
4. TRANSPORTATION SYSTEM – A SUSTAINABLE VIEW

INTRODUCTION

This chapter will provide technical background information and address specific transportation issues under four specific sections categorized as follows:

Connectivity – the primary focus areas of connectivity in Tompkins County are the different transportation networks that help to move people and goods in our community. A well connected region has transportation networks with many links, numerous modal options, and minimal service dead-ends.

System Integration - The section concentrates addressing issues that make the transportation system operate more effectively and efficiently. System Integration incorporates different issues of the Mobility goal and objectives, congestion mitigation, travel demand management, transportation system management, and alternative travel modes.

Also in this section is a discussion of issues related to intermodal links and freight movement. The section will address system-level needs required to provide efficient connections and choices between various modes of transportation, and improved communication and coordination within the transportation community including the freight and commercial passenger sectors.

Environmental - This section describes the concerns and issues associated with the impacts of transportation and urban development on the natural and built environments.

Safety - This section addresses the *Federal* requirement for a safety element in the plan. Safety and emergency management programs are identified and their relationship to transportation.

Financial - This section addresses the *Federal* requirement for a financial plan. The section will estimate financial resources available from federal, state, local and private resources for the development, operation, and maintenance of the transportation system and will demonstrate how the long-range transportation plan may be implemented.

While this Chapter attempts to clarify issues under each of the above sub-headings, the reader should be aware that substantial overlap does exist. Transportation issues are

critically interconnected with activities in the areas of land use, housing, watershed protection, agriculture, economic development, etc. This plan focuses attention on transportation but the interdependency of transportation with other sectors cannot be overstated.

Introduction

Infrastructure can be defined as the basic facilities, equipment, and installations needed for the functioning of a system. This section focuses on issues primarily associated with the development and operation of capital transportation infrastructure including roadways, bridges, the transit system, pedestrian and bicycle facilities. Maintenance, management, and operation issues will be addressed in this section. Also to be addressed are development and maintenance costs, design standards and safety issues.

CONNECTIVITY

1. Metropolitan Transportation System

Federal regulations state that the long-range transportation plan shall, at a minimum: *"Identify existing and proposed transportation facilities (including major roadways, transit, multimodal and intermodal facilities, pedestrian walkways and bicycle facilities, and intermodal connectors) that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important national and regional transportation functions"* (23 CFR§450.322.f(2)). One of the functions of this section will be to meet this legislative requirement.

a. Roadways

The City of Ithaca, located at the center of Tompkins County, is approximately 25 miles from the nearest Interstate Highway, I-81 in Cortland County. Tompkins County has one principal arterial, New York State Route 13, which is also the only Tompkins County roadway included on the National Highway System. According to the NYSDOT Infrastructure Needs Assessment Model (INAM) database, the roadway system in Tompkins County includes approximately 349 miles of State highways. In 1992 the average condition rating for those highways was 6.3 (on a 10-point scale where higher numbers indicate better condition). The figure for 2003 was 6.8, indicating an improvement in the pavement condition of State highways in Tompkins County over that ten-year period. The latest figure for 2007 also stands at 6.8.

FIGURE 14 shows a map of the approved Highway Functional Classification System for Tompkins County. **TABLE 19** describes the mileage and relative percentages of the federal-aid system in Tompkins County. **TABLE 20** lists the mileage of roads in Tompkins County by type of road, meaning which jurisdiction has responsibility of the road. Town roads are by far the largest road type, with

County and State roads also having a significant of the proportion for roadways in the county.

Functional Classification is important because it helps identify roadways that are eligible for federal aid and because different design standards are applicable depending on the roadway classification. Rural minor collectors and local roads are not eligible for federal aid funding. The functional classification of roads is usually reviewed every ten years after the decennial census, but can be updated at any time to reflect infrastructure changes. The federal-aid functional classifications system for Tompkins County was approved by FHWA on February 26, 2001 and amended by the ITCTC Policy Committee May 18, 2004. This functional classification scheme is legislatively required as a prerequisite to the use of federal transportation funds. The classification of roads was accomplished by ITCTC, local planning and NYSDOT staffs following federal guidelines.

This functional classification system is useful for planning and programming purposes for a number of reasons; first, as previously mentioned, it is required by law and is an absolute prerequisite for the use of federal aid, second, it is "regional" in scope, thus it is homogenous throughout the area and third, the process of classification is technically derived, based on the location of relative trip activity nodes and on establishment of an appropriate mix of functional classes by percentage (Source: Highway Functional Classification: Concepts, Criteria and Procedures, March 1989, Publication No. FHWA-ED-90-006). Great care was taken in developing a functional classification system that is reflective of actual roadway use and fully accommodates the technical needs of transportation officials. The next regular update to the Federal Functional Classification is expected to take place on 2011.



PROPOSED 2004 TOMPKINS COUNTY HIGHWAY FUNCTIONAL CLASSIFICATION SYSTEM

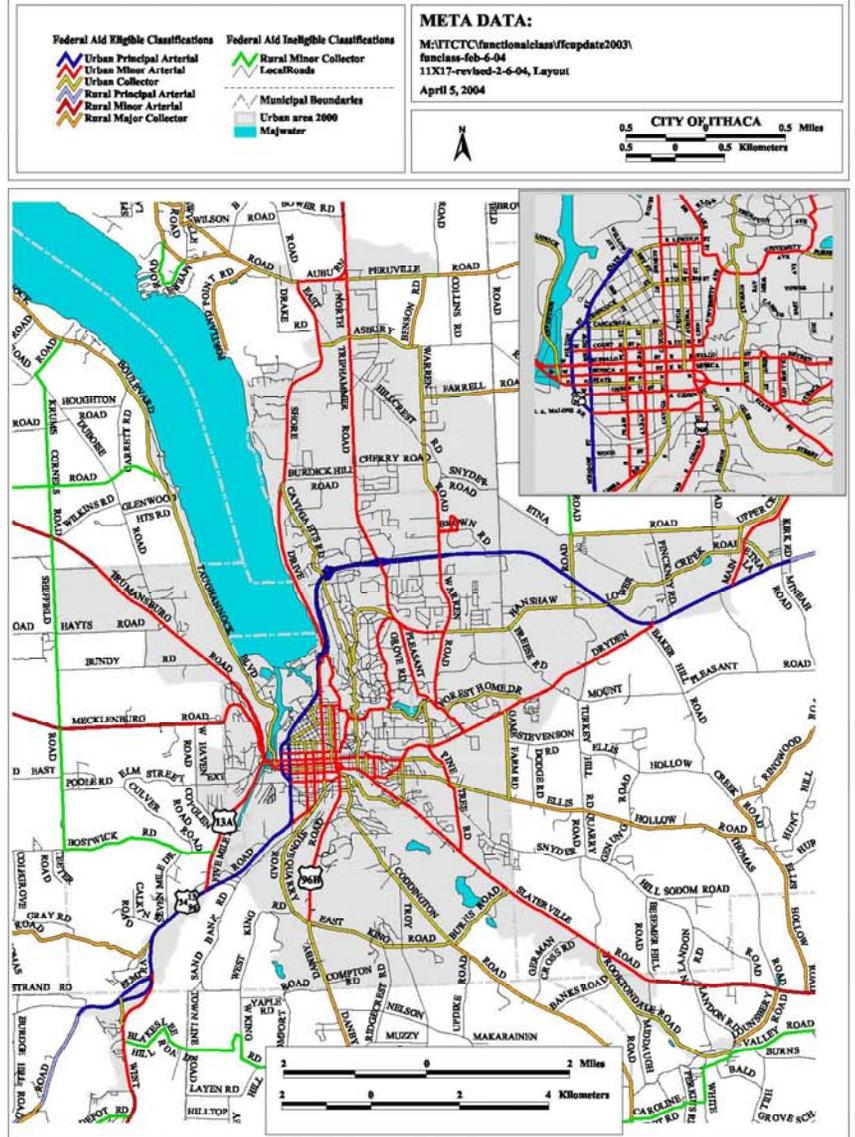
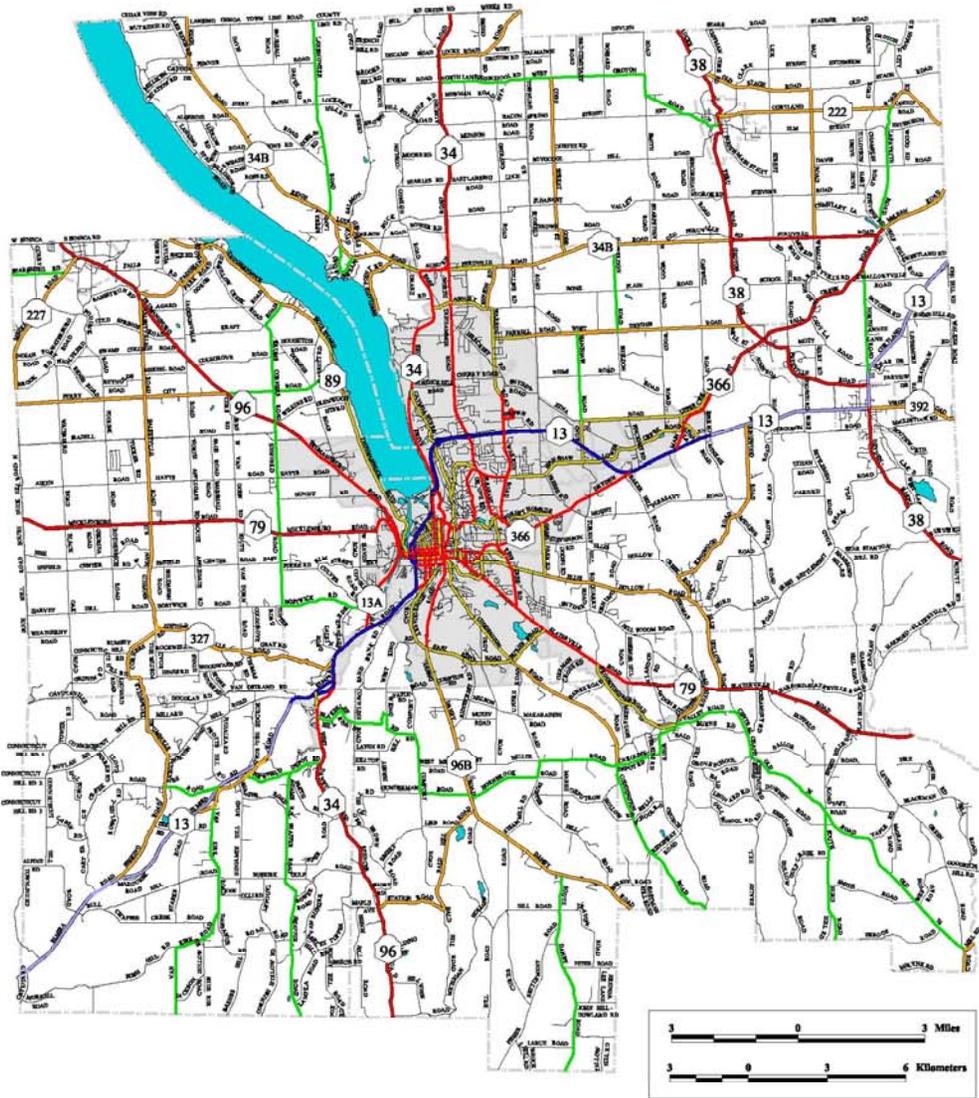


FIGURE 14

TABLE 19			
Federal Aid Road System – Descriptive Statistics 2000 System (based on Census 2000)			
Functional Class	Centerline Miles	Percent	FHWA Guidelines
URBAN ROADWAYS			
Urban Principal Arterial - Freeway	7.10	2.23%	
Urban Principal Arterial	15.90	4.99%	
Total Urban Principal Arterial	23.00	7.22%	5-10%
Urban Minor Arterial	57.80	18.14%	
Total Urban Arterial	80.80	25.35%	15-25%
Urban Collector	52.30	16.41%	5-10%
Urban Local Street	162.60	50.02%	65-80%
RURAL ROADWAYS			
Rural Principal Arterial	17.30	1.77%	2-4%
Rural Minor Arterial	57.10	5.86%	
Total Rural Arterial	74.40	7.63%	6-12%
Rural Major Collector	117.20	12.02%	
Rural Minor Collector	83.20	8.53%	
Total Rural Collector	200.40	20.56%	20-25%
Rural Local Road	700.10	71.81%	65-75%
TOTAL	1,293.60	100%	

TABLE 20		
Road System – By Type		
Road Type	Centerline Miles	Percent of Total Miles
State Roads	180.3	12.5%
County Roads	304.5	21.1%
Town Roads	644.7	44.6%
City Streets	61.5	4.3%
Village Streets	76.1	5.3%
Institutional Streets (CU, IC)	18.9	1.3%
Private Roads	63.3	4.4%
Abandoned / Vacant	56.0	3.9%
Not entirely one route type	39.9	2.8%
TOTAL	1,445.2	100%

b. Bridges

The major infrastructure issues related to bridges include maintenance and operations, traffic safety, and capacity (addressed later in this chapter).

NYSDOT performs periodic inspections of all bridges. Bridge condition ratings are assigned in a scale from 1 to 7, where 1 is a failing structure and 7 is excellent. The scale uses a weighted formula that accounts for several structural components of a bridge. Bridges that score less than 5 are considered deficient. They are candidates for rehabilitation work, replacement or perhaps closure. Priority deficient bridges are those that either have an inspection rating of less than 3.0 (there are none of these in Tompkins County) or have an inspection rating between 3.0 and 3.999 with an Annual Average Daily Traffic (AADT) of greater than 4,000 (there are 4 of these in Tompkins County). Priority deficient bridges are given priority funding over deficient bridges. A deficient or priority deficient rating does not mean a bridge is unsafe. A bridge that is considered unsafe would be closed to further use.

According to NYSDOT's Bridge Needs Assessment Model (BNAM) database, there are 194 bridges in Tompkins County that were inspected between April 1, 2006 and March 31, 2008. Of these, 53 are State-owned, 132 are locally owned, and authorities and others own nine (five by Cornell and four by the NY State Parks). Of all the bridges, 38.1% are rated as deficient. The priority deficient bridges are located as follows:

- Rt 13 (Elmira Rd) over Carter Creek (BIN# 1010290) - NYSDOT
- Rt 13 (Dryden Rd) over Fall Creek (BIN# 1010400 - NYSDOT
- Etna Road (east of Pinckney Road) – BIN# 3369020 – Tompkins County
- East Clinton Street over Six Mile Creek (BIN# 2210440) – City of Ithaca

Of these the E.Clinton Street and both Rt.13 bridges are already scheduled in the TIP for repairs between 2010 and 2011. The Etna Road bridge received repairs in 2008 after the BNAM inspection. **FIGURE 15** and **FIGURE 16** show the location of the bridges of Tompkins County along with their bridge rating.

TABLE 21 shows that the percent of deficient State owned bridges has increased since 2003, but is still lower than figures from 10 years before. The nine ‘authority’ bridges in the county have experienced significant decline in condition over the last nine years. BNAM figures indicate that eight out of the nine of these bridges are deficient.

The ITCTC recognizes the importance of bridge maintenance as a critical factor in having a safe and efficient transportation system. Over the years many bridge projects have received funding through the TIP. Over 50% of the 2007-2012 TIP funding, in effect at the time of preparing this plan, was dedicated to bridge projects. The ITCTC will

continue to include bridge maintenance as an important component of project development efforts.

TABLE 21						
BRIDGE CONDITION						
	1999		2003		2007-2008	
Owner	% Deficient	Avg. Rating	% Deficient	Avg. Rating	% Deficient	Avg. Rating
State	36%	5.88	28%	5.64	32%	5.48
Local	58%	5.05	39%	5.54	43%	5.26
Authority	66%	4.90	64%	4.73	89%	4.46

c. Transit

Public transit service in Tompkins County is provided by TCAT. In 1996, Tompkins Consolidated Area Transit (TCAT) was authorized by the New York State Legislature. In 1998, the City of Ithaca, Cornell University and Tompkins County agreed to form TCAT as a joint venture to operate public transit service in Tompkins County. In 2005, the parties reorganized TCAT as a not-for-profit corporation.

TCAT analyzes its bus route performance and proposes adjustments to fares and specific routes in response to evolving fiscal conditions and customer demands. The agency undertook two system-wide re-evaluations, a consolidated service and fare study in 1998-99, (which created the TCAT system) and a Transit Development Plan in 2008-09.

TCAT’s fixed route bus system includes three counties. TCAT operates in every town in Tompkins County. Plus, TCAT provides commuter service from Watkins Glen in Schuyler County and Newark Valley in Tioga County. TCAT service is concentrated in the Ithaca urbanized area. Nearly 61% of Tompkins County residents live within one quarter (¼) mile of a bus route, with 88% for urban and 31% for rural populations. (Source: Tompkins County Planning Department).

In 2009, TCAT used 50 buses to operate service. This is a reduction of 8 buses (14%) from 2008, which were previously used to operate select rural routes by a private contractor. TCAT contracts with GADABOUT Transportation Services, Inc. for demand responsive paratransit service required by the Americans with Disabilities Act (ADA paratransit). GADABOUT operates 26 small buses.

In 2009, TCAT operated 35 routes with a diverse range of schedules for academic year, summer and yearlong service. All towns in Tompkins County are served by TCAT. Sunday service is available in the Ithaca urban area. Public transit routes are shown in **FIGURES 17** and **18** (Note: TCAT continuously reviews its bus routes

in an effort to improve service; therefore, the bus routes shown in the maps may be changed at any given time).

In 2008 TCAT performed a complete bus ridership survey on all their transit routes – noting where transit riders boarded the bus and where they alighted. **FIGURES 17 and 18** also show the results of the ridership survey:

Very Low Ridership = 1-50 riders per day

Low Ridership = 51-100 riders per day

Good Ridership = 101-150 riders per day

Very Good Ridership = 151-500 per day

Excellent Ridership = more than 500 riders per day

Transit routes showing the most ridership were #30 (Commons-to-Cornell-to-Shops at Ithaca Mall). #81 and #82 (Cornell University Campus) and the #10 (Cornell University to Commons Shuttle). Since 2005, the top three urban routes with the highest ridership (30, 81 and 10) carried nearly 50% of total TCAT ridership.

FIGURES 19 and 20 show the principal transit boarding locations in the TCAT system based on 5 weeks of activity in 2008. The downtown Ithaca bus stops at Seneca and Green Streets handled the most passengers (44,870 and 41,538 respectively), along with Parking Lot A at Cornell (35,144). Other principal activity nodes include The Shops at Ithaca Mall, Collegetown, and Cornell University campus locations at Parking Lot B, East Ave. at Sage Hall/Statler Hall and Hasbrouck Apartments.

Before consolidation in 1999, TCAT ridership peaked in 1996 at 2,141,191 passengers. Between 1996 and 1998, ridership declined by 2.7% to 2,085,169 passengers. TCAT experienced strong ridership growth after the consolidated service began in the fall 1999. In 2000 ridership was at 2,413,150. In 2005, TCAT ridership passed 3 million passengers for the first time. In 2008 TCAT carried 3,307,531 riders.

Demand for increasing the scale and scope of transit service continues as evidenced by the interest generated by the TCAT 2008-2009 Transit Development Plan and continued ridership increases. TCAT will be operating a new hybrid fixed and demand-responsive route serving the Etna area of the Town of Dryden when the new service plan is put into effect in January 2010.

Increased service demand during the 2008 gasoline price hike offered clear evidence of the potential demand for increased service, particularly to serve the commuter traffic from rural towns and neighboring counties to the Ithaca urban area. A coalition of representatives from the counties surrounding Tompkins County, higher education institutions and transit providers have been meeting periodically to discuss and advance enhanced regional (multi-county) transportation options in the area. The ITCTC will continue to work with this group to ensure that transit and other mobility options are used to serve

the largest possible number of commuters into and out of Tompkins County.

Until the American Recovery and Reinvestment and Recovery Act of 2009 was enacted, TCAT faced a chronic capital-funding shortfall for timely bus replacement. An infusion of federal stimulus funds, directly and indirectly, provided funding to replace 15 of 16 older TCAT buses. Until then, neither federal or state capital assistance programs proved adequate to the task. Therefore, TCAT considers operating transit buses for up to 18 years, 6 years longer than the federal life cycle, as long as safe operations conditions are maintained.

In addition to rolling stock, there will be substantial capital facility needs to be addressed in the next twenty years. These include: (a) rehabilitating and expanding the transit center; (b) developing park and ride facilities; (c) vehicle location information systems to provide real time location information to dispatchers and passengers; (d) smart card fare collection system to automate fare accounting; and (e) additional and renovated passenger shelters to increase accessibility, security and ease of use.

d. Paratransit

GADABOUT Transportation Services, Inc. was developed in 1976 and re-organized as a non-profit transportation corporation in 1981. GADABOUT provides wheelchair accessible, demand responsive service for people over 60 years and persons with disabilities in Tompkins County. GADABOUT set a ridership record of 63,809 in 2008, a 67% increase in the decade of 1999-2008. GADABOUT's administration and operations center and 26 paratransit buses are based and maintained at TCAT's transit facility. GADABOUT was an original tenant of the transit facility (with a fleet of 13 buses) when it opened in 1992. TCAT contracts with GADABOUT to operate its ADA paratransit service.

In the next twenty years, with the generational shift of aging Baby Boomers, the demand for mobility services for seniors is expected to significantly increase. The trend of developing senior residential centers and mixed use, urban housing targeted to seniors will add to demand for flexible mobility services in general and, eventually, for paratransit and other ancillary senior transportation services.

Growing demands for senior mobility and the need to provide a practical alternative for automobile use by frail seniors require new business models. GADABOUT has demonstrated the value of using volunteer drivers to provide paratransit service. An example of a new approach is to use time banking to reward volunteers and car donations to fund passenger trips. Social entrepreneurship may be useful to create affordable mobility services. The ITCTC encourages coordinated planning for capital and operational needs for paratransit and new service strategies to meet the growing demand

for mobility by seniors. Such new approaches may be applicable to general community mobility.

e. Coordination Plan

Mobility services targeted to provide job access for low-income persons and special needs populations needs continued attention. The Tompkins County Department of Social Services and ITCTC have closely cooperated to develop the Coordinated Public Transit - Human Services Transportation Plan for Tompkins County (Coordinated Plan). Under this plan, required by SAFETEA-LU, human services and transportation agencies have identified resources, service gaps, and annual project priorities to improve community mobility, increase the capacity of providers to supply more service, and to increase efficient delivery of transportation for human service needs. The County's Mobility Management program, in the Department of Social Services, coordinates project implementation. The ITCTC will continue to work with its local partners to implement the Plan's priorities and to revise the Coordinated Plan in the future.

f. Multimodal and Intermodal Facilities

The issues associated with intermodal freight and commercial passenger facilities are discussed under a separate heading below. For the purposes of defining the Metropolitan Transportation System, a map of intermodal facilities is provided here (see **FIGURE 21**).

Multimodal facilities refer to the accommodation of various modes of transportation. In Tompkins County transit, bicycle and pedestrian facilities are the principal components considered under the "multimodal" aspect of this section. Specific discussions of bicycle and pedestrian issues appear later in this chapter.

TCAT's City Center project, to replace three bus stops around the Ithaca Commons, achieved progress by completing the Seneca St stop in 2007 and the Green St. facility in 2009. The Aurora St stop is being planned in relation to a proposed hotel development. The Project enhances the public transportation experience for all customers and also results in improvements for pedestrians and bicyclists. The improved streetscape at the stops directly benefits the Downtown. The functionality of the new passenger facilities promotes seamless multimodal integration.

