the present capacity issues, both on the main roadway and various ramps, start just north of Hiawatha Boulevard and end at the East Adams Street Southbound ramp. On I-690, present capacity issues start around Rte. 695 by the State Fairgrounds and end near the Midler Avenue interchange thus covering a significant portion of the study area.

2.9 Speeds and Delays

The posted speed limits on I-81 vary from one end of the study corridor to the other. At either end of the study area the speed limit is posted at 65 mph for I-81. From the south the speed

limit reduces to 55 mph as you reach the Viaduct and then further reduces to 45 mph through the I-690 Interchange. Near the Spencer Street bridge (adjacent to the old Oil City) the speed limit increases back to 55 mph and then further increases to 65 mph near the northern Syracuse City line.

Figure 19 and 20 show the predominant average travel speeds through the Viaduct area during the morning and evening peak hours. As an example, a vehicle on I-690 Eastbound (green line) heading south on I-81 to exit at the Harrison/Almond/E. Adams exit is facing congestion and delays with travel speeds in the range of 18 mph (eastbound on E. Adams Street) – 22 mph (westbound on Harrison Street). A vehicle on I-690 Eastbound heading south on I-81 through this same area is anticipated to experience travel speeds of about 30 mph. I-81 southbound traffic (red line) destined to this same exit is experiencing similar delays (23 mph to Harrison westbound, and 18 mph to E. Adams Street eastbound) and congestion. The delays are primarily concentrated around the I-81/I-690 interchange for Downtown and University Hill access. These average travel speeds are well below posted speed limits through this area. Similar patterns are observed in the reverse commute during the evening peak hour.

Figure 19 – Average Travel Speeds – Morning Peak Hour

(predominant traffic flow direction)

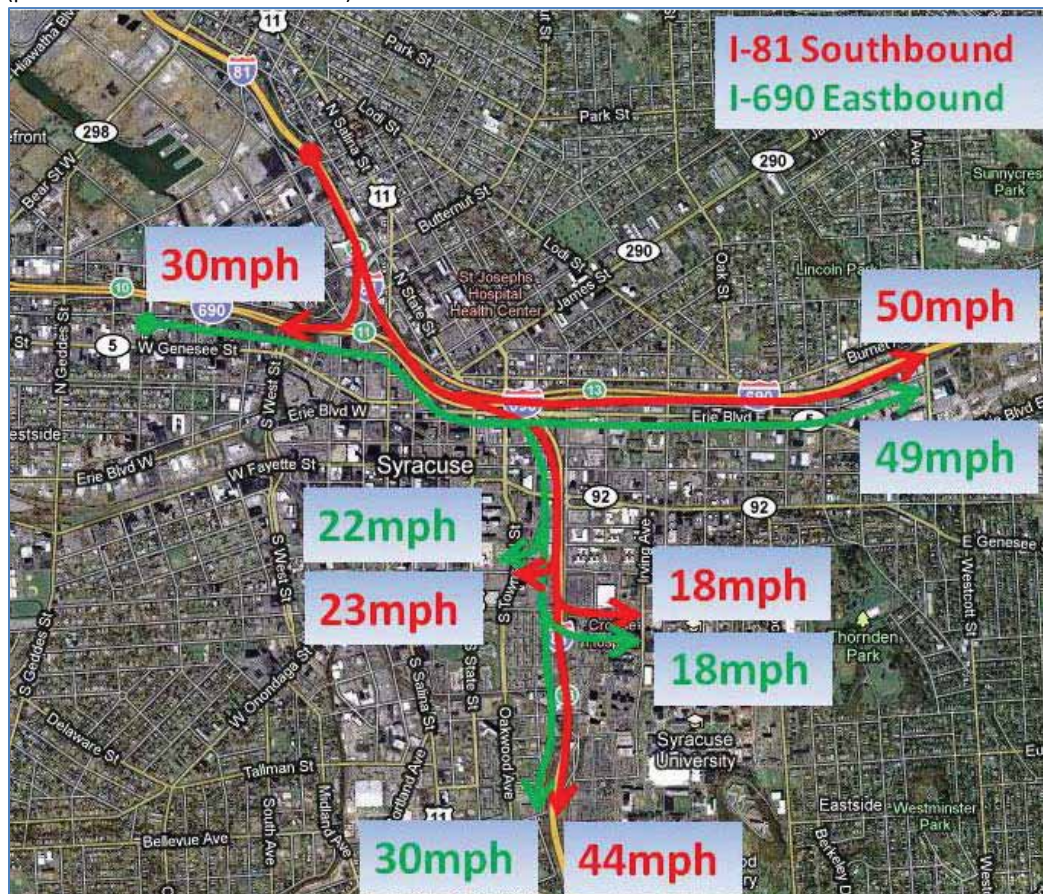
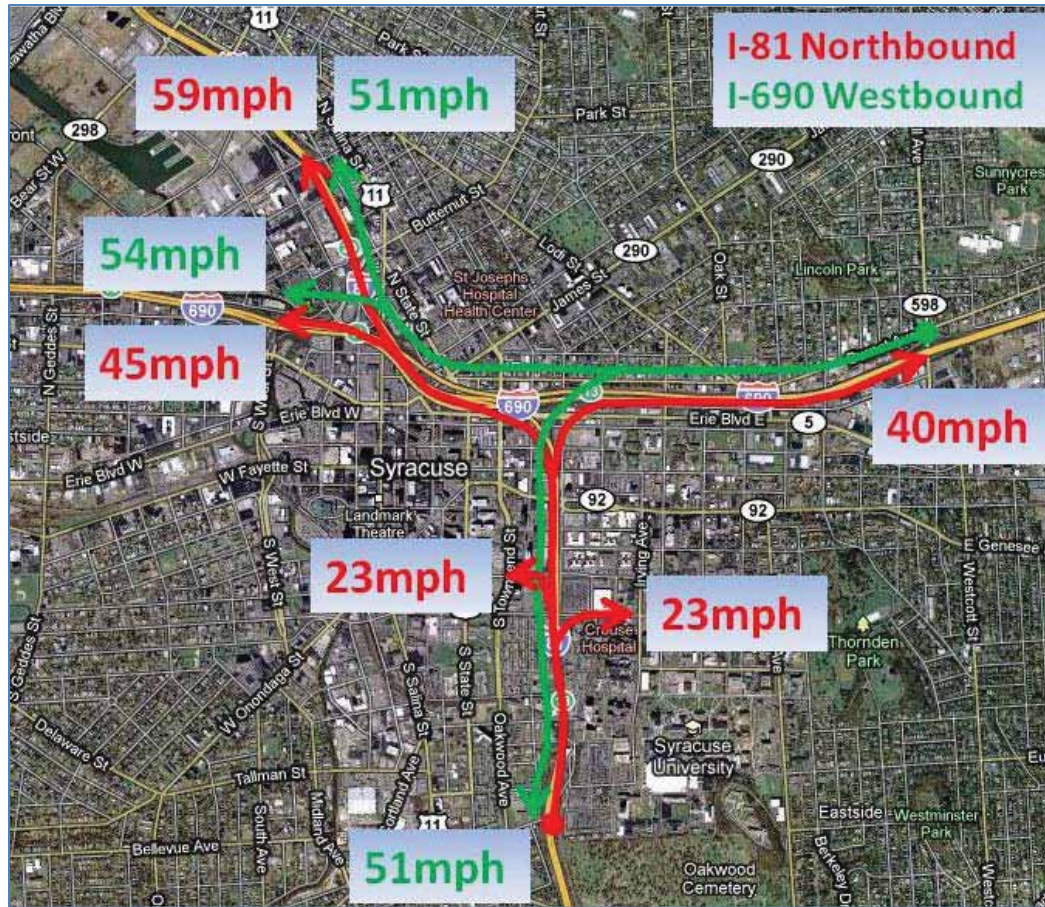


Figure 20 – Average Travel Speeds – Evening Peak Hour
(predominant traffic flow direction)



2.10 Accident History and Analysis

The following steps were used to conduct an accident analysis for the I-81 and I-690 corridors and their associated on- and off-ramps:

- Collision data was obtained from NYSDOT for the most recent three-year period available (February 1, 2006 – January 31, 2009).
- Data on Annual Average Daily Traffic (AADT) volumes was also collected. The calculated accident rates were then compared to the statewide average accident rates for specific types of roadways.

Table 3 provides a summary of the percent of the expressway (I-81 and I-690) segments with accident rates higher than the statewide average. As the data indicates, overall, accident rates on most segments of the study corridor are higher than the statewide average.

Table 3 – Average Accident Rates

Roadway Type/Configuration*	Average Statewide Accident Rate	% of Segments with higher than average accident rate
Expressway Sections with 6 or 7 Lanes	1.07 MVM	54%
Expressway Sections with 4 Lanes	1.04 MVM	83%
On-Ramp or Off-Ramp, Merge with 2 lanes	0.02 MEV	100%
On-Ramp, Merge with 1 lane	0.10 MEV	96%
Off-Ramp, Merge with 1 lane	0.19 MEV	96%

The NYSDOT Priority Investigation Locations (PIL) is a list comprising of locations where accident rates exceed the mean rate for a similar type of facility to such an extent as to suggest that some other factor than pure chance may be contributing to the accident experience. They are locations that exceed thresholds established by the NYSDOT and are identified as being appropriate for further study. The NYSDOT PIL list for I-81, I-690 and I-481 within the study limits include the following areas:

- I-81 section from the Forest Interchange I-481 to the NY481 Interchange, 10 PIL locations are on the current 2009-2010 PIL list predominantly located between Colvin Street north to Hiawatha Blvd, at the NYS Thruway interchange area, Route 11 interchange and the NY 481 interchange area.
- I-690 (I-90 Thruway to I-481), there are eight PIL locations with four of them within the primary study area from West Street to Teall Avenue.
- I-481 from Route I-481/I-81 Forest Interchange to the NY 481/I-81 Interchange, there are nine PIL locations with four PILs near the I-690 interchange and the Thruway interchange.

Summary – Accident History

Overall the accident data indicates that the expressways in the study corridor have a relatively high rate of accidents when compared to statewide averages. For example, the accident rate on the northbound Viaduct section is more than three times the statewide average. I-81 through the I-690 interchange has sections where the accident rates reach 5 times the statewide average and proceeding north on I-81 up towards Carousel Center the rate is approximately two times the statewide average. Figure 21 shows an overview of the areas experiencing above average accident rates and the where prior similar experiences (PILs) have been identified within the primary study area.

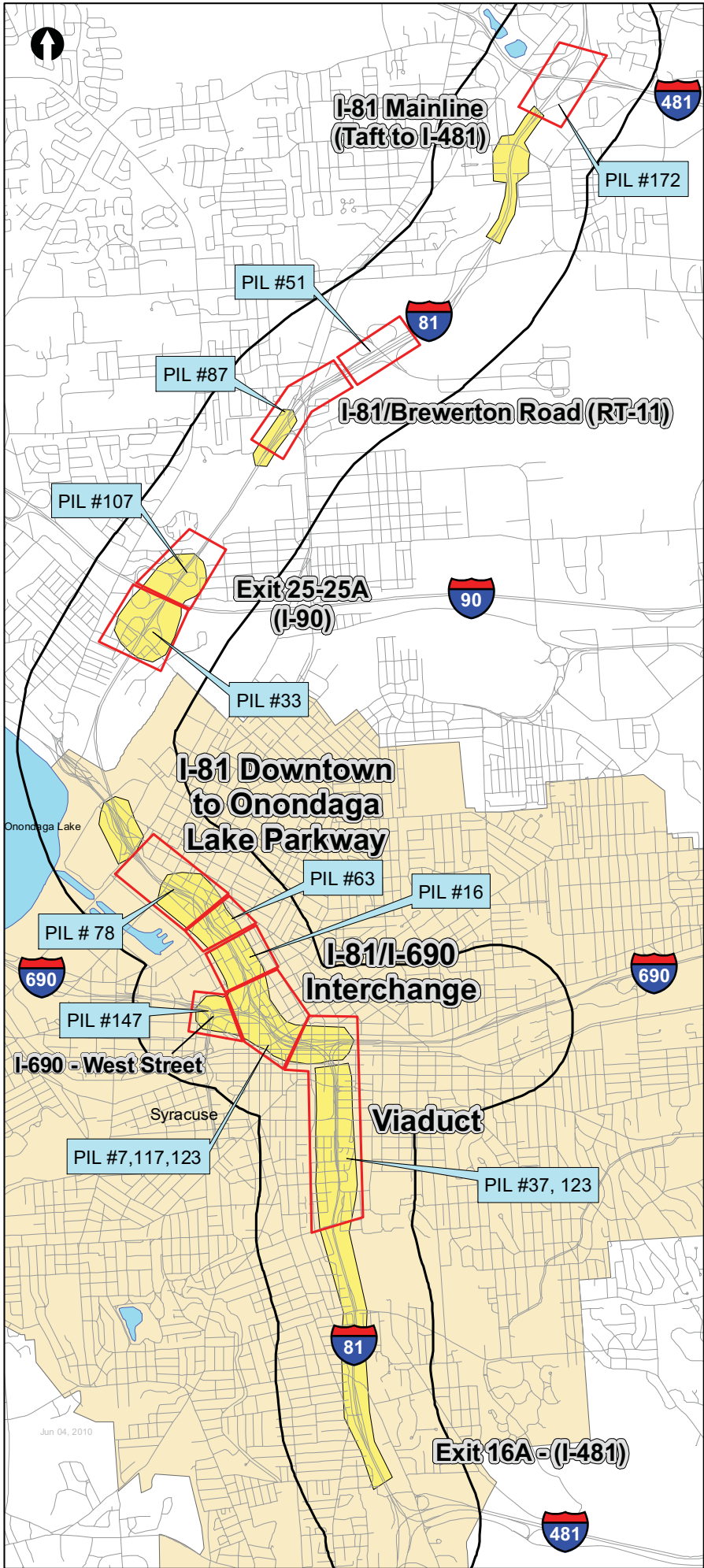
2.11 Emergency and Other Special Vehicles

Information on the location of police and fire stations was collected from service providers in order to gain an understanding of the routes emergency vehicles might take within the study corridor.

