Long Range Transportation Plan

for the Genesee-Finger Lakes Region

2040

GENESEE TRANSPORTATION COUNCIL

June 2016

GENESEE TRANSPORTATION COUNCIL

Long Range Transportation Plan for the Genesee-Finger Lakes Region 2040

GENESEE TRANSPORTATION COUNCIL

RESOLUTION

Resolution 16-47 **Adopting the *Long Range Transportation Plan for the Genesee-Finger Lakes Region 2040***

WHEREAS,

1. The Governor of New York State designated the Genesee Transportation Council (GTC) as the Metropolitan Planning Organization (MPO) responsible for transportation planning in the Genesee-Finger Lakes Region, which includes Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, and Yates counties;

2. Title 23, Section 134 of the United States Code requires that each MPO prepare and update a long range transportation plan (LRTP) for its metropolitan area;

3. Title 23, Section 134 of the United States Code requires that an LRTP shall, at a minimum, identify transportation facilities that should function as an integrated system, and include a fiscally-constrained financial plan for implementing the recommendations contained in the LRTP;

4. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed into law on August 10, 2005 and mandated additional elements that must be incorporated into a MPO LRTP by July 1, 2007;

5. The specific elements mandated by SAFETEA-LU are further defined by the Metropolitan Transportation Planning Final Rule that was published jointly by the Federal Highway Administration and Federal Transit Administration on February 14, 2007;

6. Moving Ahead for Progress in the 21st Century (MAP-21) was signed into law on July 6, 2012 and Fixing America's Surface Transportation Act (FAST Act) was signed into law on December 4, 2015, both of which mandated additional elements that must be incorporated into a MPO LRTP;

7. GTC, in consultation with affected stakeholders and the general public, has developed the *Long Range Transportation Plan for the Genesee-Finger Lakes Region 2040* (LRTP 2040) in a manner that meets and exceeds the requirements of Title 23, Section 134 of the United States Code and the February 14, 2007 Metropolitan Transportation Planning Final Rule;

8. The development of LRTP 2040, including all associated public involvement, was completed prior to the Metropolitan Transportation Planning Final Rule incorporating requirements of MAP-21 and FAST Act being published;

9. Additional requirements contained in a subsequent Metropolitan Transportation Planning Final Rule can be incorporated into LRTP 2040 without extending the horizon year;

10. SAFETEA-LU requires the incorporation of a Congestion Management Process (CMP) into the metropolitan transportation planning process of Transportation Management Areas (TMAs);

11. The Unified Planning Work Program includes Task 7110, Congestion Management Process Implementation, which has been further advanced and incorporated into said LRTP to meet and exceed the requirements of SAFETEA-LU for incorporating the identification of congested roadways, activities to mitigate the congestion, and measures to monitor performance into the metropolitan transportation planning process;

12. LRTP 2040 has been developed and reviewed by GTC staff and member agencies through the GTC committee process and its recommendations have been found to be consistent with the principles of sound transportation planning practices.

NOW, THEREFORE, BE IT RESOLVED

1. That the Genesee Transportation Council hereby adopts the *Long Range Transportation Plan for the Genesee-Finger Lakes Region 2040* as the official LRTP for the Rochester Metropolitan Planning Area and the Genesee-Finger Lakes Region in accordance with Title 23, Section 134 of the United States Code and the February 14, 2007 Metropolitan Transportation Planning Final Rule; and

2. That the Council encourages those responsible for the development and advancement of transportation projects in the Genesee-Finger Lakes Region to do their utmost to adhere to its principles and recommendations in carrying out their respective programs.

CERTIFICATION

The undersigned duly qualified Secretary of the Genesee Transportation Council certifies that the foregoing is a true and correct copy of a resolution adopted at a legally convened meeting of the Genesee Transportation Council held on June 9, 2016.

Date 6/9/16

Kevin C. Bush

KEVIN C. BUSH, Secretary
Genesee Transportation Council

GENESEE TRANSPORTATION COUNCIL

Long Range Transportation Plan for the Genesee-Finger Lakes Region 2040

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Financial assistance for the preparation of this report was provided by the Federal Highway Administration and the Federal Transit Administration. The Genesee Transportation Council (GTC) is solely responsible for its content and the views and opinions expressed herein do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

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Foreword

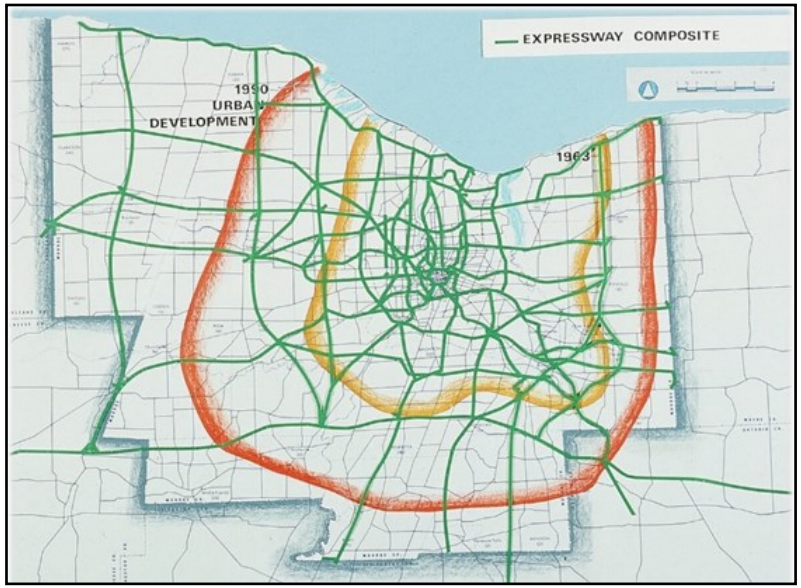
Foreword

The first long range transportation plan for our region was produced in 1969 by the Rochester Metropolitan Transportation Study, the predecessor to the Genesee Transportation Council.

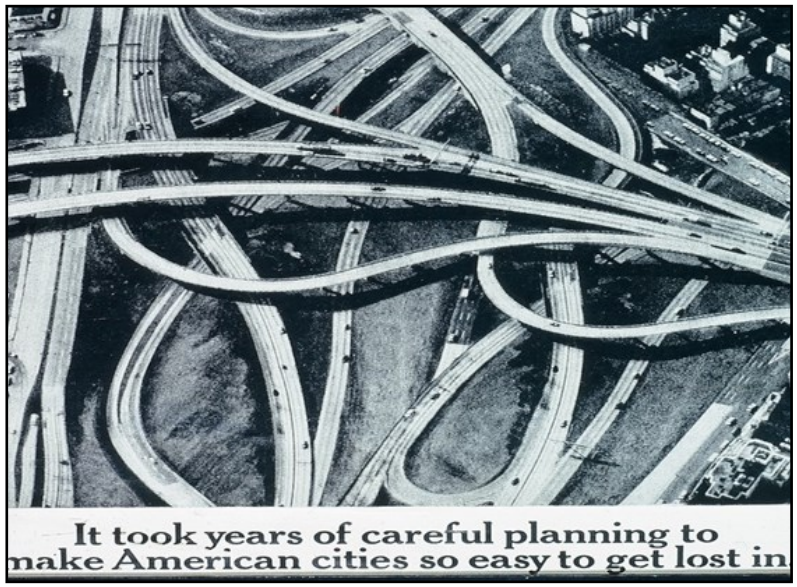
Entitled *The 1990 Transportation Plan,* it provides not only a retrospective of a partially realized future but also serves as a reminder of the challenges and importance of critically evaluating how transportation can and will impact quality of life and economic development.

While the *Long Range Transportation Plan for the Genesee-Finger Lakes Region 2040* looks to a horizon a half century beyond that of the region's original long-term prospective for transportation, one inarguable fact remains:

A safe, efficient, reliable transportation system is a necessity, not a luxury.



Proposed expressways in *The 1990 Transportation Plan*



Slide from the presentation of *The 1990 Transportation Plan*

Chapter 1 - INTRODUCTION

INTRODUCTION

"The people who thought they were in the railroad industry found out the hard way that they were in the transportation industry. Today, the people who think they're in the coal industry are finding out that they're in the energy industry."
-- Michael Bloomberg, December 11, 2014.

To meet and exceed its responsibilities as the federally-required Metropolitan Planning Organization for the Genesee-Finger Lakes Region, the Genesee Transportation Council (GTC) continues to commit itself to being in the economic and community development industry. Transportation for transportation's sake will not improve economic opportunity and quality of life for the Region's residents. Every transportation decision must be made based on thoughtful and careful consideration of its impact on jobs, natural resources, and quality of life for persons of all means and abilities.

Over the past five years, the Region has come together more so than in any other time in recent memory to identify how it should move forward economically and environmentally in an equitable manner. This has taken the form of regional initiatives developed with significant input from a wide array of stakeholders. In this sense, the Region has demonstrated that it is much more than a geography. It is a community.

GTC has fully incorporated the information and strategies contained in the aforementioned regional initiatives as an organizing framework that complements the guiding principles, customer engagement, data analysis, and consideration of strategies utilized to develop the *Long Range Plan for the Genesee -Finger Lakes Region 2040 (LRTP 2040)*.

As a traditional mainstay of any credible long range planning process, projecting changes in the demographics of the Region's population and the mix of industries comprising its economy are critical to assessing future needs. What becomes a larger component of the *LRTP 2040* than its predecessors is the consideration of the impacts of technology on vehicles, infrastructure, and services. While the deployment and market saturation of current technologies over the next 25 years continues to be debated, these applications and others yet unknown hold the promise of improved safety, expanded mobility, and increased system efficiency. The transportation technologies of tomorrow and beyond will be far from a panacea, however, as new costs and risks are introduced, including but not limited to heightened security and privacy concerns.

It is important to acknowledge upfront that just improving transportation won't solve every problem in the Region. Even where transportation can make a positive difference, the reality is that the resources expected to be available over the time period covered by *LRTP 2040* will be significantly less than what is required to meet all of the identified mobility needs of people and freight. Continuing and enhancing performance-based, data-driven decision making processes will ensure the transportation system meets the needs of the majority of the Region's residents, businesses, and institutions to the greatest extent practical. However, absent greater financial commitment from all sectors, transportation will be a limiting factor for some, preventing them from attaining the prosperity they desire.

It is within this context that *LRTP 2040* sets the direction for the implementation and delivery of transportation infrastructure and services over the next quarter century and provides the framework for federally-funded planning and investments.

LRTP 2040 is organized around and presented in six primary elements:

The Plan – Provides background on *LRTP 2040,* how it was developed, and the role of GTC in regional transportation policy, planning, and investment decision making.

INTRODUCTION

The Region – Discusses existing and projected characteristics of the Region's residents, businesses, and resources including associated emerging issues and opportunities that will impact the transportation system and be impacted by it.

Transportation System – Examines the Region's transportation infrastructure and services, the travel characteristics of people and freight, and related safety, security, technology, and congestion considerations.

Financial Plan – Describes the anticipated change in the costs of implementing transportation improvements and revenues that can reasonably be expected to be available through 2040.

Recommendations – Presents the strategies and actions that will deliver the most benefits within the constraints of the financial resources that are reasonably expected to be available for transportation through 2040.

Performance Measures – Identifies the current and expected performance of the transportation system.

GENESEE TRANSPORTATION COUNCIL

Long Range Transportation Plan for the Genesee-Finger Lakes Region 2040

Chapter 2 - THE PLAN

LRTP 2040 Development

The objectives of *LRTP 2040* mirror the intentions outlined previously in *LRTP 2035*, as follows:

1.) determine the current and projected transportation needs of the Region's residents, businesses, and institutions through 2040;
2.) assess the ability of the existing transportation system to meet these needs; and
3.) identify a set of fiscally constrained strategies that best fill the gap between the capabilities of the existing transportation system and current and projected needs over the next 25 years within reasonably expected levels of available funding.

The *LRTP 2040* provides a strategic framework for policy, planning, and investment decision making allowing for the multiple agencies that own, maintain, and operate transportation infrastructure and services to work towards the "3C" process continuously, cooperatively, and comprehensively in a coordinated fashion. It is not, nor is it intended to be, a capital or operating plan for any single transportation agency in the Genesee-Finger Lakes Region.

Genesee Transportation Council

The mission of GTC is to maximize the contribution of the transportation system to the social and economic vitality of the Genesee-Finger Lakes Region. Simply put: GTC is not interested in transportation for transportation's sake. Every transportation policy, planning, and investment decision made by GTC is based on how quality of life and economic opportunity will be improved by that choice.

Above all else GTC wants *LRTP 2040* to be approachable and readable to all the Region's stakeholders no matter one's level of transportation expertise.

Responsibilities

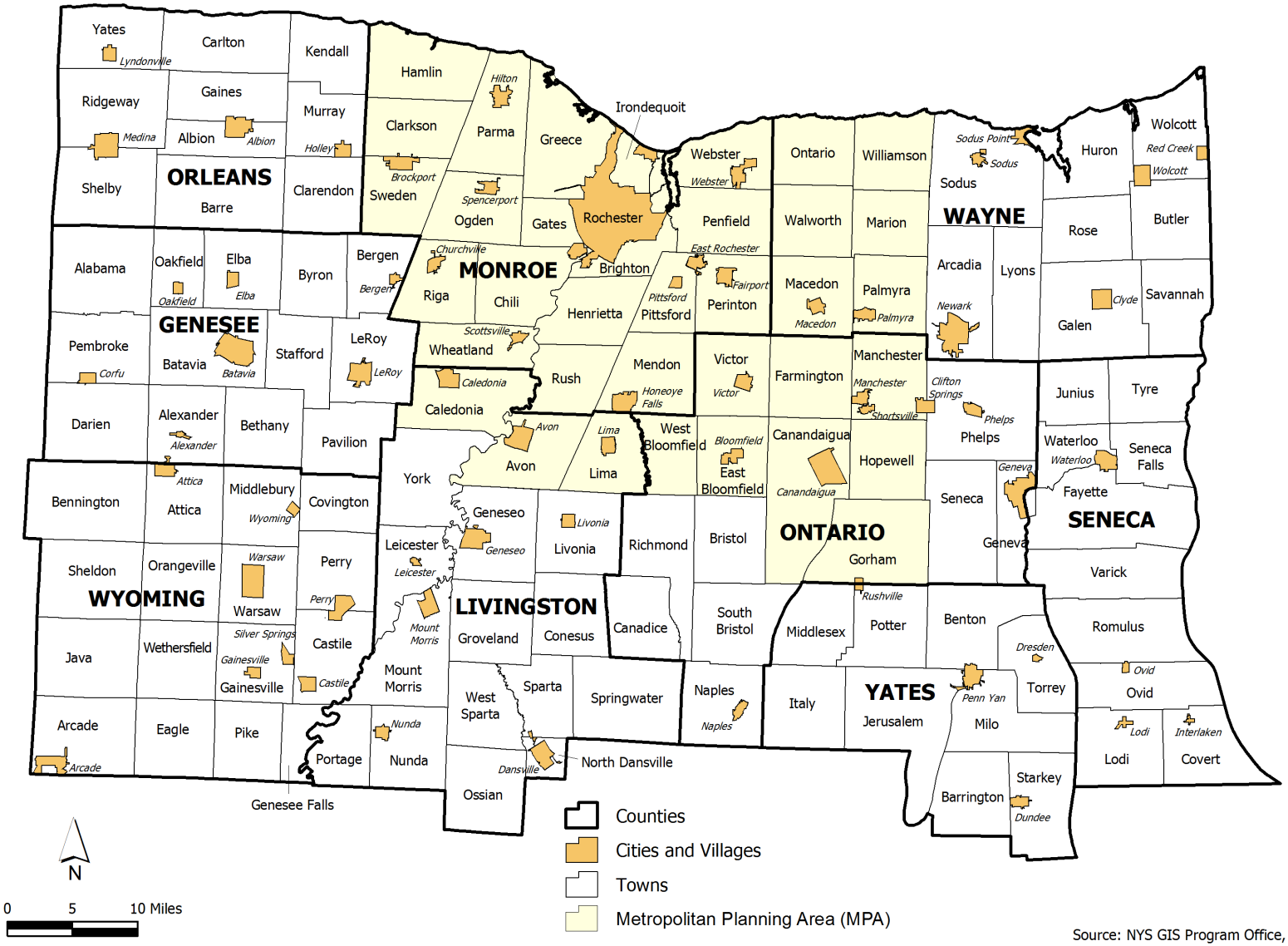
The U.S. Department of Transportation (USDOT) requires every metropolitan area with a population of over 50,000 to have a designated Metropolitan Planning Organization (MPO) to qualify for the receipt of federal highway and transit funds. In 1977 the Governor of New York State designated the GTC as the MPO responsible for transportation planning in the Genesee-Finger Lakes Region, which includes Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, and Yates counties along with the Rochester metropolitan area.

Because of the size of the nine-county Region and per federal requirements and regulations pertaining to MPOs, the primary focus of GTC's transportation planning efforts is the Rochester Metropolitan Planning Area (MPA). The Rochester MPA includes all of Monroe County plus the adjacent developed areas of Livingston, Ontario, and Wayne counties. Changes in population and land use in the Region between 2000 and 2010 resulted in an expansion of the Rochester Urbanized Area which necessitated expanding the MPA boundary in March 2015. A map of the nine-county Region along with the designated and newly expanded MPA is presented in Map 1.

