

THE I-81 CHALLENGE

Highlights from Technical Memo #1: Physical Conditions Analysis



Prepared by the
Syracuse Metropolitan Transportation Council
in conjunction with the
New York State Department of Transportation
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This document highlights key findings from Technical Memorandum #1 (Tech Memo #1): Physical Conditions Analysis. Tech Memo #1 is the first of a series of documents that will comprise the I-81 corridor study, one of the major components of *The I-81 Challenge*. The purpose of this study is to:

1. Collect data to identify the condition of the Syracuse 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.

STUDY AREA AND CONTEXT

The primary study area for *The I-81 Challenge* 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. The overall study area for purposes of public participation and traffic modeling expands to cover the Syracuse Metropolitan Transportation Council (SMTC) Metropolitan Planning Area (MPA), which includes all of Onondaga County and small portions of Madison and Oswego Counties. Within these two study areas different study limits were selected for analyzing capacity and safety data, and general social, economic and environmental features.

There are land use, demographic and economic trends within the study areas that provide a helpful context



What is the Viaduct?

A viaduct is a continuously elevated bridge structure. The viaduct section of I-81 is a 4,097-foot long bridge composed of 124 individual bridge spans.



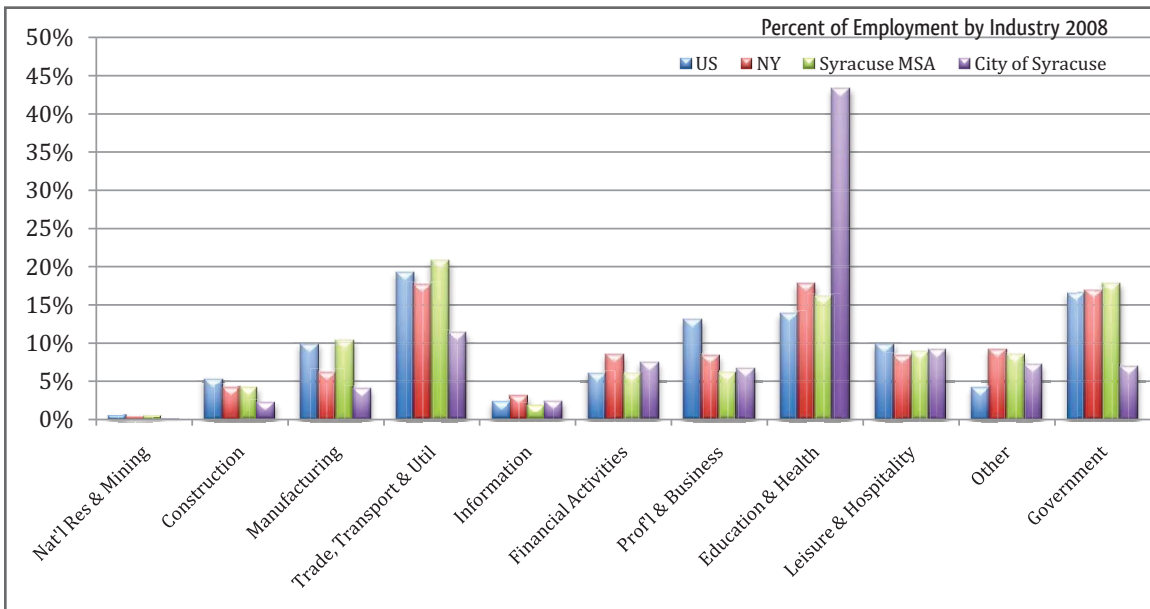
Did You Know ?

About 30% of the population in Onondaga County lives in the City of Syracuse. From 1990 to 2008 the City population decreased by 15.7%, while the County population decreased by 3.5%. And between 2002 and 2008, employment in the City of Syracuse dropped by approximately 11,000 jobs while employment in Onondaga County increased by almost 7,000 jobs.



for understanding how I-81 fits into and affects development patterns in the region. Existing development in Onondaga County generally follows a traditional radial pattern. The urbanized area is centered in the City of Syracuse, where many of the region’s jobs and about 30% of the population are located. This urbanized area has expanded over time to include first- and second-ring suburbs, which continue to develop along major commuter routes. Significant housing and commercial development has occurred in these suburbs, while industrial uses, initially located in proximity to rail lines, can generally be found north of the city.