It was found that police, fire and rescue providers, and EMS all use the highways and adjacent connecting roads. As major routes I-81, I-690, and I-481 are all used in emergencies. However,

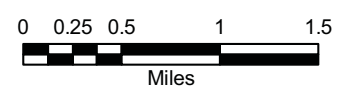
Interstate 81 Corridor Assessment

Figure 21 - Primary Study Area - Above Average Accident Rates



Legend

- PIL Locations
- Key Areas with Above Average Accident Rates
- Primary Study Area
- Waterways
- City



there are no set routes of travel. Emergency service drivers use their discretion, based on time of day and travel conditions, to determine the quickest route to/from emergencies and area hospitals or police stations. Five public safety centers (police headquarters and emergency dispatch centers) serve the greater Syracuse area. Four of the five centers are located within the study area.

2.12 Other Means of Travel: Pedestrians, Bicyclists and Multi Use Trails

The information herein is reference data for development and evaluating strategies in future phases of *The I-81 Challenge*.

Pedestrians

The I-81 Corridor study area has an existing sidewalk network that is utilized by various users including employees, residents, visitors and students. The Syracuse Metropolitan Transportation Council (SMTC) *Bicycle and Pedestrian Plan*¹ reports that 95 - 97% of the parcels within the City of Syracuse have a sidewalk on at least one side of the adjoining roadway. In addition, the Village of North Syracuse and the towns of Cicero, Clay and Salina (all traversed by the northern section of the I-81 study area) have sidewalks on select roadways.

Pedestrian count data was collected in November and December 2009 and in February and March 2010. Pedestrian counts were conducted at all the intersections where vehicular traffic was counted; however, the data illustrated here is for twenty-eight intersections. The pedestrian and traffic counts were collected in a focus area along the Viaduct as base information for use in developing possible strategies that may modify access to downtown and University Hill or modify the overall system. Twenty-four intersections were located near or directly south of the interchange of I-81 and I-690 (Figure 24). Of those intersections, pedestrian traffic was most abundant on six east-west streets and three north-south streets. From north to south these streets are: East Washington, East Fayette, East Genesee, Harrison, and East Adams. From west to east these routes are South Townsend, South McBride and Almond.

Pedestrian safety is a concern in the I-81 study area. SMTC reported that in all Onondaga County in 2000, there were 20 fatal motor vehicle accidents in which 21 people were killed. Five of the 21 people were pedestrians, representing nearly 25% of those killed in motor vehicle accidents in 2000. The majority of pedestrian accidents occurred at heavily-used intersections.

Bicyclists

The City of Syracuse has a number of on-street bicycle lanes. Typically, the bike lanes are four feet wide and have pavement markings as well as steel posted signs designating the lanes. Existing bicycle lanes include:

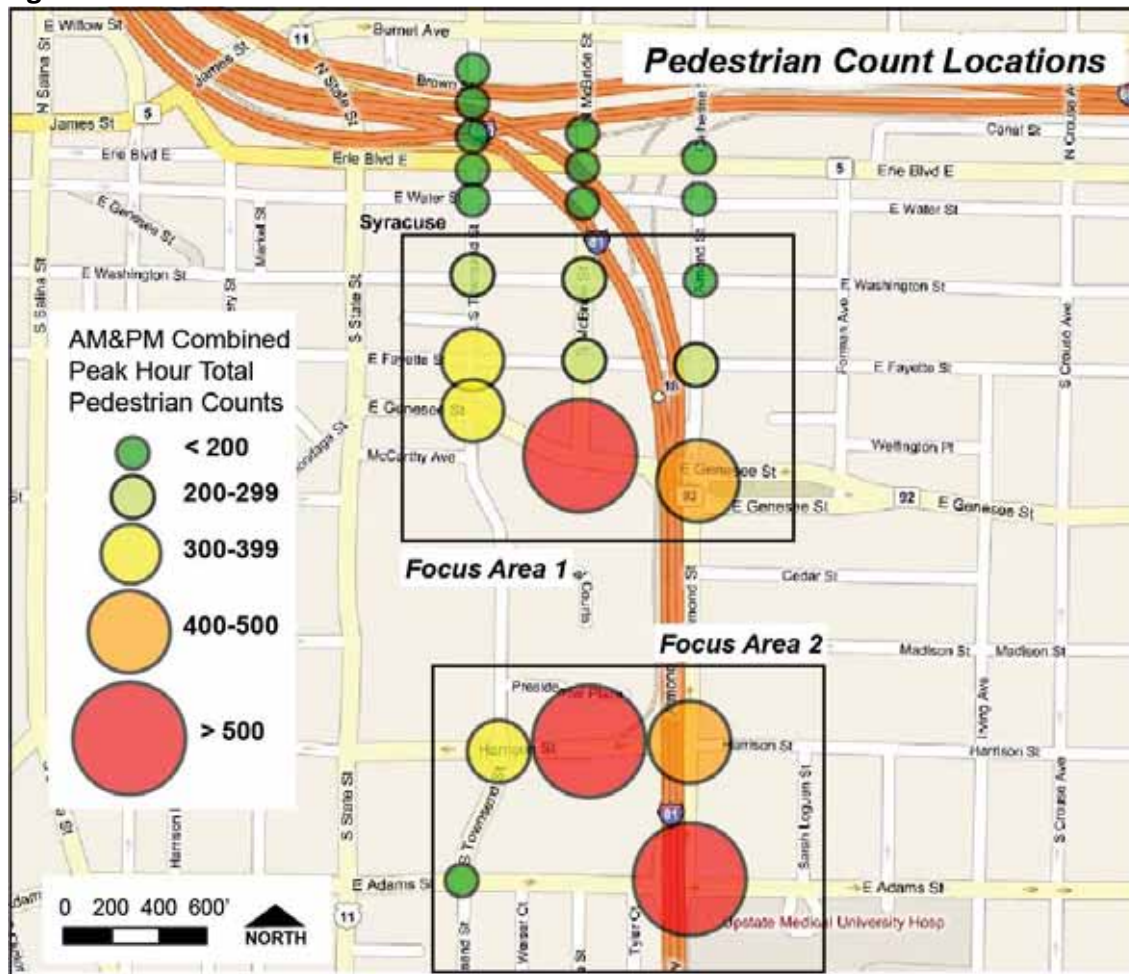
- Meadowbrook Avenue

¹ Syracuse Metropolitan Transportation Council, *Bicycle and Pedestrian Plan*, March 2005.

- Colvin Street (I-81 onramp to Nottingham Road)
- Water Street (Beech Street to Almond Street)
- Salina Street (Dorwin Avenue to Seneca Turnpike)
- Comstock Avenue (Euclid Avenue to Colvin Street)
- Euclid Avenue (Comstock Avenue to Meadowbrook)
- East Genesee Street (from City Line to Salt Springs Road)

The City plans to install bike lanes on East Genesee Street from Salt Springs Road to University Avenue. The Connective Corridor plan includes proposed bike lanes on East Genesee from University Avenue to I-81. Figure 23 illustrates existing and proposed bicycle facilities in the study area.

Figure 22 - Pedestrian Count Locations



Multi-Use Trails

In addition to the on-street bicycle network, there are a number of multi-use trails:

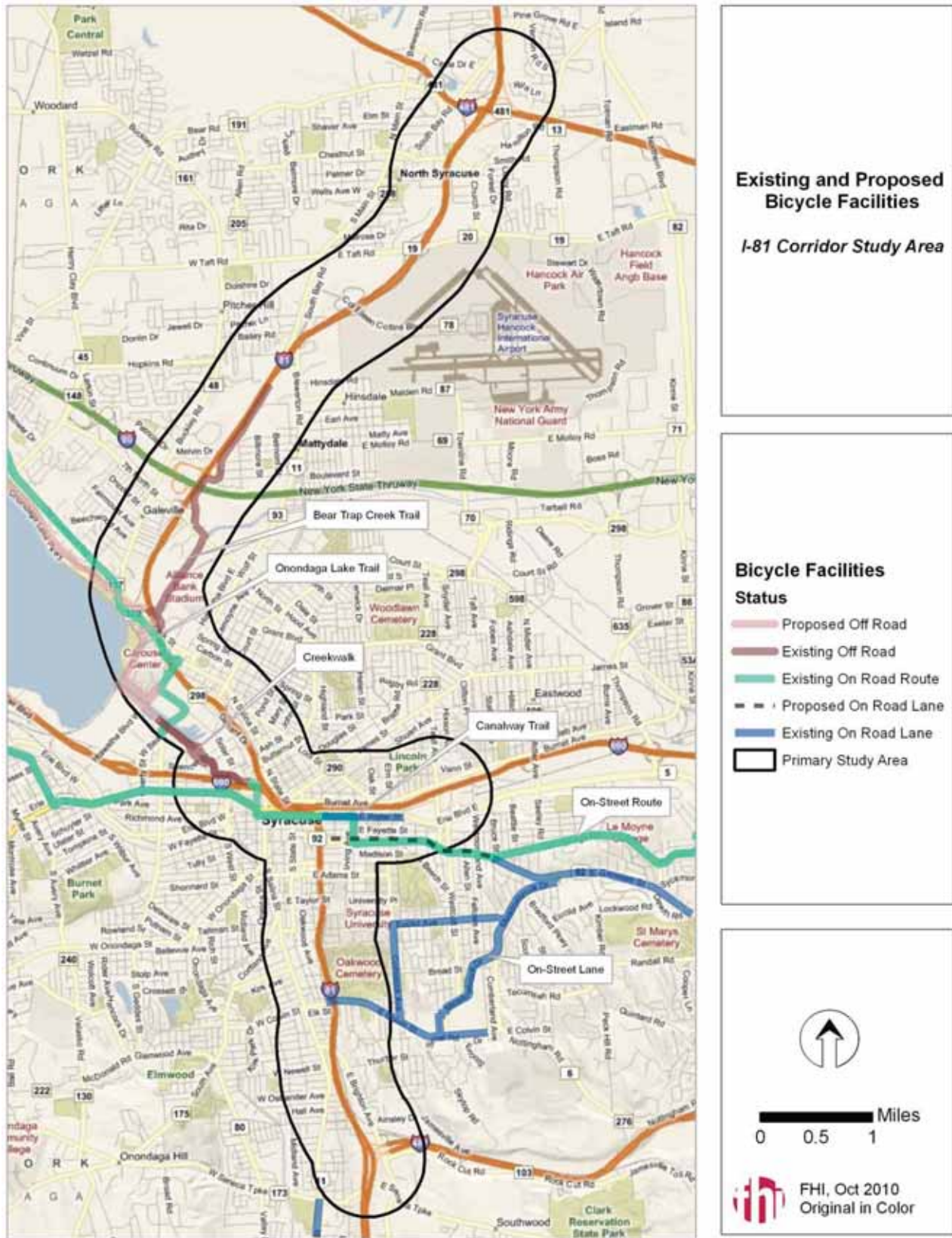
Onondaga Creekwalk: The Onondaga Creekwalk currently runs along Onondaga Creek within the City of Syracuse. Currently the Creekwalk is divided into two sections: one section in Franklin Square and the other in the Inner Harbor; there is a temporary trail connecting these two sections. The Syracuse Creekwalk Phase I Project will extend the existing Creekwalk both to the north and to the south, connecting Armory Square to Onondaga Lake in three phases (Linking Section, Northern Extension and Southern Extension). A permanent link between the two existing trails will also be constructed. Construction began in Fall 2009 and is slated to be complete by the end of 2011. Once expanded, the Onondaga Creekwalk will measure 2.2 miles with an average width of 13 feet. It is planned to connect to the proposed Onondaga County Loop the Lake Trail, as well as to the Erie Canalway Trail. The Syracuse section of the Canalway Trail will connect 15 miles of trails in Onondaga County.

New York State Canalway Trail: Portions of the Erie Canalway Trail have been completed within Onondaga County that link to the end-to-end statewide Canalway Trail. The proposed route exhibits widely differing characteristics and features, as it passes over public streets, moderately maintained utility roads, 36 access roads, multi-use trails, and a waste settling bed. A small segment of this trail is located within the study area south of I-690 as an on-street bike lane. Once complete, the Canalway Trail will connect the DeWitt path in eastern Onondaga County to the Canalway Trail in western Onondaga County in the Town of Camillus.