Typically MPOs conduct federally required metropolitan transportation planning activities for their designated MPA. As shown on Map 1 the boundaries of the GTC planning region far exceed the MPA. GTC recognizes that the transportation system in the Rochester MPA both greatly influences and is influenced by the transportation system in the surrounding area. Accordingly, GTC conducts the metropolitan transportation planning process for the entire nine-county Region, not just the MPA.

Genesee-Finger Lakes Region

Map 1



Source: NYS GIS Program Office, 2015

Federal legislation continues to shape transportation planning activities conducted by MPOs. Beginning in 1991 the enactment of the Intermodal Surface Transportation Efficiency Act (ISTEA) significantly increased the role of MPOs in metropolitan transportation policy, planning, and investment decision making. Responsibilities of MPOs were further expanded in the subsequent Transportation Equity Act for the 21st Century (TEA-21), which was enacted in 1998, and its successor the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), enacted in 2005.

Moving Ahead for Progress in the 21st Century or MAP-21, enacted in 2012, established a performance-based programming approach to increase accountability and transparency through the development of mandatory performance measures and planning targets. Fixing America's Surface Transportation (FAST) Act, signed into law on December 4, 2015, is the current five-year $305 billion surface transportation reauthorization bill. The FAST Act continues the performance-based planning approach set forth in MAP-21 and provides a level of financial certainty for federally funded transportation projects through 2020.

The USDOT requires that MPOs conduct their activities using the following "3C" process:

Continuing

The MPO must meet regularly to discuss and identify transportation solutions to the constantly changing needs of the region's residents, businesses, and institutions that depend on the system for their economic, social, and domestic needs.

Cooperative

The MPO must include stakeholders at all levels (local, regional, state, and federal) in recognition that their respective transportation infrastructure and services must be planned, implemented, and operated in a coordinated fashion to maximize benefits to the travelling public.

Comprehensive

The MPO must consider and plan for the entire surface transportation system, which includes highways, bridges, public transportation, and bicycle and pedestrian facilities, emphasizing connections that improve safety, efficiency, and reliability.

To continue to receive federal transportation funding GTC must at a minimum produce and maintain three major transportation planning documents:

1. Long Range Transportation Plan (LRTP)

The LRTP must address no less than a 20-year horizon and lead to an integrated multimodal surface transportation system, giving priority to those elements that serve regional, statewide, and national goals. Beyond infrastructure preservation and maintenance, the LRTP must explicitly consider transportation system management and operations capabilities. The LRTP must be fiscally constrained in that system-level estimates of the costs of the recommendations contained in it cannot exceed reasonably expected revenues. The LRTP must be updated no less than every five years.

2. Unified Planning Work Program (UPWP)

The UPWP allocates federal transportation planning funds to activities conducted by GTC that maintain the federally-certified planning process required by USDOT. The planning funds are shared with local municipalities and transportation agencies to conduct regionally- and locally-needed plans that advance the LRTP. The UPWP must be updated no less than every two years and is typically updated by GTC every year.

3. Transportation Improvement Program (TIP)

The TIP is a fiscally-constrained capital improvement program that lists all federally funded transportation improvements in the Region over the next four to five years. The Transportation Development Committee, comprised of technical and transportation professionals from member agencies, oversees the project selection process and determines which transportation projects will receive federal funds. Projects included in the TIP may emerge from infrastructure needs identified through UPWP-funded plans and programs and must advance the recommendations in the LRTP. The TIP must be updated no less than every four years and is typically updated by GTC every two to three years.

All GTC activities and products incorporate input from the public, technical professionals, and/or non-transportation organizations through direct outreach and consultation guided by the *GTC Public Participation Plan.* GTC also ensures that the metropolitan transportation planning process is responsive to federal mandates and guidelines including, but not limited to, the Americans with Disabilities Act, Clean Air Act Amendments of 1990, Title VI of the Civil Rights Act of 1964, and environmental justice considerations. Environmental justice builds on Title VI of the Civil Rights Act of 1964 by requiring agencies using federal funds to identify and address, as appropriate, any disproportionately high or adverse human health or environmental impacts on minority and low-income populations that may result from their activities.

Goals and Objectives

The GTC Goals and Objectives reflect local and regional priorities within the context of the eight major transportation planning factors established by SAFETEA-LU and continued through MAP-21 and the FAST Act. The development of the *LRTP 2040,* the selection of planning activities through the UPWP, the transportation system investments programmed in the TIP, and all other programs conducted by GTC are guided by the Goals and Objectives presented in Exhibit 1.

Exhibit 1

GTC GOALS & OBJECTIVES

1. **Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency**
   - A. The transportation system should support balanced community and economic development of the metropolitan area
   - B. The transportation system should be a distinguishing competitive feature of the metropolitan area relative to other areas, serving the needs of existing businesses and enhancing the region's attractiveness to new business
2. **Increase the safety of the transportation system for motorized and non-motorized users**
   - A. Transportation designs, services, and education programs should enhance and protect life, health, and property
3. **Increase the ability of the transportation system to support homeland security and to safeguard the personal security of all motorized and non-motorized users**
   - A. The transportation system, and its associated programs and services, should support both national and personal security initiatives

4. Increase the accessibility and mobility options available to people and freight

A. The transportation system should provide the capacity, coverage and coordination necessary to provide mobility to the region's population and commercial activities in a fashion consistent with the overall intent of Goal 1

B. Reasonable travel alternatives should be available to all persons in the area regardless of age, physical or mental ability, and/or income

5. Protect and enhance the natural environment, cultural heritage and community appearance, and promote energy conservation

A. Transportation planning and decision making should support and reinforce local land use and development objectives

B. Transportation planning and decision making should recognize local priorities balanced with broader community goals

C. Transportation planning and decision making should strive to address issues on a corridor level, recognizing both the multi-jurisdictional component of travel and the interrelationship between transportation and non-transportation policies and investments

D. The transportation system should encourage the efficient use of non-renewable energy resources and the exploration of renewable alternatives

E. Transportation planning and decision making should strive to embrace designs and processes that respect the natural environment and enhance the overall contribution of the transportation system to community livability

6. Promote efficient system management and operations

A. The transportation system should be designed and managed in a fashion that minimizes lifetime maintenance and user costs

B. Transportation investments should advance the Long Range Transportation Plan's goals and objectives in a fashion which maximizes benefits relative to costs *

C. Transportation and land use planning should be integrated in a fashion that optimizes the use of existing transportation and other municipal infrastructure

D. Transportation investments should be guided by cooperative planning, design, and maintenance standards to promote system continuity and uniformity across jurisdictional boundaries

7. Facilitate partnerships in planning, financing, and the execution of transportation initiatives

A. The transportation planning and decision making process should be multi-jurisdictional, fostering coordination and cooperation among local, county, state, and federal governments, concerned agencies, and the private sector

B. The transportation planning process should be conducted in as open and visible a manner as possible, encouraging community participation and interaction between and among citizens, professional staff, and elected officials

C. Financial and non-financial support for transportation initiatives should be provided by all levels of government and the private sector in a fashion which reflects their relative responsibilities for, and/or benefits from, the initiatives and related economic and social impacts

D. Innovative financing/partnerships for transportation initiatives that reflect the full scope of interests impacted or served should be explored

E. Transportation and transportation-related information resources should be developed and shared in a fashion that promotes informed public and private sector decision making

F. Awareness should be promoted regarding the impact of individual, public, and private sector decisions on the quality of mobility and the potential impact of these decisions on others

*Note: Benefits and costs are broadly defined, quantitative as well as qualitative, non-monetary as well as monetary, and involve non-transportation effects as well as those related to the direct provision of transportation services.

GTC Organizational Structure

GTC Board

GTC is governed by a 27-member policy committee, the GTC Board, which includes elected officials from the nine-counties, the City of Rochester, and representatives of other local, regional, state, and federal transportation related agencies. The Board provides the MPO direction, establishes policy, and approves all activities and major work products, including the LRTP, UPWP, and TIP. GTC Board Officers are elected from among the members.

The GTC Board meets quarterly, or as required. Each meeting is open to the public and advertised as such through media outlets across the Region. A public forum is included at the beginning of all meetings to allow for public comment on meeting agenda items before GTC Board action is taken.

The Board is supported by the Executive Committee, Planning Committee, and various ad-hoc committees (e.g., UPWP, TIP, project- and program-specific steering and advisory committees). A listing of current GTC Board members is presented in Exhibit 2.

Exhibit 2

GTC Board Members

County Legislative/Boards of Supervisors (9)

Genesee County*
Raymond Cianfrini - Chair

Livingston County*
Eric Gott - Chair

Monroe County
Anthony J. Daniele - President

Ontario County*
John F. Marren - Chairman

Orleans County
David B. Callard - Chair

Seneca County
Gary Westfall - Chair

Wayne County*
Steve LeRoy - Chairman

Wyoming County
A. Douglas Berwanger - Chair

Yates County
Dr. Timothy Dennis - Chair

Other Local Members (9)

Monroe County Executive*
*Cheryl Dinolfo - County Executive

Monroe County Planning Board
Vacant

Monroe County Supervisors' Association
John Moffitt, President

Monroe County At-Large
Daniel Hogan, At-Large Member
Justin Roj, At-Large Member

Mayor - City of Rochester*
Lovely Warren - Mayor

Rochester City Council
Loretta Scott - President

Rochester City Planning
David L. Watson - Chair

Rochester At-Large
Allen G. Casey - At-Large Member

Regional Agencies (2)

Genesee/Finger Lakes Regional Planning Council*
John F. Marren - Chairman

Rochester-Genesee Regional Transportation Authority*
James Redmond - Chairman

State Agencies (4)

Empire State Development Corporation
Howard Zemsky, President & CEO

NYS Dept. of Environmental Conservation
Basil Seggos, Acting Commissioner

NYS Dept. of Transportation*
Matthew Driscoll, Commissioner

NYS Thruway Authority
Maria Lehman, Interim Executive Director

Federal Agencies (3)

Federal Aviation Administration**
Steven Urlass, District Manager

Federal Highway Administration**
Peter Osborn, Division Administrator

Federal Transit Administration**
Marilyn Shazor, Regional Administrator

Council Officers

John F. Marren, Chairperson*
Eric Gott, Vice Chairperson
Kevin Bush, Secretary*

* Executive Committee Member
** Non-Voting

Executive Committee

The Executive Committee, a subset of the Board, is responsible for specific decision making related to administrative, organizational, and financial issues and meets as needed at the discretion of the GTC Board Chairperson. The Executive Committee is comprised of the chairperson of the GTC Board, the lead elected officials of the Rochester MPA counties, the mayor of the City of Rochester, the chairperson of the Rochester Genesee Regional Transportation Authority (RGRTA), the chairperson of the Genesee/Finger Lakes Regional Planning Council, and the regional director of the New York State Department of Transportation (NYSDOT).

Planning Committee

The Planning Committee provides professional and technical direction to the GTC Board. The Planning Committee is comprised of transportation and planning technical professionals who have been appointed by GTC Board members. Following input from various other committees, the Planning Committee reviews and recommends action on activities and work products that are then considered for final approval by the GTC Board.

The Planning Committee typically meets eight times per year during the months that GTC Board meetings are not held, or as required. Each Planning Committee meeting is open to the public and advertised as such through media outlets across the Region. A public forum is included at the beginning and the end of all meetings to allow for public comment on meeting agenda items before and after recommendation to the GTC Board is made or action is taken.

Guiding Principles

The uniqueness of regions is what defines them. Their combination of physical geography, history, existing development, and future goals for quality of life and economic development determine the opportunities to be maximized and the issues to be addressed. It is easy for planners to look solely at what other areas have completed or are implementing and recommend that the same projects and programs be advanced in their areas. This approach is easy to adopt – and often popular – but does a disservice to the region served. Successful communities don't simply copy others' answers; they ask the same questions recognizing that their answers may differ (sometimes significantly) based on their own characteristics and resources, learning from others' successes and failures.

LRTP 2035 presented four Guiding Principles to address the Region's unique planning needs that go beyond basic transportation infrastructure requirements and provided a framework for developing recommendations.

LRTP 2040 continues to strive to improve livability and promote economic development within the context of limited financial resources and decision making that must consider more than transportation exclusively. In the spirit of continuous improvement *LRTP 2040* replaced the *LRTP 2035* Guiding Principle "Maximize Existing Assets" to "Transition to Tomorrow" to reflect the new planning paradigm in the Region. The questions asked and methodology behind developing *LRTP 2040* have been guided by the four principles discussed below. Each stage in the development of *LRTP 2040* adheres to these principles to connect the presence of transportation infrastructure and services with broader community goals related to the social and economic vitality of the Region over the next several decades.

Plan for People

People are the customers, not transportation infrastructure (e.g., highways, bridges, buses, sidewalk, trails, etc.). Too often the approach to transportation policy, planning, and investment decision making is to consider infrastructure and services as the customers. Ensuring the safe, reliable, and efficient transportation for people and the products of their labor is the most important consideration. This first and primary guiding principle of *LRTP 2040* and is consistent with and is key to advancing the mission of GTC.

Place Matters

Where people live, work, and play will determine the appropriate solutions to their transportation needs. The Region's residents and its businesses live and operate in diverse settings. While transportation needs are similar across the Region (everyone needs both mobility and access to their home, jobs, services, etc.), how these needs can and should be met will differ. Regions that are more homogenous in terms of types of places (i.e., do not include rural areas to the significant extent that our Region does) do not have to consider the range of issues that GTC does.

Transition to Tomorrow

Adequate transportation funding for the foreseeable future is significantly less than the amount required to maintain a state of good repair. Emphasis on a balanced investment approach between management and operations, preservation, and rehabilitation and reconstruction needs to take precedent. This strategy may include decommissioning transportation facilities that can no longer serve their intended purpose in a cost effective manner.

Accept Uncertainty

At the time of *LRTP 2035* adoption in 2011, a new multi-year surface transportation authorization had yet to be signed. Since then two authorizations have been passed—MAP-21 (2012) and the FAST Act (2015). Even though the FAST Act provides funding certainty over the next five years, how transportation investments will be funded over the long-term remains uncertain. Transportation funding at the federal, state, and local levels continues to remain extremely limited and is not keeping pace with the levels needed to maintain the system.

LRTP 2040 Development

LRTP 2035 provided a strong foundation and starting point for the development of *LRTP 2040*. Nearly 60 UPWP planning studies and technical-data driven projects, throughout the Region, covering all modes, have been completed since *LRTP 2035* was in adopted in 2011. These plans and projects provided the framework to identify new issues and opportunities, data to help evaluate the Region's the transportation system needs and travel preferences, and alternative strategies.

As with *LRTP 2035*, the GTC Planning Committee served as the technical advisory committee or the LRTP Development Committee for *LRTP 2040*. Over the course of the past five years, the Planning Committee was updated on the development of *LRTP 2040* at each of its meetings. At critical points in the plan's development, the Planning Committee was given formal presentations on the direction of the plan. The Planning Committee's technical expertise combined with their knowledge of regional needs guided each development phase.

The primary development phases listed below were conducted consistent with the Guiding Principles to ensure that *LRTP 2040* not only meets federal requirements but is meaningful to the region.

1. Identify Issues and Opportunities
What is the Region like now?
What will it be like in 2040?
What would we like it to be in 2040?

Identify Issues and Opportunities

A review of historical and current demographic and economic data and information from a variety of national, state, regional, and local sources was conducted along with the development of future population and employment projections. Regionally significant *Emerging Issues and Opportunities*, first identified in *LRTP 2035*, were updated based on new data and trends.

2. Evaluate the Transportation System
What comprises it?
How does it function now?
How will we use it in 2040?

Evaluate the Transportation System

The regional transportation system was inventoried by mode (e.g., highway and bridge, public transportation, bicycle and pedestrian, freight, etc.) and associated travel characteristics were assessed. This inventory included the presence, condition, and operating attributes of the assets that comprise the regional transportation system (infrastructure and services). An assessment of associated travel characteristics compared to the inventory of the regional transportation system provided insights into not only how it is being used currently but might be used differently in the future.

3. Determine Current and Future Needs
How can the system minimize issues and maximize opportunities from now through 2040?

Determine Current and Future Needs

Based on the identification of regional issues and opportunities in Step 1. and the evaluation of the system in Step 2., the transportation needs of people and freight were determined based on the ability of the system to eliminate or mitigate the issues and make the most of the opportunities.

4. Develop Alternative Strategies
What projects, programs, and services will best address our regional transportation needs?

Develop Alternative Strategies

Development of alternative strategies started with a comprehensive review of recommendations from UPWP-funded plans, local comprehensive plans, and regional and statewide plans (including *LRTP 2035*), as well as projects and programs suggested by technical professionals, the public, and GTC staff.

5. Estimate Costs and Revenues
How much will each alternative cost?
How much revenue can we expect?
Where will the revenue come from?

Estimate Costs and Revenues

Per federal requirements, the amount of funding to advance recommendations included in the *LRTP 2040* cannot exceed reasonably expected revenues and must account for changes in the cost of transportation improvements (e.g., prices for materials, labor, etc.). The estimation of these future costs and revenues are contained in the financial plan for the *LRTP 2040.*

6. Select Preferred Strategies
How can we get the most out of the limited revenues we expect to have?
What tradeoffs must be made?