Demographic trends reflect these development patterns, as population has shifted from city to county and out of the county altogether. Since 1990, the populations of the City of Syracuse and Onondaga County have steadily declined. The city population decreased by 15.7% from 1990 to 2008, while the county population decreased by 3.5%.



The Syracuse metropolitan area’s economy is also characterized by a migration of jobs from the urban core to surrounding suburbs. Between 2002 and 2008, employment in the City of Syracuse dropped by approximately 11,000 jobs. Over the same period, employment in Onondaga County increased by almost 7,000 jobs. As indicated in the diagram at left, the education and health industries make up the largest employment sector in the City of Syracuse, representing 43.2% of total employment in the city. The trade, transport, and utilities industry represents the next largest share of total employment in the city at 11.3%.

TRANSPORTATION SYSTEM

Tech Memo #1 analyzed existing transportation conditions in the primary study area. This section presents a summary of the study’s findings related to traffic volumes, congestion, and safety along I-81, and provides general information on alternative travel modes in the primary study area.

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Highway Features: Critical Design Elements

An analysis was done to identify highway sections in the primary study area where there are non-standard and non-conforming design features, such as poor sight distances, sharp curves, or limited ramp spacing. When I-81 was constructed in the 1950s and 1960s, highway design standards were different from today. Based on current design standards, there are significant portions of I-81 that are non-standard or non-conforming, especially in the general vicinity of the I-81/I-690 interchange and at the adjacent interchanges with local streets (exits) on both I-81 and I-690.

These interchanges are all closely spaced and have complex layouts in order to allow access to and from downtown. The study found that highway sections not meeting current design standards generally coincide with areas of increased congestion and high accident rates, as seen on the diagram at right.