Bear Trap Creek Trail: The Bear Trap Creek Trail runs along the east side of Interstate 81 from near the New York State Thruway Exit 36 interchange at Seventh North Street to the Kmart Plaza in Mattydale. Constructed during Route 81 improvements in the 1980s, Bear Trap Creek Trail is a 1.5-mile long, 8-foot-wide paved trail, which ultimately, via the proposed Ley Creek Trail section, will connect the northern suburbs to the hub-trail activity in the Carousel Center/Regional Market/P&C Stadium district.

Figure 23 illustrates existing and proposed bicycle and multi-use trail locations.

Figure 23 - Bicycle and Trail Facilities



2.13 Transit

CENTRO, a subsidiary of the Central New York Regional Transportation Authority (CNYRTA), provides fixed route and call-a-bus (para-transit) bus transit services to Syracuse and Onondaga County as well as other municipalities in Central New York that it serves. In fiscal year 2010, the CENTRO transit system served 11.6 million riders. For the purpose of the I-81 Corridor Study, the existing fixed-route bus system in the Syracuse metropolitan area was analyzed.

CENTRO currently operates 97 fixed bus routes in Syracuse and Onondaga County, operating in a series of base routes, which typically operate along arterials, and deviation routes. CENTRO also provides express service along some of its routes that operate during the morning and afternoon peak periods. They provide direct service to/from Downtown Syracuse. The express services typically operate from Park-N-Ride lots, shopping areas, and residential neighborhoods. The majority of CENTRO routes start or end at the current central bus station known as Common Center, at the corner of Fayette Street and Salina Street in downtown Syracuse. CNYRTA is moving forward on its plan to build a new transfer hub in downtown Syracuse. The authority received FTA approval of the proposed site bound by South Salina Street, South Warren Street and Adams Street which is about two blocks south of the existing "Common Center."

CENTRO also operates from the William F. Walsh Regional Transportation Center (RTC). The RTC is Central NY's one-stop transportation center providing service to other cities. The RTC is home to train and bus services provided by Amtrack, Greyhound and Trailways. This assessment however focuses on the local Syracuse transit characteristics.

Of special interest in the Syracuse area are the following two other transit routes:

- Connective Corridor - CENTRO operates a free shuttle along the Connective Corridor. This is a two-mile long bus route connecting between University Hill, Downtown and Armory Square.
- Syracuse University - CENTRO operates eleven bus routes to Syracuse University. The routes connect to various on-campus locations, as well as off-campus destinations.

Park-N-Ride

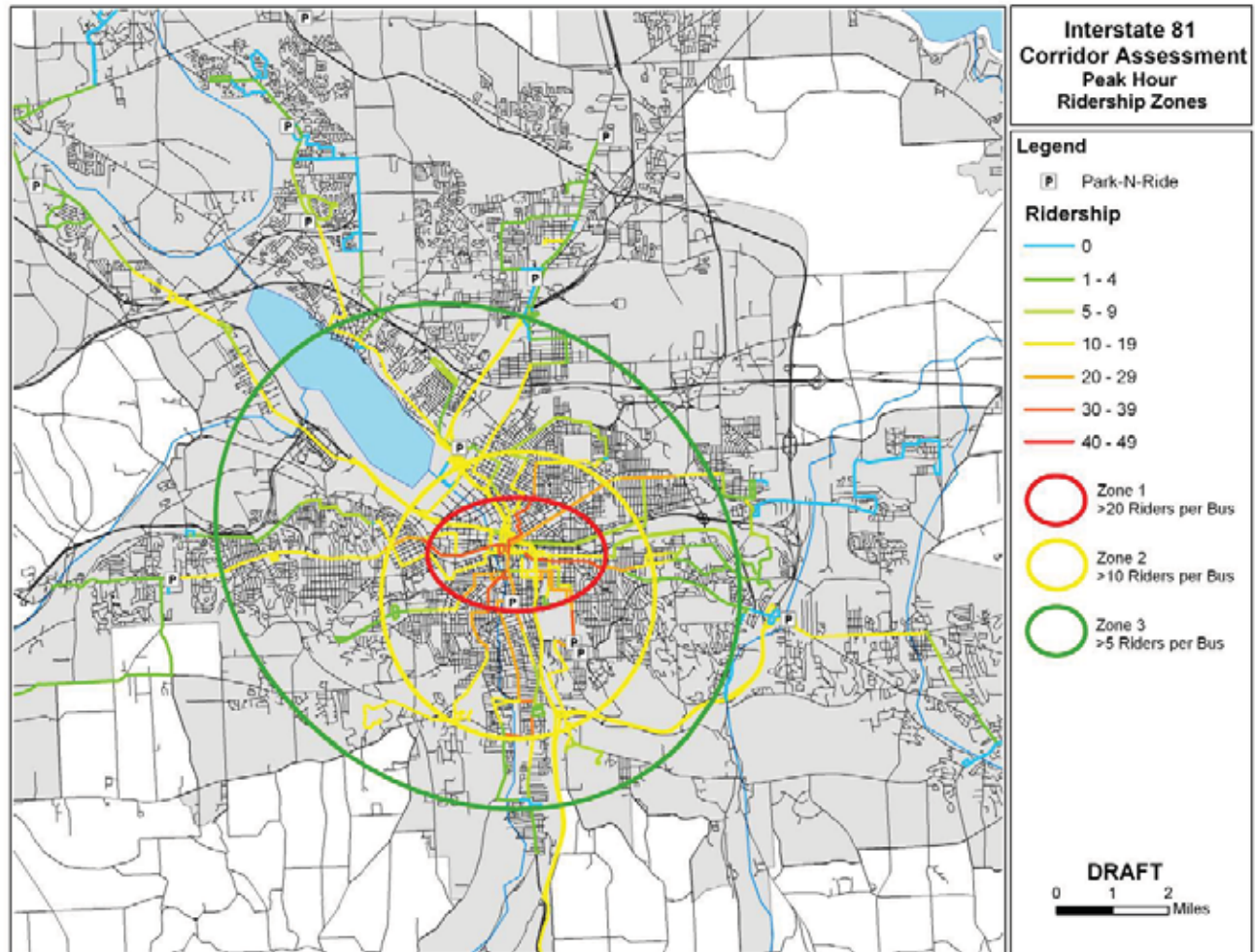
CENTRO currently has fourteen Park-N-Ride lots in the Syracuse metropolitan area where they offer bus stops. Amenities typically include a bus shelter with a posted bus schedule.

Bus Ridership

Boarding and alighting data (counts of people getting on and off the bus) was collected for this study to help identify ridership trends. The ridership data obtained was summarized into peak period and daily ridership in order to understand the system operation as a whole. Mapping tools were used to visualize passenger loads during the peak and midday off-peak periods and

these loads are illustrated on Figure 24 – Peak Hour Transit Ridership Zones and Figure 25 – Daytime Off-Peak Transit Ridership Zones.

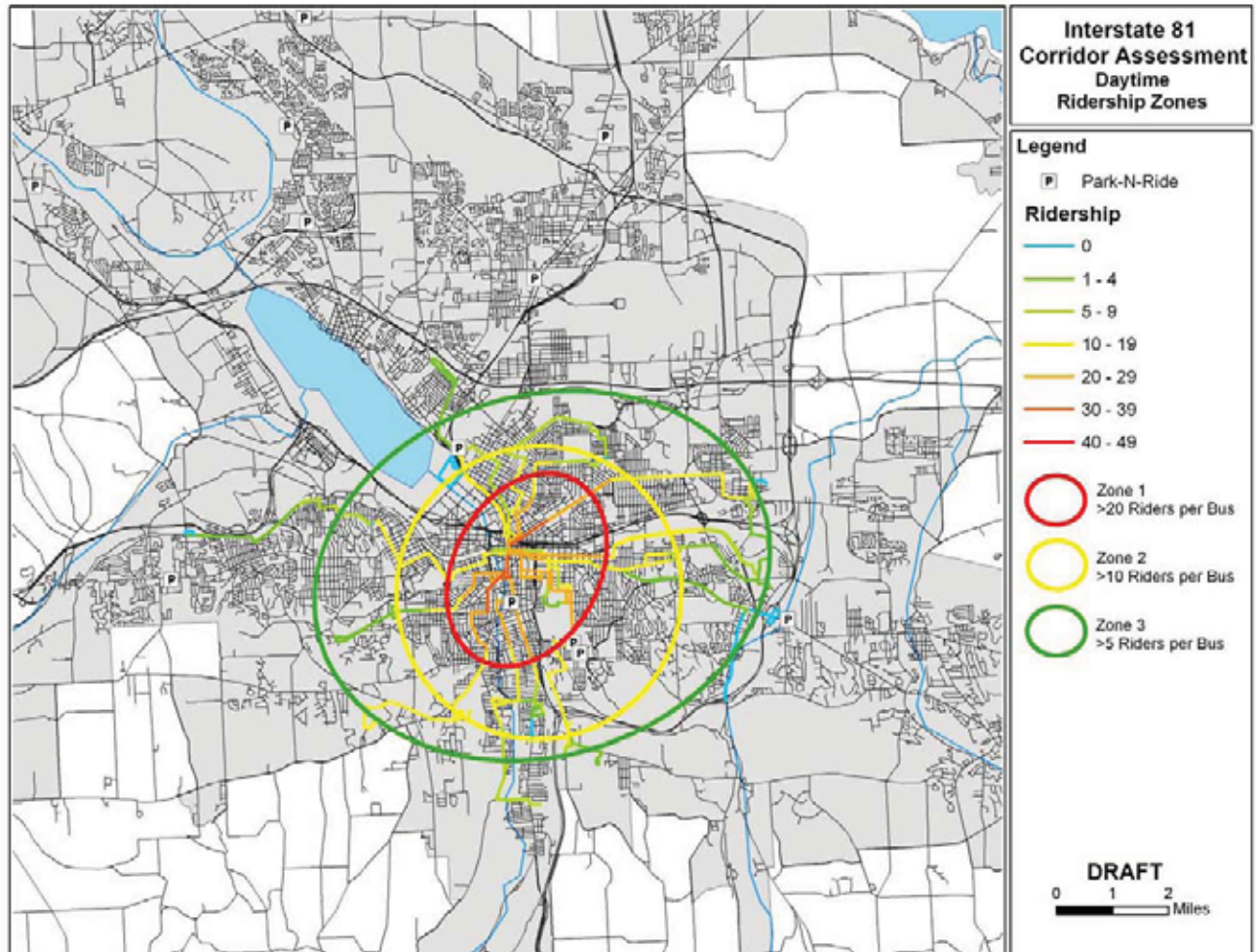
Figure 24 - Peak Hour Transit Ridership Zones



Zone 1: Zone 1 is centered over the downtown bus hub at the intersection of Salina Street and Fayette Street and represents ridership values greater than 20 riders per bus during the peak periods. Routes in Zone 1, especially those that show higher than average passenger loads throughout the entire day, may be suitable for more high-frequency service such as bus rapid transit (BRT), light rail transit (LRT), trolleys.

Zone 2: represents the area of the system where average passenger loads are between ten and twenty people per bus. Zone 2 has greater passenger loads during the peak periods due to the number of commuters using the system.

Figure 25 - Daytime Off-Peak Transit Ridership Zones



Zone 3: During peak periods in this zone, there are more commuters riding the bus and encompass a larger area with passenger loads between five and ten people per bus. Routes in Zone 3 with higher commuter loads may be candidates for BRT or other improvements to increase ridership.

Outside of Zone 3: The area outside of Zone 3 represents the system where average passenger loads are less than 5 people per bus. In many cases, the very end of the routes averaged zero riders per bus during both the peak period and daytime off-peak period.

Summary - Transit

Based on the data analysis and observations made in the field, several conclusions can be drawn. The core ridership within the transit system is made up of transit-dependent markets such as densely-populated and low income neighborhoods, Syracuse University and institutions (health care). Average passenger loads remain at less than twenty people per bus on routes to and from suburban locations. Park-N-Rides are not generating a significant number of riders.

Commuters represent only a small portion of overall system ridership. According to the 2005 Transportation Profile for Onondaga County, 2.2% of the county population uses public transit as their mode choice for travel and 7% of the City of Syracuse population uses public transit as their mode choice for travel. Table 4 shows the transit mode share for comparable cities' in upstate New York for comparison purposes.

Table 4 - Transit Mode Share

	City	Greater Metropolitan Area
Syracuse	7%	2.2%
Rochester	8%	2.0%
Buffalo	12%	3.5%
Albany	13%	3.2%
New York City	25%	
San Francisco, CA	31%	9.5%
Dallas, TX	5%	1.8%
Philadelphia, PA	25%	8.7%
Atlanta, GA	15%	3.6%

2.14 Rail, Airports, Ports and Intermodal Connectivity

Airports

Hancock International Airport is the only airport providing commercial air passenger service and air cargo service. Hancock International Airport is owned and operated by the City of Syracuse and is located off of I-81 at Exit 28 – Airport Blvd. In addition to commercial passenger service, Hancock provides an extensive air cargo operation. This includes U.S. Customs inspection service, as well as general aviation services for private pilots and military operations.