Select Preferred Strategies

The final preferred strategies were selected by GTC staff based on technical input provided by member agencies and feedback from the second round of public input. Funding is allocated among the categories of recommendations – preservation and maintenance, management and operations, and expansion.

7. Adopt the *LRTP 2040*
Receive formal approval of the plan.
Publish the document.
Start making it happen!

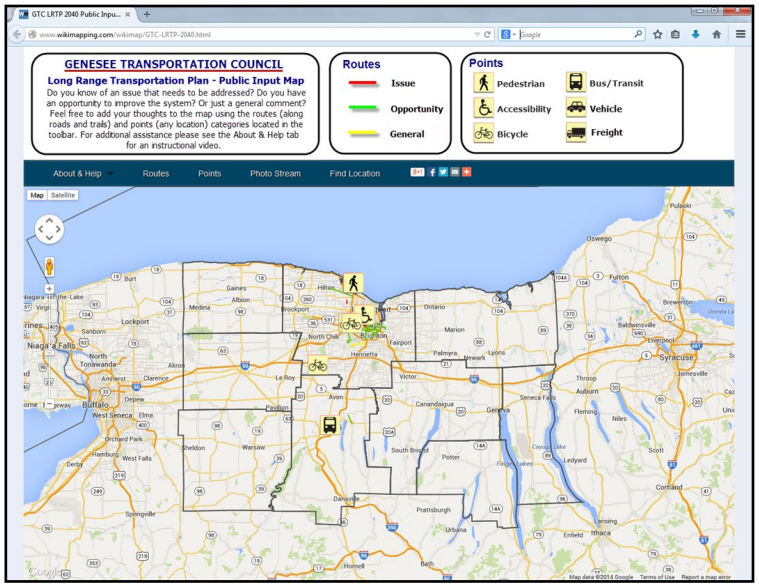
Adoption *LRTP 2040*

LRTP 2040 is anticipated to be adopted by the GTC Board at its June 2016 meeting upon recommendation by the GTC Planning Committee. The final *LRTP 2040* document will guide policy and decision making at GTC over the next five years.

Customer Engagement – What Does the Region Want?

From the moment GTC began outlining the process (i.e., steps 1-6 highlighted above) used to develop the *LRTP 2040*, the organization committed to conducting the most extensive public participation GTC has ever done for a long range transportation plan. The customer engagement process for *LRTP 2040* sought outreach techniques that went beyond the traditional public participation activities in order to gain more extensive and meaningful public involvement in the transportation planning process. The community is more than just the public who we'd like to participate in our planning process—they're our *customers* whose full and meaningful *engagement* is the only way we can identify and get support for the projects, programs, and services that will maximize transportation's contribution to the social and economic vitality of the Region.

For *LRTP 2035*, GTC relied almost exclusively on traditional, town hall-style public meetings to gather input for the long range transportation plan. At that time GTC asked the community to come to us. For *LRTP 2040*, GTC went to the community and also used social media along with more traditional forms of public involvement. The first four development phases of the plan included significant community input gathered from August 2014 through March 2015. During this time GTC staff went directly to our customers at 13 venues across the Region (e.g., Rochester Public Market, farmers markets in all the nine counties, and regional malls), developed an interactive WikiMap, and sought feedback through Twitter. Direct mailings offering to meet in person was sent to over 250 contacts including approximately 190 stakeholder groups listed in the GTC Environmental Justice database. GTC met directly with interested stakeholder groups at their convenience. GTC also held two public meetings, organized as open houses with multiple stations for attendees to talk with us one-on-one instead of the traditional presentation followed by a question and answer session.



WikiMap

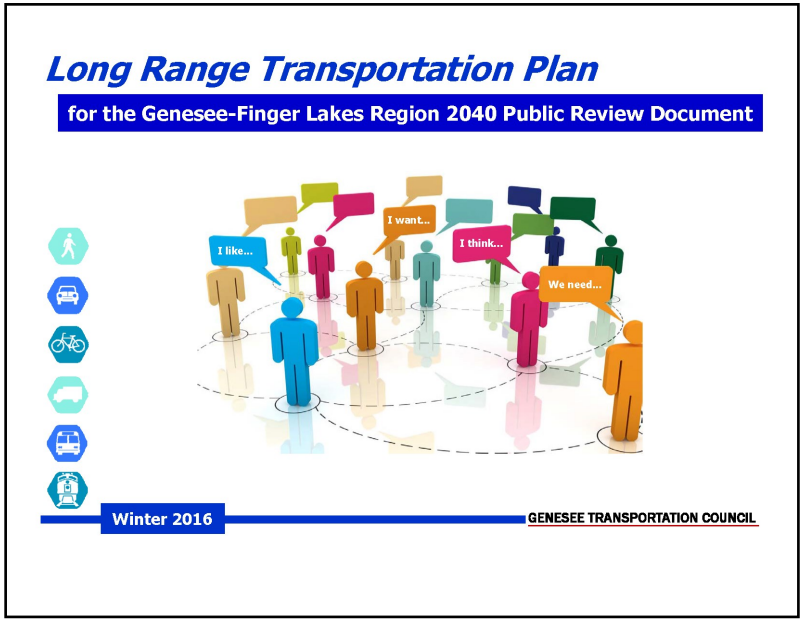
Beyond being available to receive input on specific dates and times, we developed two online surveys that garnered approximately 200 responses. A separate survey specifically for freight related businesses was also developed and distributed.

In the spirit of continuing public engagement (as opposed to public involvement), GTC created a stand-alone public review document in the winter of 2016 to conduct the second formal round of public review. The *LRTP 2040* Public Review Document focused on Step 6, Select Preferred Strategies. GTC produced a document that was attractive and digestible for the public and member agencies. The document presented feedback heard through the first round of Customer Engagement, the amount of funding that is expected to be available through 2040, a complete listing of all the proposed recommendations, and the next steps in the LRTP process. It was made available for public review from February 16, 2016 through March 18, 2016. During this time three sets of open-house style meetings were held. These meeting were

held in the afternoon and again in the early evening to provide multiple options for the public. Media outlets were notified directly and meeting notices were sent to approximately 190 stakeholder groups listed in the GTC Environmental Justice database.

The results of each round of Customer Engagement were presented to the GTC Planning Committee for their review and consideration. Additionally, comments regarding specific transportation facilities or services, received during fall 2014 and winter 2015, were sent directly to the responsible agency. The final draft of *LRTP 2040* was sent to agencies and officials responsible for non-transportation planning activities within the Region, the Tonawanda Indian Reservation, and federal land management agencies.

Comments received from the public and affected agencies during this round were considered by the Planning Committee at its May 2016 meeting. At the May meeting, the Planning Committee recommended adoption of the draft *LRTP 2040* to the GTC Board.



"3E" Approach - Economy, Environment, and Equity

The Genesee-Finger Lakes Region has completed three significant regional planning initiatives that set the platform for a "3E" approach covering the Economy, Environment, and Equity. These initiatives and their respective deliverables played a major role in the formulation of the *LRTP 2040.* These include:

Accelerating Our Transformation

The Finger Lakes Regional Economic Development Council's strategic plan and subsequent progress reports, which identify key economic clusters and associated priority projects that serve as the blueprint for our continued economic growth.

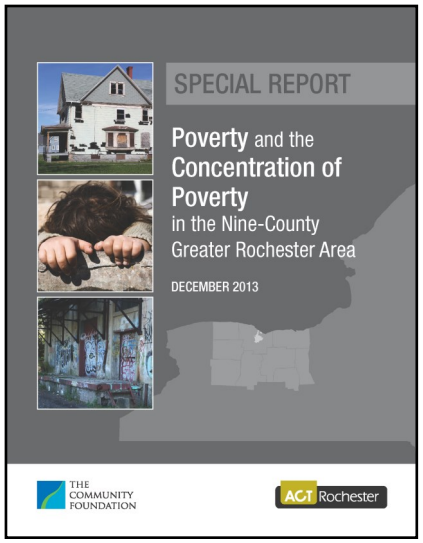
Finger Lakes Regional Sustainability Plan

The NYS Energy Research and Development Authority-funded plan, which includes actions and an implementation strategy for improving the long-term sustainability of our communities and natural resources.

Poverty and the Concentration of Poverty in the Nine County Greater Rochester Area

The Rochester Area Community Foundation's report and f follow-on benchmarking analysis, which discusses where poverty exists in the Region and its concentration in the Region's core, as well as the lasting implications of not addressing it.

By considering and wholly incorporating these plans and initiatives into the development of the *LRTP 2040,* GTC can ensure that the limited resources available to the Region address the Economy, Environment, and Equity to the greatest extent possible.



Chapter 3 - THE REGION

The Region

The Genesee-Finger Lakes Region (the Region), located in Western New York, includes the counties of Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, and Yates. The nearly 4,700 square-mile Region stretches south from the shore of Lake Ontario to the low rolling hills of the Appalachian Highlands. Many striking natural features and scenic vistas lie within the Region including the western Finger Lakes, the Genesee River, and Letchworth State Park, commonly known as the "Grand Canyon of the East."

While topography and natural features shaped the earliest physical development of the Region, it was the opening of the Erie Canal in 1825 that laid the foundation for its prosperous future. The presence of such an efficient transportation route to America's frontier enabled entrepreneurial skills and talents to be combined with the natural resources necessary to fill a burgeoning nation's demand for goods and provisions.

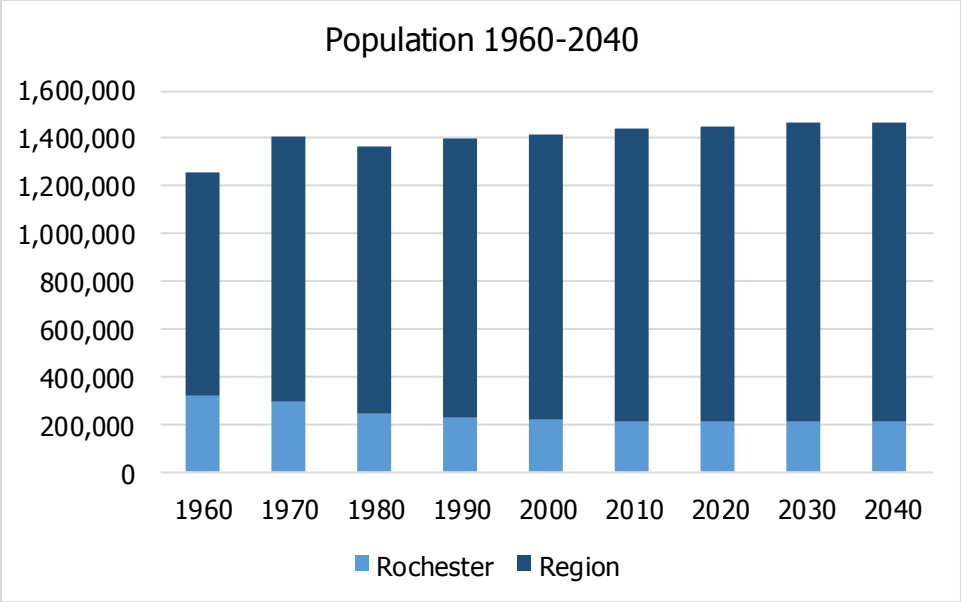
The Erie Canal eventually gave way to railroads and then highways as the primary modes of travel, but it remains an excellent example of how transportation influences the character and development of a region. Regardless of the form it takes in the future, the ability of people and freight to move safely, efficiently, and reliably will continue to be a major factor in determining the quality of life and economic success of the Region.

People

The nine-county Region is home to over 1.2 million residents and over one-half million workers. The Region's population alone exceeds nine of the fifty states. Rochester is New York State's third largest city (2010 population: 210,565) and the 51st largest metropolitan statistical area (MSA) in the nation, consisting of Livingston, Monroe, Ontario, Orleans, and Wayne counties.

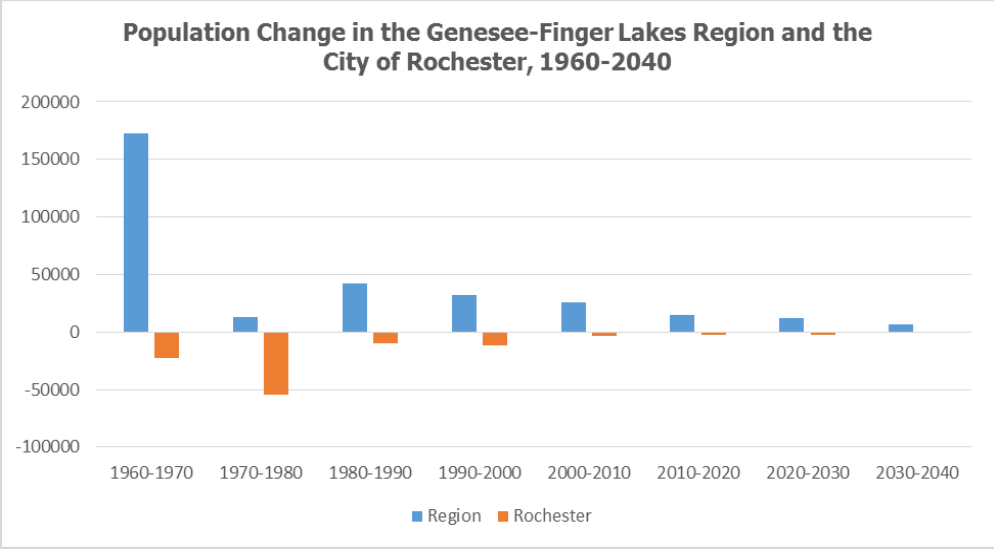
After experiencing a nearly 20 percent increase in population from 1960-1970, the Region has experienced modest population growth over the past 40 years as shown in Exhibit 3. Since 1970 the population has increased modestly at an average rate of 2.4 percent each decade. In continuation of this trend, the 2010 Census population figures confirmed a modest growth rate of 1.5 percent since 2000 for the nine-county Region. New York State's total population grew at a slightly faster rate of 2.1 percent from 2000-2010. By 2040 it is projected that the Region will grow at a slightly faster rate of 3.5 percent and approximately 1.26 million people will call the Region home. The City of Rochester's population has been steadily declining since 1960. Over the past decade (2000-2010) Rochester lost 4.2 percent of its population. This trend is projected to continue through 2040, as shown in Exhibit 4.

Exhibit 3



Source: U.S. Census Bureau and Genesee-Finger Lakes Regional Planning Council

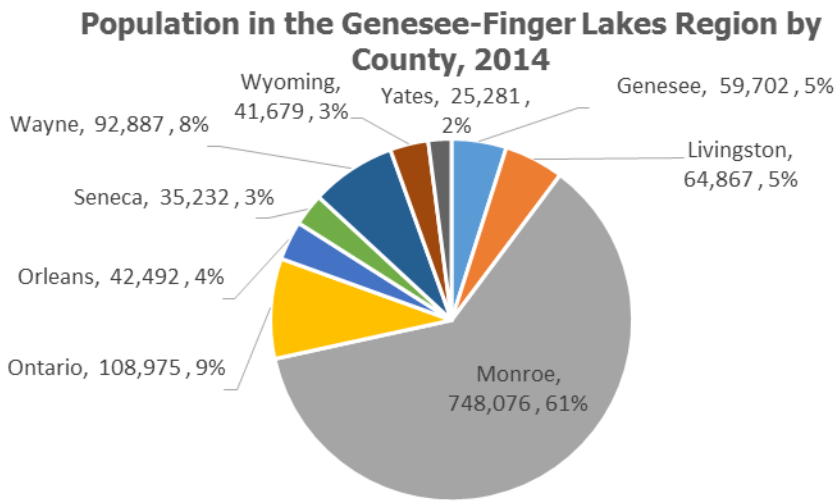
Exhibit 4

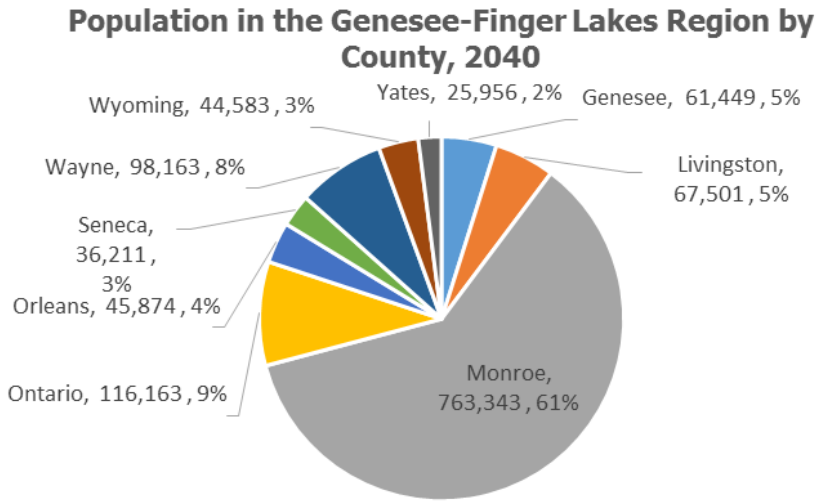


Source: U.S. Census Bureau and Genesee-Finger Lakes Regional Planning Council

Monroe County remains the most populated county with approximately 61 percent of all the Region's residents residing therein. Ontario County is the second most populated home to 8.4 percent of the Region's residents and is the fastest growing county since 2000. Livingston, Monroe, Ontario, Seneca, Wayne, and Yates counties all saw population increases over the past decade while the western most counties Genesee, Orleans, and Wyoming lost population. Through 2040, each of the nine-counties are projected to see modest population gains with the greatest gains expected in Monroe and Ontario counties. Exhibit 5 presents the population by county for 2014 and 2040. Over the next 25 years the population distribution in the Region, by county, is projected to remain the same.