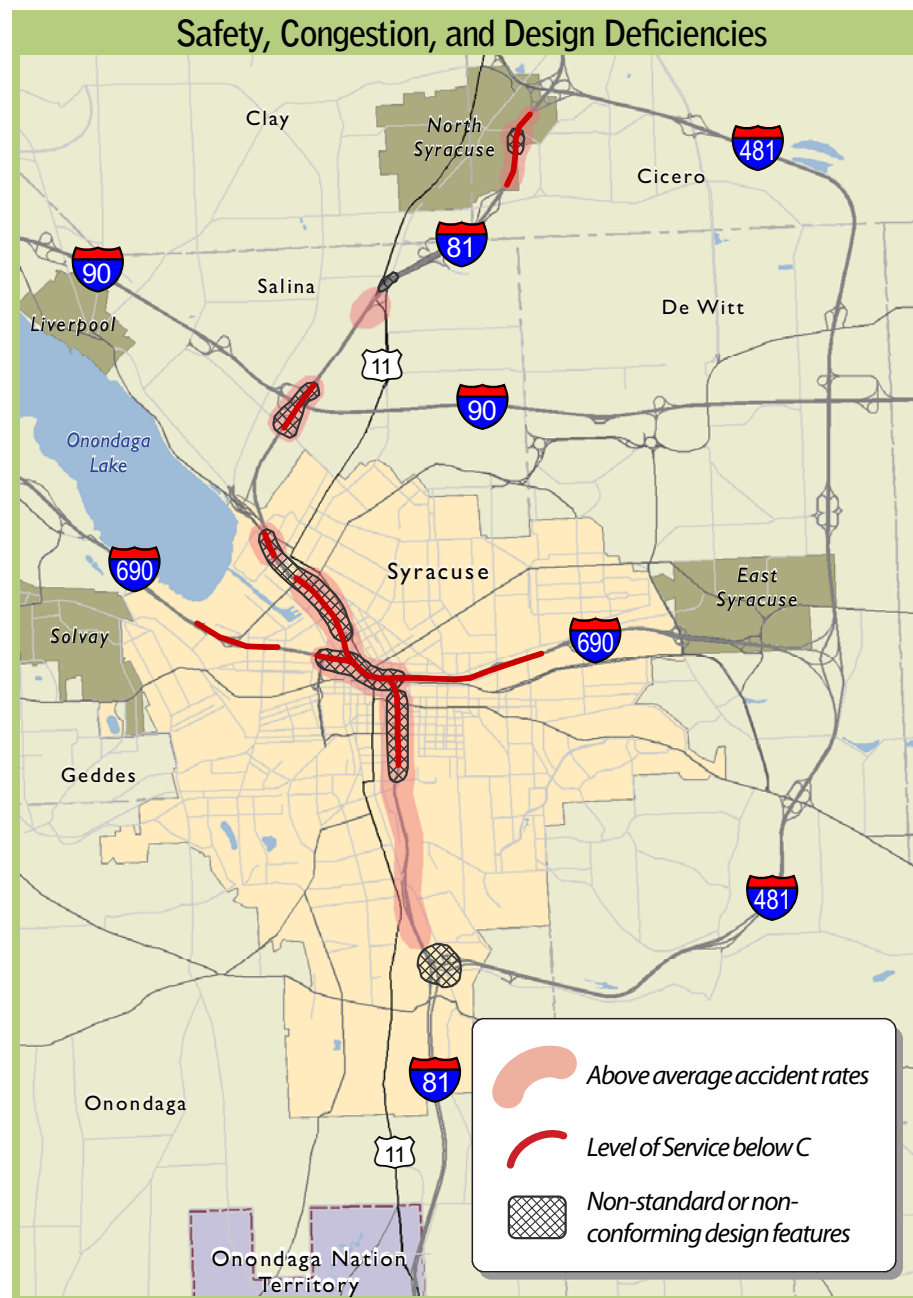
Highway and Bridge Conditions

Pavement and bridge conditions are determined by periodic inspections conducted by NYSDOT. A NYSDOT surface rating survey completed in 2008 found the majority of the pavement in the primary study area to be in “good” condition. However, given their age, the majority of the highways will need either a major rehabilitation or reconstruction by 2040 - the design year for any major highway project that may result from this effort.

Of the 76 bridges located along I-81 and I-690 in the primary study area:

- 60% (46 of 76 bridges) are classified as “functionally obsolete,” meaning the lane widths, load carrying capacity, clearance, or approach roadway alignments do not meet current bridge standards. Eighteen of these bridges are located in the viaduct section of I-81.
- 9% (7 of 76 bridges) are classified as “structurally deficient” meaning they are in need of rehabilitation, are restricted to light vehicles, or subject to closure. One of these bridges is located in the viaduct section of I-81.

Assuming only routine maintenance, most obsolete or deficient bridges in the primary study area will be in a state of serious deterioration by 2020. By the year 2050 - the design year for any major bridge project that may result from this effort - more than 80% of the bridges in the primary study area will have met or exceeded their expected



Physical Conditions Analysis Highlights THE I-81 CHALLENGE

service life. The need to address the structural issues of these bridges is one of the primary needs of this project.