Rail Service

The National Railroad Passenger Corporation (Amtrak) provides intercity rail passenger service in the Central New York Region at the William F. Walsh Regional Transportation Center located off of I-81 at Exit 23 – Park Street with limited connectivity to the CENTRO bus system. There is one major (Class 1) rail freight carrier, CSX Transportation; one regional carrier, New York, Susquehanna & Western Railway; and one short line railroad, Finger Lakes Railway.

A significant segment of the CSXT business is the rail/truck intermodal freight terminal located in the DeWitt rail yard. The DeWitt yard is a major intermodal facility serving the Northeast and is the only terminal of its type between New York City and Buffalo. This intermodal center is located northeast of the I481/I690 interchange.

Ports

The Central New York portion of the New York State Canal system crosses Onondaga County north of the City of Syracuse connecting Onondaga Lake, Oneida Lake and Lake Ontario. The New York State Canal Corporation is responsible for the overall operation and maintenance of the New York State Canal System. The Syracuse Canal Port located at the Syracuse Inner Harbor is within the project study area. It is located southwest of I-81 between Bear Street and W. Kirkpatrick Street.

2.15 Intermodal Connectivity

This section summarizes observations on multi modal interconnectivity within the overall study area from assessment of the individual modes that comprise the overall transportation network. These modes include: vehicular traffic, transit services, pedestrians and bicyclists, Amtrack rail service, CSX and regional freight service along with access to the regional airport (Hancock International Airport) and the Onondaga Lake Inner Harbor.

Key findings include:

- The Dewitt rail yard is a significant regional hub for rail to freight breakdown.
- Amtrack rail connectivity includes access to the CENTRO bus system, and the airport, as well as pedestrian and vehicular access.
- Area municipalities have comprehensive plans for multi-use trails, roadside bike lanes and pedestrian systems (ADA compliance).
- The CENTRO bus system provides a mode share (how many people use the bus system) of 2.2 percent of county population to travel to work.

2.16 Summary

Highway Design Features

Multiple design deficiencies are concentrated in the general vicinity of the I-81/I-690 Interchange and the adjacent service interchanges on I-81 and on I-690. These interchanges are all closely spaced and have a complex and unique layout for access to and from downtown.

Highway and Bridge Infrastructure Conditions

Given the age of the roadway infrastructure the majority of the highway will need either major rehabilitation or reconstruction by the design year 2040. Bridge conditions will continue to deteriorate until bridges need to be posted for reduced loads, and eventually closed. Based on the age of the bridges by year 2050, over 80% of the bridges in the study corridor will have met or exceeded their expected service life.

Traffic Volumes and Congestion

Along I-81, most of the present traffic capacity issues extend from north of Hiawatha Boulevard to the East Adams Street Southbound on-ramp encompassing the I-690 interchange and the Downtown/University Hill access. On I-690, capacity issues extend from Rte. 695 on the west to near the Midler Avenue interchange.

Accident History

The expressways in the study corridor experience a relatively high rate of accidents when compared to statewide averages. Accident rates are above the statewide average in the section of I-81 in the downtown area from Hiawatha Boulevard south thru the I-690 interchange to the E. Adams Street/Harrison Street interchange (Exit 18). Other segments include sections of I-81 north of downtown up to the North I-481 interchange (Exit 29). Most of these areas overlap

with the PIL (Priority Investigation Locations) locations which represent areas of historical accident problems.

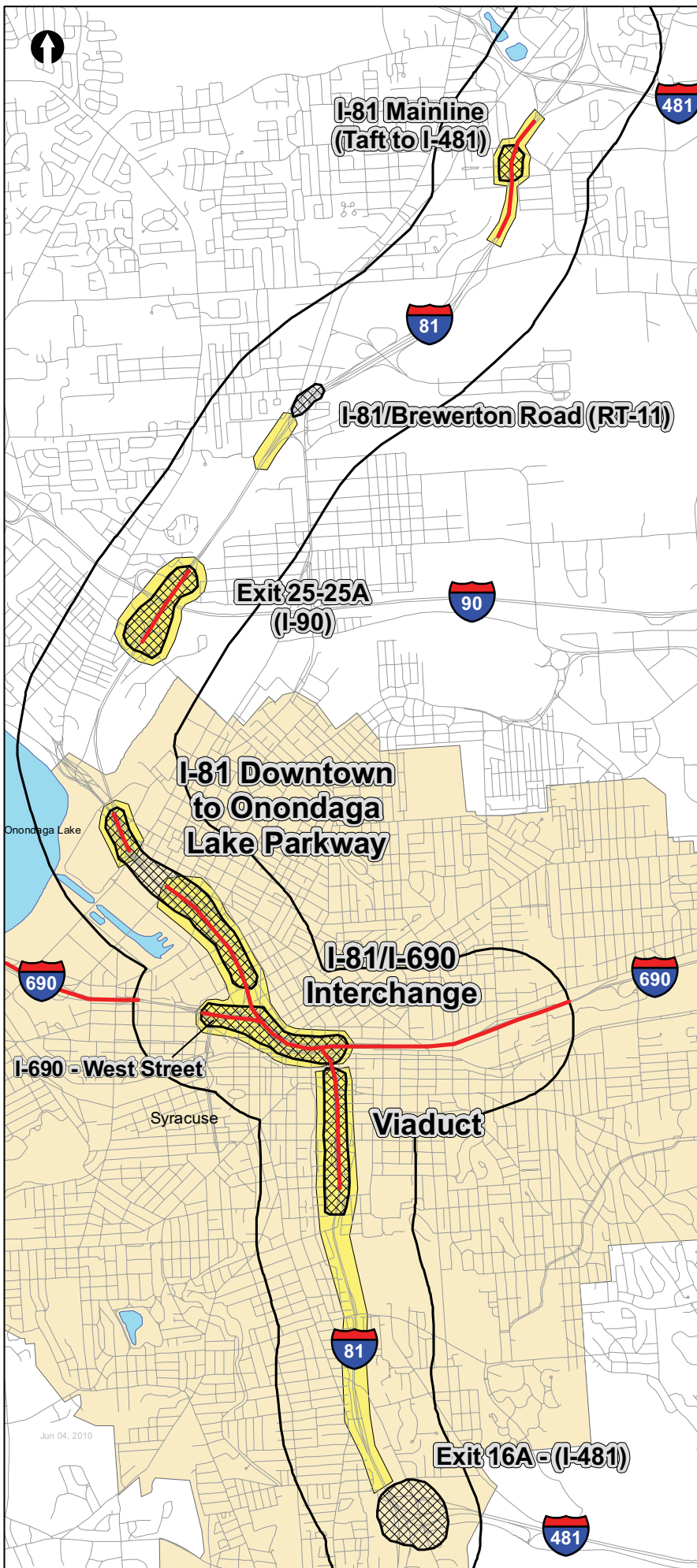
Multi Modal Interconnectivity

Overall the Syracuse region has many inter-modal activities already in place (like the DeWitt intermodal freight facility) and plans in place to improve the multi use trail system, bike lanes and pedestrian accommodations. Intermodal connections are in place for the Amtrack station, the CENTRO bus system and the airport. Recent initiatives like the Connective Corridor project also provide multi modal functions.







Figure 26 summarizes the key areas with roadway deficiencies along the primary study area, I-81 Corridor for traffic Level of Service below C, Non-Standard or Non-Conforming design features and areas with above average accident rates.

Interstate 81 Corridor Assessment

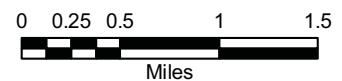
Figure 26 -
Primary Study Area -
Key Area Roadway Deficiencies



Legend

-  Key Areas With Traffic Level of Service Below C
-  Key Areas of Non-Standard or Non-Conforming Design Features
-  Key Areas with Above Average Accident Rates
-  Primary Study Area
-  Waterways
-  City

Note: For Bridge Deficiencies see Figures 5 and 6.



3.0 LAND USE AND ECONOMIC CONDITIONS

The purpose of this section is to document the land use and economic conditions in the general vicinity of the project corridor and specifically land use directly adjacent to the I-81 primary study area. This information will be used as reference information in developing and evaluating development strategies in future stages of this corridor study. This information, particularly the land use information, will help identify “constraints” to modifying the corridor like neighborhoods, parks and community facilities. It will also be used as baseline data for evaluating possible impacts to land use and economic centers.

The data herein describes existing conditions for land use and also discusses future land use planning efforts prepared by the adjacent municipalities. Information on land use provides an understanding as to how the distribution and character of development affects traffic patterns. Traffic is generated by drivers traveling between residential, employment and commercial areas. The more concentrated the area of residential and/or employment and the further the distance between them, the more traffic can be expected. As land use changes over time, travel conditions such as the degree of congestion and travel times, can be affected. The opposite is also true. Heavy traffic on the highways feeding the local roads in the study area affects the quality of life in the corridor communities.

The land use and economic assessment for this study examined the following information:

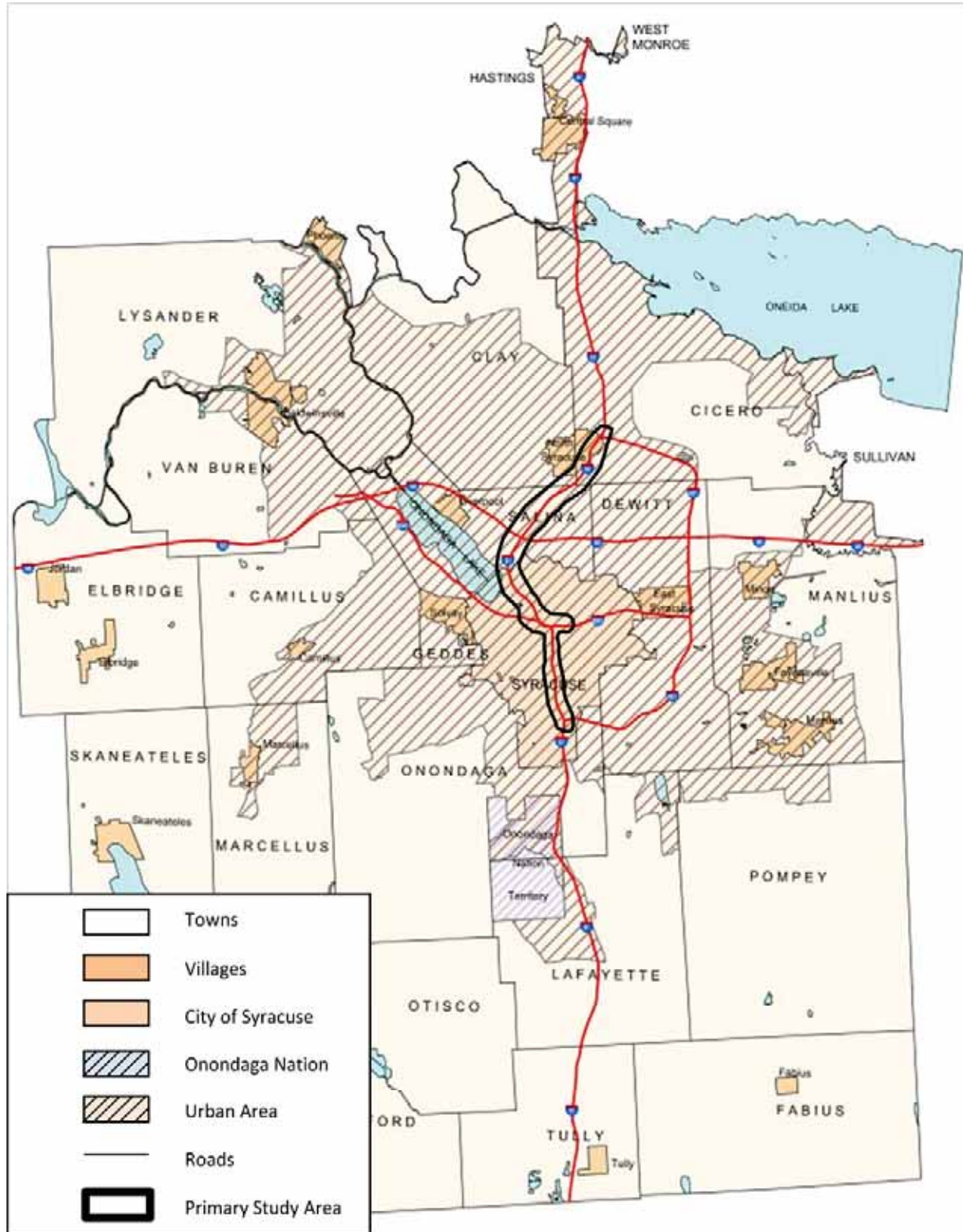
- existing land use, policy and zoning within the corridor,
- roads connectivity and access to the community,
- areas where land use is expected to change, and
- the local economy

Data on land use and development potential was derived from:

- Interviews with planning staff of study area municipalities,
- field observations,
- development of Geographic Information System (GIS) mapping of the corridor,
- literature review and analysis, and
- future land use plans.

Figure 27 shows the SMTC Metropolitan Planning Area along with the location of each of the towns and City areas the primary study area of I-81 corridor traverses.