Exhibit 5

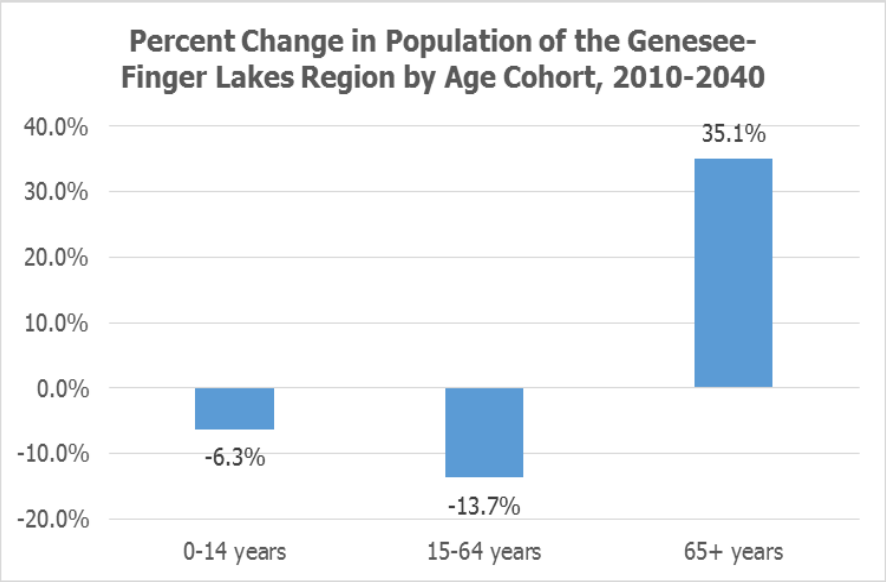




Source: U.S. Census Bureau and Genesee-Finger Lakes Regional Planning Council

In 2010, 14.3 percent of the Region's population was 65 years of age or above. Projections show that about 20 percent of the Region's population will be 65 and older by 2040 as the youngest Baby Boomers turn 65 by 2029. The "graying" of the population is a national trend not unique to the Region. By 2029 it is projected that 20 percent of the entire U.S. population will be 65 and over. Keeping an aging population mobile will present challenges and opportunities moving forward. Between 2010 and 2040 the population over 65 will increase 35 percent, as shown in Exhibit 6. Persons 14 years and younger along with working age persons, 15-64 years, will both decrease through 2040 as the population continues to "gray".

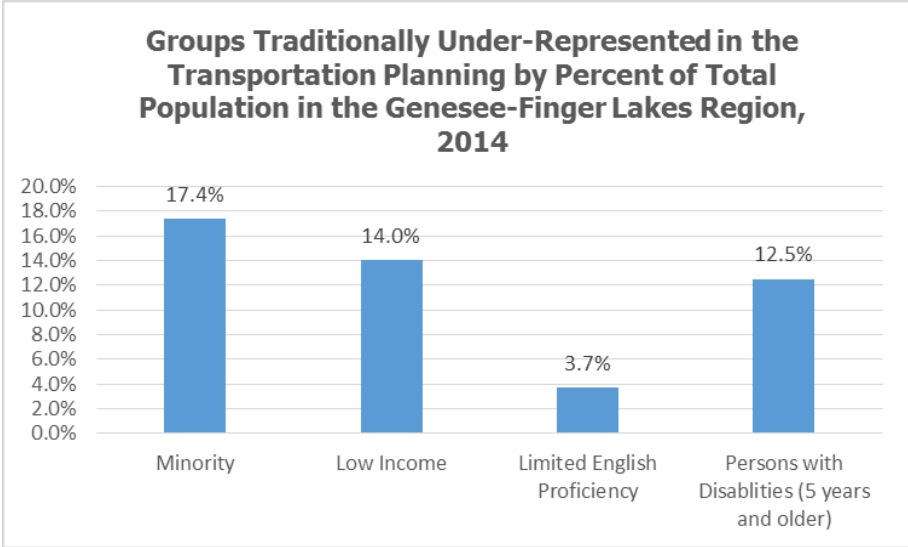
Exhibit 6



Source: Cornell University Program on Applied Demographics

Several groups of people are traditionally underrepresented in the transportation planning process including, minorities (i.e., non-whites and those of Hispanic origin), individuals with low-incomes, individuals with limited English proficiency (LEP), and individuals with disabilities. These residents face transportation challenges that include, but are not limited to, access to employment and needed services, inability to obtain or understand pertinent information about opportunities to participate in the planning process, and a lack of required accommodations. The presence of these groups relative to the overall regional population is presented in Exhibit 7.

Exhibit 7



Source: U.S. Census Bureau

The *GTC Environmental Justice, Title VI, and Americans with Disabilities Act Involvement Plan* was adopted in December 2010. This plan identifies these groups by location within the Region and discusses the actions that GTC is undertaking to ensure opportunities for their increased involvement in the metropolitan transportation planning process. The Ladders of Opportunity and the Coordinated Planning sections, beginning on page 31, further discuss the impacts of the existing transportation system in relation to jobs, education, healthcare, and other access opportunities for these residents.

Businesses & Employment

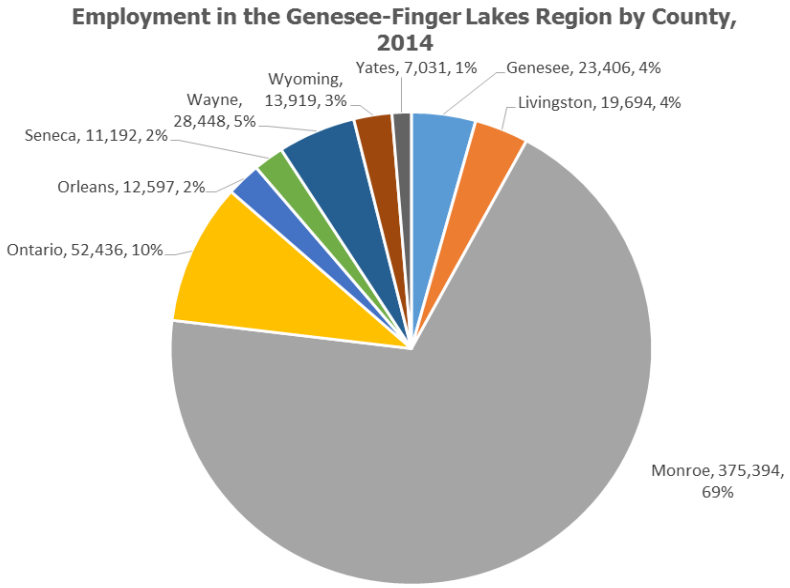
According to the Quarterly Census of Employment and Wages (QCEW) in 2014 nearly 30,000 establishments employing more than 544,000 workers – 84 percent of whom are employed by the private sector – are located in the Region. The majority of these jobs, approximately 70 percent, are located in Monroe County.

As with population, the distribution of employment within the nine counties of the Region is expected to remain nearly constant through 2040. Employment in the Region over the next 25 years is expected to increase at a rate consistent with the projected rise in the population. The distributions of regional employment by county in 2014 is shown in Exhibit 8. The distribution of employment for 2040 is expected to continue along 2014 distribution pattern with the majority of employment opportunities continuing to be located in Monroe County.

In terms of value, the Gross Domestic Product (GDP) of the Rochester MSA was the 55th largest out of the nearly 381 metropolitan areas in the nation in 2014 at more than $53.3 billion, demonstrating that the regional economy is an important contributor to the national economy.

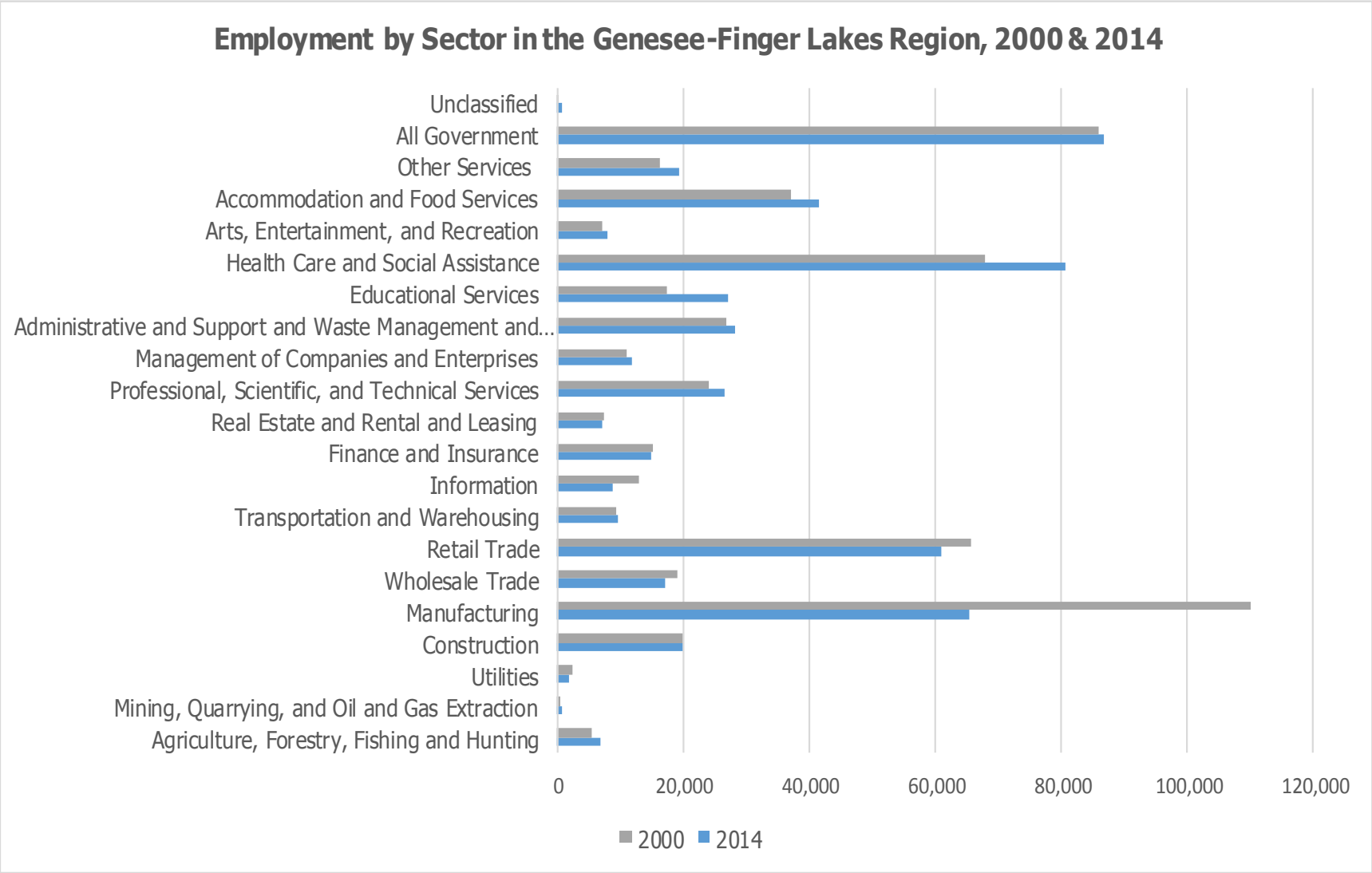
Overall, employment in the Region declined three percent (slightly less than 18,000 jobs) between 2000 and 2014. During this period the manufacturing sector saw the largest decline losing more than 44,000 jobs. Nearly two-thirds of the new jobs created in the Region have been in the health care, social assistance and educational services sectors, accounting for more than 22,000 of the approximately 38,000 new positions added from 2000 to 2014. Exhibit 9 presents regional employment by sector in 2000 and 2014.

Exhibit 8



Source: New York State Department of Labor

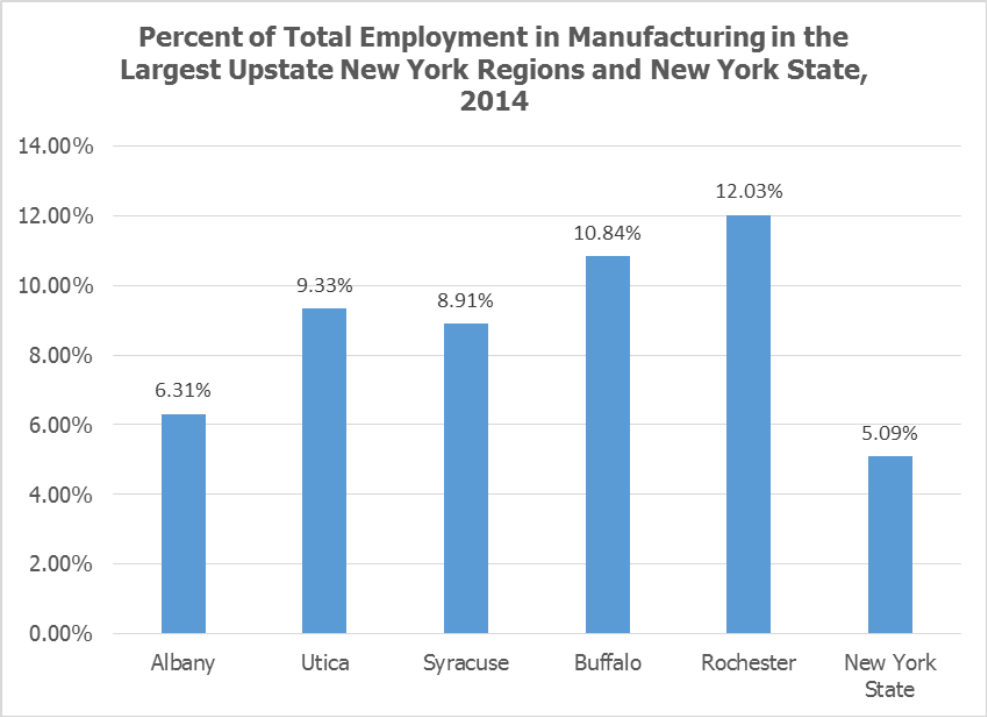
Exhibit 9



Source: New York State Department of Labor

Even as manufacturers continue to shed jobs and transition to higher value-added activities to compete in the global marketplace, they remain a major component of the regional economy. As shown in Exhibit 10, the percentage of jobs in manufacturing in our Region exceeds that of the other four largest metropolitan areas in Upstate New York, as well as New York State as a whole. Due to increases in productivity, the volume of goods produced (both finished products and intermediate inputs) in the Region is expected to continue to grow.

Exhibit 10



Source: New York State Department of Labor

Not all manufacturing firms will continue to reduce the number of workers they employ. Emerging and established high-value components of the Region's manufacturing sector that have the greatest potential for job creation include optics and imaging, alternative energy and fuels, biotechnology, printing and publication, food and beverage manufacturing, telecommunications, and precision instruments. Growth in biotechnology and food and beverage manufacturing thrive upon the Region's skilled workforce and plentiful natural resources, such as agriculture and access to fresh water. Over the last decade, Genesee County has been consistently recognized as one of the one of the fastest-growing food-processing industry metros in the country.

Agriculture and related agri-business are also important components of the regional economy that require transport of products to market and processing facilities. In 2012, approximately half of the land in the Region (1.5 million acres) was dedicated farmland. The total market value of agricultural products sold was over $1.6 billion (up from $1.2 billion in 2007). In 2012, five of the nine counties in the Region ranked within the top 10 in New York State in market value of agricultural products sold. Wyoming County ranked number one in the entire state, with $320 million sold. Four counties ranked in the top 100 nationwide in market value of milk from cows and three counties ranked in the top 100 in the country for market value of fruit and vegetable crop products sold in 2012. These products are shipped over the transportation network to markets throughout the Region, the state, the nation, and the world.

The Region is home to 18 colleges and universities that educate over 88,000 full- and part-time students. These institutions of higher education are essential to training the future workforce, upgrading skill sets for those seeking continuing education, and acting as an economic catalyst. The Region ranks third in degrees per capita nationwide. Higher education and research is identified as an economic enabler to facilitate economic growth by the Finger Lakes Regional Economic

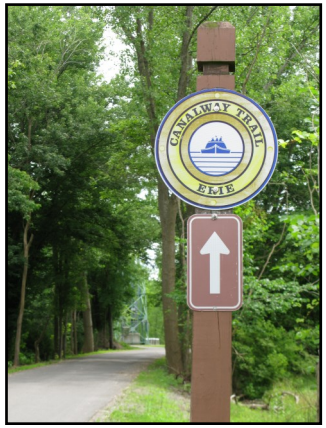
Development Council (FLREDC) and have an estimated economic impact of $5.5 billion. The University of Rochester (UR) and its affiliates employ almost 27,000 people alone, making it the Region's top private employer.

These institutions play a vital role alongside local industry in creating an environment of innovation that is one of the highest in the nation as measured by the number of patents issued per worker. The prominence of colleges and universities continues to grow and is vital to the current and future economic success of the Region.