ITCTC supports multimodal planning, which frequently requires multi-party collaboration for implementation. . A comprehensive plan is needed to bring bus stops up to standard to include effective signage, adequate shelter, and to promote multimodal and land-use integration. Identifying and geo-coding bus stops enables their use in personal way finding by pedestrians and for multimodal trip planning. Thus, identified bus stops can mark locations for multimodal services such as bike parking, car share, and rideshare stops located near by. Bus passenger shelters, electric power, information displays

and area map, can enhance potential for integration with other modes and with compatible land-uses.

Intercity bus service and bus tourism are two modes providing new opportunities for planning, public-private collaboration and multimodal integration. Recent analysis indicate that efforts by carriers to enhance their fleets and improve customer service, together with higher fuel costs for individual drivers are leading to a renaissance of the use of buses for intercity travel. The Ithaca intercity bus station is conveniently located in the West End of Downtown Ithaca, within walking and bicycling distance of most of the population in the Flats of the City of Ithaca. However, the inter-city bus station, which serves as a gateway for approximately 179,000 annual passengers, lacks basic passenger amenities, i.e. bathrooms, street furniture, bicycle parking. Rehabilitation or relocation of the intercity bus facility is needed to provide a modern facility. Currently, the intercity bus facility is served by the public transit system, taxis and paratransit. Regular and frequent service should be continued to facilitate transportation to the final destination of intercity travelers. Intercity bus service in Tompkins County includes three carriers and approximately 28 buses per day

The prospect for high-speed rail service in Upstate New York could stimulate demand for feeder bus service from Tompkins County. A regional bus plan would be needed to integrate new services with local transit and other modes. Both County and City economic strategies promote tourism, however, a plan is needed to enhance and manage bus tourism while mitigating potential negative impacts of congestion.