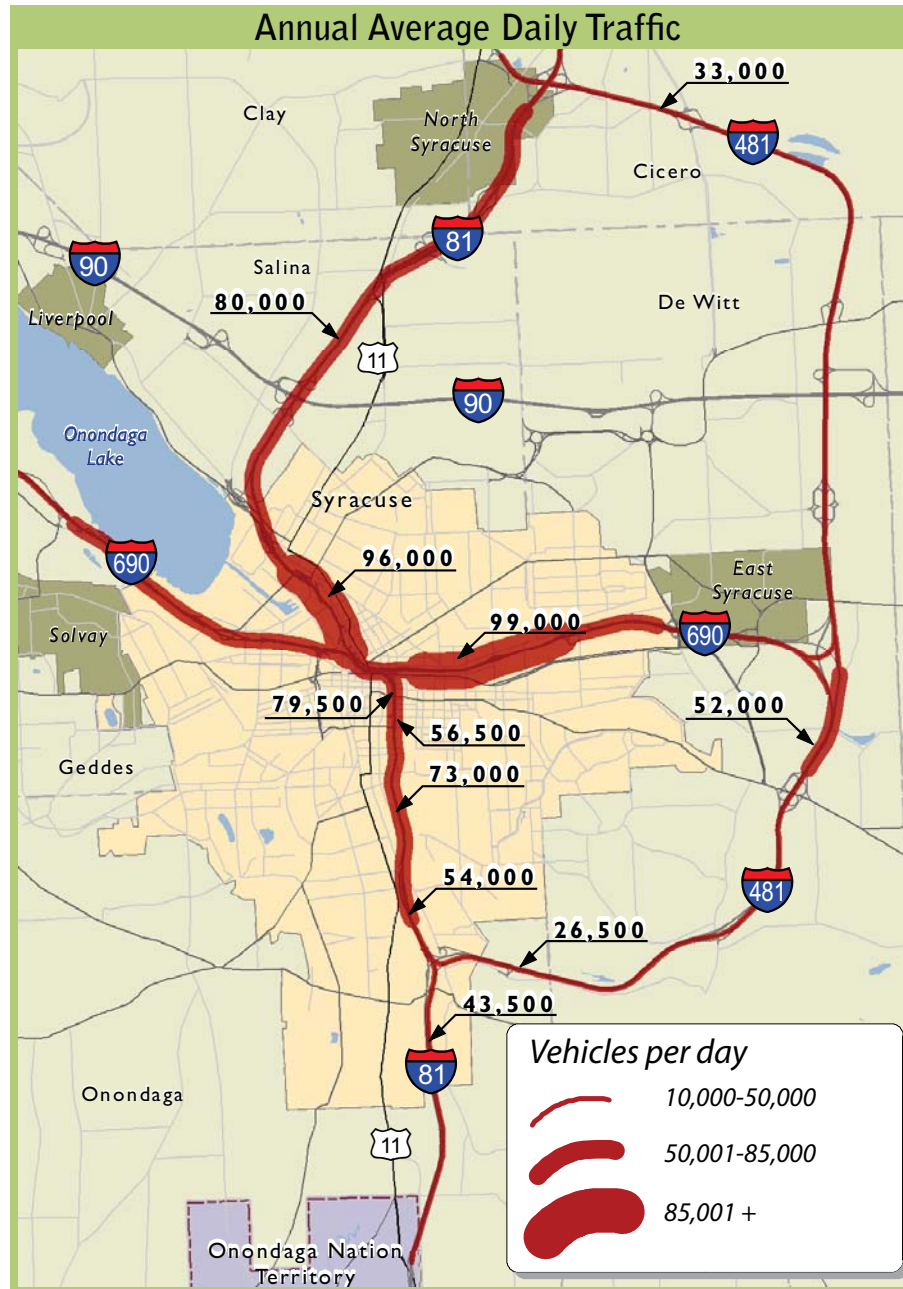
Traffic Volumes

Traffic volume data were gathered from various vehicle count locations and time periods along the I-81 corridor to determine trends and peak travel periods, as well as develop traffic volume diagrams for highways in the primary study area.

- Between 1974 and 2003 traffic increased on I-81 at an annual rate of 3.3-5.4%. Since 2003 there has been little if any growth in traffic.
- July and August have the highest traffic volumes, while January and February have the lowest.
- Heavy vehicles (trucks with at least 4 axles and buses) account for 9% of total traffic during the morning rush hour and 8% during the evening rush hour.
- Average annual daily traffic (AADT) in the primary study area ranges from about 43,000 to 99,000.
- About 45,000 vehicles per day get on or off I-81 at the Adams/ Harrison Street ramps.

Regional Interstate Through Traffic

In April 2010, an analysis was done to understand how much I-81 traffic is passing through the Syracuse region on the interstate system. This information is useful for understanding how much traffic is using or could use alternative interstate routes to bypass the Syracuse region.



How do you calculate AADT?

Average annual daily traffic - referred to commonly as AADT - is calculated by measuring the total number of vehicles passing a point or segment of a highway facility, in both directions, for one year, divided by the number of days in the year.

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Data were collected for three through-traffic routes: taking I-81 from I-481 on the north to I-481 on the south and vice versa, taking I-81 to access I-90 via I-690, or taking I-481. The data were collected on a weekday in April for 24 hours 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 I-90, and on the I-481 ramps on and off I-81. As each vehicle passed the camera locations, the license plate number and time was recorded. The license plates entering the area were then matched at each of the exit locations to determine the volume of traffic passing through the region without stopping. The license plates of 86% of the vehicles entering or exiting the area were captured. The results were then factored to reflect 100% of the entering or exiting traffic volume, based on traffic counts conducted at these locations.