Recreational and Cultural Resources

The Region is not only defined by its residents and businesses but by its geography, history, scenic beauty, and recreational venues – providing opportunities to live, work, and play.

Freshwater resources shape the Region's landscape. The shore of Lake Ontario define the Region's northern boundary, the Erie Canal is responsible for the small canal villages that dot the landscape, the western Finger Lakes stretch down to the southern end, and the mighty Genesee River flows through the center. Given the Region's rich hydrological resources, water-based activities offer numerous opportunities for increased visitor spending and have the potential to be further expanded through tourism promotion.



The Erie Canal, a significant engineering feat in its time and influential to the development of the Region, continues to serve as a major attraction for residents and tourists. The Erie Canalway Trail transverses east to west across the entire Region, as well as the state, attracting cyclists from all over the world.

Residents and visitors enjoy all four seasons in the Region. The normal daily average temperature in Rochester varies from 24 degrees Fahrenheit in January to 71 degrees Fahrenheit in July. The City of Rochester claims a spot on the list of the snowiest major U.S. cities averaging over 100 inches per year. Much of this snowfall is attributed to lake effect snow off of Lake Ontario. Given the Region's long experience with snow, there is limited impediment to the movement of people and goods.

The Region's parks offer affordable year-round opportunities to enjoy a range of outdoor activities and fresh air. The Region is home to 20 New York State Parks. The most notable being Letchworth State Park, known as the Grand Canon of the East, is nestled in southern Wyoming and Livingston Counties. The Genesee River winds through the park's 14,350 acres, flows over three major waterfalls, and carves out the 17-mile gorge.

The City of Rochester is home to an "emerald necklace" of parks designed by Fredrick Law Olmsted, the father of American landscape architecture. These parks are located along the Genesee River's banks, Erie Canal, and Lake Ontario, and provide a multitude of recreational opportunities.

The Monroe County parks system is extensive and home to many of the Region's renowned festivals. Highland Park, designed by Olmstead, with over 1,200 lilac bushes hosts the acclaimed Rochester Lilac Festival.

From an historical standpoint, the Region is renowned as the birthplace of the women's suffrage movement, center of the abolitionist movement, the birthplace of Memorial Day, and for its American Indian heritage. This history is preserved and celebrated in numerous venues including the Women's Rights National Historic Park, the Susan B. Anthony House, Memorial Day celebration in

Waterloo, and the Ganondagan State Historical Site.

The Region's agricultural bounty is showcased throughout the local farmers markets and the flourishing local food, wine, and spirits industries.

The Rochester Public Market has been at its location since 1905 and was voted the number one farmer's market in the 2010 America's Favorite Farmers Market contest sponsored by the American Farmland Trust. On any given Saturday as many as 40,000 customers visit the market. The City of Rochester is undergoing an $8 million dollar Public Market renovation project, including include a new winter shed, a new outdoor shed, and upgraded food stands, for slated for completion in August 2017.

Many communities in the Region now boast their own farmers market allowing residents easy access to fresh healthy foods. The Rochester Public Market and many smaller community markets participate in New York's Supplemental Nutrition Assistance Program (SNAP) to Market campaign. This program allows qualifying residents to use their benefit card directly at the farmers market aiming to provide additional access to quality, nutritious foods.

The Finger Lakes Wine Region is the largest wine producing area in New York State and is world-renowned for its Rieslings. The lakes offer the ideal climate for growing grapes, moderating the temperature throughout the year. The wineries attract a large number of tourists year round, supporting the local economy, particularly in the summer months and during the fall to admire the foliage along the lakeshores.

Local agriculture trends are reshaping the Regional food and spirits tourism industry. The Finger Lakes Wine trails have long been a popular tourist and local attraction. Recently new trails focused on edible specialties have been forming. The Finger Lakes Cheese trail twists and turns throughout the southeastern portion of the Region featuring small scale cheese producers. Breweries and distilleries have been springing up rapidly throughout the Region over the past few years. Experts believe the craft beverage (beer and distilled spirits) trend is just starting to pick up momentum and will transition into an economic engine potentially supporting thousands of jobs. The recently created Rochester Craft Beverage Trail is verification of the industry's rapid growth and popularity.

The Region's cultural center is the City of Rochester, home to the museums of science and art, theatrical productions, the National Museum of Play at the Strong, Rochester Philharmonic Orchestra, the George Eastman House and its International Museum of Photography and Film, and numerous festivals. The arts and cultural attractions in the Region drew 3.8 million attendees in 2013.

The National Center of Arts Research ranked the Rochester MSA 20 out of 937 MSAs throughout the U.S. as part of their Arts Vibrancy Index for 2015. Rochester shares a spot on the top 20 list with other major metro areas, such as New York City and San Francisco, a testament to the Region's vibrant arts and cultural sector.

Area amusement and water parks include Darien Lake Theme Park, Seabreeze Amusement Park, and Roseland Water Park. Concert Venues throughout the Region draw national recording artists and entertainment acts. These include the Blue Cross Arena, Constellation Brands Marvin Sands Performing Arts Center (CMAC), and Darien Lake Performing Arts Center. The traffic generated during events at these facilities can be significant and is noted as event related delay in the discussion of the Congestion Management Process.

Tourism remains a major economic driver. In 2013, the total tourism revenue, including money spent on hotels, fuel, and other expenses, was over $1.5 billion. Recreational spending, money spent by tourists on recreational activities, totaled $82 million in 2013.

Places

The type of place impacts the transportation needs of people, businesses, and institutions. Given the geographic diversity of the Region *LRTP 2035* first classified types of places based on land use patterns and uses as well as physical, social, and economic characteristics now and as then projected through 2035. Considerations in delineating these areas include their population density and the time period in which the majority of their residential growth occurred, the amount of space they provide, and for what economic activity they are meant to serve for the employment places. Given the consistent land use patterns and projected demographic changes from 2035 to 2040, no changes to the place classifications were made for *LRTP 2040*.

The combination of a place's purpose and the built environment determines the use of physical space and the associated transportation needs now and in the future. Map 2 shows the Genesee-Finger Lakes Region by place and Map 3 provides greater detail of the same for the Rochester MPA. The various types of places in the Region are discussed in detail below.

Regional Urban Core

The Regional Urban Core is comprised of the City of Rochester and includes the densest neighborhoods, the largest central business district, and major civic, cultural, and sports venues. The largest number of infill and redevelopment opportunities exists in the Regional Urban Core and the strength of this place is critical to the success of the overall Region.

Sub-Regional Urban Cores

The Sub-Regional Urban Cores include the cities of Batavia, Canandaigua, and Geneva and the villages in the Census Bureau-defined Rochester Urbanized Area. Land use in these places includes mixed-use areas of residential and commercial that are less dense than the Regional Urban Core. Historic, civic, and cultural venues are also located in these places. The Sub-Regional Urban Cores possess infill and redevelopment opportunities that can preserve and strengthen their neighborhoods and commercial districts.

Mature Suburbs

Mature Suburbs include areas in the Census Bureau-defined Rochester Urbanized Area that experienced the earliest expansion of development (initially, residential) outside of the urban cores. Population density is less than in the urban cores but multi-family housing is more prevalent than in other places (including Recent/ Emerging Suburbs). Non-residential development that serves commercial uses is less dense than in the urban cores and more automobile-oriented. Infill and redevelopment opportunities exist, as recent residential and commercial development have increased in the Recent/Emerging Suburbs, but to a lesser extent than in the urban cores.

Recent/Emerging Suburbs

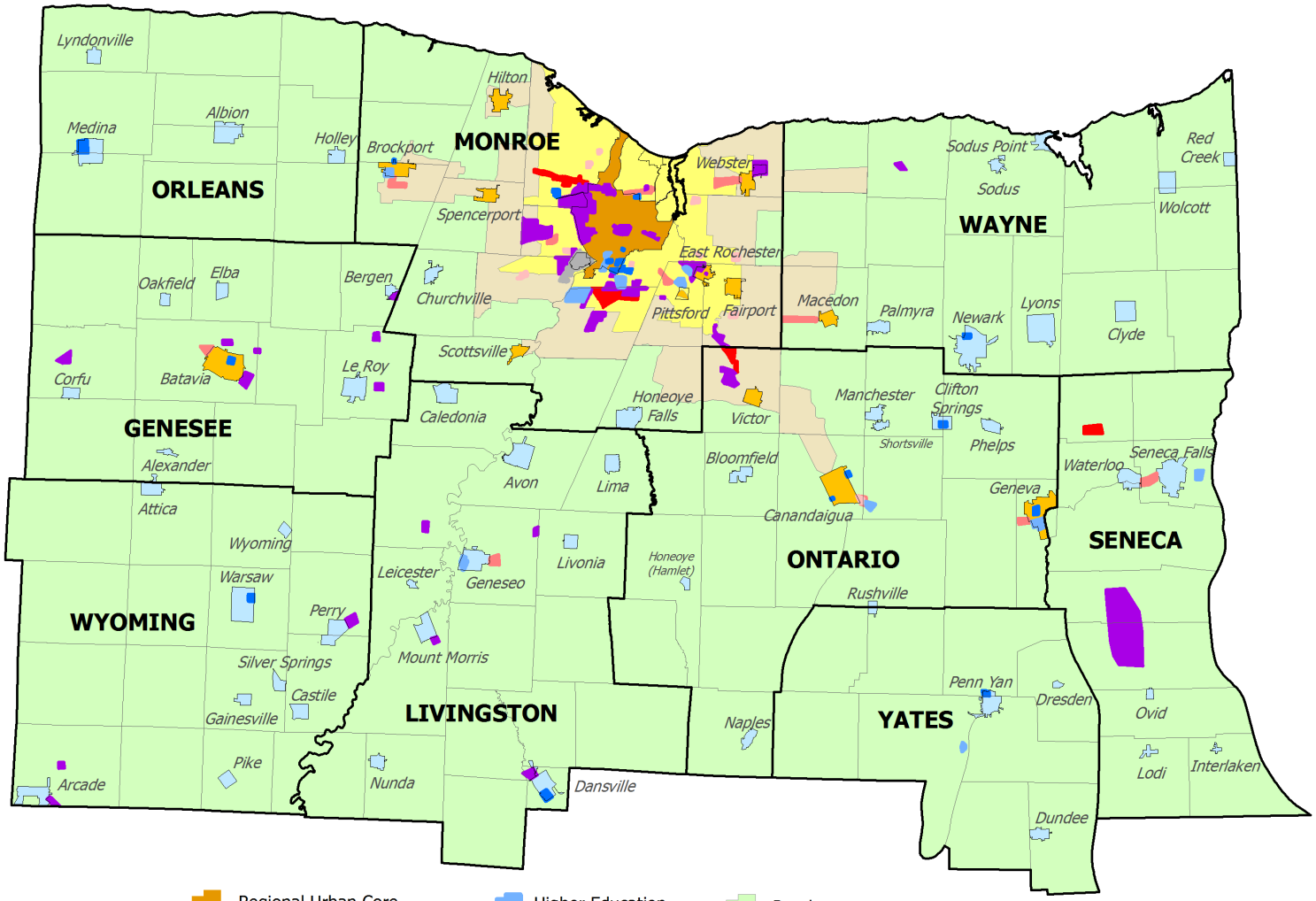
Recent/Emerging Suburbs include the portions of towns in the Rochester MPA that have experienced their greatest amount of development over the last thirty years with residential development of a less dense character than the Urban Cores or Mature Suburbs. Associated retail and commercial development in proportion to residential development has occurred in some but not all of these places, and is almost exclusively automobile-oriented.

Rural

Rural places include towns with the lowest residential and employment densities and significant portions of their land devoted to critical agriculture and related agri-business uses—which are integral to the regional economy and food system—as well as forested lands and open space. Pressure for residential and

Genesee-Finger Lakes Region by Place

Map 2

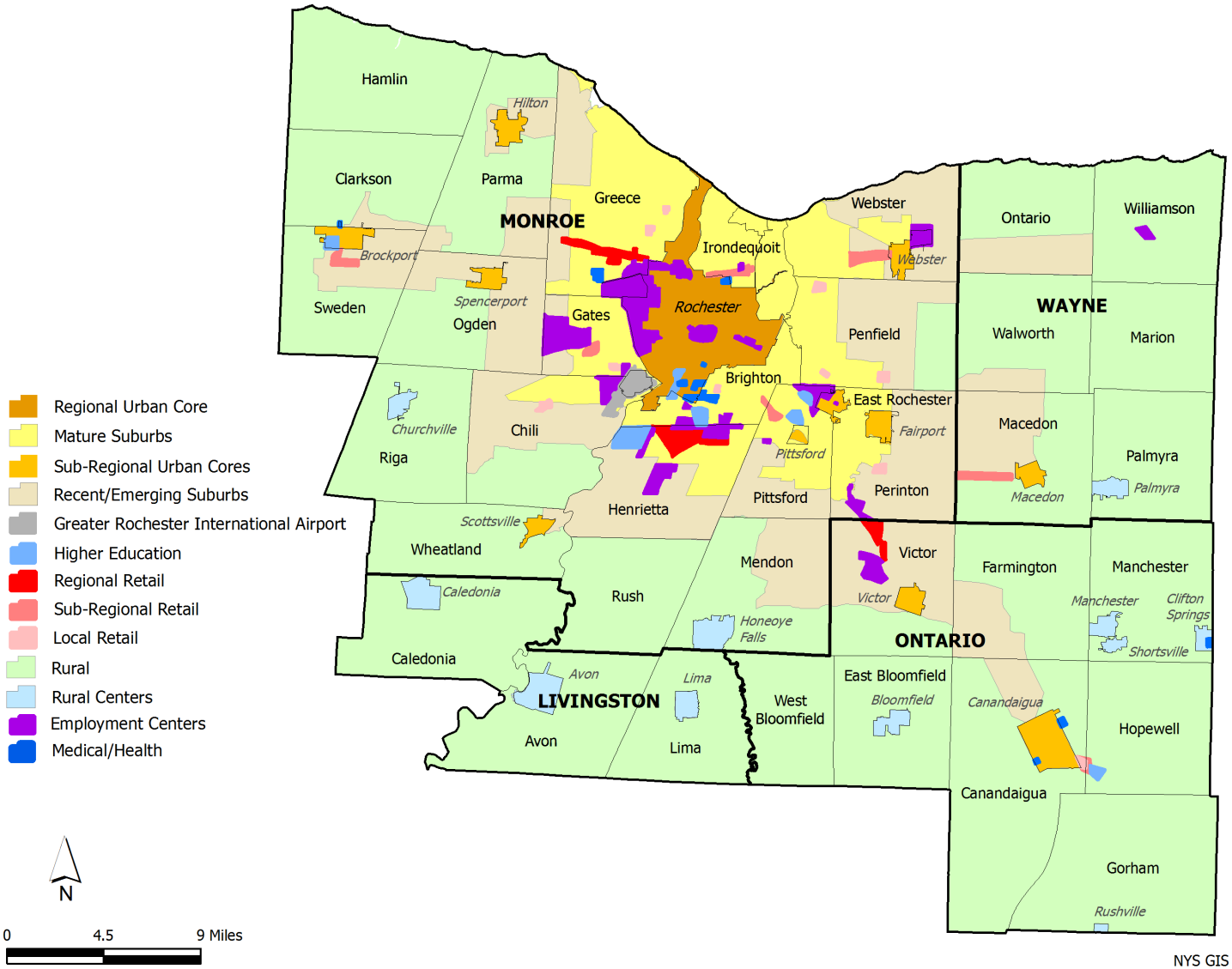


Note
The former Villages of Lyons, Pike, and Seneca Falls are shown because they continue to function as centers of activity within their respective towns.

Sources: GTC, 2010
NYS GIS Program Office, 2015

Rochester Metropolitan Planning Area by Place

Map 3



Sources: GTC, 2008
NYS GIS Program Office, 2015

associated retail and commercial development is limited compared to Mature Suburbs and Recent/Emerging Suburbs, as are infill and redevelopment opportunities.

Rural Centers

Rural Centers include Villages and hamlets located in Rural places that include mixed use development and provide localized but limited commercial and civic uses with most residents required to travel to other places for necessary employment, retail, and civic needs. Infill and redevelopment opportunities exist but are limited given population and associated market opportunities. Although select rural Villages in the Region have chosen to dissolve their formal government structure, the compact walkable nature of these Villages remain intact and are still considered Rural Centers.

Employment Centers

Employment Centers include industrial and business parks that, due to their location (with limited surrounding residential development in the case of industrial) and associated infrastructure (including transportation), have been and are planned to be developed to support the attraction and retention of large-scale employment opportunities.

Regional Retail

Regional Retail includes the Region's malls and adjacent retail and commercial development that are the major agglomerations of national shopping chain outlets, contain some associated non-retail commercial development but little or no residential development, and are almost exclusively automobile-oriented.

Sub-Regional Retail

Sub-Regional Retail includes retail and commercial development that are agglomerations of national and regional chain outlets which are smaller than and of a less intense nature than Regional Retail places and may contain limited residential development but are still primarily automobile-orientated.

Local Retail

Local Retail includes retail and commercial development with a supermarket as the typical anchor that serves a portion or combination of suburban, urban, and/or rural places and is typically primarily automobile-oriented but can be accessed by bicycling or walking due to residential development in closer proximity than in Regional Retail and Sub-Regional Retail places.