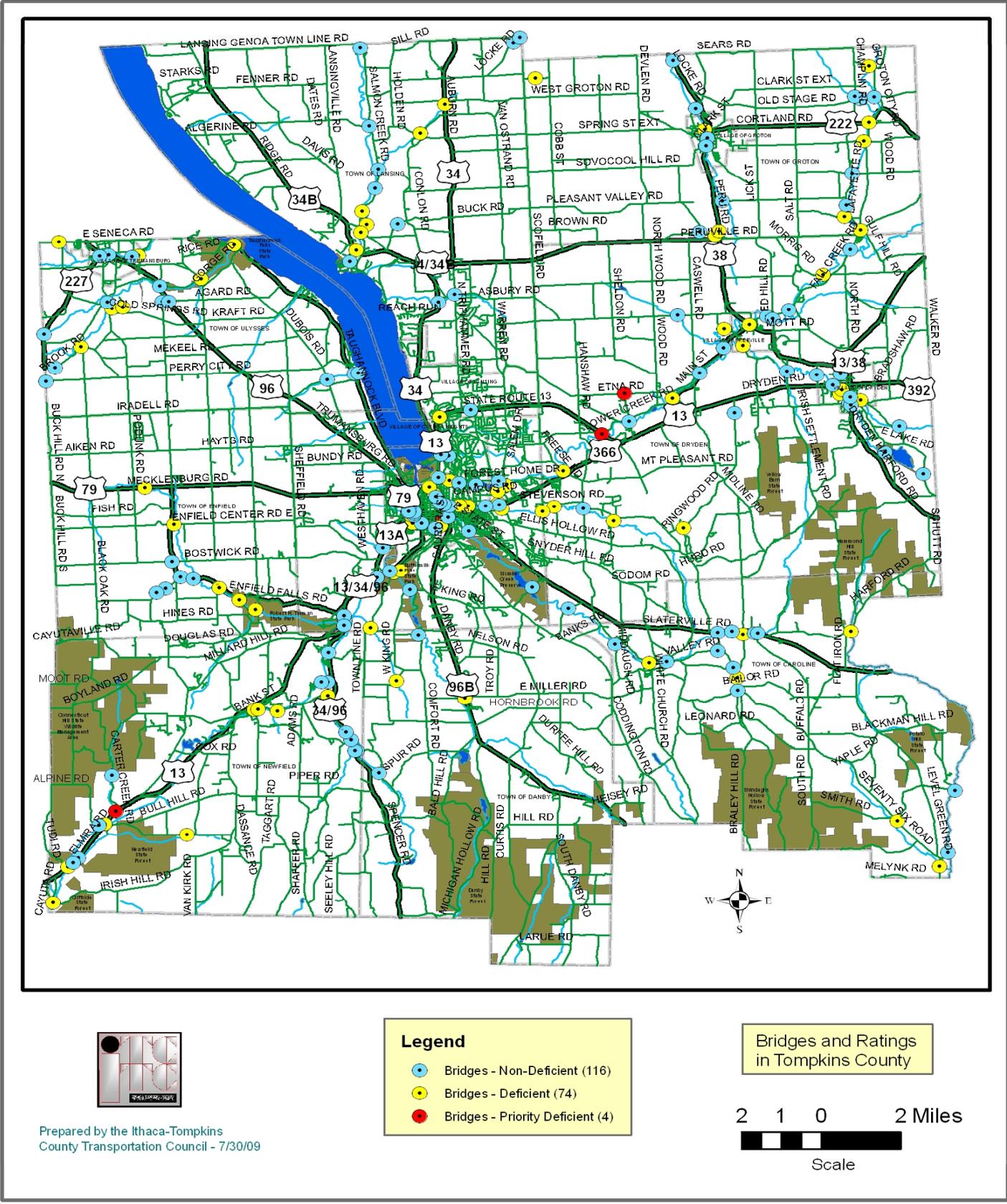


FIGURE 15

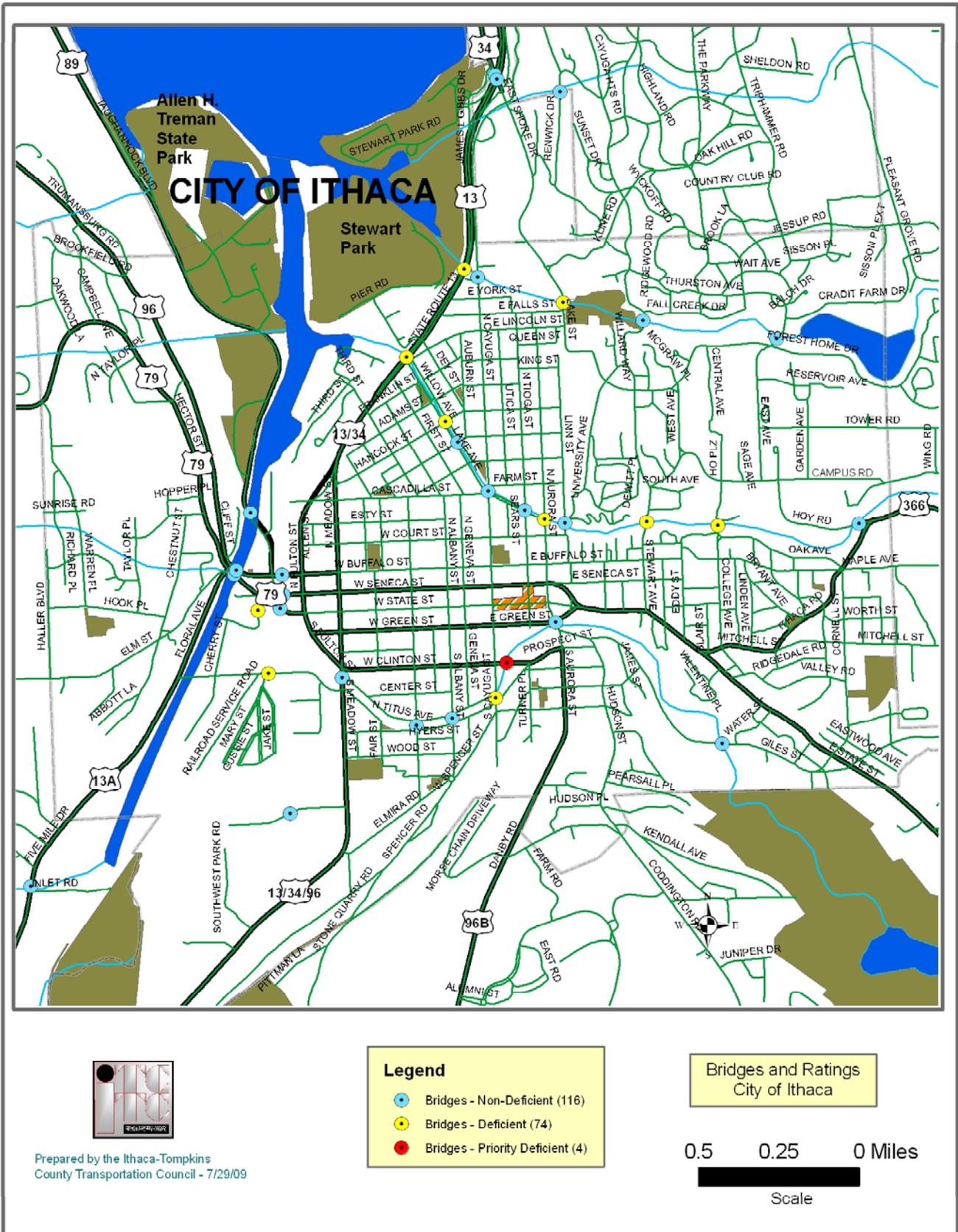


FIGURE 16

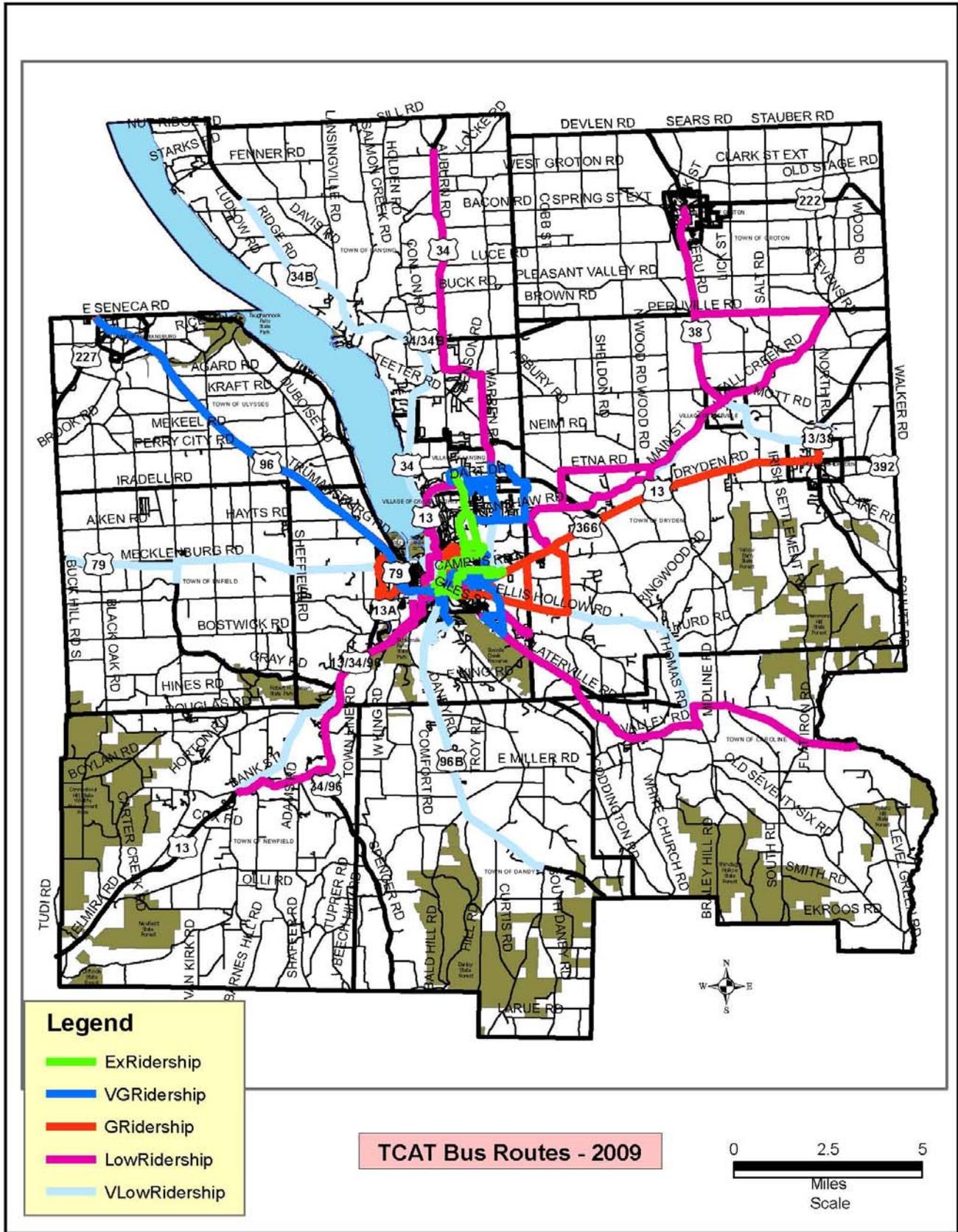


FIGURE 17

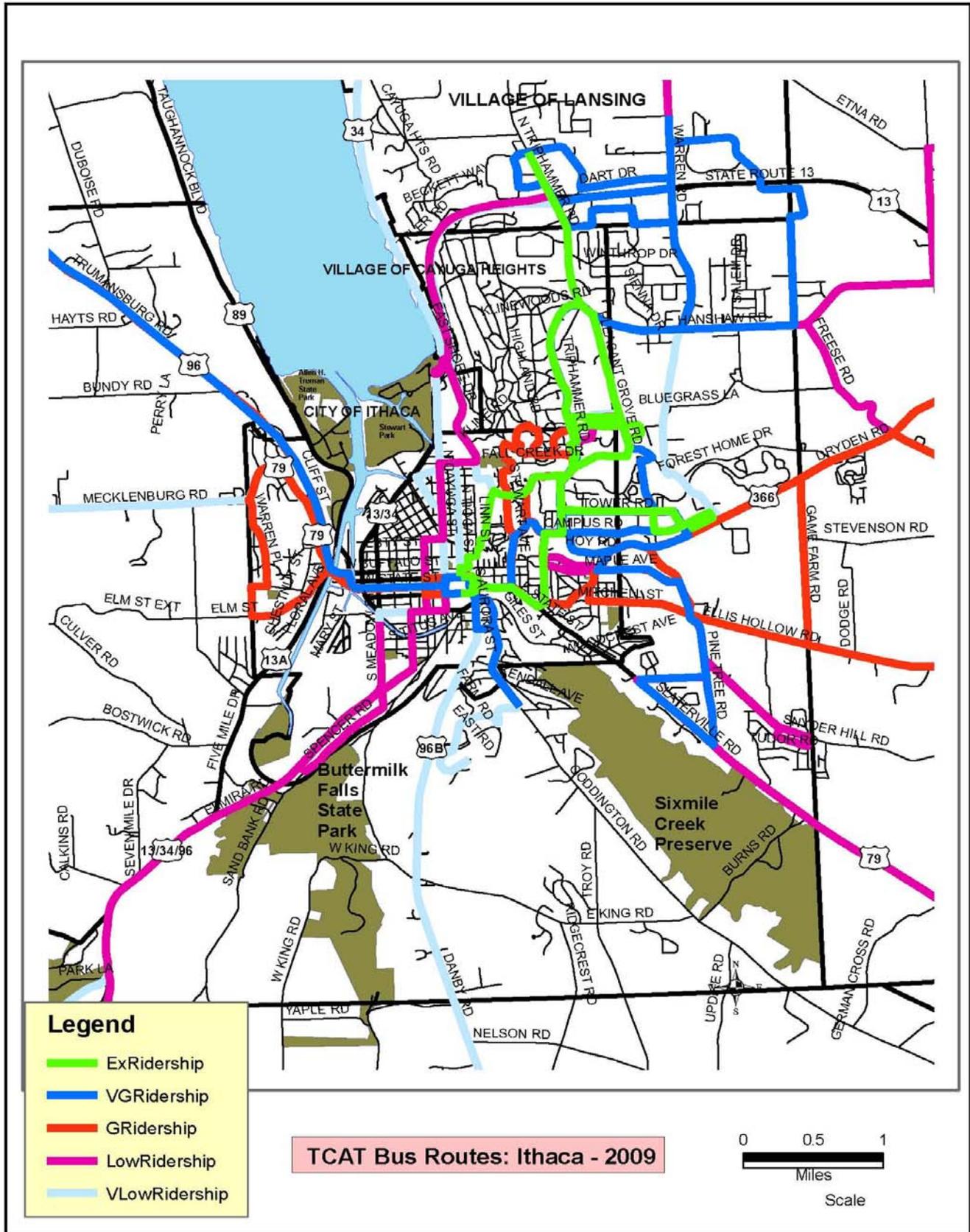


FIGURE 18

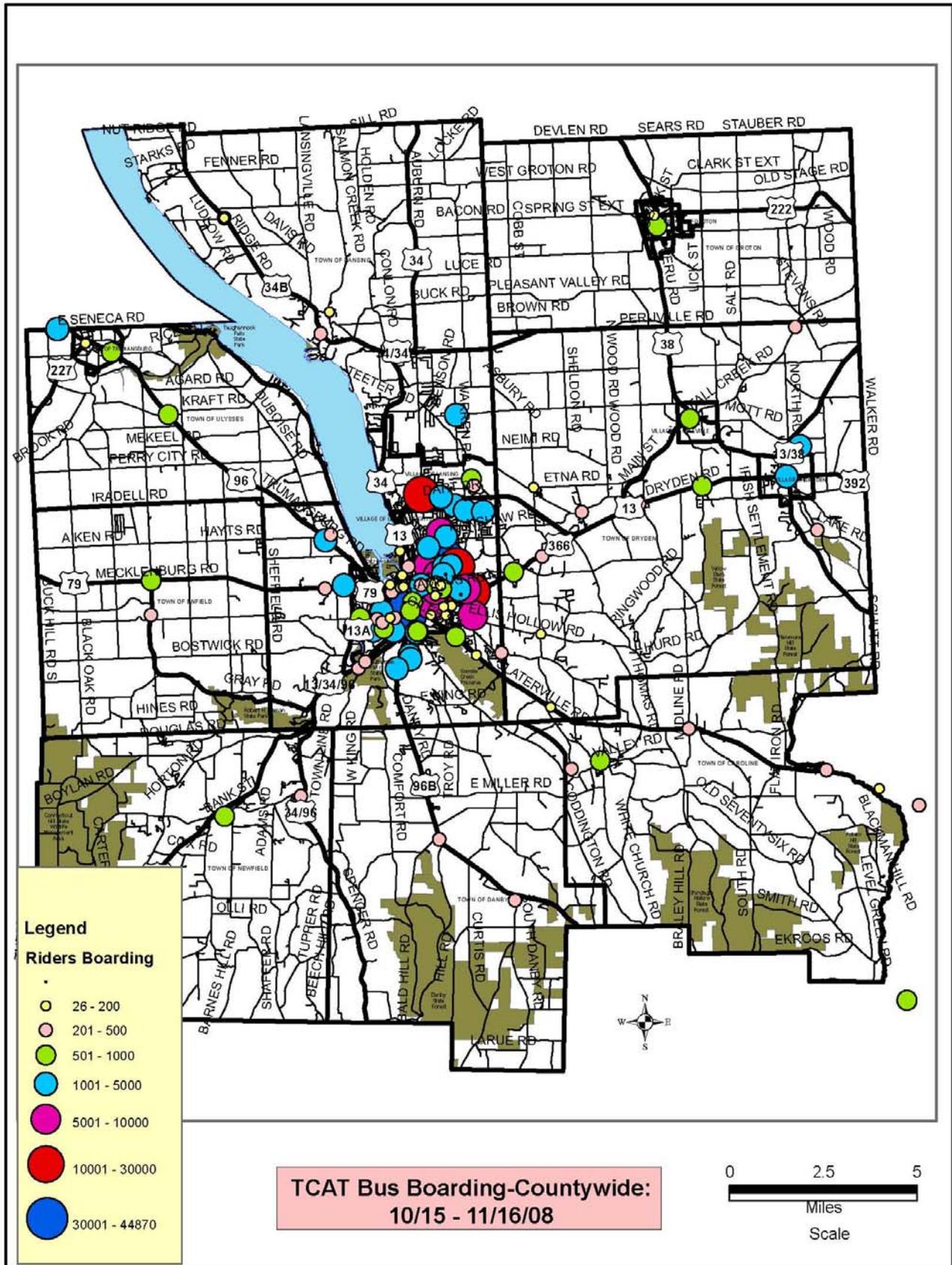


FIGURE 19

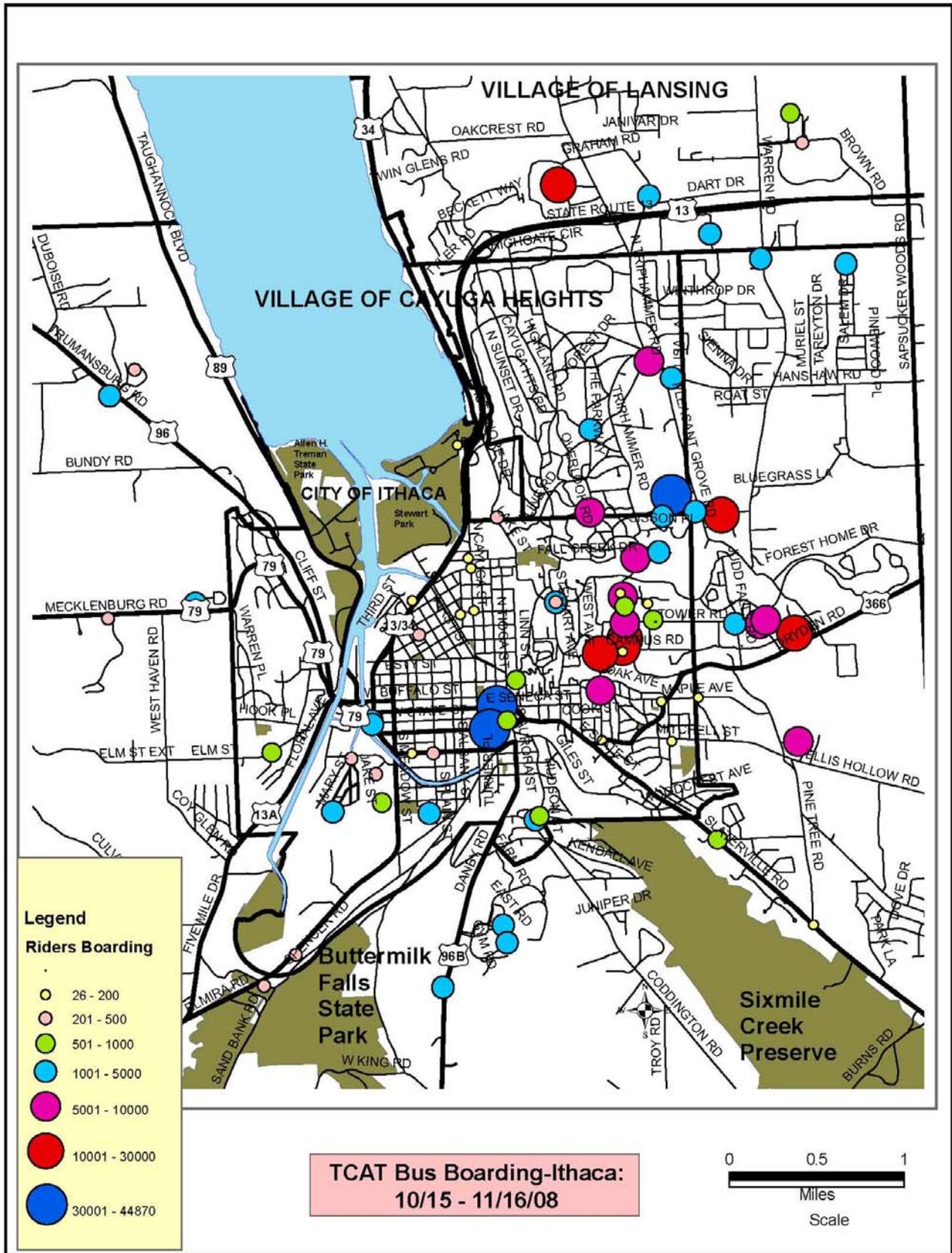


FIGURE 20

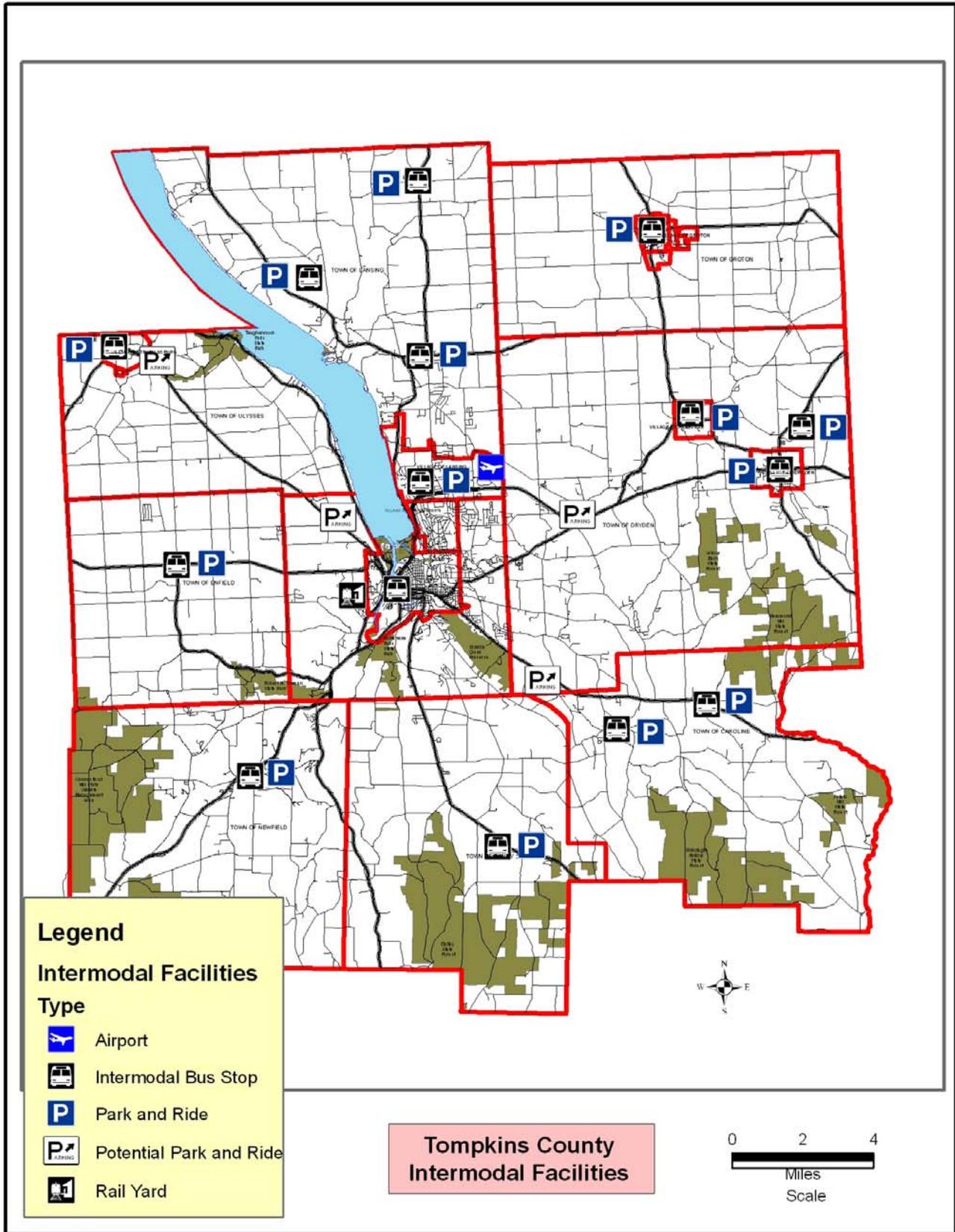


FIGURE 21

g. Bicycle and Pedestrian Programs

As explained below and in Chapter 1, the bicycle and pedestrian modes of transportation carry a significant percentage of the journey to work trips in the Tompkins County. To achieve the goals of the LRTP, reduce greenhouse gas production and dependency in fossil fuels every effort should be made to maintain and enhance the trip share of these alternative modes to the automobile. The presence of a dedicated full or part-time bicycle/pedestrian coordinator for Tompkins County would help achieve this outcome. Such a person would review projects for their multimodal impact, and coordinate training, education, and outreach and provide assistance to local municipalities. The ITCTC supports the creation of a bicycle/pedestrian coordinator position and will work with the County, City of Ithaca and other member agencies to determine the best administrative option to locate such a position and secure its funding.

Bicycles: The need to develop an integrated, countywide bicycle system is crucial. Various efforts have contributed to this end but better coordination is needed.

The City of Ithaca adopted a Bicycle Plan in 1997, but has found implementation difficult, primarily because of narrow street widths and potential impacts to on-street parking. Currently the City is using a combination of federal, state and local funding sources to design and build the Cayuga Waterfront Trail connecting the City's waterfront destinations to each other and to nearby neighborhoods. In addition, the City of Ithaca and its Bicycle Pedestrian Advisory Committee (BPAC) continue to work on a variety of projects, including sidewalk improvements, the possible designation of Bicycle Boulevards, strategically located bicycle lanes, enhanced bicycle parking facilities, etc. The BPACs work will answer questions about the actual impacts and feasibility of installing bicycle facilities within the City's road network.

Cornell University has an active program to educate students about safe bicycle use and the network of trails and paths available to bicyclists on campus. Other municipalities around the county are advancing multiuse trail projects that eventually will interconnect and provide a comprehensive countywide system.

For well over a decade TCAT has instituted a popular Bikes-on-Buses program that serves thousands of customers every year. This program allows riders to combine their bicycle trips with transit in those occasions where a bicycle only trip is not possible. Every vehicle in the TCAT fleet is equipped with bicycle racks. They are indicative of the interest and potential of developing an infrastructure for bicycling within the existing transportation system.

In 2007 ITCTC produced the first Bike Suitability Map for Tompkins County. 24,000 copies of this map were distributed throughout the county (at the Farmer's Market,

bike and outdoor shops, recreation facilities, colleges, etc). This map was so popular that a 2nd edition was produced in 2008 (see **FIGURE 22** – Bike Suitability in Tompkins County – a representation of the data included the Bicycle Suitability map for Tompkins County). **TABLE 22** shows summary information of bike suitability in Tompkins County.

It is clear that additional data is necessary to complete a more detailed, regional bicycle plan. However, some recommendations for development of a bicycle transportation system include cost-effective projects such as pavement re-striping to include bicycle lanes, providing bicycle parking, road shoulder condition/width improvements, and road shoulder maintenance (especially cleaning of shoulders), the latter of which can be implemented with minimum delay or as part of ongoing maintenance efforts.

The ITCTC supports the development of a "bicycle-friendly" transportation system that serves to encourage increased bicycle use and make cycling safer. The primary policy position is that bicycles are legitimate forms of transportation that should be accommodated in the design process for transportation facilities and land use development. Doing so minimizes the potential for conflict with motorized vehicles, thus not only making the system safer but also making it more efficient for all modes (e.g., vehicles not slowed by presence of cyclists).

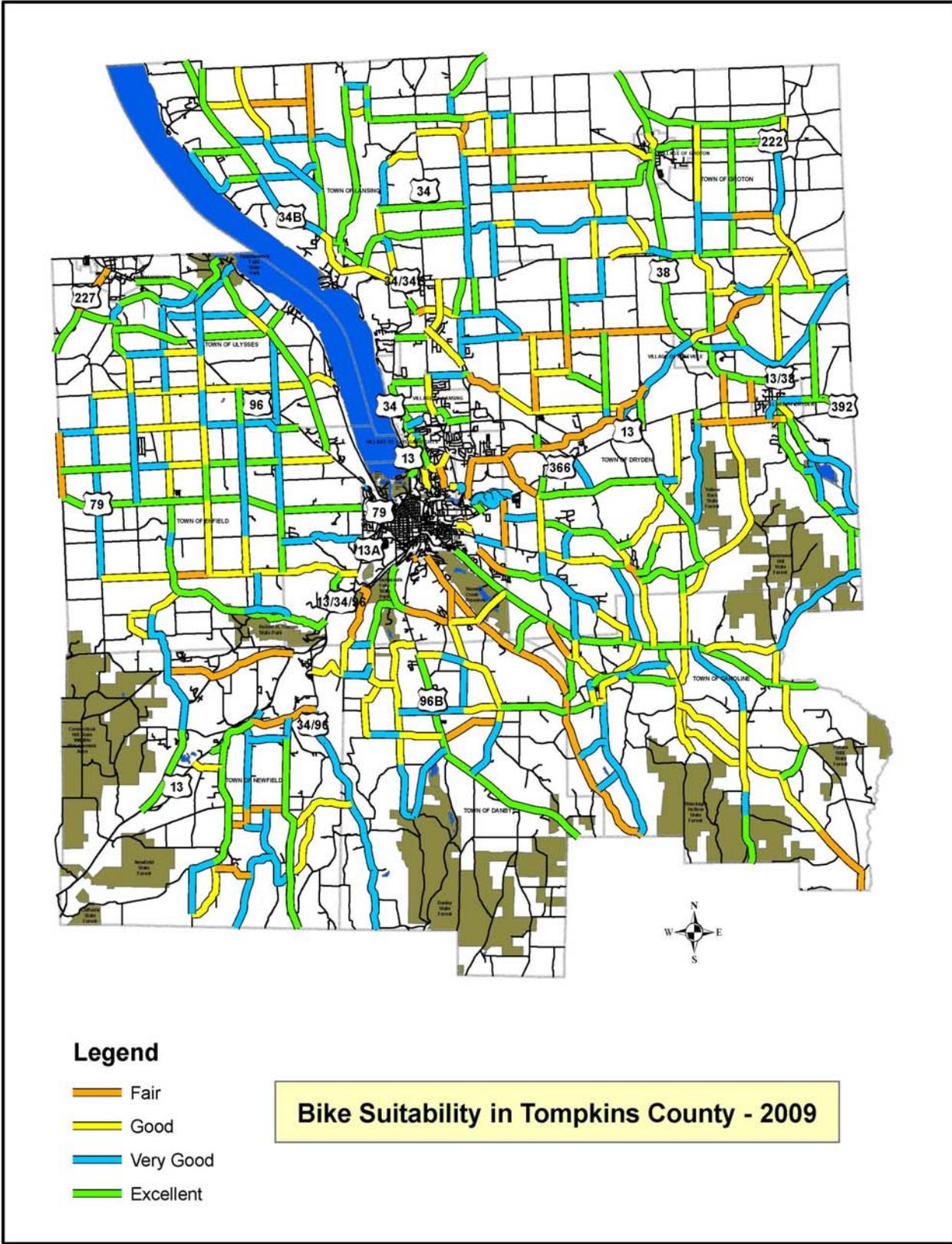


FIGURE 22

TABLE 22		
Bicycle Suitability – Score		
2008 System (from Bike Suitability Map)		
Bike Suitability Score	Centerline Miles	Percent
OUTSIDE CITY OF ITHACA		
Excellent	178.2	28.2%
Very Good	194.4	30.8%
Good	177.3	28.1%
Fair	80.9	12.8%
INSIDE CITY OF ITHACA		
Heavy Traffic Volume	17.3	13.0%
Moderate Traffic Volume	57.1	39.7%
Low Traffic Volume	74.4	30.8%
Very Low Traffic Volume	117.2	16.6%

Pedestrians: As described in Chapter 2, Tompkins County has a large percentage of its journey-to-work trips that take place by walking (2007 ACS: 17% countywide; 42% in the City of Ithaca; 20% in the Town of Ithaca). Clearly, pedestrian movements are an extremely important component of local transportation planning. The ITCTC seeks to enhance the pedestrian experience in order to maintain and increase the number of people who choose this mode of transportation to complete their daily trips.

The City of Ithaca is served by a comprehensive network of sidewalks, though gaps do exist in the system. The ITCTC supports efforts to maintain and enhance this network. The City possesses extensive GIS data on sidewalk facilities; a recent survey of this information by City staff identified four main areas lacking in pedestrian facilities or adequate network connections:

- West Hill – lack of sidewalks, substandard conditions
- Old Elmira Road and Spencer Road corridors – lack sidewalks
- East Hill and South Hill – connections need improvement, lack of sidewalks in upper sections
- Residential neighborhoods need better connections to the waterfront.

Outside the City of Ithaca sidewalks are found mostly in the Tompkins County villages and in areas of the Town of Ithaca where there are denser settlement patterns. In 2002 the ITCTC completed a survey of pedestrian facilities countywide outside the City of Ithaca (see **FIGURE 23**). This information was circulated widely to serve as a resource to local planners and decision makers. In 2009 ITCTC field checked the 2002 survey and edited to include

sidewalks throughout the County that were added in the interim period. The location of sidewalks in the City of Ithaca are shown in **FIGURE 24**. **TABLE 23** shows the sidewalk miles for each municipality with sidewalks.

The countywide network of multiuse trails identified in the ITCTC’s Transportation Trail/Corridor Study, together with the Black Diamond Trail, will provide regional connections between many population centers in Tompkins County. The multiuse trails will provide regional pedestrian and bicycle connections that will complement local pedestrian and bicycle networks (i.e. sidewalks, bicycle lanes, etc.). Substantial progress has been made in planning and development of the countywide trail system since the Trail/Corridor Study was completed. The ITCTC plan for countywide trails is shown in **FIGURES 25, 26, and 27**.

The ITCTC will continue to work with local partners to enhance the network of sidewalks, trails and other pedestrian facilities to provide expanded connectivity between activity areas and improve the safety for users. The development of a pedestrian network that safely meets the needs of all persons would in itself provide an incentive for more persons to walk.

The Ithaca-Tompkins County Transportation Council also supports efforts to address pedestrian issues through design of the built environment. In particular the design of transportation facilities (i.e. roads, bridges, etc.) offer the opportunity to consider the needs of pedestrians. A number of intersection design treatments such as bulbouts, raised crosswalks, pedestrian signals, etc. should be considered for incorporation into projects. Sidewalks should be provided at every opportunity.

Educational initiatives, such as local schools providing specific training on pedestrian safety issues (to all age groups), and promotional campaigns for walking would also help in encouraging the use of this important mode of transportation.

The need to comply with ADA standards, and to consider issues such as how traffic signal (phase) timing may affect an elderly/disabled person’s abilities to safely cross a street, is an important consideration in pedestrian planning. The importance of this issue will continue to increase as the average age of the population increases over the next 20 years.

Much progress has been made to address pedestrian issues on a project-by-project basis and as a fundamental policy in site plan review and project design. It is imperative that the *ITCTC* and its local members continue to prioritize and implement cost-effective improvements to the pedestrian network to ensure the safety of all pedestrians. The ITCTC will work cooperatively with its local partners to promote the actions and programs that will lead to the development of walkable communities in Tompkins County.



TOMPKINS COUNTY SIDEWALK INVENTORY

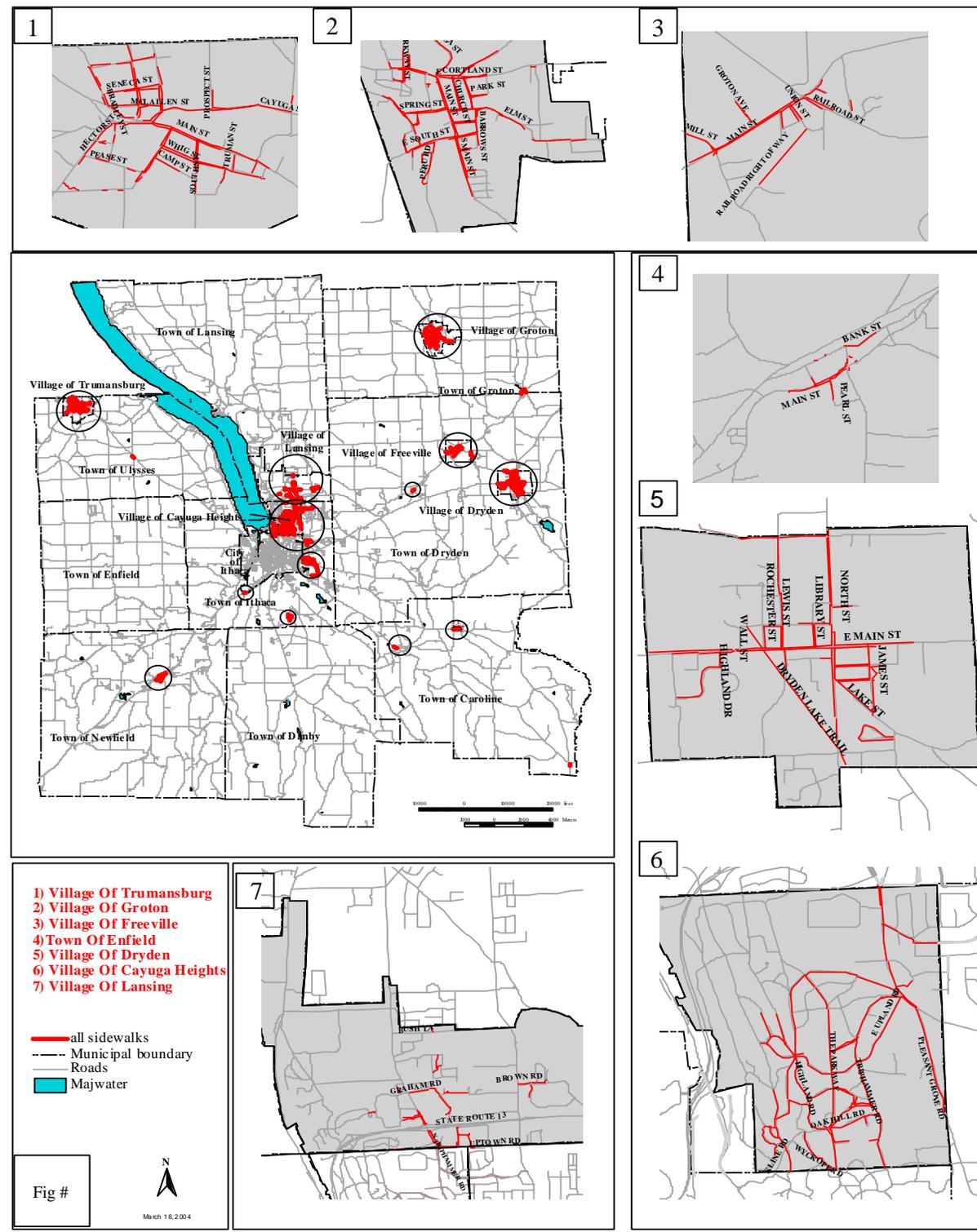


FIGURE 23

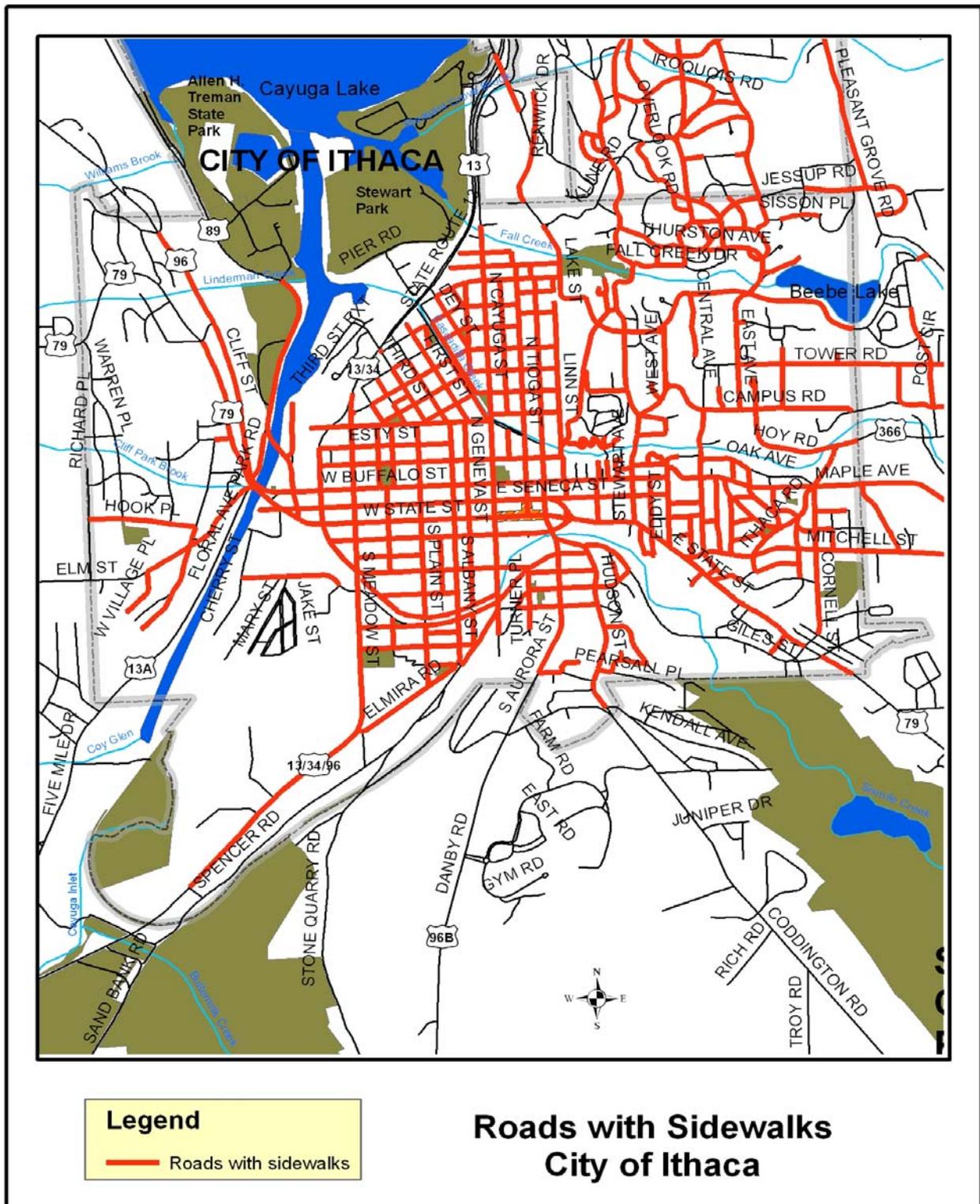


FIGURE 24

TABLE 23			
Roads with Sidewalks			
Municipality	Road Miles	Sidewalk Miles	Percent of Roads w/ sidewalks
City of Ithaca	89.7	54.4	60.6%
Town of Ithaca (Incl Villages)	174.9	13.7	7.8%
Village of Cayuga Heights	24.6	8.8	35.8%
Village of Dryden	11.9	3.3	27.7%
Village of Freeville	6.1	0.7	11.5%
Village of Groton	12.5	3.1	24.8%
Village of Lansing	33	1.4	4.2%
Village of Trumansburg	12.6	3.1	24.6%