Figure 27 – SMTC Metropolitan Planning Area



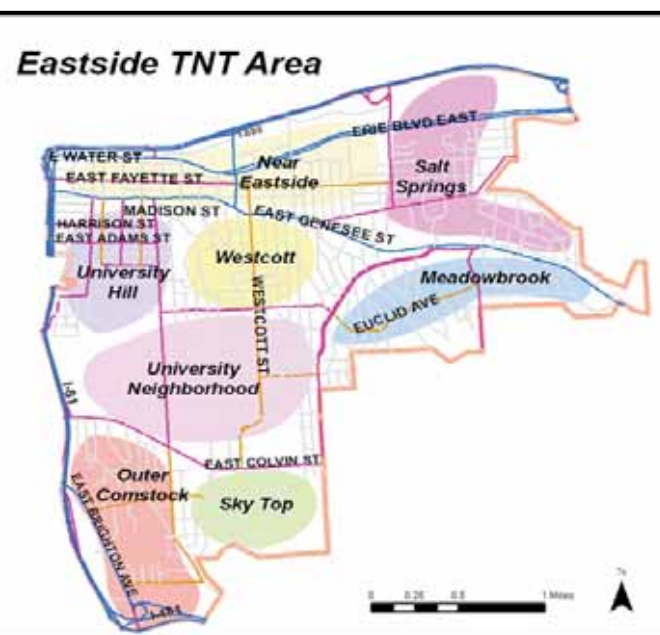
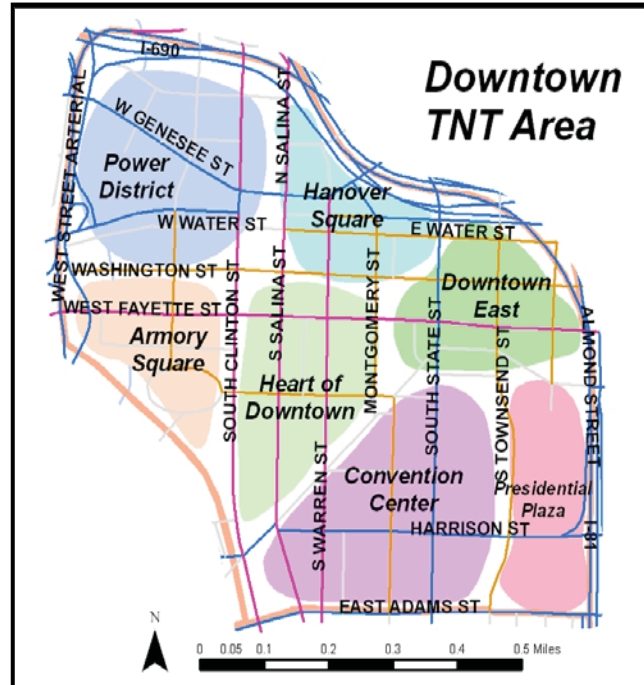
3.1 Patterns of Land Use Today

City of Syracuse

The City of Syracuse *Land Use Plan 2025* was the main information source for the assessment of existing land use patterns. The plan looks, for planning purposes, at each of the City neighborhoods. These neighborhoods were defined as part of the City’s Tomorrow’s Neighborhoods Today (TNT) program. The review of the City neighborhoods along the I-81 corridor provides the base information for developing and evaluating strategies in future phases of this study.

The Downtown TNT Area

The Downtown TNT Area is bounded by I-690 to the north, I-81 to the east, E. Adams Street to the south, and West Street to the west. Downtown Syracuse is the region’s central business district (CBD). The most prevalent land uses are office buildings, parking lots and civic uses such as City and New York State offices.

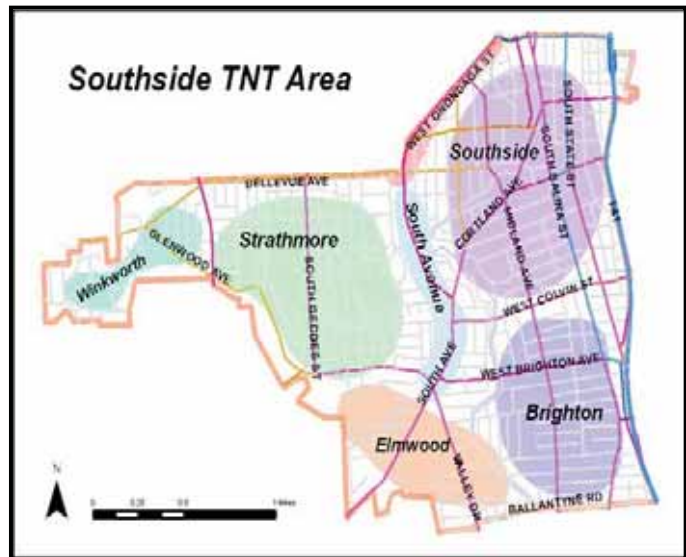


Eastside TNT Area

The Eastside TNT Area has a number of major medical institutions and includes the universities located on University Hill in particular Syracuse University and SUNY-ESF which dominate the neighborhood. Residential areas mostly east of the institutions cater to the student and professional populations while district business areas are present in the center north.

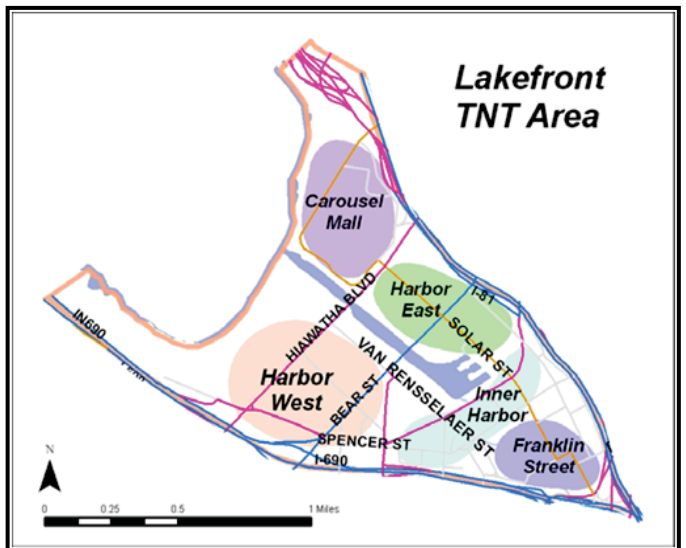
Southside TNT Area

The Southside TNT Area is located south of Downtown, west of I-81, and immediately south of the Downtown TNT area. Much of the Southside area is covered by housing, ranging from single-family homes on small lots along South Salina Street to the stately homes of the Strathmore area. Onondaga Park and Elmwood Park are located in this neighborhood.



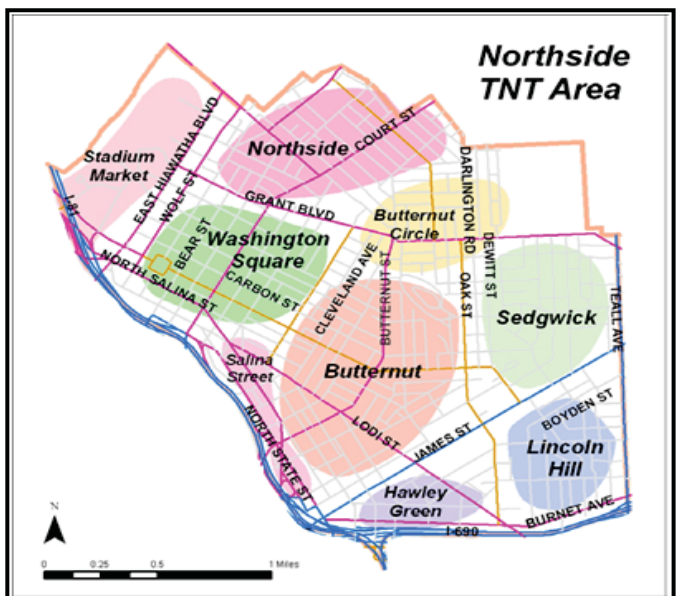
Lakefront TNT Area

The Lakefront TNT Area is bounded by Onondaga Lake northwest, I-690 to the south, and I-81 to the east. Vast tracts of underutilized land and buildings provide significant opportunities for redevelopment in the Lakefront area. Acknowledged as a Strategic Economic Area within the city’s Comprehensive Plan, the Lakefront has opportunities for major transformation. The Inner Harbor dominates the central portion of this neighborhood and is the centerpiece to potential redevelopment efforts. The Carousel Center and Franklin Square are prominent features of this neighborhood.



Northside TNT Area

The Northside TNT Area encompasses the portion of the city located east of I-81, north of I-690, and west of Teall Avenue. The Northside contains some of the city’s most diverse residential neighborhoods and commercial districts. Overall the neighborhood is mostly dominated by residential areas with distinct business districts along some of the major arterials. The original street grid remains intact, as do many of the neighborhood’s historic residential and commercial buildings. The residential portion of Washington Square



has experienced high rates of conversions from single and two-family to multiple family units. Three neighborhood business districts exist within the Northside: the Grant Boulevard business district, Butternut Street business district, and the Little Italy district along north Salina Street.

Towns of Salina, Clay, and Cicero, and Village of North Syracuse

Salina, Cicero, Clay and the Village of North Syracuse are mostly suburban towns located north of the City of Syracuse. Parts of each jurisdiction fall adjacent to the primary study corridor, I-81. Each of these areas is generally residential, typically with more dense/intense development located near the Interstate interchanges and along other major transportation corridors. The general location of each area in relation to the I-81 corridor is described here.

- Established in 1809, Salina is located north of Syracuse along the I-81 corridor. Salina consists of five small suburban communities which are known as Mattydale, Liverpool, Lyncourt, Galeville and a portion of North Syracuse. I-81 bypasses major population centers and provides access to the town thru a series of I-81 exits. Land use is largely residential along the I-81 corridor.
- Cicero is located on the southern shore of Oneida Lake, a northern suburb of metropolitan Syracuse, Cicero has access via I-81, I-481 and US 11. I-81 bypasses North Syracuse on the east before intersecting with I-481 at the northern project study limit. The Town of Cicero, similar to Salina, is largely residential. The existing land use is most dense or intense in the areas around I-81 and US 11.
- The Town of Clay is the northernmost and largest town of the nineteen towns in Onondaga County. The I-81 corridor just “clips” the southeastern corner of the town just south of North Syracuse and therefore land use has not been investigated.
- The Village of North Syracuse is bisected by the Towns of Clay and Cicero. The I-81 corridor runs along the southeastern edge of the village. The Village of North Syracuse Comprehensive Plan (2004) is focused on the centers and transition areas identified in the plan, largely along the US 11 corridor which runs through the center of town.

3.2 The Highways and the Neighborhoods

I-81 and I-690 define the boundaries of numerous city neighborhoods and at least one borders the five neighborhoods that abut I-81 along with I-81 passing through the towns of Salina, Clay and Cicero. For the towns, the interstates offer accessibility and connectivity to the larger region. As such, it is a major influence on the location of employment, shopping and residential uses.

I-81 and I-690 both offer residents convenient access to and from many abutting neighborhoods and the larger Syracuse metro area. Seven of the eight neighborhoods or towns that abut the highways have an interchange within the study limits that serve the neighborhood excluding Clay which has access via the I-81 Taft Road interchange and State Route 690 north of the primary corridor study limits. Based on review of existing traffic operations, the University Hill neighborhood is noteworthy as being somewhat underserved by the expressway system with most of the traffic concentrated at the East Adams/Harrison Street exit on I-81.

Overall the interstate highway system provides functional access to the City and adjoining towns and neighborhoods, with the possible exception of University Hill. The highway system is a boundary to many of the neighborhoods and communities and in some locations inhibits access and the social connection between them.

3.3 Future Land Use and Known Development Plans

Onondaga County

The 2010 Development Guide for Onondaga County is the long range vision and strategy document for the county. Syracuse-Onondaga County Planning Agency (SOCPA) intends to update the Guide in the coming months to extend it into the next decade. However, although the previous Guide was adopted by Onondaga County as the official document, none of the Towns or Villages embraced and adopted the Guide. While cities, towns and villages are responsible for controlling land development, the County is responsible for funding, constructing and maintaining primary infrastructure. The Guide focuses attention on community assets, articulates a vision regarding settlement patterns and resource protection, sets goals, strategies and policies, and presents a Land Use Vision. Figure 28 shows the Land Use Vision for Onondaga County.

City of Syracuse Overview

The City of Syracuse *Land Use Plan 2025* (Draft) documents locations where land use in the future could be quite different than today. The plan both notes trends in land development and spells out the vision that the City has for each. The following summarizes the findings from that plan for the five neighborhoods which abut the primary study area, I-81.

Downtown TNT: Downtown Syracuse is continuing to evolve towards an urban renaissance with successes in urban residential and commercial redevelopment efforts. This is due in part to the nation-wide renewed interest in urban living and recent private investments in the city. Several new private developments have occurred that changed properties from mostly offices to a mix of housing and retail. Syracuse University worked to bring students and classrooms Downtown by improving the linkages with University Hill through the “Connective Corridor” transit initiative.