Medical/Health

Medical/Health includes either a hospital and/or an agglomeration of health-related facilities that provide wellness services to the Region's residents and will gain importance due to the increasing senior population through 2040 and the overall growth of jobs in the health care sector.

Higher Education

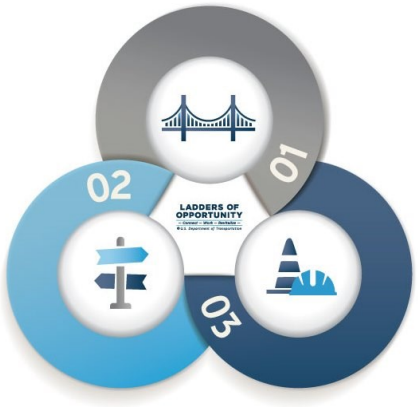
Higher Education includes the universities and colleges which serve as both a major component of the regional economy and include student housing that results in higher residential density than the immediately surrounding area (particularly in Mature and Recent/ Emerging Suburban places), but does not necessarily support higher employment density other than potentially adjacent retail uses.

Airport

This represents the Greater Rochester International Airport and the surrounding area that supports the transport and logistics needs of the majority of goods moved by airplane in the Region, which are typically high-value and low-volume. Development opportunities must strictly adhere to clearance requirements necessary for the safe and efficient movement of airplanes.

Ladders of Opportunity

According to the Rochester Area Community Foundation's *Poverty and the Concentration of Poverty in the Nine-County Greater Rochester Area,* the City of Rochester has one of the highest concentrations of persons living in the poverty compared to similar sized cities. Poverty is also prevalent throughout the Region, as the majority (59 percent) of those that live in poverty live outside of the City of Rochester. Over a third of blacks and Hispanics live in poverty compared to just 10 percent of whites. People living in poverty face many barriers to accessing employment, services, and recreational opportunities - transportation should not be a limiting factor.



"We must reinvent how we think about transportation. We need to aspire for more. We need a transportation system that connects people to opportunity while bringing opportunity to people."

-U.S. Secretary of Transportation Anthony Foxx

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) support a variety of transportation projects intended to better connect communities to centers of employment, education, and services (including non-drivers) as implementing strategies for President Obama's Ladders of Opportunity Initiative.

The guiding principle of the Ladders of Opportunity is that creating these connections will stimulate long-term job growth, especially in economically distressed areas by connecting disadvantaged and

low-income individuals, veterans, seniors, youth, and others including people with disabilities, with local workforce training, employment centers, health care, and other services vital to daily life. Three strategies to support these efforts include:

- Enhancing access to work for individuals lacking ready access to transportation, especially in low-income communities;
- Supporting economic opportunities by offering transit access to employment centers, educational and training opportunities, and other basic needs; and
- Supporting partnerships and coordinated planning among state and local governments and social, human service, and transportation providers to improve coordinated planning and delivery of workforce development, training, education, and basic services to veterans, seniors, youth, and other disadvantaged populations.

As an illustration of Ladders of Opportunity in the form of transit bus service helping to meet employment needs, Map 4 shows where people with lower incomes live and work, and where transit bus services is available in the Region. Each blue dot represents 25 people with incomes at or below the federal poverty level based on the U.S. Census Bureau's 2009-2013 American Community Survey. Each red dot represents 25 lower wage jobs, defined as those where workers earn $1,250 or less per month, from the U.S. Environmental Protection Agency's (EPA) *Smart Location Database*. The green lines on the map show fixed-route transit bus services in the eight counties where it is available in the Region, with a half-mile buffer on each side to represent a 10-minute walking distance. As such, Map 4 shows the jobs-housing relationship for low-income individuals in the Region and how transit might help them access employment. Map 5 provides an inset for Monroe County.

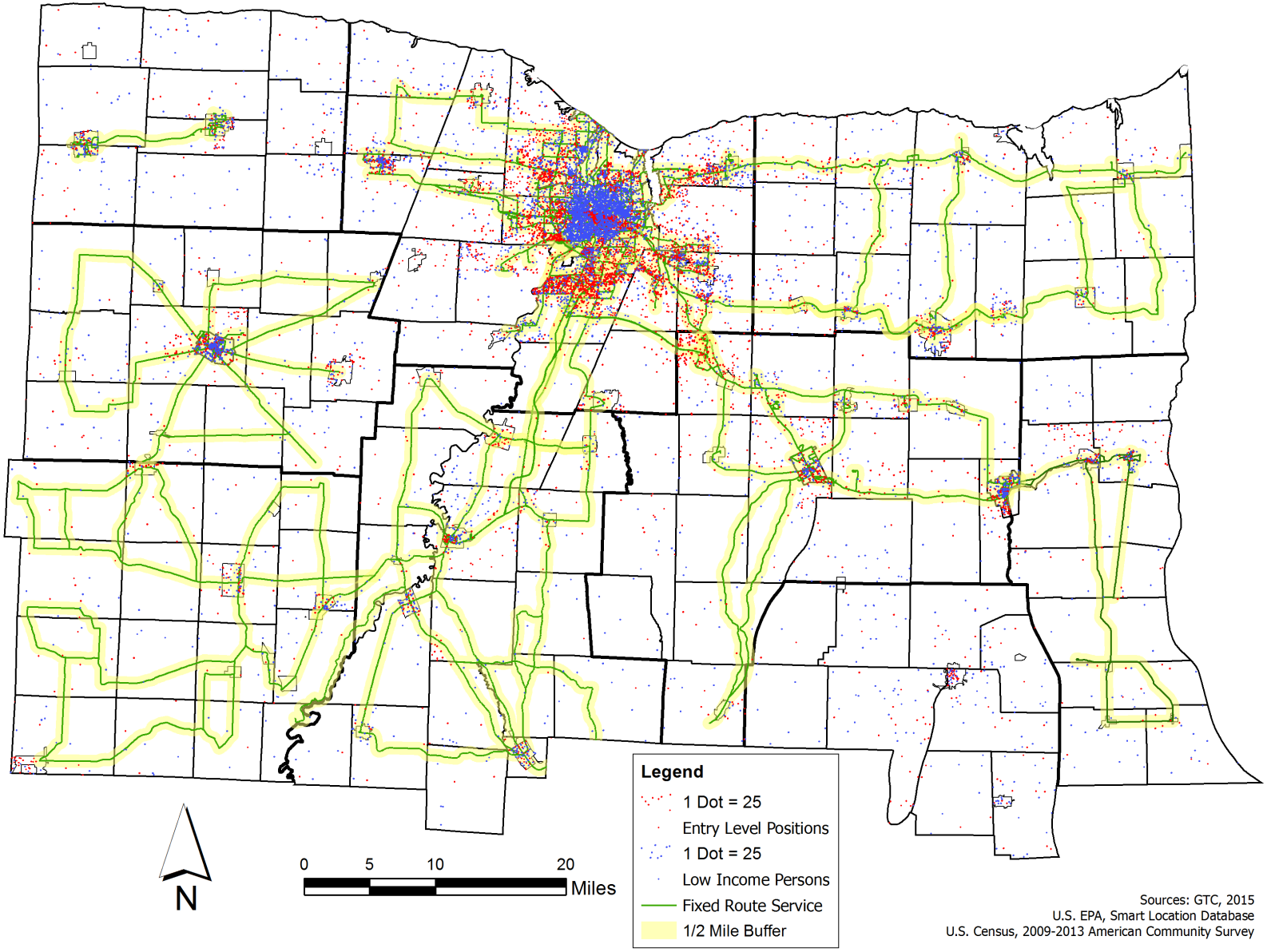
A review of Maps 4 and 5 suggests several findings:

- Eight out of nine counties in the Region are served by public transportation;
- In all nine counties, with the exception of Monroe County, lower income individuals and lower-wage jobs are most concentrated in the cities, villages, and hamlets;
- In Monroe County, lower income individuals are concentrated in the City of Rochester, but many also live in the inner-ring suburbs;
- In Monroe County, lower wage jobs are concentrated in the City of Rochester as well as in suburban towns such as the Town of Greece (Greece Ridge Mall) and the Town of Henrietta (Marketplace Mall). Eastview Mall located in the Town of Victor, Ontario County, also provides lower-wage job opportunities for individuals including many living in the City of Rochester who access these positions via transit buses; and
- There are areas in all of the counties (including Yates County which lacks public transportation services) where moderate numbers of both lower-income individuals and lower-wage jobs are located outside the service area for fixed route transit.

New York State recently passed a budget that calls for steady increases in the minimum wage. This has the potential to reduce the number of low-skilled positions available to workers. In order to climb the economic ladder, workers need to aspire to higher positions. They need opportunities to gain skills that allow them to move into higher-skilled positions that command a higher wage. These aspirations can be crushed if transportation is a barrier to these opportunities.

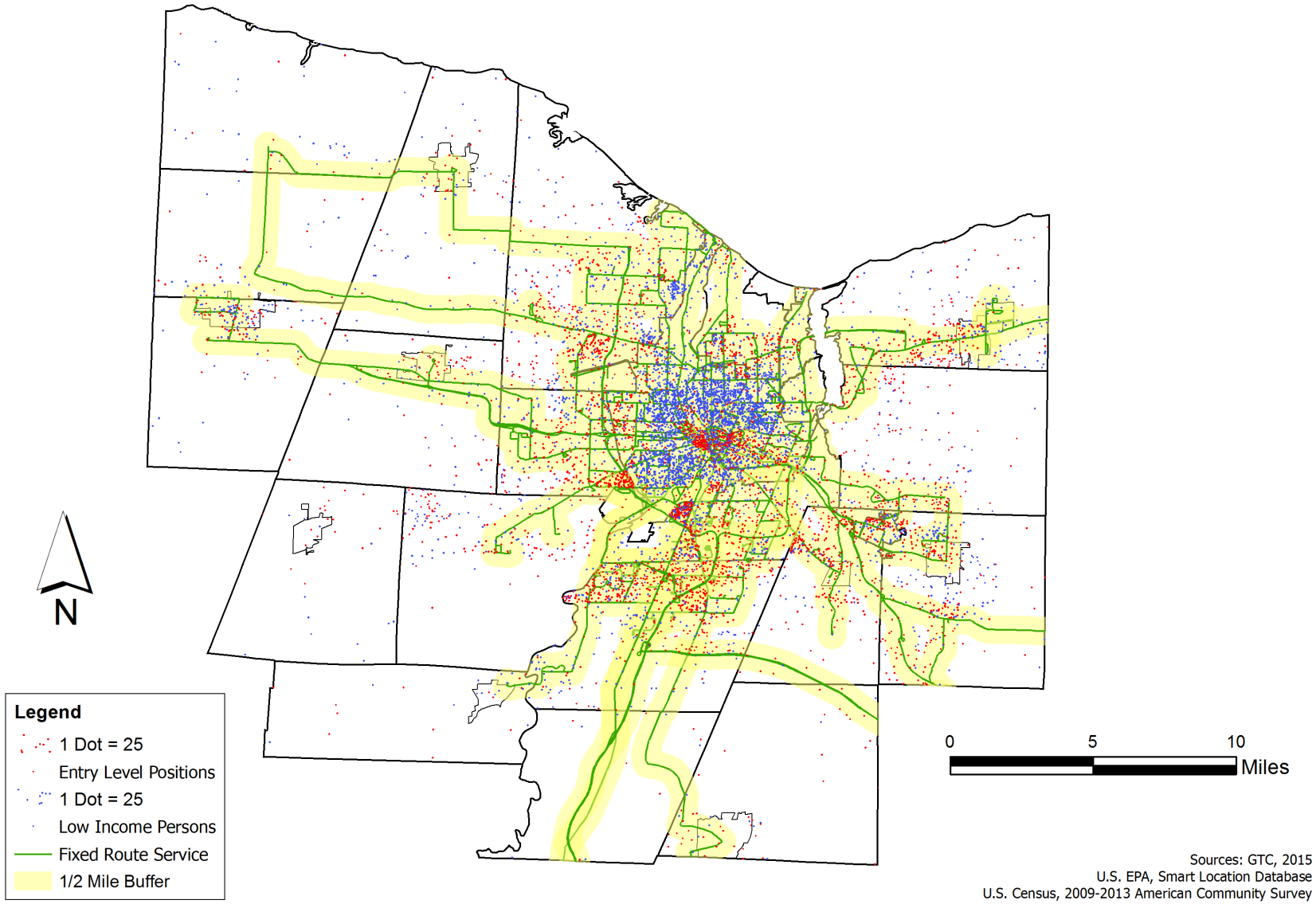
Ladders of Opportunity in the Genesee-Finger Lakes Region

Map 4



Ladders of Opportunity in Monroe County

Map 5



Coordinated Planning

The previous discussion, focused on Ladders of Opportunity to employment, underscores the fact that there are geographic areas, individuals, and opportunities for employment in the Region that are not, and in some cases can't be, cost effectively served by fixed-route bus service.

Similar findings can be made with respect to fixed-route bus service access to education, health care, and other services important to veterans, seniors, youth, and other disadvantaged populations. In addition, many individuals with disabilities are unable to utilize fixed -route bus service even where available, because they may require specialized "door-to-door" or "door-through-door" transportation services which can't be provided via fixed-route buses.

The gap in geographical areas that can be cost-effectively served by fixed-route transit and the need to serve individuals of all ages, incomes, and ability levels (including many who cannot utilize fixed-route transit) drives the need for coordinated planning. Coordinated planning can help to improve the delivery of workforce development, training, education, and other basic services to veterans, seniors, youth, and other disadvantaged populations.

To help meet these needs as required by federal law, the GTC adopted the *Coordinated Public Transit-Human Services Transportation Plan for the Genesee-Finger Lakes Region* (Coordinated Plan) in 2007. This plan was updated in September 2011 and again in March 2016. While the coordinated planning requirements (2007) predate the concept of "Ladders of Opportunity", the coordinated planning process fully embraces the concept of connecting people with the services, employment, and opportunities that they need to participate in daily life of the community.

The 2016 update to the Region's 2011 Coordinated Public Transit-Human Services Transportation Plan includes the following components:

- A validation of the 2011 assessment of transportation needs for individuals with disabilities, older adults, and persons with limited incomes;
- An update to the previous inventory of available services identifying areas of redundant services and gaps in services;
- A review and update of the 2011 strategies to address the identified gaps in services;
- A review and update of the 2011 identification of coordination actions to eliminate or reduce duplication of services and strategies for more efficient utilization of resources; and
- A reassessment and re-prioritization of implementation strategies.

Emerging Issues and Opportunities

Regional Emerging Issues and Opportunities, first identified in *LRTP 2035*, are planning considerations that will significantly impact the Region over the next several decades. How they are addressed both now and in the future will be vital to the success of the Region both in terms of quality of life and economic development.

The Growing Importance of Seniors: An Economic Engine

The increase in the senior population presents tremendous opportunities for our Region's economy and society. According to the American Community Survey 2009-2013 five year estimates, households in the Region that were headed by persons 65 years and older realized over $5.8 billion in income. The Baby Boomers who, with their keen sense of lifestyle and personal fulfillment, currently outspend every population cohort and can be expected to do so as they age. According to the Bureau of Labor Statistics Consumer Expenditure Survey, the Baby Boomers are outspending all other generations by $400 billion every year on consumer goods and services. Accordingly, the ability to retain wealthy retirees (including current and potential "snowbirds") presents the opportunity to increase economic development in the Region. In the Region, seniors had disproportionately more income than their population size – 17.8 percent of the Region's total household income compared to comprising 14.7 percent of the Region's population.

Few things are more important to seniors than remaining independent, aging in place, and being able to drive as long as possible. Nationally and locally, seniors prefer almost exclusively to age-in-place or retire where they raised their families over living in group quarters, such as senior housing. In order to reap the economic benefits of an aging population we must continue to help seniors remain mobile. Our Region's mobility challenge is two -fold: in the urbanized portion of our Region, we have to figure out how meet the new and growing demands for transportation infrastructure and services; in other areas, we have to figure out how to match transportation services to smaller populations that are more spread out and therefore more difficult and expensive to serve.

The Regional Food System: Stability and Enhancement

Agriculture and food production both remain significant economic engines for the Region, especially for the rural communities. The regional food system – and the contribution of agriculture to the economy and equitable access to fresh fruits and vegetables – can be stabilized and enhanced by ensuring that the transportation system connects production with consumption. Since the inception of *LRTP 2035,* several region-wide initiatives have been conducted to support both the transportation system and the regional food system.

In 2011, GTC and the New York State Department of Transportation, in cooperation with its partners, completed *Transportation Strategies for Freight and Goods Movement in the Genesee-Finger Lakes Region* (Regional Goods Movement Strategy) to determine how transportation investments can be

leveraged to increase regional economic competitiveness and maximize economic growth. A key objective was to develop goods movement strategies that will position the Region's transportation system as a distinguishing factor in retaining and attracting both traditional and emerging-technology manufacturing firms as well as enhancing the viability of agriculture. The Regional Goods Movement Strategy aims to contribute to the regional food system by enhancing the regional freight network through recommendations that improve efficiency, preserve and improve access, provide a safe and secure system while mitigating negative community and environmental impacts, and create opportunities for job growth that are cost-effective in nature.