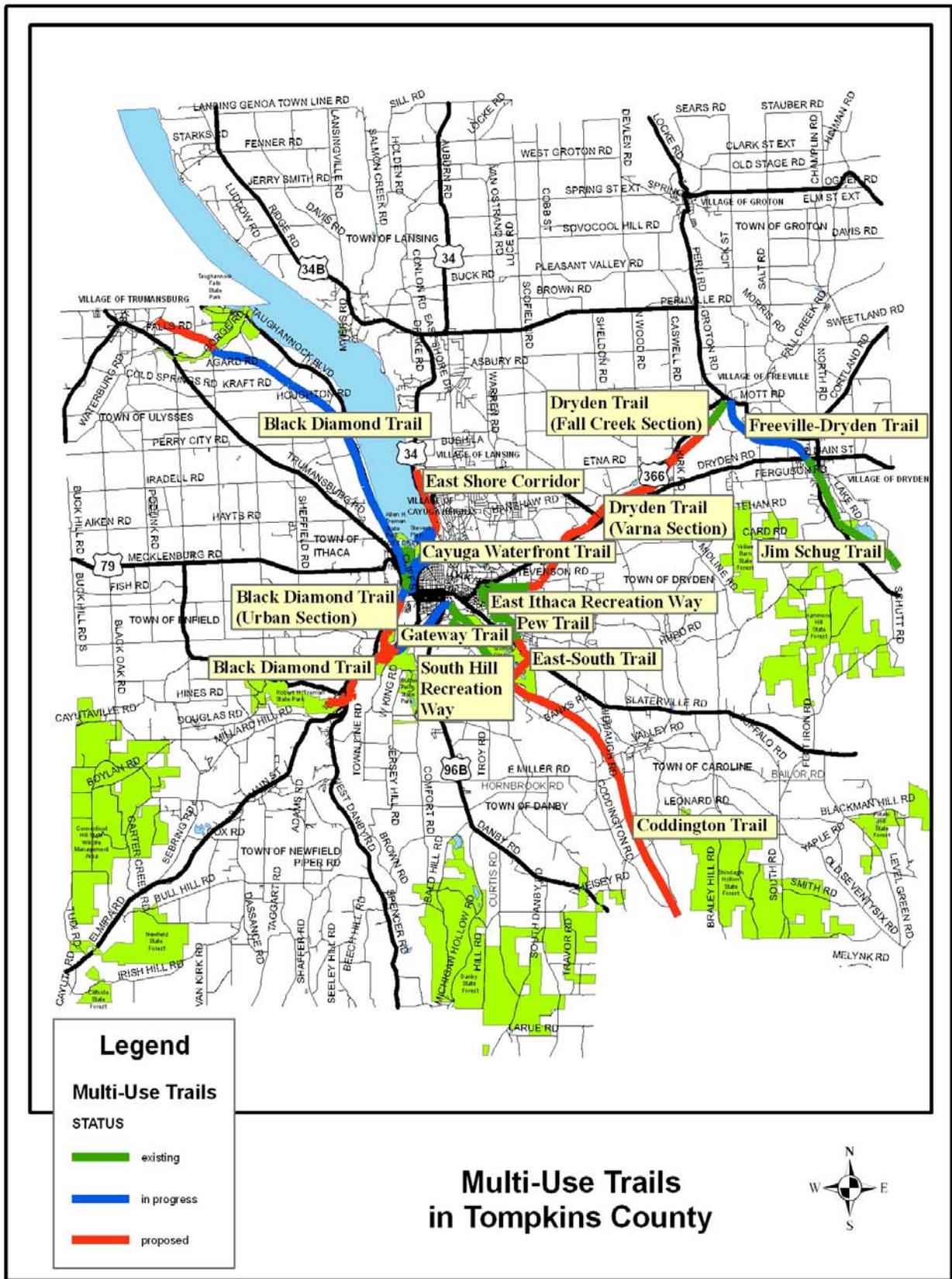


FIGURE 25

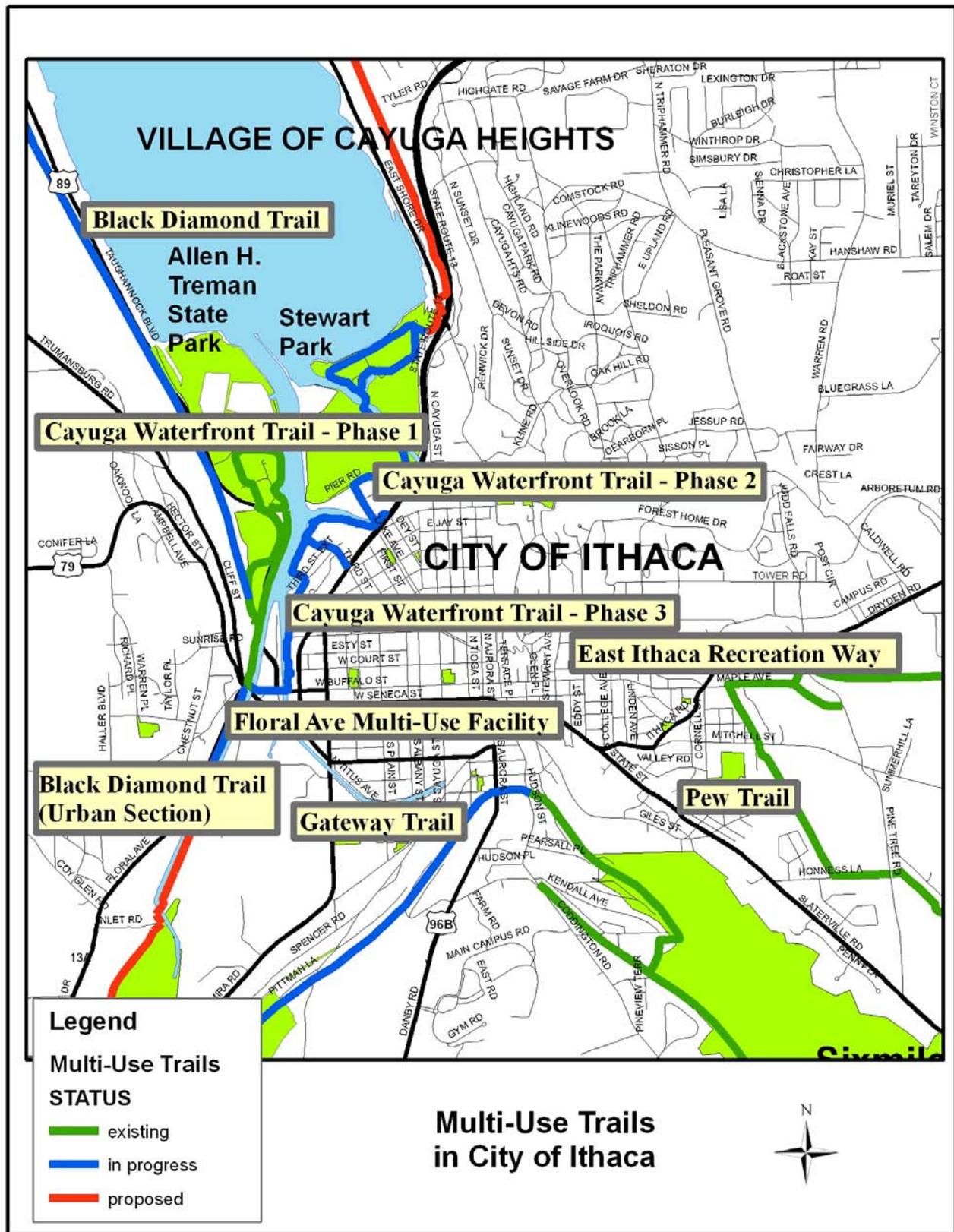


FIGURE 26

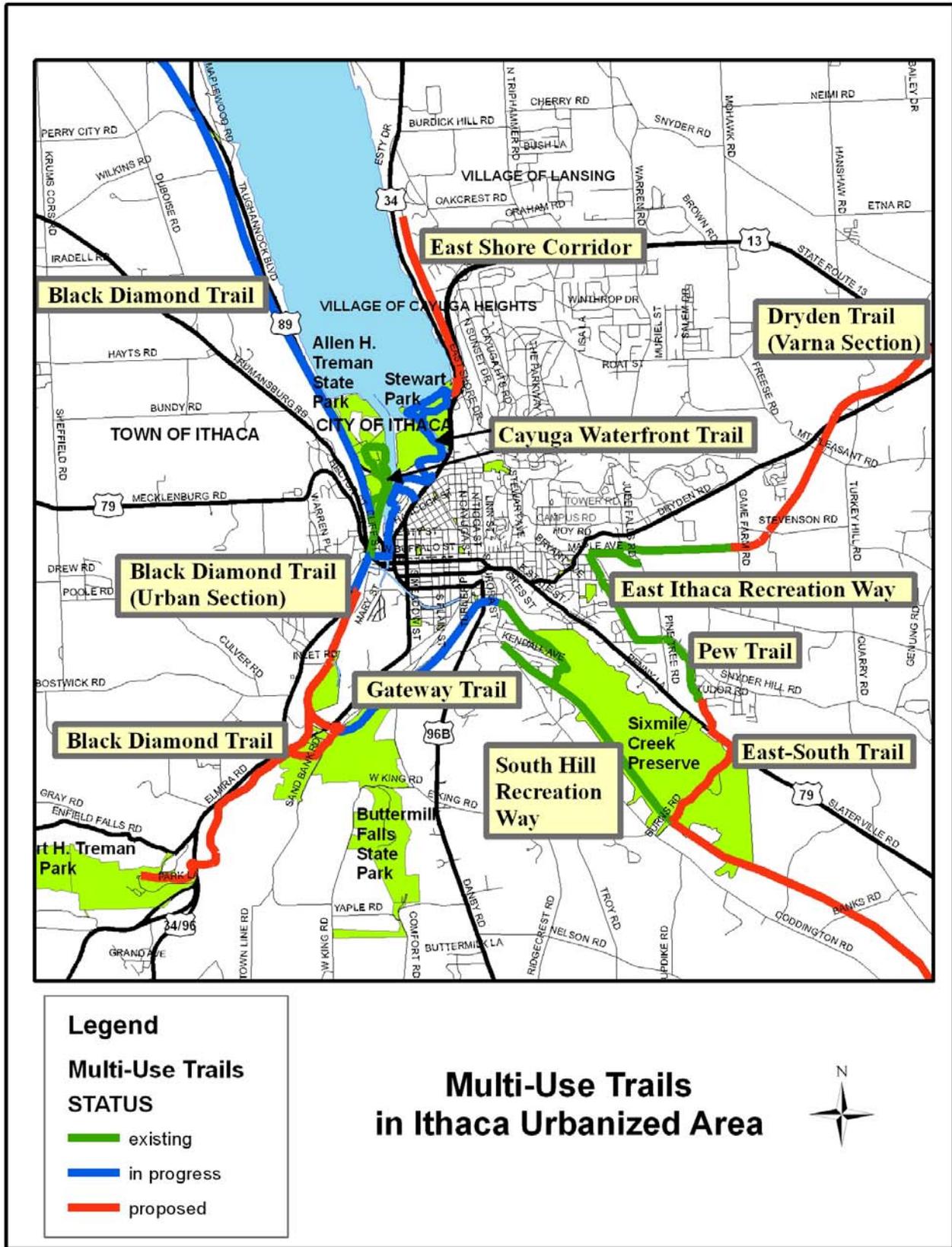


FIGURE 27

SYSTEM INTEGRATION

Introduction

This section concentrates on making the transportation system operate more efficiently as a coordinated system. Issues relate to the mobility impaired, travel demand management, transportation system management strategies, parking management and related data needs are addressed here.

1. Mobility Impaired

In the United States mobility impaired persons are commonly those persons who, for one reason or another, do not have personal access to the use of an automobile. In general, these persons are elderly, disabled, youths, or economically disadvantaged. It is a stated objective of Federal legislation to provide specific consideration for the transportation needs for these groups. Most critical in addressing the issues in this section is to continue to develop a well-integrated, strongly multimodal transportation system for Tompkins County. Every individual has a particular set of needs and limitations that cannot be addressed by single transportation mode strategies. Providing options in transportation - transit, paratransit, car share, bicycling, pedestrian, taxi, etc. - will allow individuals to achieve mobility without the need and burden of private automobile ownership.

Currently, the ITCTC supports data gathering efforts conducted to determine the nature and extent of resources and needs of the mobility impaired population. Other ideas to consider include: (a) making transportation a consideration in the planning of programs and facilities serving the elderly and people with disabilities; (b) studying and considering the development of day care facilities and other services in conjunction with major activity nodes/employment centers, and (c) considering the need to link low income neighborhoods to employment opportunities, retail and service centers, and recreational facilities.

Children's activities should also be considered in order to create initiatives and programs to reduce the number of trips related to these activities. ITCTC staffs meets regularly with members of the youth services community to coordinate efforts and planning for youth transportation. The following are possible areas of activity in Tompkins County: (a) work to decentralize organized activities, basing their location on neighborhood and community units; (b) provide enhanced transit service to those centralized activities that would include security features such as advanced registration and check-in for children; and (c) improve bicycle and pedestrian facilities in order to provide better safe access for children to events or transit stops, d) as possible, provide comprehensive and frequent transit service to the outlying

areas of Tompkins County; e) open dialogue between the transit operators and the school districts to better accommodate the youth population and f) enhance ridesharing opportunities for students and families.

2. Parking and Circulation

Parking areas are an integral part of the transportation system. Their construction, maintenance (including snow removal), and performance must be considered as part of any planning process.

The City of Ithaca and Cornell University include the principal employment centers in the Tompkins County. In addition, they generate a significant number of recreational, personal, and entertainment based trips. Parking management in these two critical areas is crucial to addressing traffic circulation and public transportation issues. In 2008, ITCTC did an analysis from aerial photos locating and measuring road and parking areas in the City of Ithaca (see **FIGURE 28**). The results of the analysis showed the following:

- a) there are 231.37 acres (0.362 sq. miles) of parking areas in the City of Ithaca, which accounts for approximately 6.6% of the total acreage of the City of Ithaca.
- b) there are approximately 0.5937 sq. miles of road surface in the City of Ithaca. This accounts for 10.8% of the total acreage of the City of Ithaca.
- c) parking areas and roads combined account for 17.4% of the total acreage in the City of Ithaca.

The layout and design of parking areas can have a serious impact on the circulation patterns and efficiency of adjacent roads. Major developments should provide detailed on-site circulation studies that maintain the capacity of adjacent roadways by implementing access management techniques such as, minimizing curb-cuts and promoting internal circulation. In addition, full consideration of "alternative modes" (i.e., pedestrians, bicycles, public transportation vehicles) needs to be integrated in the design phases of parking lots.

Recent studies and professional literature have focused attention to the land use/transit/parking interactions. In particular, there are strong arguments on how the provision of free or low-cost parking can influence the selection of travel modes in favor of private automobile use. In urbanized areas like the City of Ithaca, there are increased opportunities to offer the public options to private automobile use for transportation. Dense transit service, a comprehensive sidewalk network, car share, taxi use, Gadabout and bicycling all offer options for private automobile use. Well developed parking management strategies that seek to capture the true cost of parking can help promote the use of alternative modes while at the same time providing parking access to help support a healthy urban environment.

It is also important to note the potential impact of minimum parking requirements on land use development potential. There is a trade-off between parking and other development options (residential, commercial). In urban areas seeking increased densities in order to stimulate their local economies and the vibrancy of the community, parking requirements may need to be reconsidered in order to allow more land to be dedicated to productive uses (residential, office, commercial) instead of parking. The City of Ithaca can consider offering access to transit and car share as ‘credits’ to reduced parking requirements. The ITCTC supports the City of Ithaca’s efforts to consider and debate these issues in the Colletown Plan.

The ITCTC will work closely with the City of Ithaca, Cornell Transportation Services, TCAT and other community partners in studying and developing parking management strategies and plans.

3. Design Issues

Roadway Design

A significant amount of research and an ever-growing list of completed projects provide guidance in what is called Context Sensitive Design (CSD), or what NYSDOT calls Context Sensitive Solutions (CSS). This is an approach to transportation planning that recognizes that transportation has wide societal impacts and is not merely the practice of road construction to maximize vehicular movements. It can be defined as “...a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting, and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. (Project for Public Spaces)”

NYSDOT offers the following definition: “*Context Sensitive Solutions (CSS) is a philosophy wherein safe transportation solutions are designed in harmony with the community. CSS strives to balance environmental, scenic, aesthetic, cultural and natural resources, as well as community and transportation service needs. Context sensitive projects recognize community goals, and are designed, built and maintained to be sustainable while minimizing disruption to the community and the environment*” (NYSDOT-Context Sensitive Solutions website-www.dot.state.ny.us/design/css/resources.html).

Roadway design can influence how transportation corridors operate: i.e. are they welcoming to non-motorized modes? Do they facilitate the provision of transit? What land uses are best suited for the road type? Therefore, one can expect the roadway design on a rural road to differ significantly from that in an urban area.

Within urbanized areas there are many different ‘contexts’ that need to be accommodated: main streets, residential neighborhoods, commercial districts, etc. In each of these roadway design that applies CSS can play an important

role on the land development patterns of adjacent properties. Design of a road as a single-mode automobile oriented commercial arterial, for example, will result in single-use development, large parking lots, and a road that is unfit for anything but driving. Walking and bicycling become inconvenient and unsafe, and with dispersed development, transit is less efficient. In contrast, a different road design can welcome pedestrians and bicyclists without losing capacity while allowing for mixed use development of adjacent properties. In a case like this road design can be the catalyst to help move away from sprawl development to a smarter, more efficient land use development pattern.

Ultimately, a community’s goals are best accommodated by some form of context based roadway design. Much research has been done to help planners and decision makers consider the best solutions for their areas. Locally, the Tompkins County Planning Department has developed a “toolbox” offering ideas and tools for consideration in all types of planning activities (<http://www.tompkins-co.org/planning/vct/index.html>).

The Cornell Community and Rural Development Institute has also developed a toolbox designed primarily for rural communities, but of help to anyone interested in community development (<http://www.cdtoolbox.net/>). More specific to roadway design the Institute of Transportation Engineers published a set of guidelines titled *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*, which help expand the conventional approach to roadway design to facilitate walkable, connected neighborhoods, mixed land uses, and easy access for pedestrians and bicyclists. (<http://www.ite.org/css/>). Additional resources can be found in Appendix C under ‘Transportation Related Web Sites’.

Scenic Resources

Residents in Tompkins County have shown a strong desire to consider the aesthetics and impacts of roadway projects during the planning stages. The ITCTC supports the idea that the “infrastructure should fit the land”, through consideration of geographic conditions, environmentally sensitive areas (e.g., wetlands, etc.), and respect for existing land uses.

The possibility of creating a countywide scenic road system in Tompkins County has been included in past LRTPs, as was the need to identify and protect scenic areas, vistas, and corridors. This latter emphasis was also evident in the development of goals and policies for the Tompkins County Comprehensive Plan and the resulting project, Tompkins County Scenic Resources Inventory, to help identify scenic areas and views in Tompkins County (<http://www.tompkins-co.org/planning/nri/documents/TCSRreportJan17.pdf>).

The New York State Scenic Byways Program designated the Cayuga Lake Scenic Byway (CLSB) as a scenic byway in 2001. The CLSB is an eighty-six mile long system of roads circumventing Cayuga Lake, including: State Roads 89, 90, 34, 34B and 5/20 (www.cayugalake.com). Currently, the non-profit corporation Cayuga Lake Scenic Byways, Inc., serves as a facilitator agency implementing the byway's corridor management plan, applying for funding and otherwise managing the development of the CLSB in cooperation with interested parties and all three counties with jurisdiction: Cayuga, Seneca and Tompkins. It is expected that together with the Route 90 Scenic Byway the CLSB will provide a solid foundation for the development of a broader Finger Lakes Scenic Byway network. The ITCTC will continue its participation in development of the CLSB for the benefit of residents of Tompkins County (see **FIGURE 29**).

4. Transportation Demand Management

Transportation Demand Management (TDM) is the name given to a series of strategies that can be utilized singly or in tandem to create a program whose purpose is to alleviate traffic problems through reduction of automobiles on the road, especially single occupancy vehicles. The strategies include combinations of improved alternatives to driving alone, incentives to use alternative modes, disincentives for driving alone, along with work hour management. The ITCTC supports implementation of voluntary transportation demand management programs, which target major employers or employment areas, such as downtown Ithaca. These programs should address work hours (flextime, compressed work weeks, staggered hours) telecommuting options, carpool/vanpool, guaranteed ride home, transportation allowances, parking management, enhancements to bicycle/pedestrian facilities, and the role of transit and car sharing as part of an overall strategy. The programs should also provide training and assist in start-up procedures. Potential benefits to employers include: reduced absenteeism, increased productivity, reduced parking costs, etc.

There are several other actions that are instrumental to the reduction of travel demand. For example: (a) promoting economic development and job development in locations that reduce total commuting mileage; (b) investigating the demand for teleconferencing centers at major activity nodes; and (c) implementing parking management policies that minimize the number of vehicles in specific areas (e.g., require residential permits, limit the number of on-street spaces, provide secure remote parking lots, etc.) in conjunction with incentives for use of public transportation, car sharing, car pools, walking or bicycling.

Integration of communication strategies for TDM including: public information, consumer education, proactive outreach to agencies and employers, customer feedback, and promoting coordination between service providers are the objectives of Cornell Cooperative

Extension's Way2Go program. The potential benefit for integrating mobility information is much greater than the sum of marketing and advertising efforts of individual transportation providers. The Cornell Transportation Services Office has developed and promoted TDM strategies to the Cornell community since 1988 with great success. Cornell Transportation Services actively reaches out to Cornell students, faculty and staff with incentives and information on using TDM. The County Mobility Management Program conducts train-the-trainer programs on individual travel training (for persons who need training or coaching to access mobility services) for agencies with the aim of creating a network of experienced and trained travel trainers. The ITCTC will work with Way2Go, Cornell Transportation Services, the County and other local programs and agencies to facilitate and enhance access to information that will help the traveling public make informed personal transportation decisions.

Integration of revenue collection or payment among service providers is an unrealized opportunity for increasing consumer convenience and market growth. Several service providers are using new fare collection or access technologies. TCAT has a contactless smartcard (which is encoded in Cornell University identification cards), Ithaca Dispatch uses prepaid TaxiCash cards, and Ithaca CarShare uses a wireless key "fob" to access and lock its vehicles. What is missing is the ability for consumers to use a single payment media to access multiple transportation services, an EZ-Pass for local mobility. The EZ-Pass example simplifies using a consumer's credit card to pay for small transactions for trips. The goal is to maximize consumer convenience with a single payment media. ITCTC supports collaborative efforts to evaluate options for integrating payment media, involving financial and telecom partners working with transportation providers.

Public transportation plays a key role within travel demand management programs. The ITCTC supports efforts that will make public transportation easier to use by overcoming some of its associated penalties (time, inconvenience, etc.). Past studies by the ITCTC and TCAT propose strategies and recommendations aimed at enhancing transit service in Tompkins County. The ITCTC will work with TCAT and other MPO partners to facilitate implementation of those recommendations that show greatest promise. In addition the ITCTC will work cooperatively with other agencies to attract more commute riders to public transportation. This can be achieved through a series of strategies aimed at expanding and enhancing commuting services including: establishing a coordinated park and ride program for the urbanized area, continued monitoring of bus route operational efficiencies, discount programs and other pricing incentives to commuters, and provide a guaranteed ride program. Furthermore, amenities should be provided to ensure passenger comfort, extensive customer support, and

that information is available to the public 24 hours a day. **FIGURE 21** shows the location of existing rural park and ride facilities as well as the potential location for regional park and ride facilities that could serve the Ithaca urbanized area.