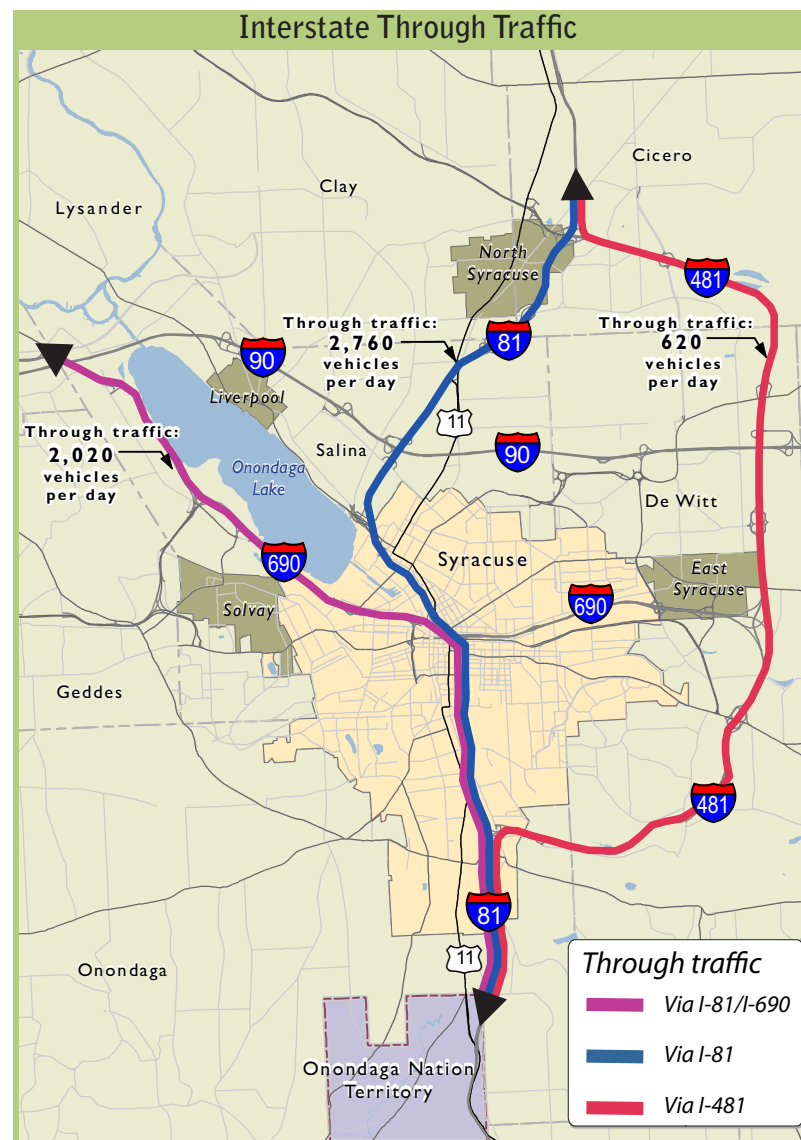
The analysis revealed that:

- There are 44,000 total vehicles per day on I-81 south of the southern I-481 interchange (Exit 16A).
- Of these 44,000 total vehicles, 12% (5,400 vehicles per day) are currently traveling through the region without stopping. This includes:
 - 6% of the 44,000 vehicles (2,760 vehicles per day) traveling through the region on I-81.
 - 5% of the 44,000 vehicles (2,020 vehicles per day) traveling through the region via I-81 and I-690 to/from the Thruway (I-90).
 - 1% of the 44,000 vehicles (620 vehicles per day) traveling through the region on I-481.

These results, as illustrated on the diagram at right, suggest that diverting regional interstate through traffic to I-481 or other alternative interstate routes will have little impact on traffic volumes or operations on I-81 within the primary study area. Additional traffic data is likely to be collected to assist in the assessment of different options for I-81.

Congestion: Level of Service and Mobility

The evaluation found that highways within the primary study area generally have sufficient capacity for current traffic volumes, meaning they are operating at LOS A, B or C during morning and evening rush hours. Certain areas along I-690 and I-81 in the downtown area approach or exceed capacity (LOS D/E/F) during peak periods. A number of merge/diverge areas and on/off-ramps are also operating at LOS F. The average speed in these congested areas are well below posted speed limits during morning and evening peak hours and any disruption due to maintenance or accidents can cause severe traffic congestion.



What is Level of Service (LOS)?