The FLREDC lists Agriculture and Food Production as a core job driver, or pillar, and calls for strategic investments through proposed priority projects to support the viability of this industry throughout the Region.

The Transportation System's Role in Public Health: Beyond Safety

Transportation's traditional role in public health over the past several decades has been almost exclusively focused on safety and air quality. While decreasing the number of motor vehicle crashes that result in fatalities, injuries, and property damage is and will continue to be the primary safety goal of GTC, opportunities have risen to positively impact current public health issues through our built environments. The transportation system and how our communities are designed has a profound effect on one's personal health whether it's limited access to fresh healthy foods or health care, increased air pollution and noise, limited or dangerous walkability and bicycling options, or an overall lack of options aside from taking a private vehicle.

Most importantly from a transportation perspective, enabling bicycling and walking promotes active transportation that has the potential to reverse the epidemic of obesity that is one of, if not the most, pressing public health issue in the nation. The most acute illustration of this is the widely publicized fact that the current generation of children is the first in history to have a life expectancy less than its parents as a result of a sedentary lifestyle combined with unhealthy eating habits. Increasingly, communities in the Region are taking the lead and developing Active Transportation Plans to enhance quality of life, livability, and economic opportunity through increased multi-modal options for all people regardless of age or ability. GTC continues to lead regional active transportation projects such as the Regional Walkability Improvement Program that developed action plans in ten communities to address pedestrian safety, accessibility, convenience, and comfort in downtowns and on main streets.

With an increasing senior population, it is imperative that access to health care (including preventative services that reduce overall costs) be a primary consideration in the design of future transportation services. Overall the reductions in emissions from the transportation sector has been and will continue to be the result of advances in technologies regarding a vehicle's fuel efficiency, design, material, and pollution controlling devices.

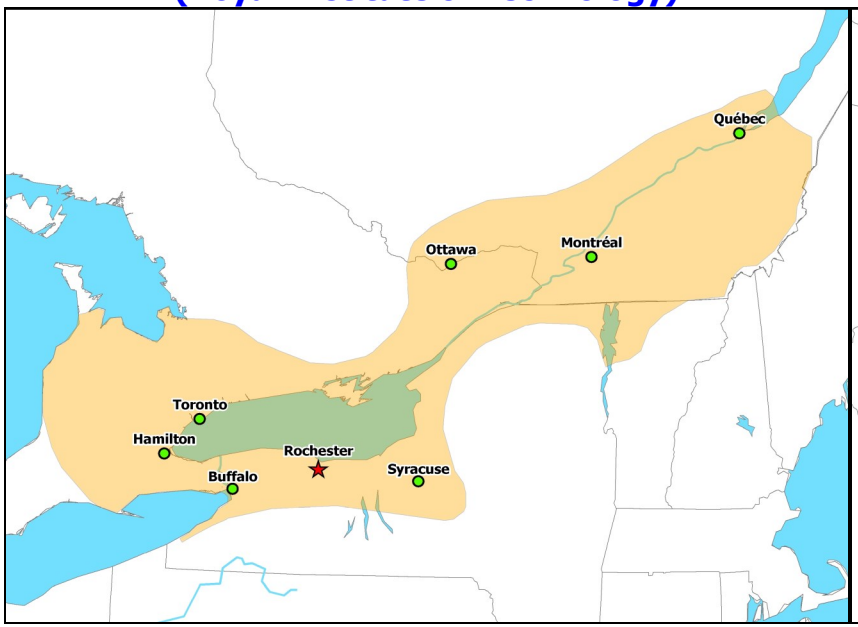
The Larger Mega-Region: Positioning the Region for Success

Over the past 50 years, metropolitan regions have expanded – both physically and economically. Cities today compete in the global economy where national and geographical boundaries are blurred. The connections between metropolitan regions have increased both physically and functionally into agglomeration economies as defined by the clustering of related industries combined with shared customers and the available labor force. Mega-regions are tied together by geographical features and resources, cultural linkages, transportation infrastructure, and economic interdependencies. As presented in Exhibit 11, the Region has been included in two identified mega-regions: the Royal Institute of Technology-Centre of Excellence for Science and Innovation Studies' Tor-Buff-Chester (i.e., Toronto-Buffalo-Rochester) Mega-Region and the Regional Plan Association's Great Lakes Mega-Region. The Region is also included in the Greater Golden Horseshoe (GGH), a moniker since the 1950s, which starts in Toronto, wraps around the western shoreline of Lake Ontario and terminates at Rochester [creating the illustrious "horseshoe" shape]. The GGH is a "smaller" mega-region situated within the "larger" Tor-Buff-Chester and Great Lakes mega-regions. All of these mega-regions include the Greater Toronto Area.

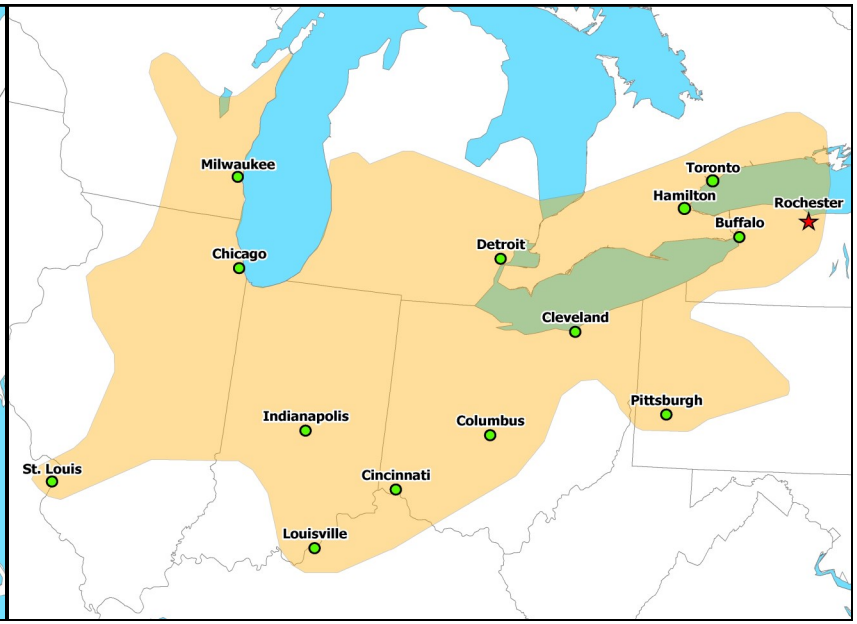
The U.S. and Canada have the largest bi-national flow of goods, people, and services of any two nations in the world. Over $1.95 billion worth of good cross the border every day. Keeping the transportation system at the border functioning is vital to this bi-national, symbiotic, trading relationship. Trade accounts for over half of Ontario, Canada's GDP and 90 percent of this trade is with the United States. The Greater Toronto Area alone produces 20 percent of Canada's GDP. This prosperous economic relationship represents significant opportunities for the Region. Moving goods

Exhibit 11

Tor-Buf-Chester (Royal Institute of Technology)



Great Lakes



and people throughout the mega-region efficiently will increasingly gain importance for future economic growth and success. To take full advantage of this Region's geographic location, the transportation system will need to ensure reliable, convenient, and cost-effective connections for people and freight both within the larger mega-region and to other domestic and international markets.

The Impacts of Climate Changes: Mitigation and Adaptation

Extreme weather events (e.g., Hurricanes Irene and Sandy) have been increasing in frequency and strength and pose a significant threat, through amplified flood events and stormwater runoff, to the integrity of the transportation system. Transportation policies, services, and programs have the ability to reduce the emission of greenhouse gas (GHG) and the dependency on foreign oil. Policies that reduce GHG and seek alternative fuel sources simultaneously attain other significant benefits that are far reaching from an environmental, economical, and a national security perspective.

Adapting transportation facilities to be more resistant and resilient to climate change is clearly a public responsibility given that the vast majority of associated infrastructure and services are provided by government entities. The recently completed *Genesee-Finger Lakes Critical Transportation Infrastructure Vulnerability Assessment*, assesses the vulnerability of the Region's roads, bridges, railroads, operations centers, intermodal transfer facilities, and other surface transportation infrastructure assets to natural and manmade hazards and proposes solutions for preventing and/or mitigating the impacts of hazard events on those assets. Through 2040, the reconstruction and replacement of transportation facilities should include design features as well as operations and management capabilities that account for these impacts and increase resiliency and resistance throughout the system.

The Future of Energy Requirements of the Nation: Undecided Sources

Uncertainty remains surrounding transportation's preferred future energy sources through 2040. According to the U.S. Energy Information Administration's Annual Energy Outlook 2015, gasoline consumption in the transportation sector for 2040 is expected to decrease given the new Corporate Average Fuel Economy (CAFE) and GHG standards. This downward trend represents a shift from the historical average given that gasoline consumption has continued to rise steadily since the early 1970s. By 2040 the average light duty vehicle will achieve an average of 37.0 miles per gallon compared to the current standard of 21.9 miles per gallon in 2013. These increases in fuel economy will offset GHG emissions created by additional vehicle miles traveled through 2040. In other words, people will be driving more than ever but decreasing fuel consumption and polluting less thanks to tighter regulations at the federal level.

The mobility provided by private automobiles, the fact that public transportation primarily utilizes buses, the need for trucks to transport freight to its final destination, and the significant investment in facilities (e.g. highways and bridges) that serve these modes demand that alternative fuel sources be identified and that related infrastructure be developed. Although alternative fuel, flex-fuel, and hybrid vehicles will continue to increase their market share by 2040 the Annual Energy Outlook 2015 is projecting the largest share of light duty vehicles sold will continue be gasoline-only vehicles at 46 percent of the total market share.

Hydraulic fracturing (commonly referred to as hydrofracking), as noted in *LRTP 2035*, remains at the forefront of energy-related issues in the Region. Hydrofracking involves injecting water and chemicals into horizontally drilled wells to fracture rock formations and release natural gas. The Marcellus Shale formation, located in the southern portion of the Region, and the Utica Shale, a deeper formation extending throughout the entire Region, both contain

extensive reserves of natural gas that would need to be "fracked" in order to be extracted.

On June 29, 2015 the New York State Department of Environmental Conservation (NYSDEC) issued the *State Environmental Quality Review* Findings Statement for hydrofracking that officially banned fracking in New York State. According to the NYSDEC a horizontal well with high-volume hydraulic fracturing may produce a total of 6,790 heavy and light duty truck trips. Road use agreements are the primary means of holding well operators financially accountable for any damage caused to the local roads, bridges, and drainage infrastructure due to fracking activities and the resulting required repairs. The *2011 Revised Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program* called for site-specific Transportation Plans to be developed in order to hold well operators accountable for any resulting transportation infrastructure damage. If the ban is lifted the impacts on the transportation system and resulting deterioration to roads and bridges will be significant – pursuing and securing additional funding to repair the impending damage will be imperative given the current climate of fiscal constraint.

Connected and Automated Vehicles

The rapid development of Connected and Automated Vehicle (C/AV) technologies in recent years has led to an explosion of interest and concern as to how these technologies will impact our transportation system and the people who use it. Connected Vehicles are vehicles that use wireless technology to communicate with other vehicles and roadside infrastructure, while Automated Vehicles are vehicles with safety features that function automatically, i.e., without driver input. Many Automated Vehicle technologies (e.g., adaptive cruise control, collision avoidance, emergency braking, blind-spot detection, lane-keeping assist, and automated parking) are already available on the market.

The full range of impacts from these emerging technologies is unknown. Anticipated benefits include greater mobility for all system users, including those who cannot drive due to age, disability, or health concerns; increased safety through reduction in crashes; improved productivity for commuters, freight carriers, and other travelers, reduced vehicle emissions and increased road capacity due to greater vehicle and roadside infrastructure operations efficiency. However, a range of potential disadvantages have also been identified. These include the initial high costs of adopting and deploying C/AV supportive technology, data security and privacy issues, and induced demand for road space which may lead to increased congestion and emissions, as well as the simple fact that many people enjoy driving and may not want to give up manual control of their vehicles. The current national sentiment towards these technologies is mixed. A 2016 study conducted by the American Automobile Association (AAA) found that while 75 percent of drivers are afraid of self-driving cars, 61 percent also want autonomous features in vehicles. Balancing the public's concerns with the potential benefits of these emerging technologies will be among the key challenges that transportation agencies, the automotive, legal, and technology industries, as well as the community at-large will need to address over the next several decades.

Image credit: U.S. Department of Transportation

The Region in 2040

LRTP 2035 presented two future scenarios for the Region that were developed based on the projected population and employment and the Emerging Issues and Opportunities through 2035. Scenario planning is typically conducted by regions that expect to experience significant growth in residents and jobs that will drastically impact future transportation needs. Even though population and employment growth in the Region is not anticipated to be comparable to that of high-growth areas, it was decided during the development of *LRTP 2035*, it would be beneficial to consider how the anticipated moderate growth in the Region would be geographically distributed. Given that the population and employment projections for 2040 are similar to 2035, the scenarios presented in *LRTP 2035* are still reasonable through 2040.

Additional feedback from the public was sought for *LRTP 2040*. During the Customer Engagement process two surveys were distributed and respondents were asked a series of preferential questions that focused on the Region's issues and opportunities and quality of life indicators. Respondents were asked if they wanted the Region's population to be less, stay where it is now, or grow. Approximately 56 percent of respondents noted they wanted the Region's population to grow, 39 percent wanted it to remain the same, and approximately five percent wanted the population to decrease. The second survey asked respondents where they wanted future population growth to occur in the City of Rochester, suburbs, villages, and/or rural communities. The majority of respondents wanted growth to be concentrated in the City of Rochester, followed by villages, suburbs, and rural communities.

The following two scenarios assume the same population and employment projections but distribute the growth differently among the identified places, as follows:

- "Familiar Tomorrow" - assuming growth will continue to occur as it has in the past based on historical trends (i.e., development will continue to sprawl out from the urban center); and
- "Changing Landscape" - incorporates a re-densification within the Rochester MPA driven by increased energy costs and/or other factors that precipitate changes that alter the demand for housing and location of firms in a way that results in more compact development.

Compared to the "Familiar Tomorrow" scenario, the "Changing Landscape" scenario can be summarized as:

- Stabilization of and increase in the population of the City of Rochester as opposed to a decrease;
- Similar population growth in the Sub-Regional Urban Core and Rural Center places;
- Reduced population growth in the Mature Suburban, Recent/Emerging Suburban, and Rural places; and
- Greater concentration of manufacturing, wellness services, and shopping in the existing Employment Centers, Medical/ Health, and Regional, Sub-Regional, and Local Retail places.

Based on feedback received from the community the "Changing Landscape" scenario is the most desirable future growth pattern for the Region through 2040. Nevertheless, the development pattern that materializes in the Region will depend on decisions made at the local level regarding land use and types of development that are allowed by municipalities' comprehensive plans and zoning codes. The vast majority of this development will be driven by the private sector as it responds to market demand within locally-determined land use regulations. However, major

transportation infrastructure and services will continue to be provided by the public sector; specifically, state and regional agencies. Accordingly, coordinating transportation and land use planning is essential as transportation facilities and services determine the land uses that can be reasonably supported while land use decisions determine the demand for transportation infrastructure and services.

Recognizing that transportation is one of many considerations in the land use planning and development processes, it is imperative that cities, towns, and villages work with county, regional, and state transportation agencies to gain a full understanding of how their decisions impact the existing transportation system and what improvements are generally achievable given physical and fiscal constraints.

GTC has and continues to develop resources that allow for better integration of transportation and land use planning, and provides direct financial assistance through the UPWP to local governments to conduct coordinated transportation and land use plans and transportation-focused zoning code updates.

GENESEE TRANSPORTATION COUNCIL

Long Range Transportation Plan for the Genesee-Finger Lakes Region 2040

Chapter 4 - TRANSPORTATION SYSTEM

Transportation System

The Region's social and economic vitality are dependent on a transportation system that safely, efficiently, and reliably moves people and freight. Residents and visitors require a system that provides mobility and access to employment, schools, health care services, religious and social activities, and recreational and cultural venues. The system must also connect employers with inputs (including labor) and the ability to get their products and commodities to local, domestic, and international markets. In meeting these requirements, consideration must be given to the system's impacts on the environment and how non-transportation-related decisions (namely, land use) affect the function and form of the system.

The transportation system of the region considered in the GTC policy, planning, and investment decision making processes is comprised of the following modes:

- Highways and Bridges
- Public Transportation
- Bicycle and Pedestrian
- Freight
- Interregional Travel

In addition, travel characteristics, congestion, Transportation Systems Management and Operations, safety, and security are important transportation-related factors that have significant impacts on quality of life and economic development, requiring specific attention in the regional transportation planning process.