Technological innovations now allow for telecommuting and smart bus systems. Smart bus systems improve the quality of the communication between the public transportation system and potential riders. The ITCTC supports TCAT's efforts to provide improved printed schedules, station/stop signage and state-of-the-art passenger information systems. These latter include technologies that allow for interactive communications equipment located at transit stations/stops and use of the internet for trip scheduling and to provide real-time transit information. For example, an automated vehicle location system, utilizing global positioning technology (uses satellite signals to determine vehicle locations), can report real time positions of public transit vehicles, which are then relayed to the TCAT website where riders can see the exact location of their bus. Opportunities also exist for further enhancements to the current electronic fare payment system in order to increase convenience and ease of use for customers.

The ITCTC recommends studying, developing, and implementing projects and programs that enhance the feasibility of alternatives to single occupancy vehicle use. Public transportation services, ridesharing (carpooling), vanpooling, shared-ride taxi, paratransit, walking and bicycling should be promoted to reduce single occupancy vehicles. To achieve a higher percentage of trips made by bicycling and walking there is a need to improve and/or build walkway and bikeway networks with separate signage and traffic control devices for pedestrians and cyclists. It would also be possible to coordinate with area employers to offer financial or other incentives to employees who do not require parking spaces for automobiles. The ITCTC will continue to monitor new ideas and concepts, such as major employers providing "fleet bikes" for their employees to use in daily work or personal travel that shows potential for application in Tompkins County.

5. Transportation System Management

Transportation System Management (TSM) involves managing the existing transportation system to obtain increased efficiency, which relates to the "supply side" of the transportation system equation. TSM projects are often used as cost-effective means of reducing intersection or corridor related congestion.

The ITCTC travel demand model was used to identify links with the highest levels of congestion. The model based its analysis on estimating Volume-to-Capacity ratios (V/C ratio) for the principal roadways in the county. V/C ratios relate the traffic volumes to the roadways traffic capacity based on the road's geometry, traffic flow speeds and

adjacent land uses. **FIGURES 30 and 31** display the output from the travel demand model for 2009 conditions. The travel demand model is currently designed to model the afternoon peak hour (5-6PM). Therefore, the map may not highlight links that experience congestion at other times. While further, more detailed quantitative analyses are necessary, this figure provides a starting point from which to begin the process of developing strategies and projects that address the needs in these problem areas.

TSM strategies focus on upgrade to coordinated traffic signals, establishing formal traffic incident management plans addressing accidents and weather events, advanced planning for detour routes, providing real time information to drivers, coordinated/shared data collection. Specific roadway design changes such as alleviating bottlenecks on a road, adding a turn lane at an intersection or the use of alternative intersection designs (e.g., roundabouts) may be considered as TSM strategies. However more intensive capacity expansion – adding new lanes or new roads – is not considered TSM. The appropriate use of TSM measures should be determined on a case-by-case basis within the framework of a regional plan of action.

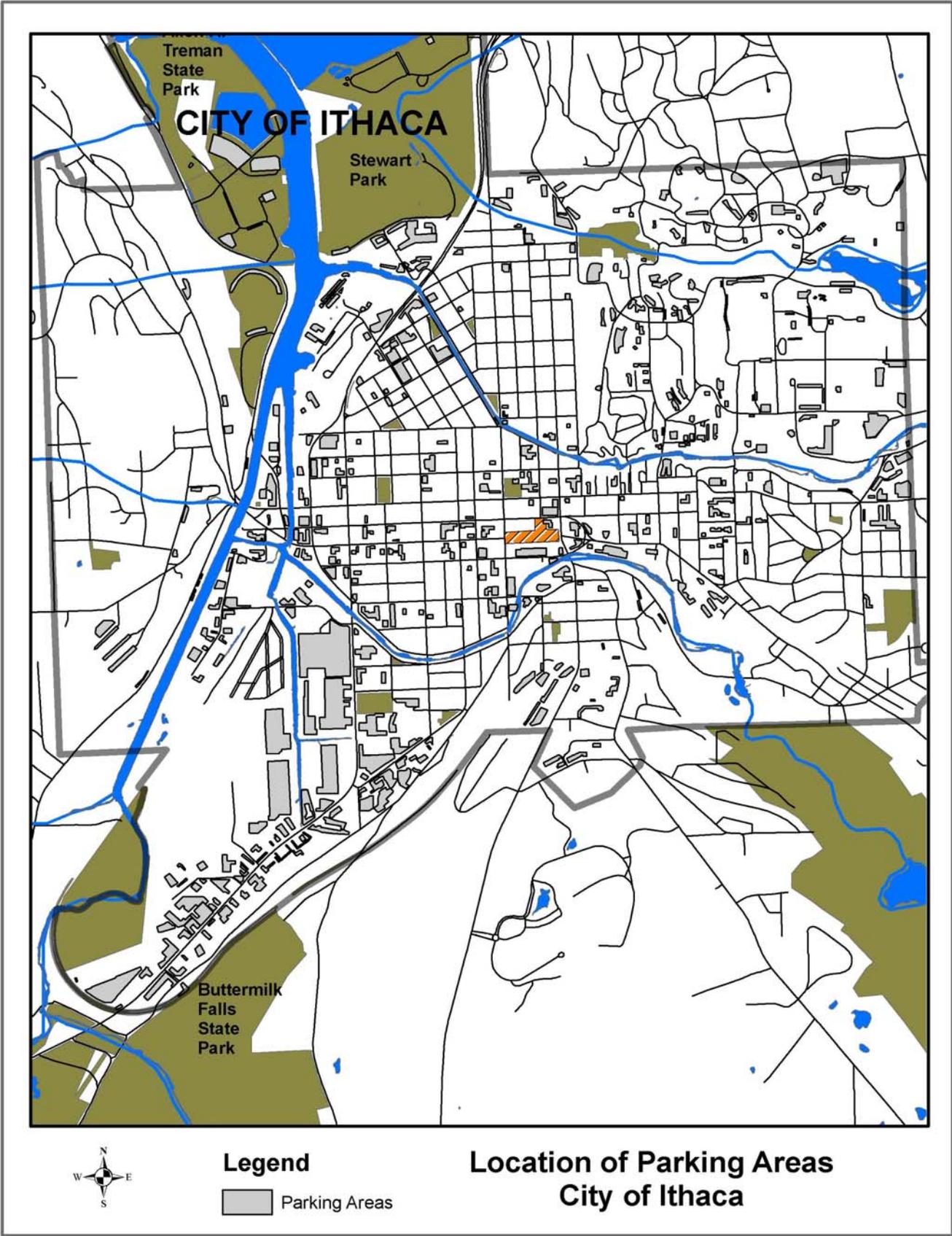


FIGURE 28

Cayuga Lake Scenic Byway

A Sampling of Area Attractions

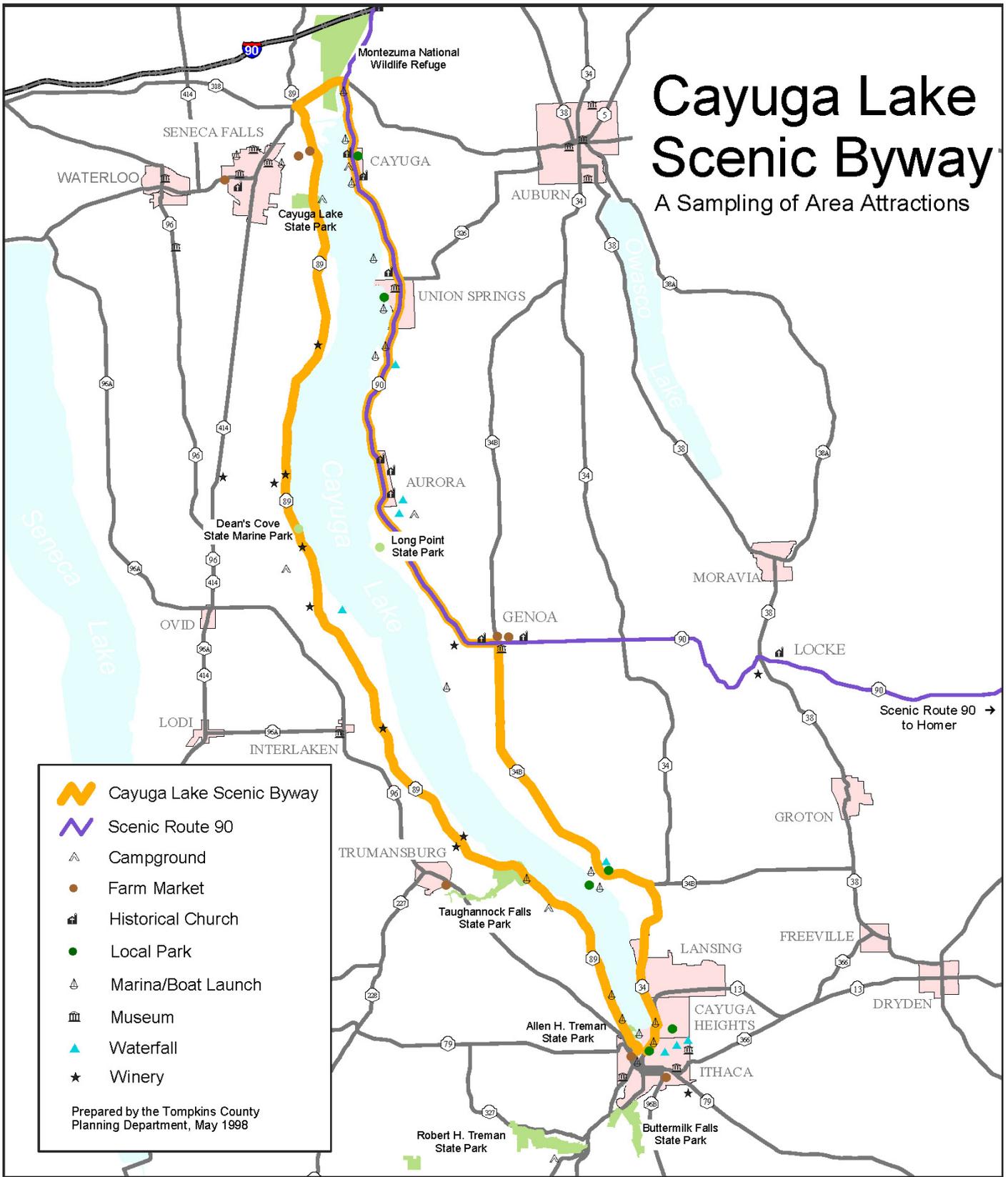
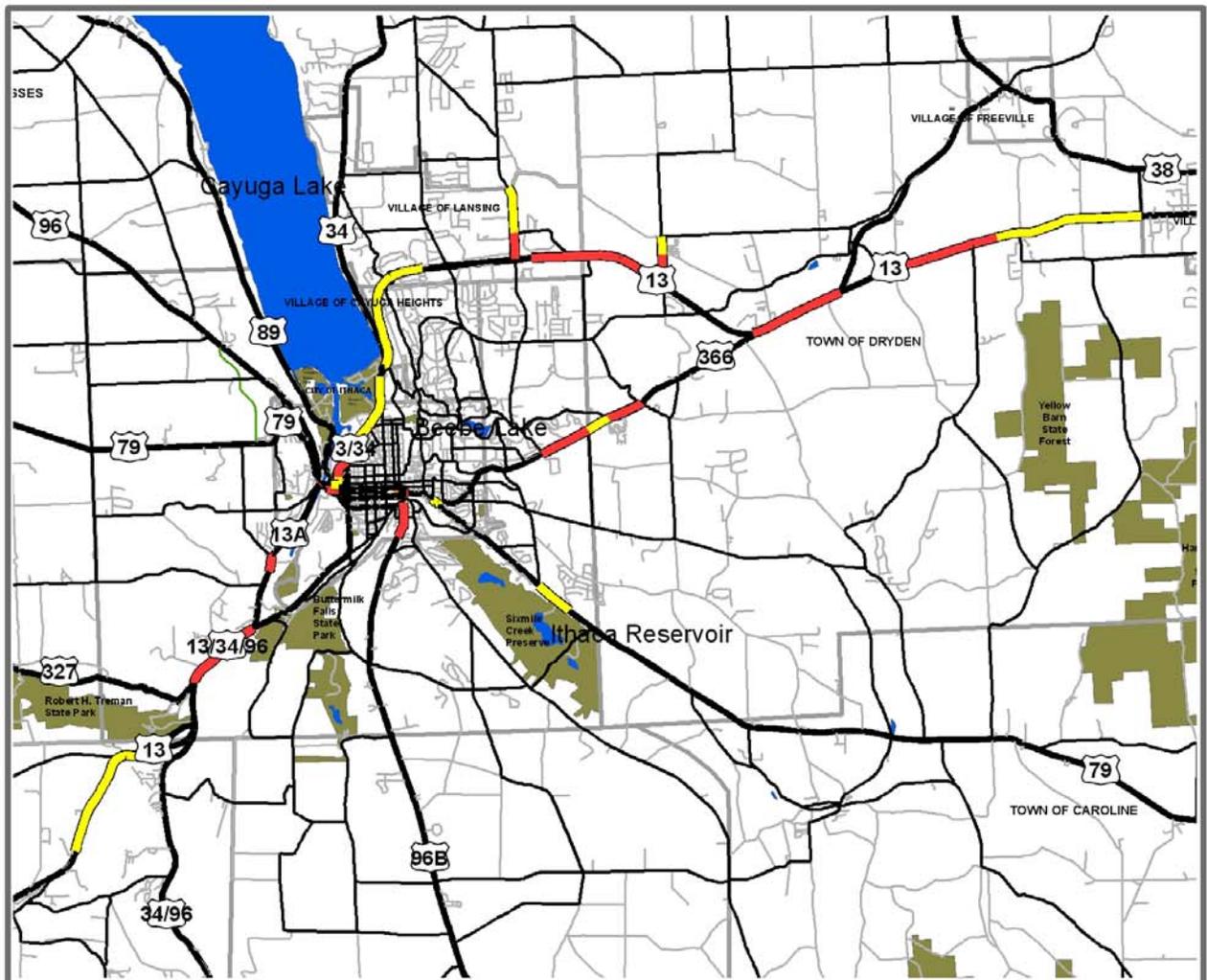


FIGURE 29

Tompkins County Congested Roads - 2009



Legend

- Road Segments Approaching Congestion: Volume-To-Capacity Ratio .8-.9
- Congested Road Segments : Volume-To-Capacity Ratio > or = .9

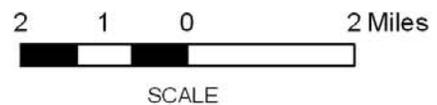
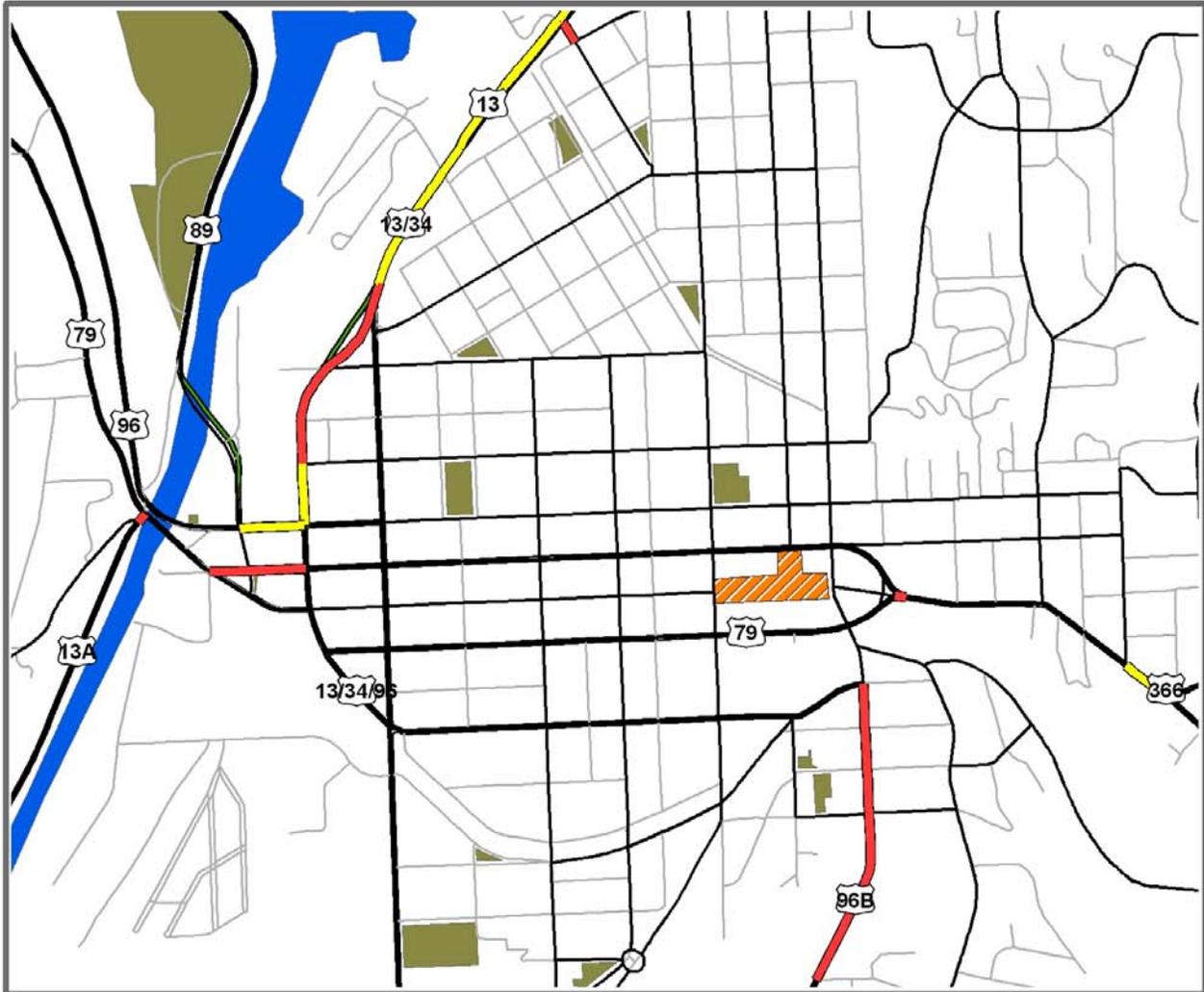


FIGURE 30

City of Ithaca Congested Roads - 2009



Legend

-  Road Segments Approaching Congestion: Volume-To-Capacity Ratio .8-.9
-  Congested Road Segments : Volume-To-Capacity Ratio > or = .9

0.2 0.1 0 0.2 Miles



SCALE

FIGURE 31

The ITCTC is supportive of ongoing efforts to upgrade traffic signals in the City of Ithaca, particularly in high traffic areas. Bicycle and pedestrian needs should be considered in the design of the signals upgrade. Resources should be allocated to ensure the optimal management and operation of the traffic signal system.

Other TSM strategies that may have future local applications include the following: (a) use of reversible lanes for high-volume commuting corridors; (b) use of peak-period on-road parking restrictions to obtain additional capacity; (c) use of peak-period parking surcharges to encourage mode shift or to reduce peak-period travel volumes; (d) developing better project planning methods to minimize delays, congestion, and disruption due to construction/maintenance projects; (e) removing or modifying unnecessary controls (stop signs, right turns on red, etc.); (f) use of transit and non-SOV preferential treatments for congested corridors; and (g) developing local policies to address incident management. For example, there should be a clear policy for clearing/towing procedures, particularly on the main commuter routes. Any addition of new capacity by constructing new facilities in key corridors must be carefully studied and considered a last recourse action.

4. Data Needs

Transportation data is a critical input to achieving improvements in transportation planning and the implementation of transportation projects and initiatives. There are three key areas where data is needed: traffic counts; accident reporting system; and household travel survey data.

Traffic counts are a fundamental set of data used in every transportation related operation. The ITCTC has a travel demand model, which depends on traffic count data for calibration purposes and to verify its outputs. In 2007 the ITCTC began to implement a coordinated traffic count program resulting in an annual report on traffic counts. The ITCTC coordinates with NYSDOT, Tompkins County Highway Division, City of Ithaca, Town of Ithaca and other local jurisdictions that perform traffic counts. The program will be most effective after five years, when traffic counts are repeated at specific locations along local highways and location specific comparisons can be made. Coupled with NYSDOT's triennial counts on state roads this will provide a comprehensive traffic count record for Tompkins County.

A reliable and comprehensive traffic accident reporting system is a key component of a planning process to identify and address traffic safety needs. The state unveiled the Accident Location Information System (ALIS) in 2008 after many years of effort. Through ALIS the ITCTC has access to vehicular accident information that was previously collected and stored by at least 5 different agencies with different reporting formats and protocols. The ITCTC will

work closely with local partners to analyze and utilize data from ALIS in ongoing transportation safety planning efforts.

The ITCTC will continue to work with the US Census and NYSDOT to obtain updated household travel survey data. After the 2010 Census and depending on the data generated by that effort, the ITCTC will consider conducting a travel behavior survey to better determine travel patterns and modes used in Tompkins County. This data would also be used to redefine the modeling parameters of the ITCTC's travel demand model and to make it multi-modal.

In 2009 ITCTC staff trained on using NYSDOT's Roadway and Rail Energy and Greenhouse Gas Analysis Extension (RREGGAE) with the US Environmental Protection Agency's Motor Vehicle Emission Simulator (MOVES) software for predicting greenhouse gas emissions in future scenarios. These software were used in the analysis presented in Chapter 5. The ITCTC will continue to utilize this software and it's associated Region 3 data for future analyses.

5. Intermodal/Freight

Present legislation requires federal, state, and metropolitan areas to focus on intermodal planning, which involves the efficient and effective operation of the transportation system. In order to obtain the most efficient use of the system, users must be able to select the most appropriate mode for each segment of a trip. The first step is to ensure that transfers between modes are possible and that users are given the option to choose between different modes. Invariably the transfer of people and goods within a transportation system will represent costs and time delays. The emphasis of intermodal planning is to provide users with the opportunity to choose between modes and provide them with the ability to transfer between them in a manner that minimizes costs and time delays.

The major intermodal (transfer) facilities in Tompkins County include: *Ithaca-Tompkins Regional Airport, intercity bus facility, park-and-ride facilities,* and a small *railroad yard* (see **FIGURES 21 and 32**). In addition, travelers in Tompkins County routinely transfer modes at bus stops and stations from pedestrian and bicycle to transit. As described in the 'Transit' section earlier in this chapter, the TCAT bus stops at Seneca St. and Green St. in downtown Ithaca and the A-Lot at Cornell are the busiest in the transit system. Other stops at Cornell and the Shops at Ithaca mall also serve a substantial numbers of customers and function as important intermodal facilities. This plan section is divided into two parts, freight movements and passenger movements.