Level of Service (LOS) is an indicator of congestion on road segments and at intersections. It measures delay experienced by drivers on a scale of A (short wait times) to F (long delays).

Did You Know?

Some of the largest pedestrian generators in the area of the I-81 viaduct include Upstate Medical Center, Syracuse University, and the commercial, residential, and office space on East Genesee Street.



Similarly, nearly all of the 79 signalized intersections that were studied, which serve the downtown, the University Hill area and the north side near St. Joseph’s Hospital Health Center, operate very well overall, except for six intersections along Almond, East Adams, West Genesee, and Butternut Streets. Many of the operational issues at these intersections are associated with access to/from the interstate system for downtown and University Hill.

Accident Analysis

Collision data were obtained from NYSDOT for the most recent three-year period available (February 1, 2006 – January 31, 2009) to calculate accident rates for the I-81, I-690, and I-481 corridors and their on- and off-ramps. These accident rates were then compared to the statewide average accident rates for similar types of roadways.

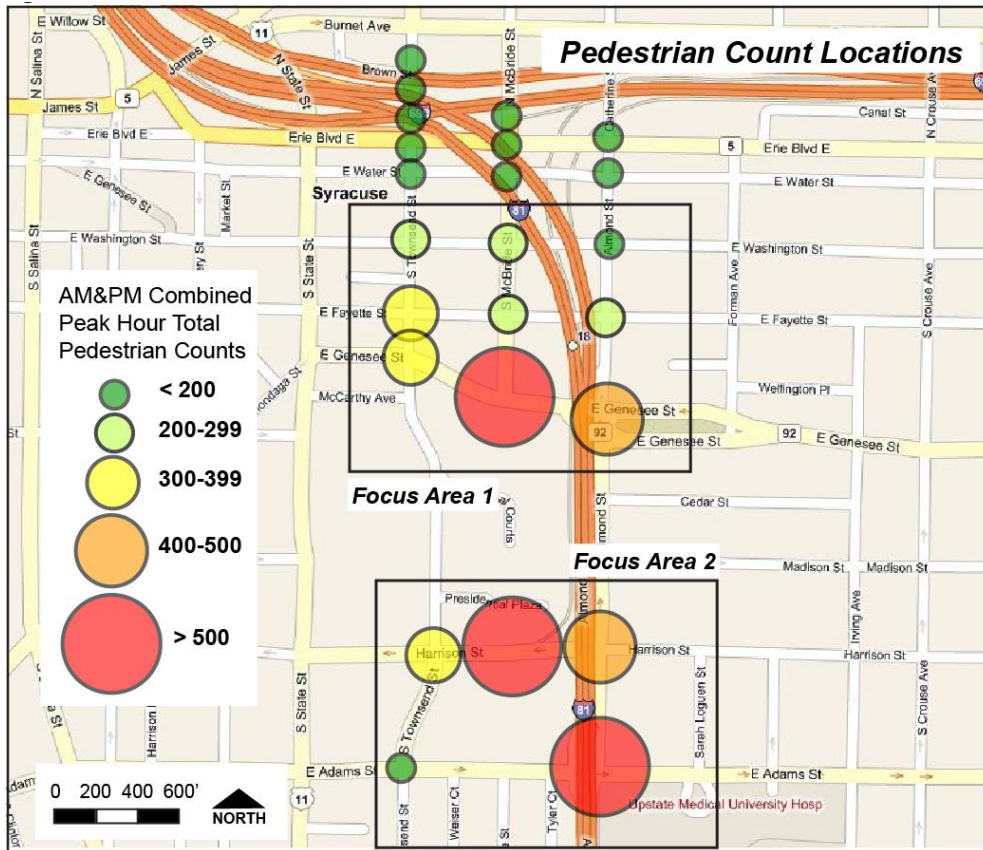
The highways in the primary study area have a relatively high rate of accidents when compared to statewide averages. This is especially true in the area around the I-81/I-690 interchange. For example:

- The northbound viaduct section of I-81 has an accident rate more than three times the statewide average.
- I-81 through the I-690 interchange has sections where the accident rates reach five times the statewide average.
- I-81 north of the I-690 interchange, toward Carousel Center, has an accident rate approximately two times the statewide average.