Eastside TNT: Land use patterns in the Eastside TNT area are strongly influenced by the major medical institutions and universities located on University Hill. This area is experiencing economic growth. More than \$700 million in new capital projects are planned to be completed in the future to expand and upgrade facilities. Residential and commercial areas nearest to these institutions cater to the local student and professional population. Residential neighborhoods cover the eastern areas leading to the cities edge.

Land Use Vision

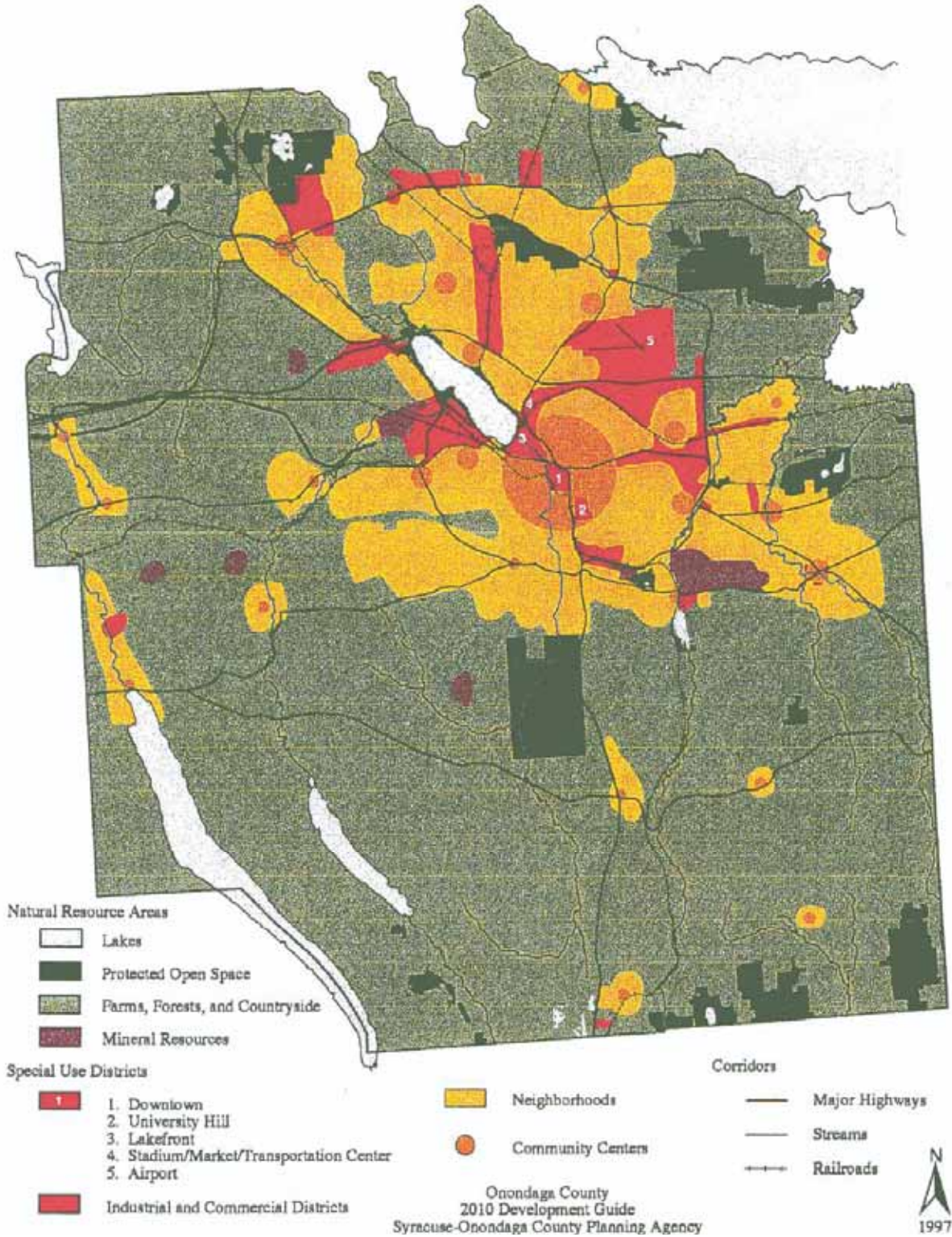


Figure 28 - Onondaga County Land Use Vision

Southside TNT: The Southeast Gateway has drawn redevelopment interest. This is because of its prime, central location and its proximity to heavily populated residential neighborhoods. Pioneer Homes, and the Central Village Apartments located at the intersection of University Hill and Downtown, and along South State Street, represent one of the country's oldest public housing complexes. This urban neighborhood is expected to benefit from the upgrades and services available as part of the proposed Southeastern Gateway redevelopment.

Lakefront TNT: Vast tracts of underutilized land and buildings provide significant opportunities for redevelopment in the Lakefront area. This area is acknowledged as a Strategic Economic Area within the City's Comprehensive Plan. Although many redevelopment initiatives are still on the drawing board, the neighborhood has experienced development within the past ten to twenty years that give the area its current character and identity. These initiatives include Carousel Center and its expansion efforts, the Inner Harbor beautification and infrastructure improvements, and the Franklin Square and Creekwalk initiatives.

The City of Syracuse has also developed a master plan for the Lakefront area. The Master Plan envisions the Lakefront as a mixed-use New Urbanist community. A New-Urbanist neighborhood is one where there is a new town square with businesses surrounding it and a variety of high-density housing. The Inner Harbor is envisioned as a waterfront promenade with specialty retail, shops, and dining opportunities. One potential development scenario, the DestiNY USA proposal, envisions much of the Lakefront as a premier retail and entertainment destination.

Northside TNT: The Stadium market Center area has recently developed as a significant commercial area that attracts people from throughout the region. The Regional Market is active year-round, and the Regional Transportation Center is home to Syracuse's Amtrak station and charter bus terminal. Alliance Bank Stadium is located just east of the Regional Transportation Center; industrial and vacant properties comprise the rest of the Stadium Market area.

The commercial portions of the Washington Square neighborhood have experienced a lack of investment and many industries and businesses have closed operations. Opportunities for the adaptive reuse of these structures are promising. Washington Square is one of the oldest neighborhoods in Syracuse. The historic street grid remains intact, as do many of the neighborhood's historic residential and commercial buildings. The residential portion of Washington Square has experienced high rates of conversions from single to two-family to multiple family units.

The Hawley Green neighborhood (also referred to as the LBJ Triangle) is located within the confines of Lodi Street, Burnet Avenue, and James Street. Hawley Green has a well preserved eclectic mix of Victorian-style homes, apartments, and row-style townhouses.

This neighborhood should continue its evolution as a dense urban neighborhood with street scale storefronts and dining establishments to complement its existing development pattern.

Little Italy consists of several North Salina Street blocks located south of the Lodi Street intersection, along with immediately surrounding areas. Streetscape improvements have helped to unify the corridor and spur private investment. Most street-level storefronts are occupied by retail and dining establishments, but the upper floors of many properties are underutilized and provide opportunities for conversion to residential or office space.

Towns

Salina, Cicero, Clay and the Village of North Syracuse are mostly suburban towns located north of the City of Syracuse. Parts of each jurisdiction fall adjacent to the primary study corridor, I-81.

- Town of Salina's land use is largely residential along the I-81 corridor and no future plans for change were noted.
- The Town of Cicero Comprehensive plan does identify some land use change along the I-81 and the I-481 corridor, mostly adding commercial and industrial uses along these corridors.
- The Town of Clay just barely crosses the southeast corner of the town and therefore future land use has not been investigated.
- The Village of North Syracuse Comprehensive Plan (2004) is focused on the centers and transition areas identified in the plan, largely along the US 11 corridor which runs through the center of town.

Summary – Future Land Use

Even with an official Countywide Land Use Vision, implementation is up to individual jurisdictions. Each one operates under home rule and makes its own planning decisions. Based on interviews with various planning agencies and stakeholders, this planning autonomy makes coordinated regional planning difficult. Home rule stands as one of the great challenges to effect corridor-driven land use changes, as I-81 spans multiple jurisdictional boundaries. Consequently, local jurisdiction's future land use plans, especially in the City of Syracuse, are especially important.

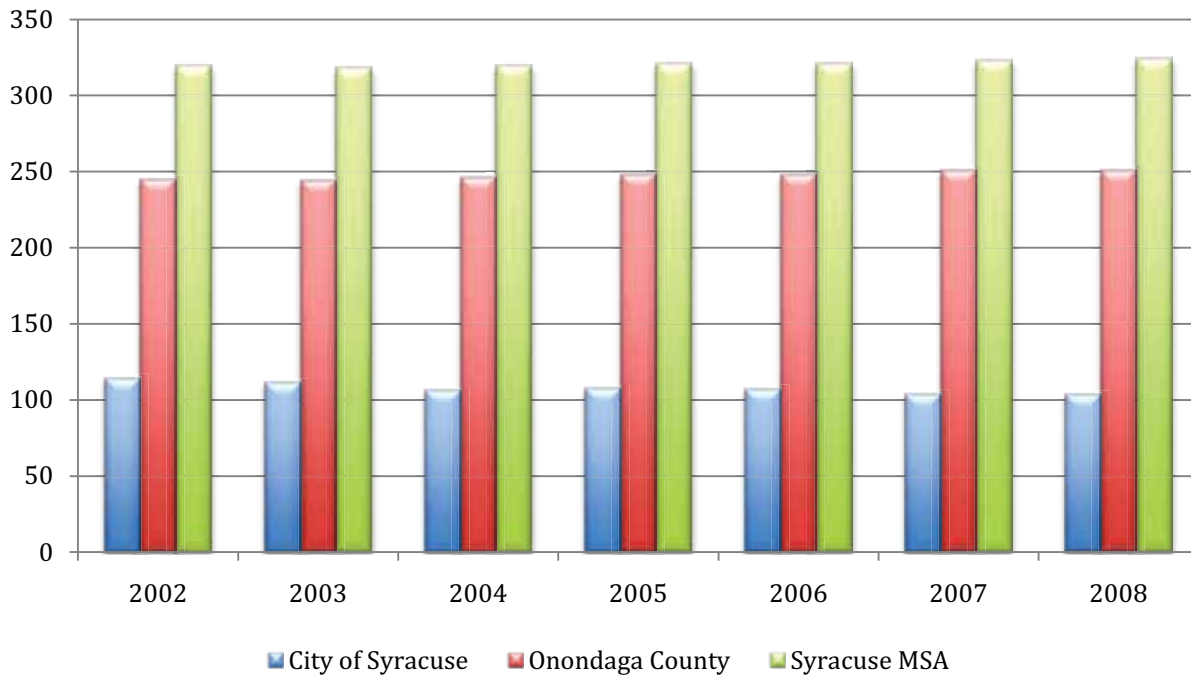
3.4 Syracuse Metro Area Economy

The City of Syracuse and Onondaga County are faced with some economic and demographic challenges. The City of Syracuse population declined by 15.7 percent between 1990 and 2008. Onondaga County also experienced decreasing population, a reduction of 3.5 percent. There has been very little to no growth in population in the past 20 years.

Total employment in the City of Syracuse has decreased 9.6 percent between 2002 and 2008, from 114,134 to 103,227 employees. As shown in Figure 29, Onondaga County's employment

increased from 244,613 in 2002 to 251,169 in 2008. The Syracuse MSA has increased employment by 1.5 percent, from 319,700 to 324,600 employees during the time period.

Figure 29: Total Employees – City of Syracuse, Onondaga County, and Syracuse MSA (thousands)

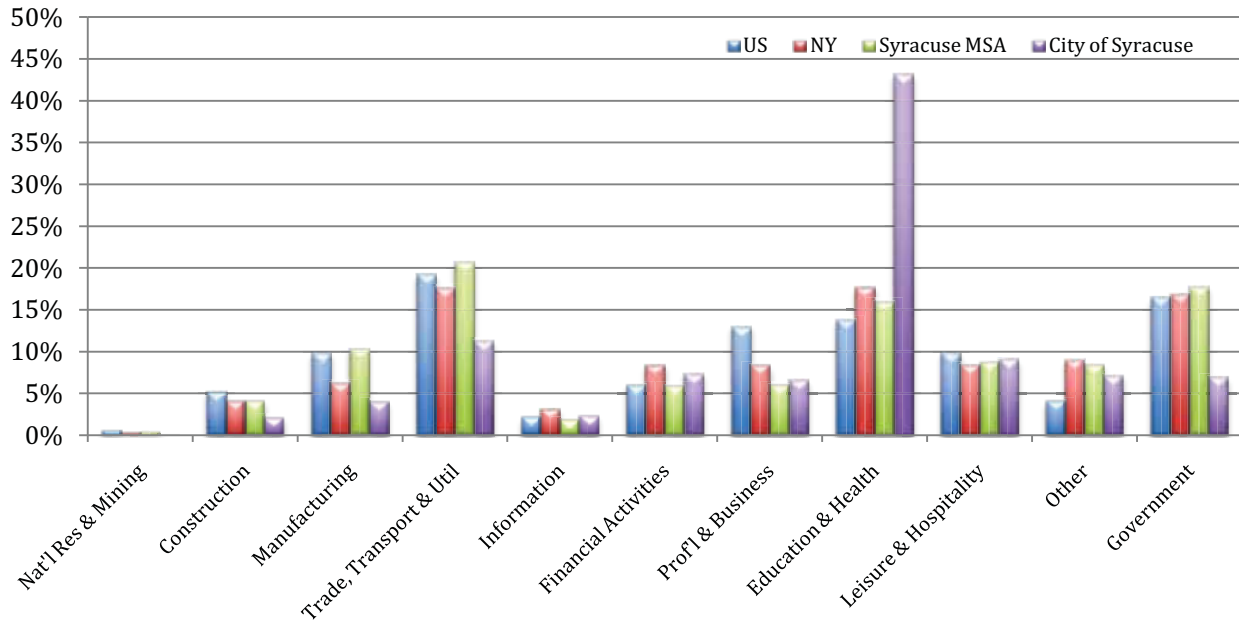


Source for Onondaga County and Syracuse MSA: Bureau of Labor Statistics, Total nonfarm employees, not seasonally adjusted. Note: data are for nonfarm employees.