Freight Movements

Freight movement in the Greater Ithaca-Tompkins County area must be addressed in a different manner than in larger metropolitan areas. This area does not serve as a major hub

for the transport of goods, but rather serves mostly as a destination to which goods are brought. The area relies heavily on trucking and rail for the movement of freight. Rail is used to transport coal, a portion of which is transferred to trucks for local delivery at the Ithaca rail yard, while the remaining coal continues by rail to the AES Cayuga power plant. The railroad is also used to ship salt from the Cargill, Inc. salt mine in Lansing, and ash from the power plant. A minimal amount of freight is flown into Tompkins County Airport and there are no plans to increase freight movement in this mode. For other freight the area relies exclusively on trucking. (FIGURE 32 shows the major freight generators and freight corridors in Tompkins County).

The ITCTC coordinated implementation of a consultant based Tompkins County Freight Transportation Study (FTS). The FTS was completed on April 2002. The study provided the first comprehensive look at truck movements countywide, including:

- truck traffic counts
- a truck origin/destination survey
- surveys of area residents, highway superintendents and major shippers/receivers

The FTS included a series of public meetings, developed and analyzed alternative strategies to address concerns and finally, presented a series of recommendations and mitigation strategies. A network of recommended truck routes, consisting mostly of NY state routes, was identified to provide for the safe movement of freight while best addressing the negative impacts of truck movements. Other recommendations address changes to ordinances, developing a truck route signing system, enhanced law enforcement, and creating a public education programs for truckers/shippers/carriers.

The FTS identified the long-standing generators of hazardous waste in Tompkins County. New York State does not require registration of vehicles that transport hazardous materials, nor does it have a set routing system for hazardous material hauling. State highways are built to handle all truck traffic. Hazardous materials haulers are likely to follow the same travel patterns as the rest of the trucks.

It is recognized that commercial delivery vehicles transport hazardous material and can offer small risks; however, larger quantities of materials should be specifically routed through the area to ensure a fast and efficient response by local agencies in the event of an emergency. Municipalities may regulate the routing of hazardous materials through ordinances. Such an effort would need to be coordinated to ensure the continuity of routes. Local agencies should consider developing a hazardous materials routing plan for the greater Ithaca-Tompkins County metropolitan area.

Tompkins County has access to water routes for shipping via the Cayuga Lake and Erie Canal system. Local companies, due to high costs, environmental regulations, and their frequent shipments to/from land-locked southward destinations, do not currently utilize water transportation for freight in the Tompkins County area. Nevertheless, it is possible that faced with increased costs in fossil fuels, water transport may regain an economic advantage over the 20-year planning horizon of the LRTP.

Norfolk Southern Railroad has one train a day running in Tompkins County, Sunday through Thursday. In addition, one to three days a week rail is used to deliver coal to the AES Cayuga power plant and shipping salt out of the mines of Cargill, Inc. in Lansing. Unfortunately, the rail line crosses one of the most congested areas of the City of Ithaca. A problem exists when trains run through the City during the morning and afternoon peak traffic periods, creating significant backups on the main area roadways. The ITCTC supports increased coordination between the railroad, the City of Ithaca and emergency response providers to minimize the impact of rail movement through the City.

Passenger Movements

The LRTP supports enhanced connectivity between the passenger modes of transportation available in Tompkins County: automobiles, intercity bus, public transit, bicycles, pedestrians, and air travel.

Currently TCAT provides regular public transit service to the Ithaca-Tompkins Regional Airport terminal. In addition, there is readily available taxi service, airport limousine and car rental services. As discussed under the CONNECTIVITY section, the Ithaca Inter-City bus terminal is served by the public transit system, taxis and paratransit. The facility is located within walking and bicycling distance of many residents in the Flats of Ithaca. Regular and frequent TCAT service to the inter-city bus terminal should be continued to facilitate transportation to the final destination of intercity travelers.

TCAT bus stops serve as important intermodal facilities. The ITCTC will continue to work with TCAT to improve bus stops in ways that facilitate intermodal use. These projects can take many forms – i.e. connecting bus stops to sidewalks, providing bicycle parking, providing shelter, providing traveler information (next bus arrival time) – depending on the needs of individual stops. TCAT's offers their popular Bike-on-Buses program, which provides two bike racks in every TCAT vehicle. Among others, this program is popular for cyclists looking to overcome the obstacles of hilly terrain in Tompkins County.

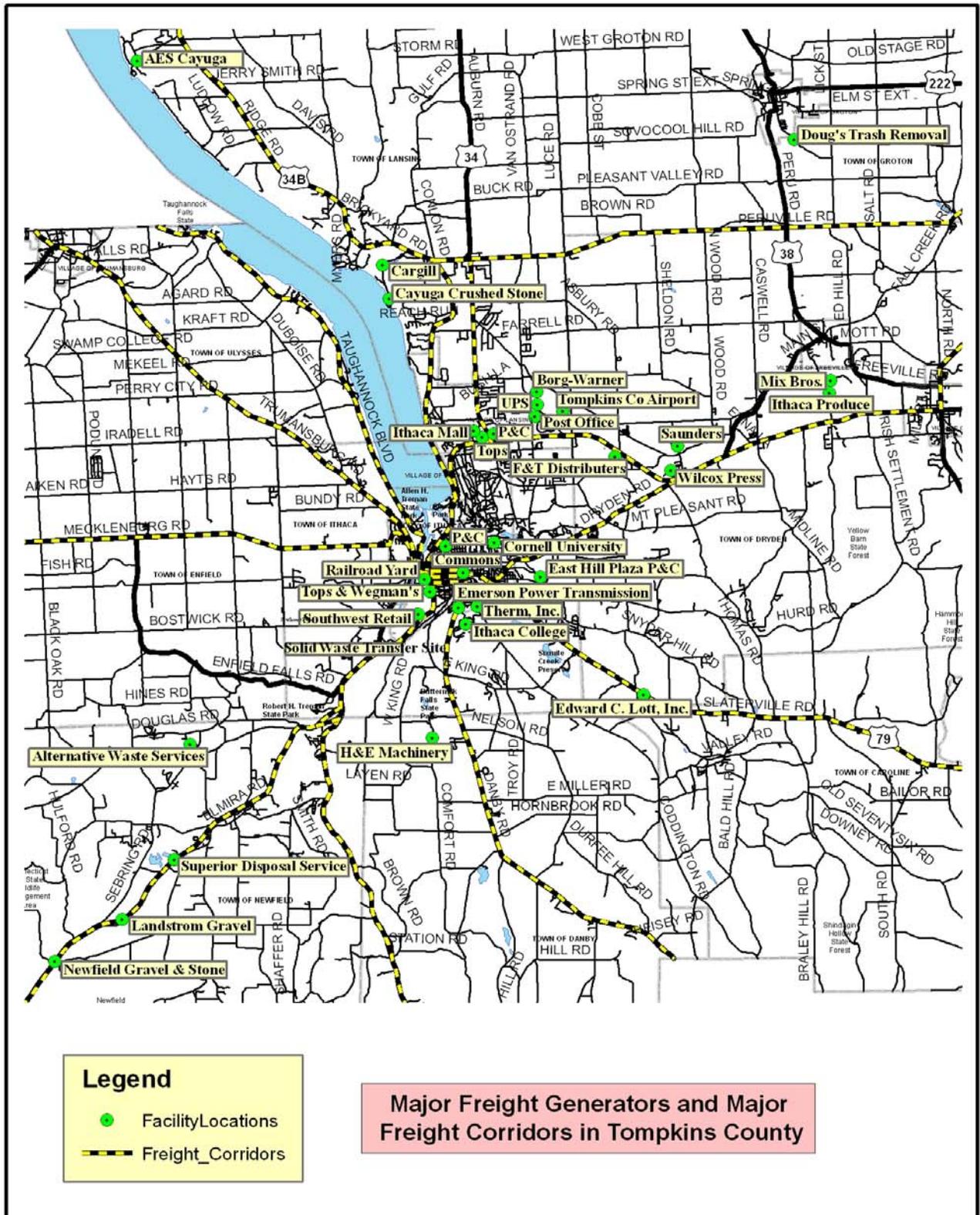


FIGURE 32

ENVIRONMENTAL

In 1996, TCAT began its Bikes on Buses (BoB) program. All TCAT buses were equipped with bicycle racks, providing a popular and important service to riders in Tompkins County. Buses carry approximately 18,000 bikes each year. The bike on buses program is arguably the most successful intermodal program in Tompkins County. The ITCTC will continue to work with TCAT to improve the transit systems ability to address needs of bicyclists and pedestrians by providing safe, attractive and accessible bus stops, passenger shelters, and park-and-ride lots with widespread distribution of bike racks.

All public transit trips begin and end with a pedestrian component. Bus stops need to be evaluated to ensure the necessary pedestrian infrastructure is provided to allow for efficient movement to and from the transit stop; and to make sure they meet the requirements of the Americans with Disabilities Act. In addition, transit operators should ensure that all stops are within appropriate distances of origins and destinations.

Transfers between the public transit system and the automobile are often made at park-and-ride lots. Currently, Tompkins County is strong importer of labor. Approximately 15,000 people travel into the County on a daily basis for employment, many of them in single occupancy private vehicles. These conditions indicate a strong potential for successful implementation of a park-and-ride system. Actions to improve transit use by commuters include: (a) improving amenities at existing park-and-ride facilities; (b) promoting the increased use of such facilities (through such methods as encouraging local employers to participate in transportation demand management programs); (c) providing incentives to customers for using public transit; and (d) by increasing the frequency of public transit routes. Additional park-and-ride facilities should be developed based on existing and future commuting patterns.

Preliminary studies indicate that northern and eastern approaches to the Ithaca urban area would be the best candidates for new park-and-ride facilities. Specifically, facilities may be successful serving the SR-13 corridor from Dryden to Cortland; the Village of Lansing in the vicinity of the Shops at Ithaca mall; the SR-96 corridor in the vicinity of the Cayuga Medical Center; and the SR-79 approach from the Town of Caroline. The ITCTC will continue to work with local sponsors; TCAT and NYSDOT implement a more robust regional park-and-ride system in Tompkins County.

Introduction

The transportation system must balance the protection of our natural, social, cultural, and historical resources with the need to address transportation demands. It is undeniable that the provision of transportation, particularly a system based on internal combustion engine cars and trucks, will generate significant undesirable environmental impacts. Environmental concerns range from the more direct vehicle related issues (e.g., air quality, noise impact, energy use, etc.) to more community-level concerns (e.g., neighborhood preservation, jobs/housing balance, appropriate mixed-use development, etc.). There are several transportation related areas that impact the environment, these will be addressed in the following sections: *Air Quality*, *Land Use Planning*, *Energy Efficiency*, and *Minimizing Impacts and Disruptions to the Natural, Scenic, or Cultural Environment*. Any discussion of environmental issues related to transportation will necessarily result in considerable overlap between multiple planning disciplines, i.e. land use, economic development, neighborhood planning, natural areas planning, etc.

The Tompkins County Comprehensive Plan presents alternative future land development scenarios, which were used as the basis for an analysis of future air quality impacts, energy consumption and greenhouse gas emissions from the transportation sector. The ITCTC travel demand model, TransCAD, was used to model future year road networks based on the proposed land use scenarios. The results of this analysis are found in Chapter 5: Future Scenario Analysis.

In addition, the Tompkins County Comprehensive Plan was amended in 2008 to include an 'Energy and Greenhouse Gas Emissions Element'. ITCTC staff worked with the Tompkins County Planning Department to ensure that their new plan element and the ITCTC's Long Range Transportation Plan were mutually supportive.

1. Air Quality

Currently, Tompkins County is in attainment of National Ambient Air Quality Standards. However, it is understood that failure to consider emission issues in an integrated and comprehensive manner could lead to continued and unacceptable degradations in air quality.

Nationwide the transportation sector accounts for approximately 28% of carbon emissions, the second largest sector after electricity generation. Trucks and cars account for 79% of the transportation related emissions. **TABLE 24** shows the U.S. transportation emissions by mode.

Locally, the “Cities for Climate Protection – Local Action Plan, Tompkins County, NY” calculated the greenhouse gas emissions for Tompkins County in units of ‘equivalent carbon dioxide’ - eCO₂ for the base year 2008. The results of that inventory indicated that in 2008 Tompkins County produced a total of 1,319,955 tons of eCO₂. The inventory showed that emissions from transportation (more specifically the combustion of gasoline and diesel) produced the majority of community emissions at 34%.” **FIGURE 33** and **TABLE 25** show the distribution of greenhouse gas emission sources for Tompkins County. **TABLES 26** and **27** give data pertaining to transportation mileage and emissions.

The policies, projects and initiatives in the LRTP support the development of a transportation system that reduces its dependence on automobiles by promoting and enhancing the use of alternative modes of transportation. This is proposed through the provisions of improved service and facilities, and by encouraging land use development practices that support alternative modes of transportation. Concurrent with the above, the LRTP recommends improvements in transportation system operations that result in enhanced system efficiency, reducing congestion and idle time, also resulting in reduced emissions.

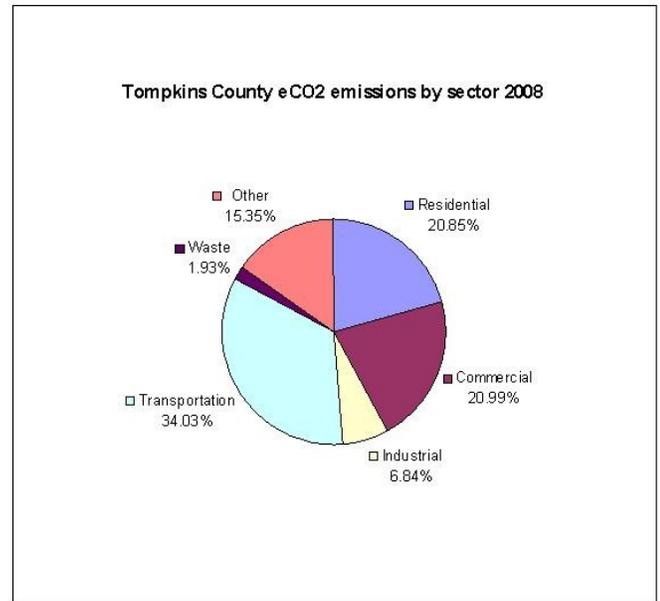


FIGURE 33

TABLE 25
Overall Emissions by Sector

Year 2008	Tons of eCO ₂
Residential	275,275
Commercial	277,065
Industrial	90,304
Transportation	449,158
Waste	25,516
Other	202,637
	1,319,955

Source: “Cities for Climate Protection – Local Action Plan, Tompkins County, NY”

TABLE 24

U.S. Transportation Carbon Emissions (% by mode)	
Light Vehicles (cars, vans, SUVs)	60%
Heavy Vehicles (trucks)	19%
Air	9%
Rail	2%
Waterborne	3%
Pipeline	3%
Other	4%
	100%

The ITCTC recommends that the impacts of proposed transportation initiatives should be assessed to determine their effects on air quality. Wherever feasible overall improvement in air quality should be attained through transportation initiatives. The ITCTC will continue to work with local, state and federal partners to develop and establish proactive and constructive evaluation criteria and planning strategies which will have a significant influence on protecting and preserving future air quality.

TABLE 26
Tompkins County Mileage by Mode

	% total miles	
	Gasoline (miles)	Diesel (miles)
Passenger Cars	60.2%	0.3%
Heavy Truck	0.0%	5.2%
Light Truck/SUV	32.4%	1.3%
Motorcycle	0.4%	0.0%
Transit Bus	0.0%	0.2%

Source: "Cities for Climate Protection – Local Action Plan,
Tompkins County, NY"

TABLE 27
Tompkins County Emissions by Mode

Emissions by Source	Tons eCO2
Diesel	69,644
Gasoline	371,848
Motorcycle Gasoline	585
Transit Bus Diesel	7,080

Source: "Cities for Climate Protection – Local Action Plan,
Tompkins County, NY"

Greenhouse gas emissions in future scenarios for Tompkins County will be discussed in Chapter 5.

2. Land Use Planning

In New York, land use and transportation planning have occurred in relative isolation from each other. In the July 1994 edition of the Land Use Law Reporter (Pace University School of Law, Albany, New York) it was stated that,

"...failure to coordinate land use and transportation planning has:

- made it very difficult if not impossible, to predict transportation demand and plan effective regional transportation systems;*
- created land use patterns that are automobile dependent, energy inefficient, environmentally damaging and that cannot be serviced properly by public transportation systems;*
- generated traffic congestion that increases air pollution..."*

These statements are still valid in 2009 as communities across the New York continue to struggle with containing sprawl development, and managing congestion, energy and air pollution issues.

Land use patterns are fundamental determinants of the number of trips that people make. Zoning ordinances have traditionally served to separate land uses. Automobiles allowed this separation to be intensified and expanded. As a result much of the development in the last sixty years has been auto oriented, often at the expense of other modes of transportation.

Local municipalities are encouraged to review zoning and other land use regulations in order to allow and support development patterns that allow for mixed uses. Zones that offer a mix of complementary land uses (e.g., commercial, residential, recreational) together with supporting design guidelines, would enable persons to combine trips, encourage more pedestrian and bicycle trips, facilitate the provision of transit, reduce the number and length of automobile trips, and result in reductions in congestion, and consequently, energy consumption and vehicular emissions.

Municipalities in New York State are not required to adopt comprehensive plans, nor must these plans contain a transportation section. Until recently in Tompkins County, with a few exceptions, contemporary comprehensive land use plans did not exist or were outdated. Fortunately, this is changing. Currently there is a Tompkins County Comprehensive Plan and most jurisdictions have existing comprehensive plans or ongoing initiatives to develop or update plans. This is a favorable trend that will have a significant impact on the ability of the ITCTC to conduct more effective transportation planning by improving coordination with planned future land uses. The ITCTC will support local efforts to develop comprehensive plans including making available use of the travel demand model for analysis.

Local governments are also encouraged to consider the balance of jobs and housing in their planning decisions. The "jobs-housing balance" is the ratio of suitable employment opportunities available to the working age population of a region or sub-region. A balanced jobs/housing ratio in an area can result in shorter trip lengths and encourage the shift from the single occupant automobile to other modes, thus allowing for reductions in automobile trips. This balance is best accomplished through the coordination of economic development and housing development via the local planning and development review function. The issue of housing in Tompkins County has received much attention locally in the years approaching the 2030 LRTP update. The Tompkins County Comprehensive Plan covers this topic in great detail and provides guidance for local municipalities. The ITCTC will continue support land use, housing and economic development activities that lead to more efficient use of our existing transportation resources as stated in the LRTP goals and objectives.

Neighborhood preservation has repeatedly been one of the premier issues when addressing transportation planning. In both the NESTS and Freight Transportation Studies protection of residential areas became a principal issue of concern. In Tompkins County many neighborhoods are crossed by roads that have grown in their traffic volumes as land was developed further out from the Ithaca urban core. Commuter and other trips use these roads to move across the area, impacting the neighborhoods.

There seems to be general agreement that traffic and traffic speed should be reduced in residential neighborhoods. This may be accomplished by implementing appropriate traffic-calming techniques and/or increasing law enforcement efforts. On rare occasions there is an opportunity to re-route traffic around neighborhoods by favoring access to alternative routes that make "cut-through" trips less attractive. In all cases traffic must be managed based on the particular conditions of each neighborhood and considering the need and desires of the residents. There is no single strategy or recommendation that will serve all locations.

There are many design elements that can be incorporated into site plans and the existing infrastructure to ensure "human-scale" developments and spatial relations. Sample ordinances and development regulations can be found by investigating applicable design standards and models from other areas that address both new large-scale and smaller in-fill development projects. Residential areas should have bicycle and pedestrian friendly street networks that are visually pleasing and safe. Building mass, setbacks, signage, street lighting, landscaping, pedestrian and bicycle access, transit access, etc. can be included in guidelines to ensure consideration of these issues during project planning and review.

Also important is the subject of equity. Proposed transportation projects must be evaluated to ensure both positive and negative environmental (including social, cultural, and economic) impacts are distributed equitably across neighborhoods and communities so as not to unfairly burden or advantage any socioeconomic group or community. Transportation related technical project evaluations are important, but it is also crucial to analyze the transportation system to ensure that the principles of social and environmental justice and ecological sustainability are achieved.

3. Energy

-Approximately 28% of all energy consumption in the United States is attributable to the transportation sector. Over 86% of all energy consumption in transportation is in the form of petroleum fuels. Cars and light duty vehicles (60%) and heavy-duty trucks (16%) together consume 76% of all transportation related energy, which is almost totally dependent (97%) on petroleum fuels.- [Source: US Department of Energy, Transportation Energy Data Book (2007)].

The quote above shows the important role the transportation sector plays in the nation's balance of petroleum fuel use. The international political relations and economic policies dependent on oil supply and demand cycles are intricately associated with transportation. To reduce oil dependency in the U.S. you have to address transportation in the U.S.

There are many ways to improve energy consumption in transportation which include: reducing the number of

automobile trips, reducing distances traveled, increasing the use of alternative fuels, and increasing the fuel efficiency of vehicles. The LRTP includes goals, objectives and project recommendations that seek to promote reductions in transportation energy use through planning, operational enhancements and growth management strategies.

The fuel efficiency of vehicles and the utilization of alternative fuels are important energy concerns that are primarily acted on at the State or national level. Nevertheless, this plan encourages the study of the utilization of alternative fuel sources, understanding that the desirability of an alternative fuel source should be evaluated on an embodied energy basis and its ability to meet the following goals: reduce dependency on oil for sustainability and national security/economic reasons, reduce air pollution, and reduce global warming impacts. The use of alternative fuels should be considered for the vehicle fleets of major employers, where economies of scale may make a shift in fuel type economically feasible.

There are different ways of addressing fuel efficiency locally. Through individual actions of choice, Tompkins County residents can shift more fuel-efficient cars, such as the hybrid models that are becoming more widespread in the market. Also through individual choice, people can greatly improve the efficiency of their vehicles by keeping them well tuned, tires properly inflated, and by applying eco-driving practices such as reducing idling time, determining the lowest mileage route for trips, using cruise control where appropriate, etc. (More on Eco-driving practices can be found at <http://www.ecodrivingusa.com/#/ecodriving-practices/>).

The policies and recommendations in this plan will be most influential on the number of trips and trip length factors. The initiatives, policies and programs mentioned in other sections of the Systems Integration section, including transportation system management and transportation demand management strategies, changes in land use regulations, and promoting transit, bicycle and pedestrian modes of transportation are aimed at improving the operational efficiency of the transportation system and reducing the number of automobile based trips. These outcomes will result in reductions in energy consumption in the transportation sector, with corresponding reductions in emissions.

There is a distinct possibility that, over the next 20 years, fossil fuel prices will rise as a result of continuing/increasing demand and declining marketable supplies. Gasoline prices will have a marked effect on consumer decisions on everything from what car to buy to where to live, and are likely to be a major determinant on future transportation policy and funding decisions at the national level. The oil price peaks of 2008 demonstrated the volatility of the fossil fuel market and how powerful a tool energy pricing can be

to achieve reductions in energy consumption. Under these circumstances there is increased opportunity for new technologies, programs and concepts to come online. Electric cars, fuel cell vehicles, personal rapid transit, transit priority systems and other intelligent transportation system ideas are all ripe for implementation. Other concepts are sure to arise. The ITCTC will remain alert to technological advances and, through the metropolitan planning process, offer a venue to consider their potential local benefits and opportunities for implementation.

4. Minimizing Negative Impacts on the Natural and Scenic Environments

Although transportation projects can leave undesirable effects on the natural environment, measures can be taken to reduce and minimize these effects. While the intent of national and state legislation is to ensure this process occurs, there are other non-regulatory measures that can be considered.