Pedestrians and Bicyclists

Pedestrian count data were collected in a focused area along the viaduct during November and December 2009 and February and March 2010. Within this area pedestrian traffic was greatest on Harrison Street between Almond and Townsend Streets, at the intersection of East Adams and Almond Street, and at the intersection of South McBride and East Genesee Street.

The evaluation also documented a number of bicycle facilities and multi-use trails located within the primary study area, including on-road bike lanes and off-road trails such as the Onondaga Creekwalk, New York State Canalway trail and Bear Trap Creek Trail.



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Transit

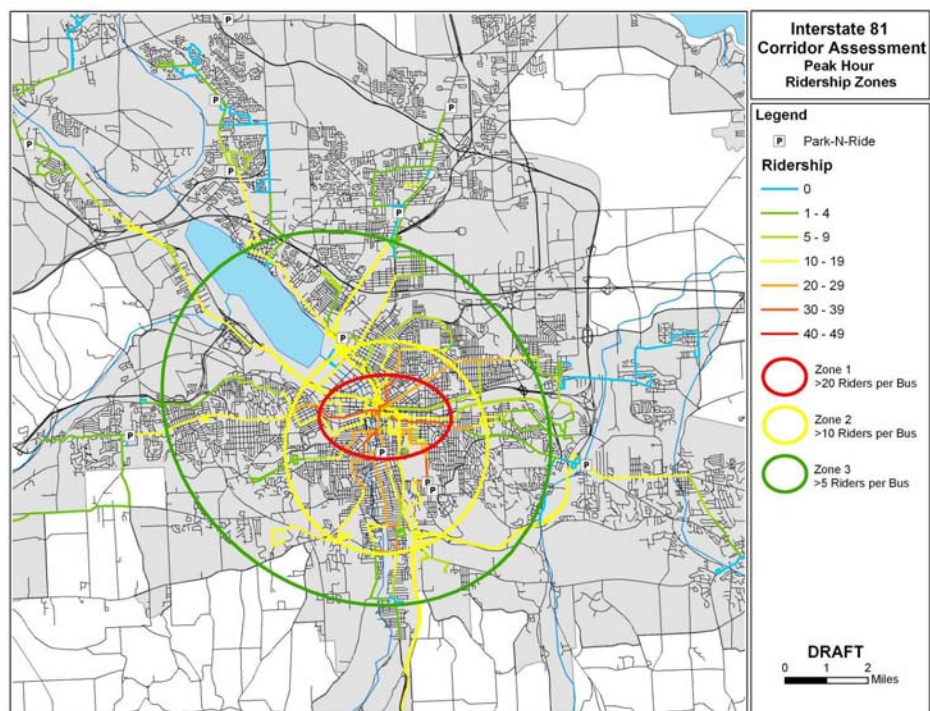
Centro's transit ridership trends were identified by collecting information about the number of people getting on and off buses at a series of locations within the Metropolitan Planning Area.

The analysis showed that Centro's ridership is concentrated in the area around the downtown hub (Zone 1 on the diagram at right), with more than 20 riders per bus during peak periods in this area. This core ridership is largely a product of densely-populated neighborhoods and transit-dependent populations. Throughout most of the remainder of the city (Zone 2) ridership is moderate with 10-19 riders per bus during peak periods. Ridership drops significantly throughout the suburban areas (Zone 3 and beyond) with fewer than five riders per bus during peak periods.

Routes outside the central core largely cater to commuters. According to the 2005 Transportation Profile for Onondaga County, 2.2% of the county population and 7% of the city population use public transportation as their mode choice.

NEXT STEPS

Over the next several months, *The I-81 Challenge* will engage the public to gather initial ideas for the future of I-81 and develop a set of criteria to evaluate different options. Once a list of future options for I-81 has been established, the options will be evaluated to determine the effects each would have on traffic, land use and neighborhoods, and environmental resources located within the study area. The findings of these evaluations will be shared with the public.



Did You Know?

Centro operates almost 100 fixed bus routes in Syracuse and Onondaga County. The majority of Centro routes start or end in downtown Syracuse at the Common Center. This means that the highest density of transit ridership can be found downtown.

Get Involved!

To join our mailing list or learn more about *The I-81 Challenge* and opportunities to get involved, visit our web site at www.theI81challenge.org.

Send us comments at contactus@theI81challenge.org or contact us directly at the SMTC:

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