Source for City of Syracuse: Bureau of the Census, LED OnTheMap Origin-Destination Database.

The largest employment sector in the City of Syracuse is the education and health, representing 43.2 percent of total employment in the City, or 44,590 employees (see Figure 30). This is consistent with the largest employers in the Syracuse area: St. Joseph's Hospital Health Center employs 3,150 people and Crouse Hospital employs 2,400 people. Other large employers in this sector include Syracuse University with 5,925 employees and the State University of New York (SUNY) Upstate Medical University, which is the largest employer in the City with 6,400 employees. Medical education facilities and hospitals represent half of the top six employers in the Syracuse area, helping to explain the large percentage of employment in this industry. The remaining industry categories combined account for less than half of the total employment in the City. Trade, transport and utilities represent the next largest share of total employment in the City of Syracuse after education and health, 11.3 percent or 11,634 employees.

Figure 30: Percent of Employment by Industry 2008



Source: 2008 preliminary data from Quarterly Census of Employment and Wages, State of New York and U. S. Bureau of Labor Statistics; <http://www.labor.state.ny.us/stats/ins.asp>.

Note: "Other Services" includes Other Services, Unclassified, and Administrative & Waste Services.

The average annual wage for the Syracuse metro area (MSA) employees in 2008 was \$40,551 (see Table 5). This was lower than the statewide average of \$60,384, but New York City wages push the average state wage upward. New York City's greater concentration in higher paying industries such as Financial Services and Information contributes to this higher average wage. Compared to other upstate New York metro areas, the Syracuse MSA's wages are relatively in line. The Albany area reported an annual wage that was \$3,000 more than the wages in Syracuse. The national average wage for MSAs of \$47,194 is higher than the wages reported in the upstate New York MSAs.

Table 5: 2008 Wages

	2008 Average Annual Wages
Syracuse MSA	\$40,551
Rochester MSA	\$41,821
Albany-Schenectady-Troy MSA	\$43,941
Buffalo-Niagara Falls MSA	\$39,018
New York State	\$60,384
United States – Total MSAs	\$47,194

The unemployment rate for December 2009 is estimated to be 9 percent, comparable to the New York State rate for that month. In addition, the increase in the unemployment rate from the 2008 level was less significant in the City of Syracuse than it was for either the state or nation as a whole, suggesting that Syracuse is faring better during the economic recession than other parts of the country or the rest of the state. Although the rate is still much higher than the approximately six percent rates experienced by the city between 2004 and 2008, the city does not appear to be worse off than the nation from an unemployment perspective.

Commercial vacancy rates in the Syracuse area have increased from their 2008-2009 levels, but not significantly so in the Central Business District. Class A, B and C office space experienced vacancy rates of 16.3 percent, 22.7 percent, and 54.9 percent, respectively. Other submarkets in the city have experienced larger increases in vacancy over the past few years than the CBD. Retail vacancies range from 9.6 to 20 percent, depending on the type of space. Downtown retail vacancy was 15 percent this past year. For industrial space, vacancy rates are highest in the eastern part of the Syracuse area (17.25%) and lowest in the south (9.01%).

The median home price in the Syracuse MSA is approximately \$100,000 and has been for several years. The Rochester MSA's median home price was \$124,000 in the third quarter of 2009. Buffalo MSA's median price of \$110,000 at the end of 2009 is also quite similar to the prices in the Syracuse and Rochester MSAs. The Albany MSA has significantly higher median home prices, above \$150,000 and fluctuating to nearly \$200,000 at different times during the past three years. The national median home price of \$179,000 in the third quarter of 2009 is a significant reduction from the previous year's median price of \$205,900. Since the third quarter of 2006, median home prices in the Syracuse MSA have decreased 8.3 percent. In contrast, the median home price in the US has decreased 27.8 percent. Relatively speaking, Syracuse MSA home prices have weathered the real estate crisis relatively well when compared to the national experience.

The region also has strengths. Residents are relatively well-educated, there are a number of well-established employers in the city, and there is relatively low cost of living. These qualities set the stage for future economic and business growth. Available and affordable commercial and industrial real estate also presents an opportunity for new business or business expansion.

4.0 SOCIAL AND ENVIRONMENTAL CONDITIONS

The purpose of this section is to document the social and environmental conditions in the general vicinity of the primary study area. This information will help identify constraints and important community features like community cohesion, historic and cultural resources, parks and recreation facilities and natural resources. This data will be used as baseline information as project strategies are developed in subsequent phases of this Corridor Study, *The I-81 Challenge*.

This document is a summary of the social and environmental resources within the corridor. The study team coordinated with SMTC, the City of Syracuse, the Syracuse-Onondaga County Planning Agency (SOCPA), and the New York State Department of Environmental Conservation (NYSDEC) to collect the data for resources.

4.1 Social Environment

The social environment section summarizes information on population characteristics, neighborhoods, historic and cultural resources, parks and recreation and the visual environment.

Demographics and Population Characteristics

Since 1990, the populations of the City of Syracuse and Onondaga County have been steadily declining, as shown in Table 6. The population in the City decreased from 163,860 in 1990 to 138,068 in 2008, a reduction of 15.7 percent. The county population also decreased, though less significantly. Onondaga County's 1990 population was 468,973 and 452,633 by 2008, a 3.5 percent decline.

Table 6 - Population – City of Syracuse, Onondaga County, NY and US

	1990	2000	2008	% Growth from 1990 to 2008
United States	248,709,873	281,421,906	304,374,846	22.4%
New York State	17,990,455	18,976,457	19,541,453	8.6%
Onondaga County	468,973	458,336	452,633	-3.5%
City of Syracuse	163,860	147,306	138,068	-15.7%

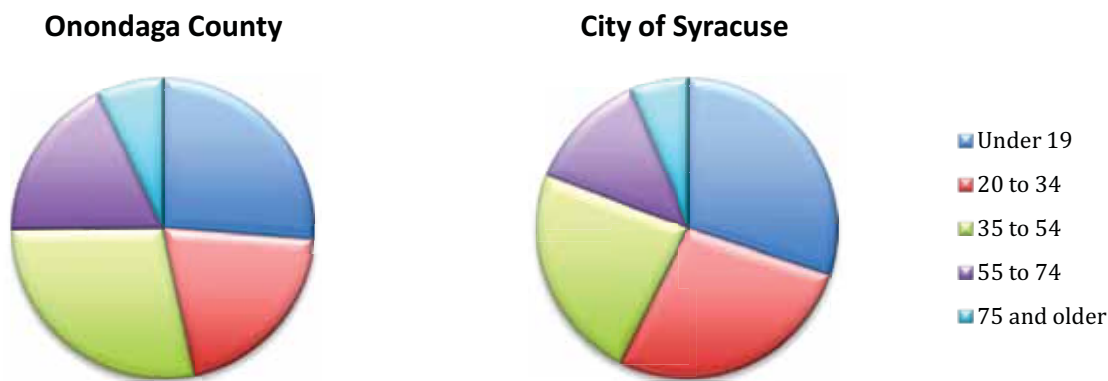
In contrast, the population of the State of New York has increased 8.6 percent since 1990, with much of this population growth due to New York City. Since 2000, 69 percent of all growth in the state is attributable to the five boroughs of New York City, and the city represents approximately 40 percent of the state's overall population.² The United States population has also increased over the past 18 years, growing by 22.4 percent.

² New York City Department of City Planning, <http://www.nyc.gov/html/dcp/html/census/popcur.shtml>

In general, Syracuse and other areas in upstate New York have been impacted by the simultaneous movement of jobs and people to the South and West due to the decline in manufacturing in the northeast, attraction of warmer climates, lower cost of living, and other factors.³ While the population trend in the City of Syracuse may not be surprising, it is an important consideration when evaluating future economic growth trends and opportunities for the area.

The City of Syracuse has more residents aged 20 to 34 (27%) than the county (20%), see Figure 31. Fifty-three percent of Onondaga County residents are aged 35 or older, as compared to 43 percent in the City of Syracuse

Figure 31 - Population by Age Groups



Source: US Bureau of the Census

Although population is decreasing in the City of Syracuse and Onondaga County, out-migration has not been equal across all age groups. According to studies focused on upstate New York, the region is losing its young, prime-age workers. Between 1980 and 2000, upstate New York lost roughly 20 percent of people aged 20 to 34, with most out-migration occurring during the 1990s.⁴

For the City, the greatest decline in population has occurred among 35 to 44 year olds (13.4%) and residents who are aged 65 and older (35.2%). Like the City of Syracuse, the county experienced a significant reduction in its 35 to 44 year old population, a reduction of 16.8 percent since 2000. The data suggest that out-migration is occurring in the Syracuse area. This trend is consistent with the experience of the upstate New York region as a whole and is relevant since a significant out-migration for this age group could erode the workforce available in the City of Syracuse and surrounding area.

³ *Population Out-Migration from Upstate New York*, Winter 2005, Buffalo Branch Federal Reserve Bank of New York, http://www.newyorkfed.org/research/regional_economy/upstate/winter05.pdf

⁴ *Population Out-Migration from Upstate New York*, Winter 2005, Buffalo Branch Federal Reserve Bank of New York, http://www.newyorkfed.org/research/regional_economy/upstate/winter05.pdf

The largest increase in population for the City of Syracuse is among 55 to 64 year olds, up 30.8 percent since 2000. Onondaga County also experienced the greatest growth in this age group, 32.1 percent. This trend is consistent with both the state and nation, reflecting the large baby boom population entering this age bracket.

Neighborhoods and Community Cohesion

Community cohesion refers to the sense of togetherness shown by members of a neighborhood or larger community. It is characterized by the residents' expression of general belonging or unity within a specified geographic area, and is typically related to common experiences such as similar lifestyles, family structure, mutual values, and shared goals for their community. Key elements of community cohesion considered for this study include:

- Recognized neighborhoods within or abutting the study corridor;
- Population characteristics of the neighborhoods;
- Community resources within each neighborhood;
- Notable neighborhood characteristics that help define them; and
- Interface of the neighborhood with the interstates (I-81, I-90, I-481, I-690).

In particular, the long standing presence of I-81 and I-690 has created the following physical barriers to neighborhood cohesion along the Primary Study Corridor.

- I-81 is a visual barrier between the Downtown and University Hall
- I-690 is a physical barrier between the Lincoln Hill and Near Eastside neighborhoods
- I-81 along with I-690 boxes in the lakefront neighborhood and is a physical barrier between it and adjoining neighborhoods.
- I-81 north of the City of Syracuse passes west of Mattydale in the Town of Salina and the east of North Syracuse which straddles the Towns of Clay and Cicero.

4.2 Environmental Justice

Title VI of the Civil Rights Act of 1964 specifies that no person in the United States shall, on the grounds of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, issued in 1998, states that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

In order to evaluate the I-81 Corridor for the purposes of environmental justice, the 2000 U.S. Census data was used to determine the presence and concentrations of minority and low-income populations within the study area. The findings gained through this data source is

qualified by the fact that the Census is now 10 years old and the 2010 Census data will not be available for several years.