Agro-ecosystems and other ecosystems such as wetlands, streams, uplands, and forests should be maintained to ensure they perform their desired services and retain their natural integrity and inherent value. Areas of high biological diversity should also be maintained. Areas with an abundance of species provide a variety of important aesthetic and genetic functions. Wise management does not always preclude activity in these areas. Routine maintenance activities such as mowing can be managed to promote species diversity. Therefore, complete protection of an area is not always the best or only management alternative. Local municipalities are encouraged to protect native flora and fauna, giving particular attention to unique natural areas, and threatened or endangered species when reviewing transportation system maintenance practices. Adequate planning and implementation of mitigation strategies should help minimize negative impacts when designing and maintaining transportation facilities.

Potential recommended actions that reduce environmental impacts include: diverting storm-water runoff to retention basins to reduce salt, silt, and thermal contamination; collecting paint chips from bridge maintenance projects to protect streams from lead contamination; minimize the use of salt in winter; ensure sedimentation and herbicidal pollution are minimized during maintenance practices; minimize the use of defoliant and herbicides by planning for maintenance free plantings through State or National wildflower programs; and maintaining the health and effectiveness of roadside trees, shrubs and groundcover. The goal should be for highway departments to eliminate the use of herbicides. Minimizing the application of herbicides is appropriate and should be considered by the affected MPO participants. Cleaning roadside drainage systems has been identified as a major source of sedimentation in creeks feeding Cayuga Lake. Immediate

reseeding of ditch sides after cleaning is an effective way of mitigating these negative impacts.

In addition, it is recommended that Tompkins County's Unique Natural Areas be protected to preserve their important ecological functions. These areas have been identified as having outstanding environmental qualities and deserve special attention (<http://www.tompkins-co.org/planning/nri/nri.htm>).

Scenic resources contribute significantly to the quality of life of Tompkins County residents. A variety of planning and regulatory tools exist to enable local governments to protect locally significant scenic areas. For example, they could adopt view shed zoning that considers obstructions and hence attempts to maintain public access to the view; promote acquisition of land for pull-offs, overlooks and other uses that preserve the scenic nature of the area and provide access to views; and local agencies can consider urban forestry projects, volunteer maintenance, and other community-based activities to keep the roadway/transportation environment beautified. As mentioned earlier in this chapter, an important tool available to local governments is the *Tompkins County Scenic Resource Inventory* prepared by the Tompkins County Planning Department in January 2007. This document can be a useful starting point for any effort to help protect scenic resources in Tompkins County (www.tompkins-co.org/planning/nri/documents/TCSRreportJan17.pdf).

Another resource is the Cayuga Lake Scenic Byway (CLSB), which includes State Routes 34b, 34, 34/13, 96/89 and 89 in Tompkins County (www.cayugalake.com). This system of roads circles the southern end of Cayuga Lake and comprises part of the tri-county scenic byway around Cayuga Lake. The Cayuga Lake Scenic Byway, Inc. non-profit organization is coordinating development of the CLSB in cooperation with Cayuga, Seneca and Tompkins County. The ITCTC has participated in the process leading to the byway designation and will continue to be an active participant in the development of this important regional transportation resource. The ITCTC encourages residents and municipalities along the byway to take action in protecting the scenic resources that make the CLSB a unique and special route and a destination for visitors to the area.

5. Locating Environmental Impacts and Areas of Mitigation

In implementing transportation improvements, project sponsors need to be aware of possible negative impacts on natural and historic resources in the County. Mitigation of these impacts is facilitated by clear delineation of areas of high environmental importance. **FIGURES 34 through 38** show the locations of *Natural Features Focus Areas*; *Unique Natural Areas*, *Federal and State Wetlands*; and *Historic Bridges and Structures* in the ITCTC region.

Projects planned in the LRTP and included in a Transportation Improvement Program primarily consist of maintenance and improvements to existing facilities. Projects with severe environmental impact, such as construction of new roadways, are rare within the ITCTC planning area. Nevertheless, Tompkins County features a high concentration of natural and historic resources that may be subject to the adverse impacts of transportation projects. These resources include gorges, forests, and wetlands, as well as significant architectural sites.

The resource location information will enable the ITCTC and project sponsors to more readily anticipate concerns in areas of environmental impact. In developing each Transportation Improvement Program, projects will be overlaid on the base-maps included in this Plan and areas of potential mitigation will be identified. Environmental mitigation efforts can then be pursued as appropriate and necessary. Potential mitigation activities are discussed in the above subsection. The ITCTC will play an advisory role in analyzing the potential for environmental impacts and the location of those impacts during TIP development. Project sponsors will be responsible for meeting all applicable regulations and requirements during project implementation.

The ITCTC worked closely with the Tompkins County Planning Department as it developed the County's Comprehensive Plan. The Planning Department's *Natural Features Focus Areas* maps (**FIGURES 34** and **35**) provide general categorization of natural resource zones in the County, including watersheds and habitat areas. The *Unique Natural Areas, Federal and State Wetlands in Tompkins County, NY* map (**FIGURE 36**) shows the County's wetland resources, plus the nearly 200 Unique Natural Areas sites identified by the Tompkins County Planning Department which are determined to contain significant ecological, biological, geological, or aesthetic characteristics. These areas are administered by various agencies at the local, state, and federal level. The Tompkins County Comprehensive Plan includes goals and policies for the protection and management of forest, agricultural, natural and recreational resources countywide. The Tompkins County Conservation Plan developed in 2007 identifies the issues and strategies needed to address the priorities established in the Comprehensive Plan. More information on the Conservation Plan, the Natural Resources Inventory and the Unique Natural Areas can be found at www.tompkins-co.org/planning/nri/nri.htm.

Landmarks of historical interest are abundant in the ITCTC region. The *Historic Bridges and Structures* maps (**FIGURES 37** and **38**) show the location of these features as determined by the New York State Historic Preservation Office (NYSHPO) and the Historic Preservation Field Services Bureau. The historic features are particularly clustered in the downtown Ithaca area and on the Cornell University campus.

FIGURE 34

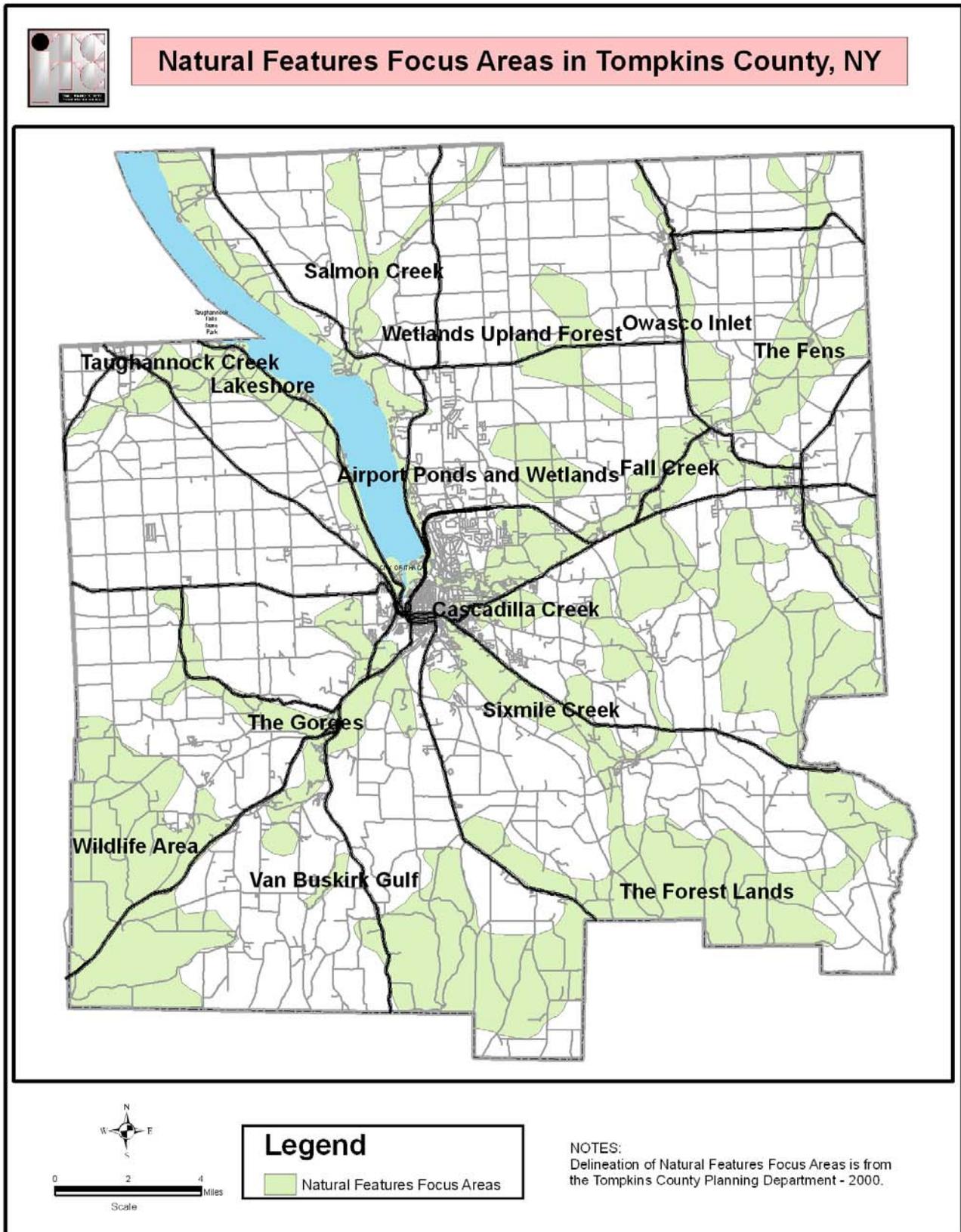


FIGURE 35

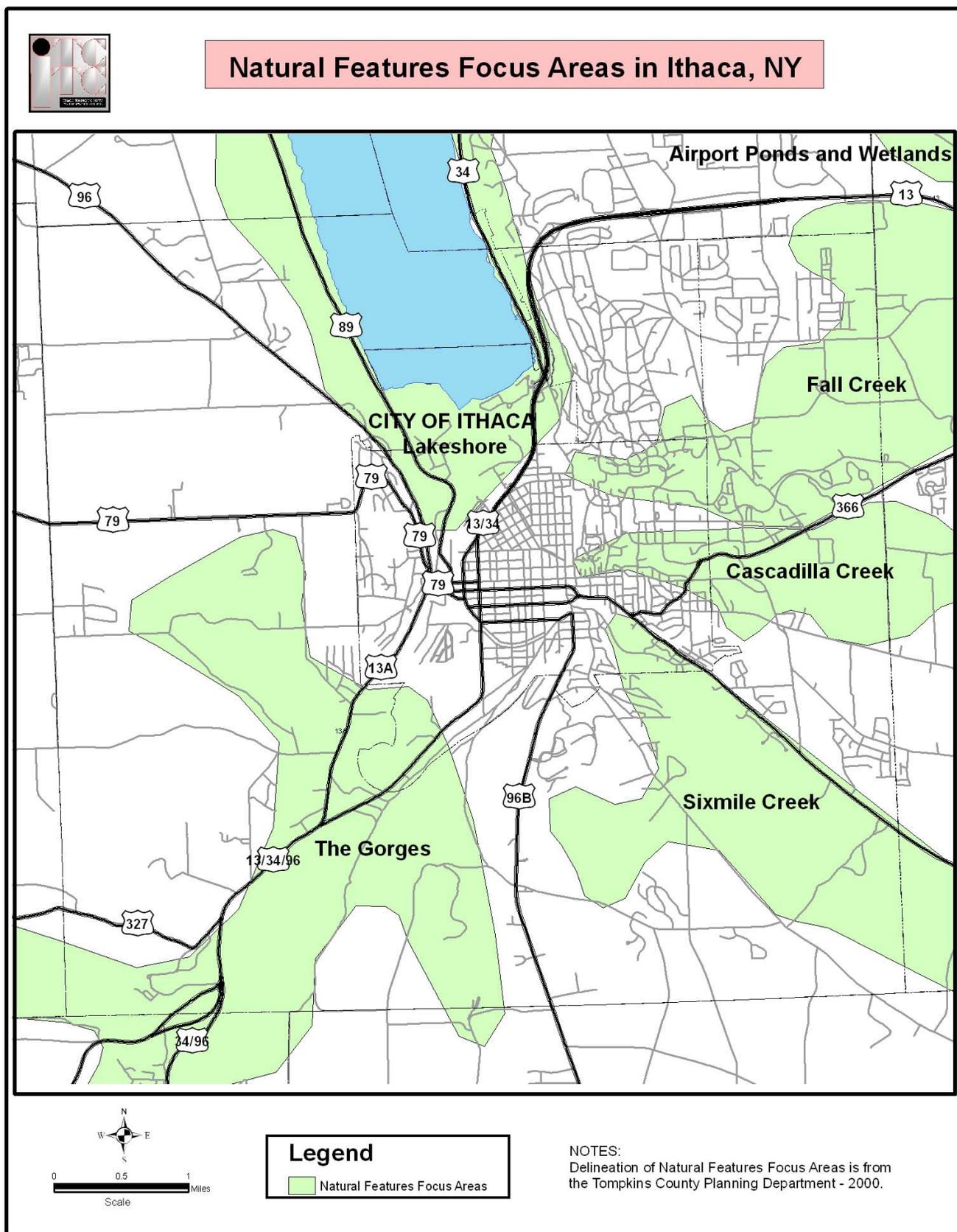


FIGURE 37

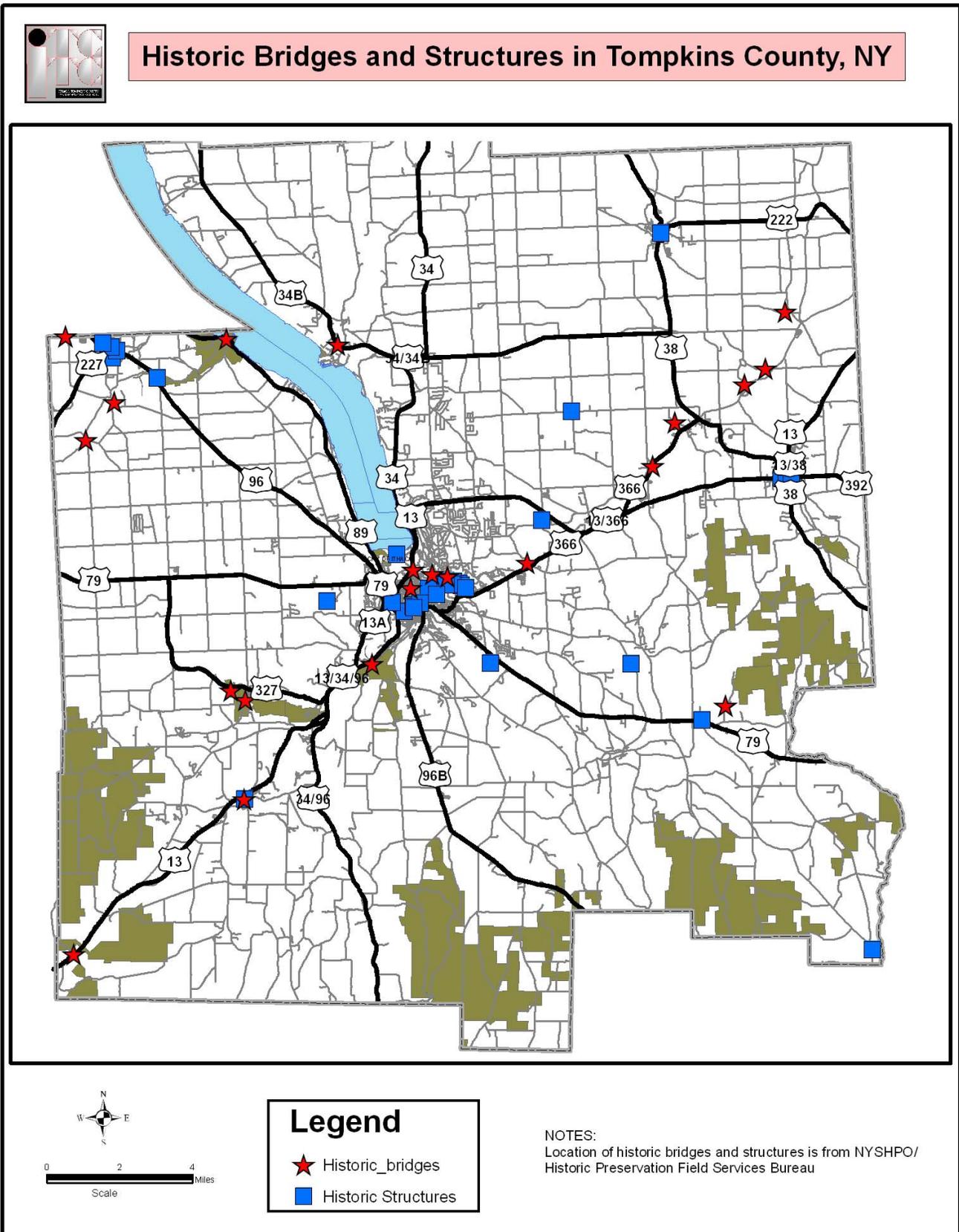
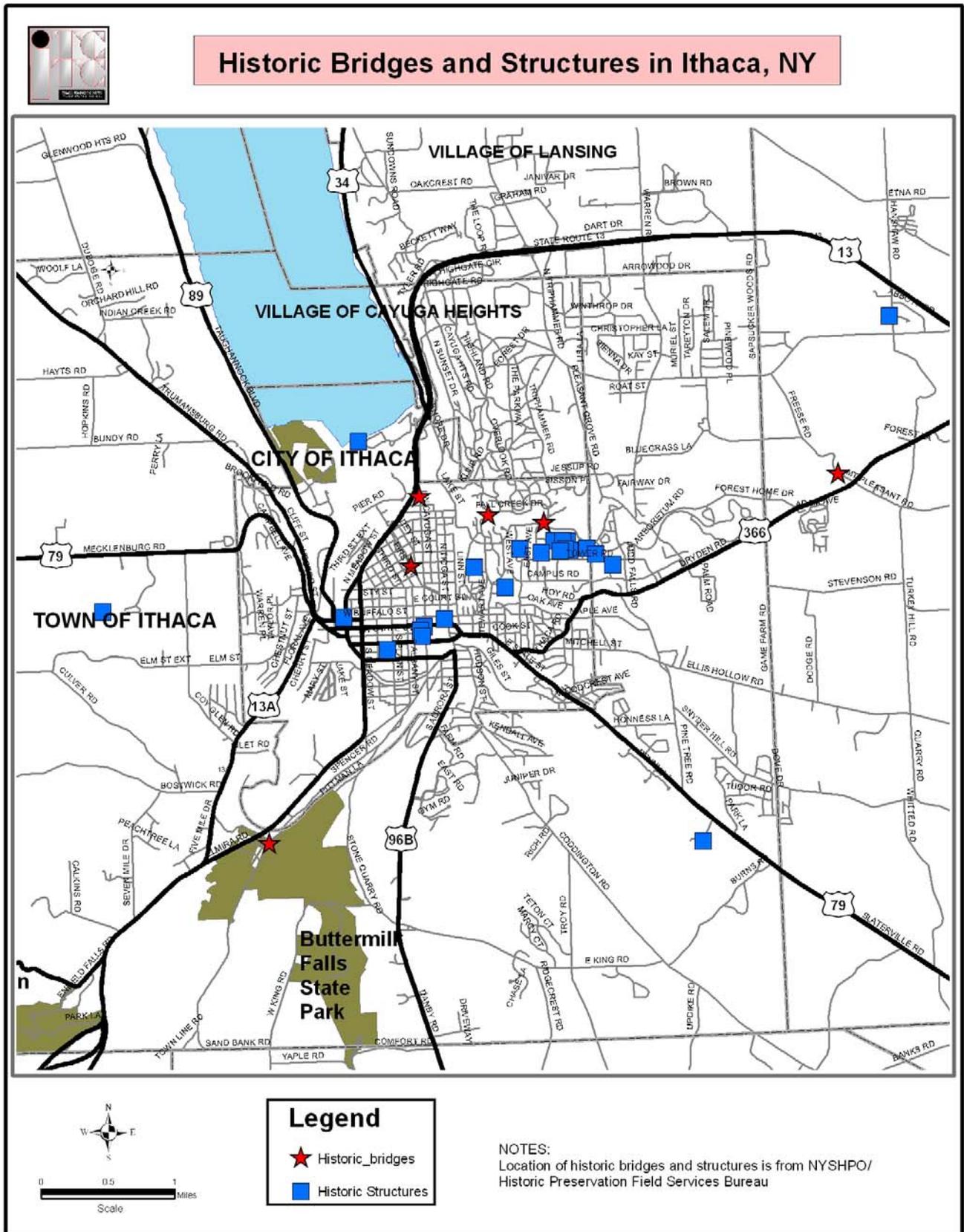


FIGURE 38



SAFETY ELEMENT

Traffic Safety Issues

Traffic safety is the paramount concern of all ITCTC actions. The areas of *traffic distribution, facility design, education, and enforcement* emerge as the primary issues.

A recurring theme in public comments was the need to reduce the impact of traffic through residential areas. Pedestrian, bicycle and motor vehicle safety, noise, vibrations and emissions all contribute to make this more than a continuing annoyance, but a legitimate health and safety concern. The use of a variety of traffic calming techniques to “tame” the traffic moving through residential and other built-up areas has received much attention nationwide and locally. The transportation planning profession including NYSDOT, and organizations such as the Transportation Research Board, the Institute of Transportation Engineers and the American Association of State Highway and Transportation Officials have all developed guidelines and positions that allow for the implementation of traffic calming techniques. The ITCTC will continue to support the appropriate application of traffic calming to encourage the development of a transportation system that minimizes the negative impacts of motor vehicles without affecting overall mobility.

Education is a major component of any effort to address traffic safety. A tremendous amount of data has become available thanks to advances in electronic communications, which could support educational initiatives. The idea of promoting multi-modal transportation, offering skills training, and raising public consciousness levels regarding the presence of different modes, principally pedestrians and bicyclists, are all-important. The Ithaca-Tompkins area must continue and enhance existing efforts to reach more of the population. Small programs, such as safety programs in our schools need to be renewed and pursued with vigor.

Another area of constant concern regarding traffic safety is traffic law enforcement. Speeding traffic is an issue of overwhelming concern. While providing additional traffic control officers sounds like an easy solution, it is generally recognized that the costs of doing so are prohibitive. Technological solutions, such as remote radar “smart signs” and traffic light enforcement systems, might play a role in addressing this issue. Prioritized enforcement actions, based on data collected from traffic counters and vehicular crash and other incident information, offer another potential strategy for implementation. The LRTP Projects for Implementation include a projects for the study of remote enforcement options and development of a priority enforcement plan. Traffic calming techniques, mentioned

earlier in this chapter, also offer a variety of options to help deal with speeding traffic through roadway design.

Early in 2009 data from the statewide Accident Information Location System (ALIS) became available to New York MPOs. The ITCTC has distributed this information and will work with local partners and law enforcement agencies to in planning and program development efforts that will lead to increased safety on our roadways.

SAFETEA-LU established and funded a Safe Routes to School (SRTS) program. This program has been successful in bringing to the forefront issues addressing the relationship of childhood obesity, safety and transportation. A grant cycle in 2008 resulted in three applications from Tompkins County, one of which received funding. The ITCTC will continue to use the data, educational information and funding opportunities offered by SRTS to promote the safety of pedestrian and bicycle routes to schools in Tompkins County.

State and Regional Safety Planning

Federal legislation requires the Metropolitan Transportation Plan to include a safety element that incorporates or summarizes the priorities, goals and countermeasures or projects for the Metropolitan Planning Area (MPA) as contained in the State Strategic Highway Safety Plan. In addition this chapter provides an overview of Federal, State and Local Government’s participation in the development of Tompkins County’s emergency response preparedness. The chapter outlines the general responsibilities of the operational departments and provides a chronology of some key legislation effecting the Tompkins County Comprehensive Emergency Management Plan and related documents. These topics are discussed below in Part I- New York State Strategic Highway Safety Plan and Part II- Tompkins County Emergency Preparedness.

Part I - New York State Strategic Highway Safety Plan

The Vision Statement of the New York State Strategic Highway Safety Plan of 2007 contains key elements that provide guidance to ensure that those who live, work and travel in New York State enjoy a transportation system where:

1. safety is appropriately considered in education, enforcement and engineering;
2. the movement of people and goods is efficient;
3. there is a balance of transportation modal options;
4. the transportation system is environmentally sound;
5. there is a reduction in fatal and injury crashes.

The Vision Statement of the Tompkins County LRTP (Chapter 3) organizes its Goals and Objectives under the concept of a Transportation System that is *Sustainable*

and Accessible. Below are LRTP goals and objectives taken from Chapter 3, which demonstrate how the LRTP's vision of a Sustainable Transportation System relates to the Vision Statement of the New York State Strategic Highway Safety Plan of 2007. A complete record of the goals and objectives can be found in the LRTP Chapter 3 *Vision Statements, Goals and Objectives.*

The Tompkins County LRTP Vision Statement divides its Goals and Objectives under the following broad categories:

- Integration
- Proximity
- Connectivity
- Mobility
- Quality Of Life
- Environment

LRTP Vision Statement Goals and Objectives

Overarching goals that pervade all the goals and objectives:

1. Improve the safety of the transportation system.
2. Enhance coordination between transportation providers to the benefit and convenience of users.
3. Minimize negative environmental impacts of transportation.
4. Reduce fossil fuel energy dependency.

Integration:

Goal: To develop an integrated transportation system for Tompkins County that is seamless, multimodal and coordinated to achieve greater operational efficiencies and increase the safety and convenience of users.

Objective C: Continue development of an integrated multimodal transportation system, including public transit, bicycle and pedestrian facilities and networks, infrastructure and operations planning, construction and maintenance practices.

Objective E: Encourage the use of Intelligent Transportation System and other technologies to improve transportation system coordination, convenience and reliability for all users.

Objective H: Promote the use of Travel Demand Management techniques in order to achieve objectives such as reduced traffic congestion, road and parking cost savings, increased safety, improved mobility for non-drivers, energy conservation and pollution emission reductions.

Objective K: Promote benefits of walking and bicycling, including participation in promotional activities to encourage the increased use of walking and bicycling as modes of transportation.

Proximity:

Goal: To achieve land development patterns that enable the efficient provision of multimodal transportation services.

Objective C: Link transportation investment with local and regional land use planning.

Objective E: Consider land use and site design as it relates to efforts to reduce relative number of vehicle trips and vehicle miles of travel.

Objective I: Promote trip minimization and increased vehicle occupancy rates.

Connectivity:

Goal: To maintain and improve transportation networks to enhance safety, multimodal and intermodal connectivity and facilitate the movement of people and goods.

Objective A: Consider safety as the base component of all infrastructure design decisions with an end objective of reducing fatal and injury crashes.

Objective B: Improve the existing and proposed road network to safely accommodate bicycling, pedestrian and transit uses.

Objective J: Encourage the development and maintenance of advanced communication networks that can facilitate the use of communication technology as a substitute to travel.

Mobility:

Goal: To promote implementation of transportation services, programs and projects that enhance mobility.

Objective L: Encourage the provision of safe and comfortable environments for public transit employees and passengers on vehicles and at shelters, stops and stations.

Objective M: Support the provision of real-time system information to customers via the internet, wireless services and at bus stops, shelters, stations and other appropriate facilities.

Quality Of Life:

Goal: Develop a transportation system that sustains and enhances the quality of life for Tompkins County residents and visitors.

Objective C: The transportation system and proposed transportation projects should ensure both positive and negative environmental impacts are equitably distributed to all areas and population groups in the community.

Objective E: Support efforts to address the special needs of the growing elderly population in Tompkins County.

Objective K: Promote infrastructure designs that are sensitive to local environmental issues and preserve or enhance scenic beauty.

Objective L: Support community-based discussions involving the relationship between transportation and affordable housing, community planning, and economic development and revitalization.

Environment:

Goal: To work progressively towards a transportation system that will have zero-net negative impact on the environment.

Objective B: Promote alternative fuels and clean air strategies, which can be implemented in public fleets and private vehicles.

Objective C: Support the development of a transportation system that is responsive to changes in energy availability.

Part II-Tompkins County Emergency Preparedness

Organization Description

The County's emergency management program is a three-pronged effort implemented by the County's Department of Emergency Response, the County's inter-agency Emergency Management Planning Committee and its internal Emergency Management Strategic Group. The ITCTC fully supports the work of these groups and their efforts to address the emergency response needs of Tompkins County. The emergency management program is further described below.

a. Department of Emergency Response

The Department holds responsibility for managing the county's emergency dispatch and communications system, implementation of the county's 911 communications system, oversight of county mutual aid and disaster plans, and training and development of emergency medical and fire personnel. In addition, the Department provides Emergency Preparedness information to the public including development and maintenance of the Tompkins Ready website - www.tompkinsready.org.

b. The Tompkins County Emergency Planning Committee (TCEPC)

The TCEPC was established by resolution of the Tompkins County Legislature in 2000. Its mission is to facilitate the planning process for emergency management of disaster responses and to assist with operations during times of local emergencies. The committee is composed of representatives of county government, city government and other local response agencies. Its responsibilities include identifying appropriate local measures and resources to prevent disasters, developing mechanism to coordinate local resources, and delivering services to aid citizens during and after disasters. Among the Committee's responsibilities, are to annually update the *Tompkins County's Comprehensive Emergency Management Plan*. A diverse team of individuals and local agencies participate in support of TCEPC and the County's emergency management programs.

c. The Emergency Management Strategic Group

The Emergency Management Strategic Group chaired by Deputy County Administrator and is an internal team of County department staff, focusing on readiness issues within county government and related to maintaining services in the event of an emergency. Responsibilities involve assessment of the county government infrastructure, internal countywide emergency planning and developing a workforce emergency management plan.

Background

Federal and State agencies and their rules provide support and mandates for Tompkins County emergency management efforts. The Federal Emergency Management Agency's (FEMA) mission is to support citizens and first responders to ensure that the nation works together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards. The New York State Emergency Management Office (SEMO) Mitigation Section led the development of the State Multi-Hazard Mitigation Plan. The New York State Multi-Hazard Mitigation Plan represents the State's approach to mitigating the adverse impacts of natural disasters within its borders and to fulfill its Federal obligations to mitigate the risks resulting from natural hazards.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, enacted by Section 104 of the Federal Disaster Mitigation Act of 2000 (DMA2K) provided new emphasis on mitigation planning. Operationally, Hazard Mitigation is defined as the process whereby hazards are identified, risks and vulnerabilities are quantified, risk elimination or reduction measures are identified, awareness is created, and cooperative efforts are undertaken to prevent, reduce or eliminate losses.

The DMA2K emphasizes the need for State and Local governments to closely coordinate mitigation planning and implementation efforts as well as continuing the requirement for a State Mitigation Plan as a condition of disaster assistance. This plan is also intended to serve local jurisdictions as a guide in completing and updating natural hazard mitigation plans that will meet the requirements set forth in DMA2K. To be eligible for future disaster mitigation funding, FEMA requires that all local governments have an approved Federal hazard mitigation plan. In cooperation with the Towns of Caroline, Danby, Enfield, Groton, Ithaca, Lansing and Ulysses, Tompkins County completed the *Tompkins County Multi-Jurisdictional All-Hazards Mitigation Plan* (www.tompkins-co.org/planning/haz_mit.htm), which was approved by FEMA in 2006. The Towns of Newfield and Dryden are developing hazard mitigation plans independently. The City of Ithaca has completed its own plan independently. The County and each of the Towns actively coordinate between themselves and local partners

to implement the action items identified in each hazard mitigation plan.

FINANCIAL

Introduction

The weakest part of any planning process is in the area of financial resource estimating and forecasting, particularly when working within a long planning horizon. One of the major problems is forecasting revenues that are dependent on the political process. The Federal transportation program is vulnerable to political and procedural vagaries, where a legislative body sets one level of funding ("authorized") but may appropriate a lesser amount or change funding levels with other legislation. Given the unpredictability of the funding process, inflation and other economic factors, it is difficult to make accurate annual projections, and impractical when projections are forecasted for twenty years. In addition, the multi-agency/governmental arena of an MPO makes it difficult to determine exact equivalencies of diverse funding streams.

This financial analysis is largely based on a continuation of the priority guidance to "preserve existing facilities". The analysis is based on past revenue and expenditure levels and does not attempt to incorporate fundamental changes that may result from the implementation of this plan. For instance, implementing some measures may lead to increased governmental expenditures (e.g., computer models, computerized traffic signals, real-time transit information, new and improved bicycle facilities, etc.), but may also result in reduced societal costs (e.g., reduction in the costs of congestion, improved air quality, improved personal health and sense of community, etc.). Others may lead to decreased government expenditure (e.g., prioritized snow removal, local roadways built to more modest design standards, less rigorous maintenance practices, etc.), but may lead to other undetermined costs. This type of comprehensive, cumulative analysis is beyond the scope of this plan.

1. Resource Estimation

Information on fiscal resources was gathered from three sources: the New York State Department of Transportation, Tompkins Consolidated Area Transit and the New York State Comptrollers Office. Demographic data was derived from the US Census, New York Statistical Information System and Cornell's Institute for Social and Economic Research. In all cases resources were projected into the 20-year planning horizon based on historical funding trends that are reflective of variations and inflationary forces.

Local Resource Projections

An adjusted *Per-Capita Multiplier Method* was used to develop local transportation funding resource projections for the 20-year plan horizon. This method links future resources to the population base. This approach was used in lieu of carrying out a linear "trend based" projection because, as an estimator, applying the per capita cost multiplier method directly on the projected population, offered a smaller standard error.

Transportation expenditure data was obtained for the seventeen local governments in Tompkins County (Tompkins County, the City of Ithaca, the Towns of Ithaca, Caroline, Danby, Dryden, Enfield, Groton, Lansing, Newfield and Ulysses, the Villages of Lansing, Cayuga Heights, Dryden, Groton, Trumansburg and Freeville). Figures compiled from the State Comptrollers Office were used to calculate local transportation capital and operations funding resources into the future. Application of the per-capita multiplier method required developing an 'adjustment factor' that would account for variability in transportation expenditures observed in the base years (2001-2007). The 2001 to 2007 average ratio between expenditures of local transportation funds per capita and average percent change in per capita transportation expenditures generated the adjustment factor of 41.2608. This was added to the average ratio of transportation expenditures per capita (406.1535) to generate the adjusted per-capita multiplier of 447.4143. Applying the per capita multiplier to the annualized population growth estimates resulted in a 20-year (2010-2029) local transportation resources estimate of \$650,058,456.

Local transportation expenditures include "Operation & Maintenance" (O&M) and "Capital Projects". Funds were disaggregated into these categories based on average percentage expenditures on O&M versus Capital Projects calculated from New York State Comptrollers Office Special Report on Municipal Affairs for 2002 through 2007.

In addition, private sector contributions were estimated at \$13,001,169 over 20 years, or approximately \$650,000 per year. Private contributions are transportation funds that originate from a non-governmental source. The estimated number was found by setting the private contributions to 2% of what would be the total expenditure, the same percent that the private contributions were estimated to be in the 2025 LRTP. Private contributions include projects such as mitigation for proposed land use development, private subdivision roadways, expenditures in private bridges, etc. Private contributions were assigned to capital projects for purposes of analysis of expenditure allocation. **TABLE 28** shows a summary of the local highway resources estimate as described in the paragraphs above.

TABLE 28			
Summary of Local Highway Resource Estimates 2010-2029			
Operations & Maintenance	Capital Projects	Private Contributions	Total
\$477,922,977	\$172,135,479	\$13,001,169	\$663,059,625

NY State Resource Projections

The New York State Department of Transportation (Region 3, Syracuse) provided estimates of State and Federal highway program aid for the six-year period 2010-2015. These figures were used to develop a 20-year estimate of available resources from the State. **TABLE 29** includes the federal, state and local resources available to Tompkins County over the 20-year period.

NYSDOT estimates were based on planned funding targets through 2015 and conservative estimates of anticipated program growth through 2030. The estimate of available State funds, \$174,035,000, includes some operations, such as materials, tree removal, bridge painting and cleaning, drainage, contract maintenance for NYSDOT bridge and pavement facilities, etc. What is not included in the State fund resource estimate is the cost of State forces that undertake these operations.

Federal Aid Resource Projections

Federal aid for highway programs was estimated at \$200,000,000. This is reflective of the approximately \$10,000,000 per year that are programmed in the ITCTC TIP. It is important to note that while NYSDOT did not include a set-aside for the Transportation Enhancement Program in their estimates, it was considered as part of the total federal aid by the *ITCTC* at the rate of \$300,000 per year. This has the effect of reducing the amount of federal aid estimated to be available for other types of projects, adding further to the conservative nature of the fiscally constrained plan. The amount under the "State Funds" column is for NYSDOT projects and does not include any funds available to local entities.

The third source of information pertains to transit funding. TCAT and Tompkins County, the designated FTA grant recipient, provided the information required to develop the transit estimates in **TABLE 29**. The local and State "matching" contributions to these funds were calculated based on current program requirements. The FTA Section 5307 (urban area transit service) figures for capital and operating assistance were based on actual Federal Fiscal Year 2009 figures. The State Dedicated Funds (SDF)-Capital funds were calculated based on the 2009 formula. The estimates from TCAT reflect the most recent changes in funding formulae and appropriate fund levels.

TABLE 30 summarizes the previous two tables and provides the estimate of total resources available.

TABLE 29				
Highway and Transit Resource Estimate 2010-2030				
Funding Program	Local	State	Federal	TOTAL
Highway Program	\$663,059,625 ¹	\$174,035,000 ³	\$200,000,000 ³	\$1,037,094,625
Transit²:				
Sect. 5307 – Urban Formula (capital)	\$445,453	\$445,453	\$3,563,623	\$4,454,529
Sect. 5309 – Discretionary Capital	2,650,000	2,650,000	21,200,000	26,500,000
Sect. 5310 – Paratransit (capital)	585,000	0	2,340,000	2,925,000
Sect. 5311 – Rural Capital	637,500	637,500	5,100,000	6,375,000
Sect. 5316/17 – JARC/New Freedom	5,800,000		5,800,000	11,600,000
SDF – State Dedicated Funds (capital)	0	3,750,000	0	3,750,000
<i>Subtotal Transit Capital</i>	\$10,117,953	\$7,482,953	\$38,003,623	\$55,604,529
Transit Operations*	\$271,261,456	\$113,766,512	\$41,264,855	\$426,292,823
Transit Sub-Total	\$281,379,409	\$121,249,465	\$79,268,478	\$481,897,352
Total Transportation	\$944,439,034	\$295,284,465	\$279,268,478	\$1,518,991,977

Sources:

¹The Local Government Data Base, New York State Office of the Comptroller (see Table 22) – funding increases over planning period based on historical trends.

²Tompkins Consolidated Area Transit

³NYSDOT

Note:

*Funds for *Transit Operations* come from the following sources:

Local – fare revenue and local subsidy, increasing at approximately 6.5% per year after year 2010

State – New York State Transit Operating Assistance, based on 2010 budget request and increasing 3% per year after year 2013

Federal – Section 5307 funds (includes transfer from 5311 to 5307), based on 2010 adopted budget and increasing 2.5% over planning period

TABLE 30				
Summary of Total Estimated Resources 2005-2024				
Program	Local	State	Federal	TOTAL
Highway	\$663,059,625	\$174,035,000	\$200,000,000	\$1,037,094,625
Transit	\$281,379,409	\$121,249,465	\$79,268,478	\$481,897,352
Total	\$944,439,034	\$295,284,465	\$279,268,478	\$1,518,991,977

In summary, for the 2010-2030 planning horizon, local resources are estimated to provide 58.4% of the transit funds, 63.9% of the highway funds, and 62.2% of the total transportation program funds. State resources are calculated at 25.2% of the transit funds, 16.8% of the Highway funds, and 19.4% of the total program funds. Federal government funds are estimated to contribute 16.4% of the transit funds, 19.2% of the highway funds, and 18.39% of the total transportation program funds. **FIGURE 39** provides a graphic representation of the Local/State/Federal funding splits for the Transit, Highway, and Total program resources.

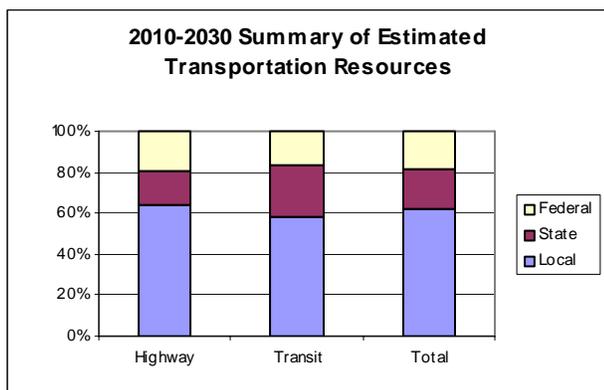


FIGURE 39

2. Expenditure Estimation

The estimation of expenditures is based on several factors. The issue of which federal program resources to allocate for each expenditure area is considered to be minor. Due to the flexibility included in federal transportation legislation, it is expected that funds will be transferred between programs to best meet the expenditure demands of the area. This section does not attempt to differentiate federal from state from local fund sources (although based on the estimation process there should not be any cases of local expenses exceeding local resources).

A clear division between "transit" and "highway" projects has been maintained for the sole purpose of making the allocation of estimated resources easier. These estimates are based on "historic trends" which are subject to variables such as annual state and federal appropriations.

Federal and state highway funds were distributed one-third to bridges, one-third to pavement projects. This is in accordance with the established practice used to allocate resources during TIP development under NYSDOT's Goal Oriented Programming process. This proportion in the distribution of funds also reflects historical trends. The last third of federal and state highway funds were distributed to

cover other project categories such as safety, transportation enhancement and capacity projects.

Another major source of information came from the local government expense data. Since local operating and maintenance costs were included in these data, these were assumed as "baseline" costs and were allocated as expenditures against the resource estimate.

Transit allocations were based on expenditures proportions utilized by TCAT. The Capital Facilities include projects with a high probability of implementation.

No attempt has been made in this plan to allocate costs by individual project year. The expenditures reflect 'year of expenditure dollars' based on the analysis used above under *1.Resource Estimation*. However, **TABLE 31** provides a summary of the estimated expenditure allocations. A brief discussion of these allocations follows the table.

Highways

Bridge: NYSDOT data analysis revealed 17 state-system, 57 local-system, and 8 authority or other-owned bridges are classified as in “deficient condition”, requiring work over the 20-year planning period. Additional bridges will also continue to require regular maintenance, while other bridges may need emergency work as a result of weather events, accidents, etc. The \$137,912,250 allocated to bridge rehabilitation and repair in **TABLE 31** includes one-third of Federal and State highway resources plus a five-percent local share. In addition, an estimated \$200,000 per year was added to account for private fund used for bridge projects. The aim is to reduce the percentage of State deficient bridges from a current 32% to 20%, locally owned bridges from 43% to 30% and to limit deficient authority or other-owned bridges to no more than 4 out of the 9 bridges in that category.

Pavement: In support of LRTP objectives to maintain existing transportation infrastructure, one third of the federal and state highway resources, plus an estimated \$200,000 per year in private funds, a total of approximately \$128.7 million over 20 years, was allocated to this category. Approximately \$110.6 million in additional local capital projects were added to this figure to cover funding of local road pavement projects. A total of approximately \$239.3 million is shown for pavement expenses. As stated previously, the aim of the pavement program is to maintain and improve the condition of the highway infrastructure.

Safety: Increased safety has been a priority of the ITCTC since its initial LRTP. Even though very few projects get funded exclusively from surface transportation program “safety” funds, it does not detract from the importance of this policy. The fact is that safety features are designed and constructed as principal or incidental aspects of nearly every type of transportation project. This plan maintains the allocation of highway funds for safety projects at 5% of the total transportation program. While even at \$52.2 million the funds may underestimate the “needs” for safety improvements, they also under-represents the commitment and investment to safety that is part of every TIP project.

Enhancements: The Transportation Enhancement Program (TEP) under under past federal legislation has been a popular and highly competitive program. Applicants from Tompkins County have aggressively and successfully pursued this line of funding. For purposes of this LRTP it is estimated that \$300,000 per year will be available to Tompkins County from the TEP or other similar competitive grant programs.

Operating and Maintenance: The combined estimates of 20 year O&M costs calculated for all the Tompkins County local governments were incorporated here. It is important to note that the NYSDOT estimate of available State funds included some operations costs, such as materials, tree removal, bridge painting and cleaning, drainage, etc.

Multimodal Capacity Projects: The LRTP analysis and vision strongly recommend the need to expand mobility options in Tompkins County (see Ch.3 Vision and Ch.5 Scenario Analysis). This will help meet multiple energy efficiency, emissions reduction and sustainable accessibility objectives.

Although the 20-year total of approximately \$126.7 million is intended to cover for targeted capacity projects on the local roadway network, it is acknowledged that these resources will be of greatest value when funding Transportation System Management (TSM) activities (e.g., signal synchronization, traveler information systems, traffic circles, bike lanes, “flex” to transit, etc.); for expansion of multimodal facilities and programs (principally bicycle, pedestrian and transit); and for the implementation of transportation mobility and demand management program such as ridesharing, car sharing, vanpools, guaranteed ride home, staggered work hours, etc. Implementation of these non-automobile based transportation strategies, coupled with more efficient land use development patterns provide a framework for long-term sustainable transportation in Tompkins County.

Transit

Capital Facilities: The total of \$14,363,632 includes funding for TCAT Facility rehabilitation, and replacement of passenger facilities and shelters.

Operating: The total operating budget estimate of \$426,292,823 reflects an annual growth rate of 5% over the 20-year planning horizon. The Operating projections include all revenue sources: local (fare revenue and local subsidy), state transit operating assistance and federal operating assistance.

Maintenance/Miscellaneous: This “catch-all” category includes a variety of projects that may range from short-range planning to implementation of special transit projects, from communications and data processing equipment replacements to improved signage. A cost of approximately \$700,000 per year was used to calculate this allocation.

Buses: The buses estimate includes urban, rural and paratransit buses operated by TCAT, its contractors,

and GADABOUT. The resources estimate for purchasing buses is \$27,140,897, which includes purchases for GADABOUT under the Section 5310 program. The estimate for bus acquisition assumes TCAT will be successful in getting funding from different non-formula Federal sources (i.e. congressional earmarks, one-time programs such as ARRA, etc.). Further, the estimate assumes regular allocations from the New York State Dedicated Transportation Fund.

TCAT's biggest long term funding problem is capital funding, especially for replacement buses. The size of TCAT's bus fleet requires capital funding at a level that far exceeds its annual urban formula allocation (Sec. 5307). Therefore, TCAT must compete for discretionary capital funding from federal and state programs. The cost of not being able to replace buses in a timely fashion is reflected in the high maintenance costs of an aging bus fleet. As part of its strategic planning, TCAT will identify strategies for funding replacement buses, bus rehabilitation and re-manufacturing.