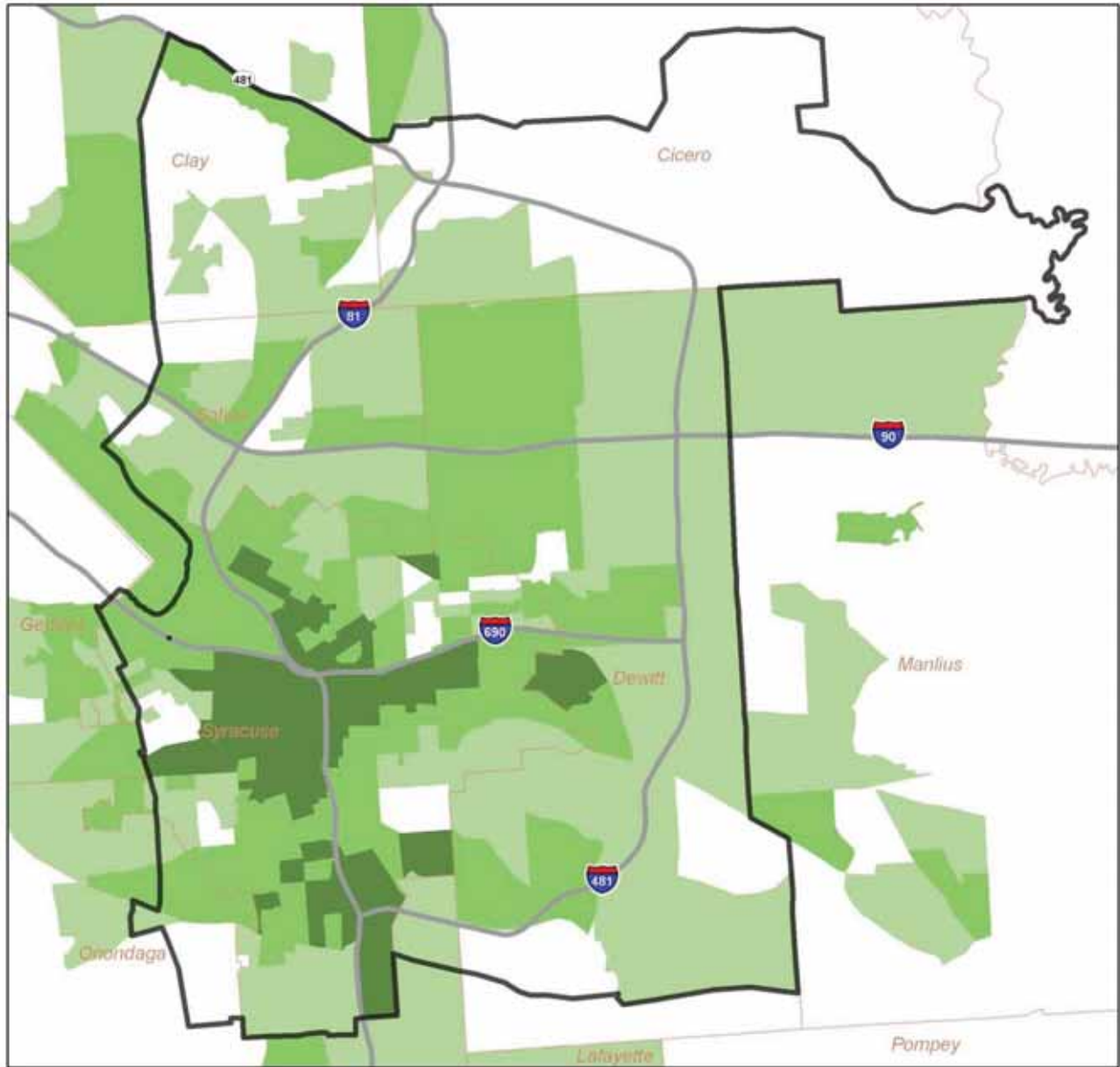
The methodology used to identify possible environmental justice populations in the study corridor was that adopted by the Syracuse Metropolitan Transportation Council (SMTC) as documented in the Environmental Justice Analysis, Syracuse Metropolitan Planning Area, Final Report, UPWP 2004-2006. This SMTC study covers the whole SMTC MPA boundary; however, the information included herein is focused on the general limits of the Social, Economic and Environmental study area. The SMTC methodology established the following thresholds for defining EJ populations:

- Low-income: Households in which median household income does not exceed 50 percent of the metropolitan area median household income.
- Minority: Any population self-identified as non-white only within the 2000 U.S. Census race classifications, as well as Hispanics who consider themselves white only.
- Seniors: All groups of persons aged 65 years or older, for both males and females.
- Disabled: Persons with a long-lasting physical, mental, or emotional condition that can make it difficult for them to perform activities such as walking, climbing stairs, dressing, bathing, learning, or remembering. This condition can also impede a person from being able to go outside the home alone or to work at a job or business.

The data indicates that within the I-81 corridor study area there are extensive areas of EJ populations, primarily in the central core of the study corridor.

- Minority: Minority concentrations spread across the central portions of Syracuse, as well as large areas in the southern and eastern portions of the city. Minority populations are also concentrated in some non-central city areas and suburban areas where high-density residential complexes (apartments/mobile home parks) are located.
- Low-Income: The areas of highest concentration of low-income people are found in portions of the City of Syracuse and the Village of East Syracuse. Most of the high concentration areas in the City of Syracuse were clustered around the Downtown neighborhood, with a few others scattered on the outskirts of the city.
- Seniors: In general, concentrations of seniors are more decentralized than minority and low-income areas. Most of the high concentration areas were situated in suburban areas adjacent to or on the outskirts of the City of Syracuse. For many of these areas, large senior residential facilities contribute to the high concentrations.
- Disabled Persons: There are several decentralized high concentrations of disabled persons located throughout the City of Syracuse, as well as in southern DeWitt and western Salina.

Figure 32 – Environmental Justice Target Areas



↑

0 1 2 Miles

FHI, Aug 2010
Original in Color
Source: U.S. Census

Legend

- Demographic Study Area
- Town Boundary
- Major Highway

Environmental Justice Target Areas by Census Block Group

- Below Threshold
- Low Priority Area
- Medium Priority Area
- High Priority Area

Environmental Justice Target Areas

I-81 Corridor Study Area

Each of these individual factors is combined in Figure 30, which presents environmental justice “target areas,” prioritized as high, medium, and low. They include all of the areas of environmental justice concern within the general Social, Economic and Environmental study area.

- High priority environmental justice target areas: Census Block Groups identified as high priority are located within the City of Syracuse, in the Downtown, southeast, near west, and north areas.
Medium priority environmental justice target areas: Block Groups identified as medium priority environmental justice target areas exhibit less significant concentrations of the target populations than high priority target areas. Medium priority environmental justice target areas are located in the City of Syracuse, southern and northern DeWitt, a portion of the village of North Syracuse, and some areas in Clay and Cicero.
- Low priority environmental justice target areas: Block Groups identified as low-priority environmental justice target areas cover an extensive portion of the study area.

4.3 Historic and Cultural Resources

In many ways, Onondaga Lake and, later, the Erie Canal, shaped the cultural and economic history of the City of Syracuse and surrounding communities. As such, a variety of historic and archaeological resources have been previously found in the study area, particularly in the vicinity of these historic waterways. These resources range from prehistoric villages and encampments to historic buildings and structures that date to the early 20th century.

There are a series of legislative actions that have been initiated in the past to document historic, cultural and natural resources. These include legislative actions at the Federal, State and local levels. The following summarizes the data sources from which existing resources have been documented.

National Heritage Areas: These are designated by Congress and are managed through a partnership between the National Park Service and local agencies. The Erie Canal National Heritage Area covers 234 municipalities which adjoin the 524 miles of the NYS Canal System including City of Syracuse/Onondaga County.

New York State Heritage Areas: Created by State legislation in 1992 with the mission to develop, preserve and promote the state’s cultural and natural resources. The Syracuse Heritage Area focuses on the original trade and banking centers in present day downtown Syracuse.

Syracuse Local Preservation Districts and Local Protected Sites: There are several local preservation districts and protected sites including the Sedgewick/Highland/James Preservation

District, the Berkley Park Preservation District, the Columbus Circle Preservation District and the Hanover Square Preservation District.

National Register of Historic Properties (NRHP) Sites: Past studies have identified historic and archaeological resources adjacent the Primary Study Corridor that are listed in the NHRP. Additionally, there are documented resources that are listed or eligible for listing in the New York State Register of Historic Places.

Summary of Historic and Cultural Resources: Historic and cultural resources from the data sources noted above have been organized in a database and mapped in a Geographic Information System (GIS). It will be used for future reference in the development of improvement strategies in later phases of this corridor study, *The I-81 Challenge*.

4.4 Archaeological Resources

Fifty four archaeological sites have been reported within the study area. Of these sites, four have been determined by the State Historic Preservation Officer (SHPO) to be eligible for inclusion in the NRHP. Seventeen of the sites have previously been evaluated as ineligible for inclusion. The National Register eligibility of the remaining 33 sites reported in both the New York State Museum (NYSM) and NYS Office of Parks, Recreation and Historic Preservation (OPRHP) site files has not been determined. The Viaduct is located in what is considered an archaeologically sensitive area. Archaeological information has not been specifically documented herein as the information is deemed confidential by state and federal agencies.

4.5 Architectural Resources

Several historic buildings, structures, and districts are concentrated west of I-81 in an area of downtown Syracuse roughly bounded by I-690 to the north, East Adams Street to the south, and Onondaga Creek to the west. This section of the corridor is bordered by historic architectural resources that are listed in the National Register of Historic Places (NRHP). East of I-81, several historic properties are located along portions of East Genesee Street and in the University Hill neighborhood of Syracuse. These resources include Oakwood Cemetery, Thornden Park, and historic buildings and structures associated with Syracuse University. A smaller concentration of significant historic properties is located north of I-690 in an area bounded by I-81 to the west and Lodi Street to the east and north.

4.6 Parks and Recreational Facilities

The City of Syracuse and adjacent municipalities within the study area have an extensive park system. Most public parks and recreational areas are not located adjacent to the interstate highways or arterial roads within the study area. Major parks in the study area include Burnet Park, Elmwood Park, Kirk Park, Meachem Field, Onondaga Park, Schiller Park, Sunnycrest Park, Thornden Park, and Clark Reservation State Park. A detailed listing of parks by neighborhood can be found in Technical Memorandum #1.

4.7 Visual and Aesthetic Conditions

The I-81 Corridor in the City of Syracuse is a significant visual element within the primary study area. It is particularly prominent in downtown where the I-81 / I-690 interchange rises well above the surface street network and most downtown buildings. Similarly, the viaduct is an elevated highway, which runs between downtown and University Hill with Almond Street running underneath and numerous east-west cross streets. The visual environment for the I-81 corridor can be reviewed by looking first at the “viewshed” areas within the corridor and then analyzing these viewsheds relative to the viewer groups (residents, pedestrians/bicyclists and visitors/tourists) and the viewer sensitivity. Five distinct viewsheds have been identified for the I-81 corridor as follows:

- **Southern Section:** I-81 South interchange to the Viaduct: this area is typified as an open highway with views of the highway more visible from the west than the east due to the rising terrain (west to east).
- **Viaduct Section:** This section is an elevated highway with Almond Street and its connecting ramps (Adams/Harrison interchange) running parallel and underneath I-81 for most of its length. This area has poor visual quality due to the elevated highway and its numerous bridge piers along with the busy crossing roads and Almond Street.
- **I-81/I-690 Interchange Area:** this area is elevated approximately 20 feet above the downtown area terrain, occupies a significant land mass and accommodates numerous local street crossings underneath.
- **I-81/I-690 Interchange to Carousel Center:** This area transitions to a “sunken” roadway section where the highway is below the adjacent terrain and typically “out of view”. The land use is industrial and open space (Harbor) on the west and commercial; residential on the east.
- **Carousel Center to I-481 North Interchange:** As the highway crosses the north city line, it transitions to an open highway section. User views are not prominent in this section of the highway, excluding highway users, and the land use is open/semi-rural.



View of I-81/I-690 Interchange



Viaduct looking south

Viewsheds will be further considered in the strategy development phase of this study.

4.8 Natural Environment

A review was performed of natural environment information that is available via local, state and federal agencies. This information has been collected for future reference for the next phases of this study and similar to the other resources has been assembled in a database and GIS system for visual display.

Summary: twelve (12) specific categories of natural environmental resources can be summarized in three basic categories:

- Water Resources
- General Ecology and Farmlands
- Air, Noise and Contaminated Materials

Water Resources: The primary study area is within four major drainage basins: Onondaga Creek to the south, Ley/Bear Trap Creek to the east, and Mud Creek at the north end of the corridor and the Onondaga Lake drainage basin. These areas, primarily Onondaga Creek and Ley/Bear Trap Creek, also are related directly to the wetland areas and floodplains. There are specific areas along I-81 and I-481 where their locations are directly adjacent the corridor.

General Ecology and Farmlands: Limited sensitive plant and annual species presence has been identified from the New York State Department of Environmental Conservation (NYSDEC) resource information, limited to I-81 corridor, from south of I-690 to south of I-481 along with the area between I-690/I-81/Thruway and the adjacent Onondaga Lake. Prime farmland has been identified along some portions of I-81 north of the City of Syracuse.

Air, Noise and Contaminated Materials: More refined studies of air and noise conditions will be developed as *The I-81 Challenge* study progresses. Air quality studies will be reviewed on a regional basis to maintain and/or improve the Syracuse MPA's status as a maintenance area. When an area transitions from a non-attainment to an attainment designation as Syracuse has, the it is subject to two 10 year maintenance plans that demonstrate the area will remain in attainment for the 10 year periods of each plan.

Noise screenings for this project include identification of noise sensitive land use, collection of representative noise measurement data (Fall of 2010) and the screening of possible improvement strategies. Contaminated Materials (Hazardous Waste and Asbestos) have been documented from resource data information from procedurally indicated sources including past land use, Environmental Protection Agency resources and NYSDEC resources. From the data collection, hundreds of potential sites have been identified and plotted along the primary study area and the noting of approximately 10 "areas of concern".