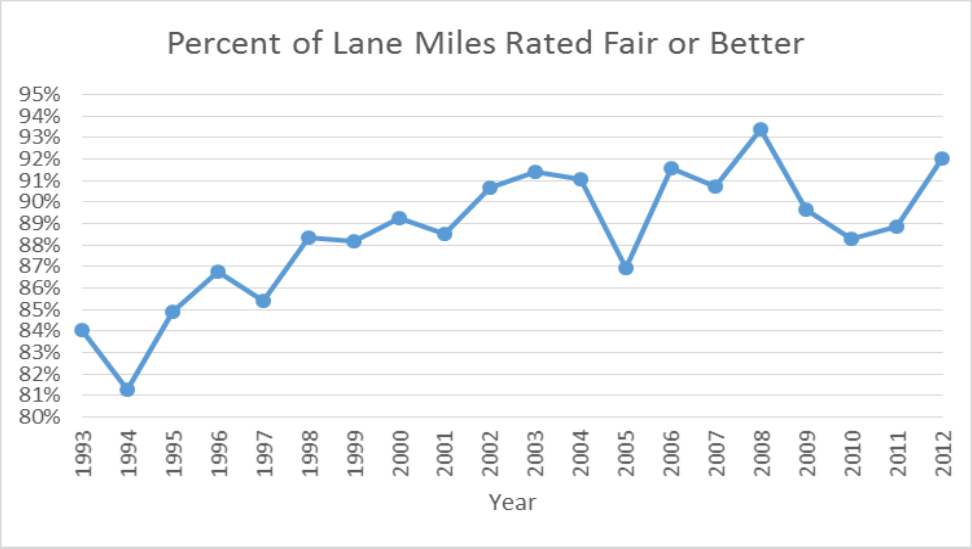
Highways

Highways and bridges comprise the vast majority of the transportation system in the Region. Personal vehicles, bicycles, trucks carrying freight, and buses that provide public transportation utilize these highways and bridges. The highway and bridge network carries over 30 million vehicle miles daily (the number of vehicles multiplied by the distance they travel) on nearly 27,000 lane miles and nearly 1,600 bridges. GTC has and continues to emphasize the preservation and maintenance of this network as one of its highest priorities.

Major highways that serve regional, state, and national needs are eligible to be repaired and improved with funding from federal transportation programs (i.e., are federal aid eligible). Approximately 7,300 lane miles of roadway in the Region (about 30 percent of total lane miles) are federal-aid eligible, handling approximately 80 percent of the vehicle miles traveled (VMT) on any given day. Map 6 presents the annual average daily traffic (AADT) on federal-aid eligible roads. FHWA is reporting that nationally, 2015 will be a record year for VMT.

The physical state of these highways is measured by their pavement condition. Exhibit 12 shows the percent of federal-aid highways in the Region with pavement conditions of fair or better since 1993.

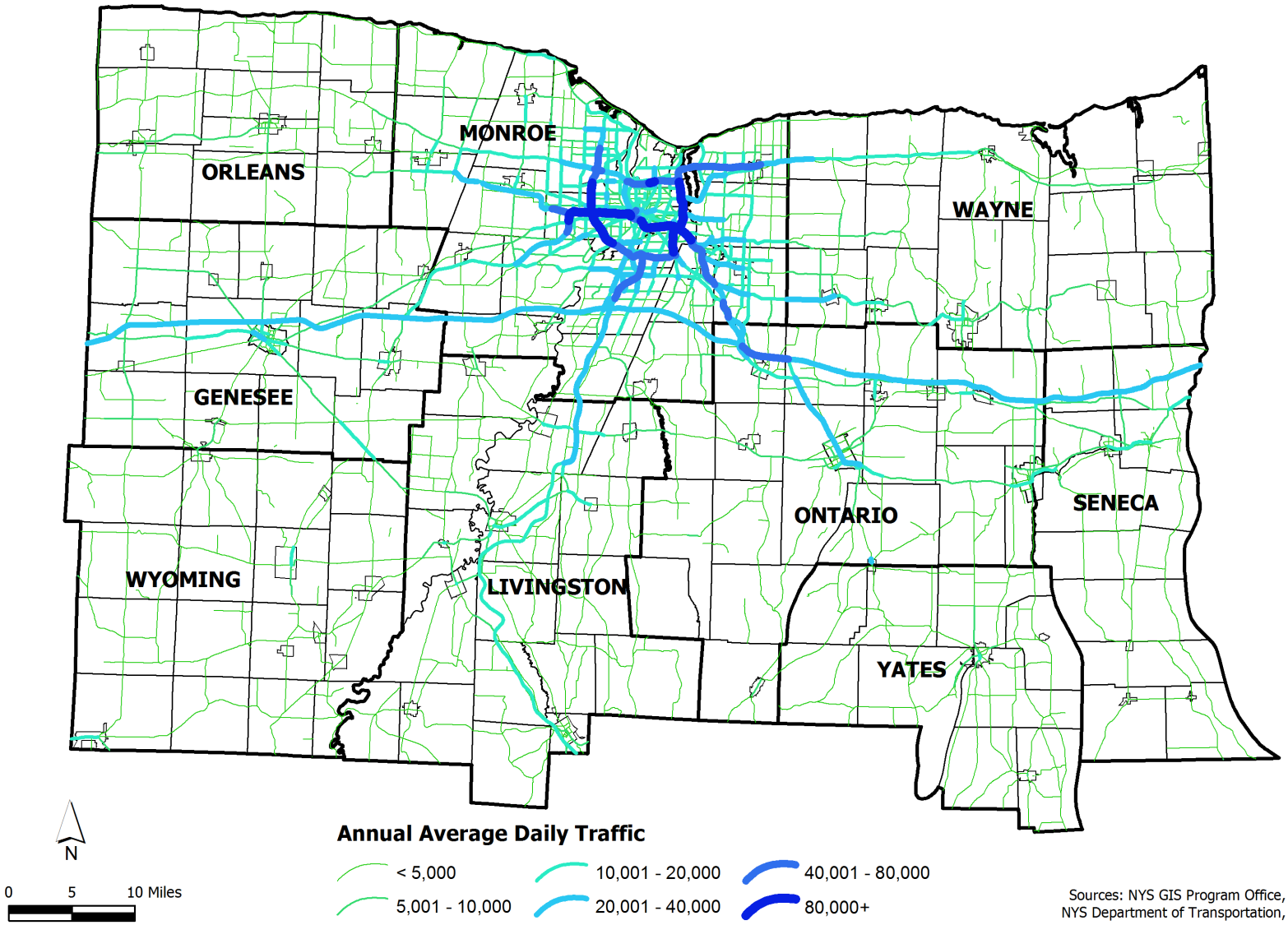
Exhibit 12



Source: New York State Department of Transportation & GTC

Traffic Volumes in the Genesee-Finger Lakes Region

Map 6



Sources: NYS GIS Program Office, 2015
NYS Department of Transportation, 2013

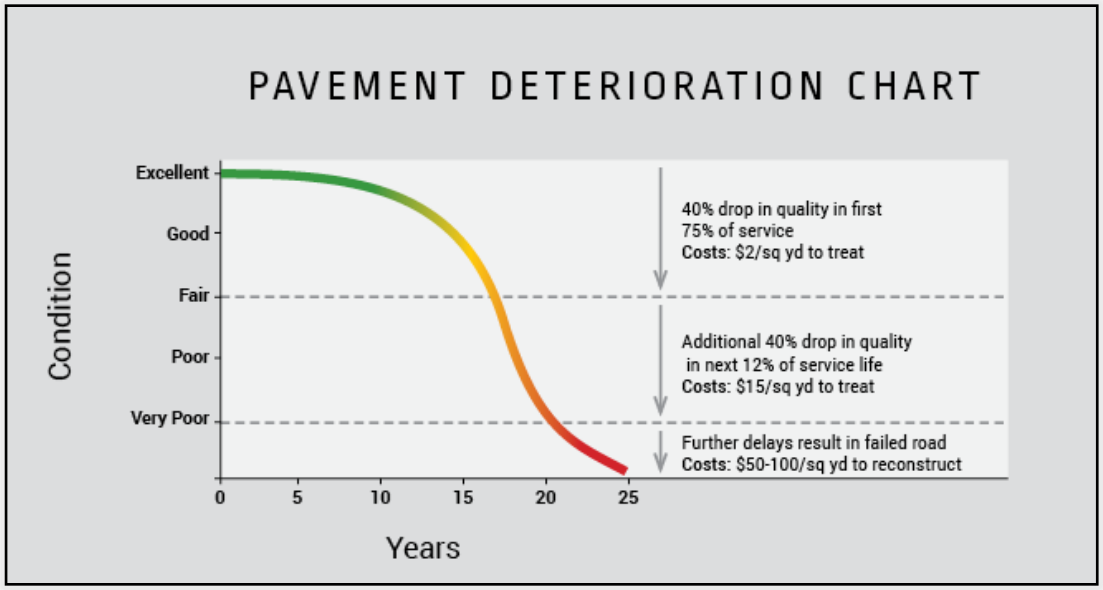
The general trend has been improving and peaked at 93 percent in 2008. While this measure dipped to 88 percent in 2010, it has since rebounded to 92 percent in 2012, the latest year of complete data.

According to FHWA, "State, city and county departments of transportation must manage this asset with ever more limited resources in comparison to the need. Their traditional approach has been to fix the worst pavements first. Only a few agencies are realizing the cost benefits of a sound pavement preservation program that includes preventive and corrective maintenance practices." and "While in the past, agencies had been reactive in their maintenance activities, some are now becoming increasingly proactive in preservation initiatives. The potential benefits are numerous, including improved pavement performance, safer roads, higher user satisfaction and reduced overall life-cycle costs." GTC encourages the owners of federal-aid roads to use an asset management approach to maintaining their roads. Simply put, asset management of roads means using the right treatment on the right roads at the right time.

Some roads are past the point where preventive and corrective maintenance is viable and will need a more intensive treatment (e.g., pavement rehabilitation, full-depth pavement reconstruction) to restore them to good condition; however, by investing resources in keeping good roads good, we can improve the overall condition of the entire road network.

Why is that road being repaved, it looks good to me?

Studies have shown that over the life of a road, it is more cost-effective to conduct less intense maintenance of roads within various windows of opportunity than it is to let the road deteriorate to the point that a more intensive treatment is necessary.



Bridges

Bridges are the most critical element of the regional transportation system. Ensuring their structural integrity is absolutely vital to safety and connectivity. If a road is allowed to deteriorate, it can result in increased wear and tear, and possible damage, to vehicles; if a bridge that is not structurally sound remains open to traffic, the consequences can be disastrous including loss of life. Inspectors measure the various components of the bridge (e.g., substructure, superstructure, bearings, deck, etc.) and rate the bridge's overall condition on a scale of one to seven, with seven being the highest. These ratings are based on inspections that are conducted for all bridges in the Region no less frequently that once every two years.

Using the rating system discussed above, bridges with a condition rating of 5.0 or above are considered non-structurally deficient. Those with a condition rating of less than 5.0 are considered structurally deficient. It is important to note that sufficiency ratings apply to the overall structural condition of bridges, and structurally deficient bridges are not inherently unsafe. Unsafe bridges are closed, and bridges that cannot handle typical weights are flagged—resulting in weight limits being posted and more frequent inspections.

Traditionally, bridges were designed to last 50 years, but newly constructed bridges are designed to last 75 years. In terms of the age of bridges in the Region, approximately 43 percent have been built in the last 35 years and will reach the end of their design life by 2040. Approximately 35 percent were built prior to 1960 (55 or more years ago) and have already passed their design life.

Approximately two of every three bridges in the Region are non-deficient. Of the approximately one-third that are deficient, 52 percent have a condition rating of 3.75 to 4.99. This is important to note because bridges that are non-deficient require preventive and corrective maintenance. Deficient bridges often require rehabilitation or replacement. While both rehabilitation and replacement are more expensive than preventive maintenance treatments, rehabilitating a bridge costs less than replacing it. Bridges with a condition rating of 3.75 to 4.99 are typically candidates for rehabilitation as opposed to replacement. Provided the required funding is available, and based on use by the travelling public, rehabilitating as many of these bridges as possible before they deteriorate further could save the Region a substantial amount of money in the long-term. While 41 percent of deficient bridges have a condition rating greater than 4.99, they are primarily Functionally Obsolete (i.e., they were not built to today's standards) and may still be candidates for preventive maintenance; however, they will eventually succumb to the elements and need more intensive treatments. Exhibit 13 presents the condition ratings of bridges in the Region by the year built.

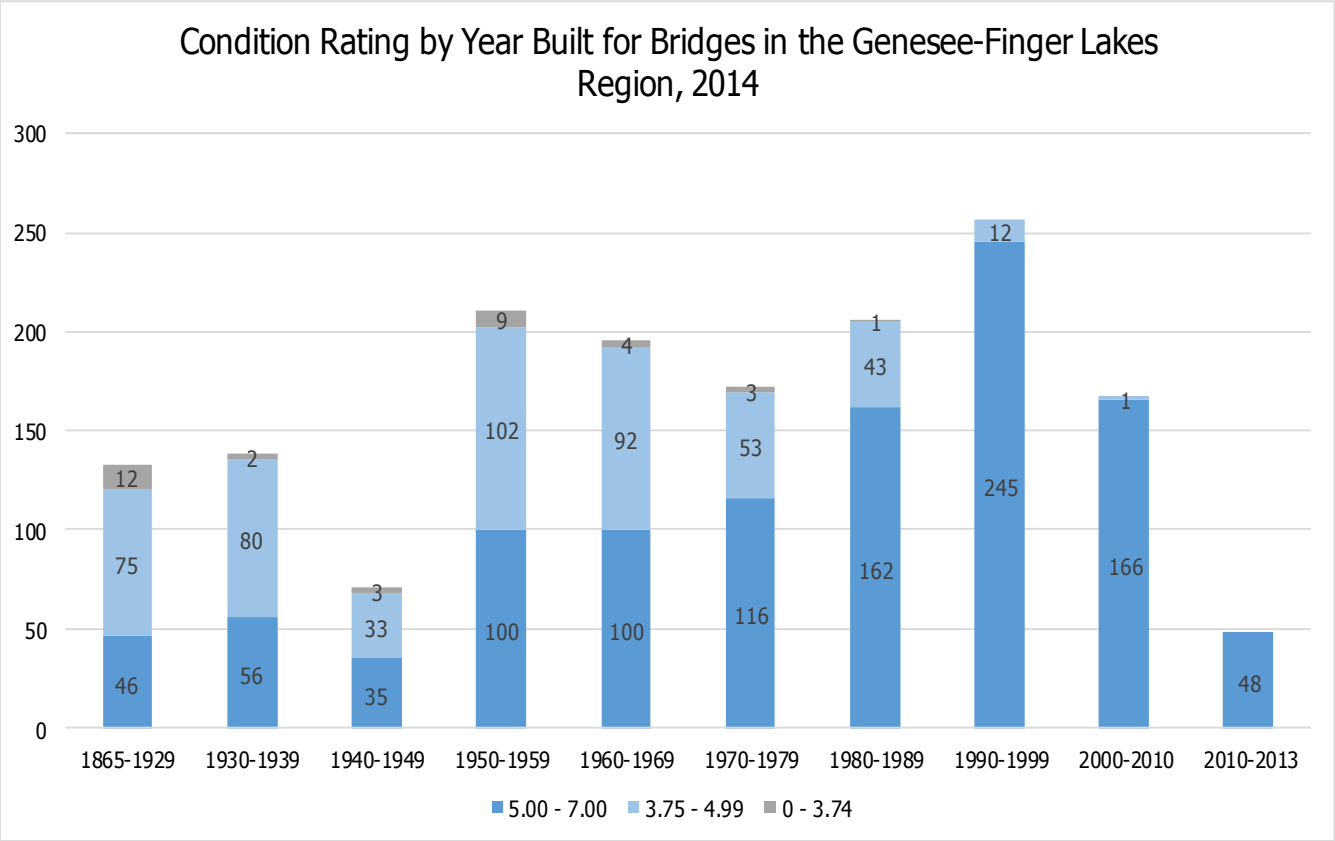
What is a deficient bridge?

Per Federal Standards, bridge condition is assessed in these terms:

Structurally Deficient - Describes the condition of a bridge and its elements at the point when the bridge requires significant maintenance and repairs to remain in service. The classification of a bridge as "Structurally Deficient" does not imply that it is unsafe for travel.

Functionally Obsolete - Describes a bridge that is no longer by design functionally adequate for its purposes (for example due to lack of compliance with current bridge design standards such as lane widths, shoulder widths, vertical/horizontal clearances), although the bridge is structurally sound and safe for all vehicles.

Exhibit 13



Source: New York State Department of Transportation

Similar to pavement, conducting preventive and corrective maintenance of bridges within the appropriate window of opportunity allows for more cost-effective investment. A balanced approach to timely bridge preventive and corrective maintenance, rehabilitation, and replacement allows for the overall condition of the entire bridge system to be improved.

In 2014, GTC commissioned the Genesee-Finger Lakes Regional Bridge Network Needs Assessment and Investment Strategy (Strategy). In recognition of limited resources available to fund transportation projects, the Strategy evaluated bridges from an economic optimization standpoint to determine the point at which investing money into a bridge no longer provides a return on investment. This point was deemed a State of Good Repair. The Strategy concluded that, to attain a State of Good Repair, the Region would need to increase annual investments in bridges by 60 percent between now and 2040.

As budgets are currently strained, this increased level of investment does not seem reasonable and, therefore, the Region needs to make informed investment decisions. As part of the Strategy, the Bridge Asset Management Planning Tool was developed to identify a cost-effective balance of work types for bridges in the Region based on the amount available to be invested.

In 2014, the Village of Albion decided to remove a bridge over a railroad rather than replace it since the traffic could be sufficiently served by a nearby at-grade crossing. To help other bridge owners make informed decisions, the Bridge Prioritization Screening Tool was developed to prioritize bridges based on various factors and provide the necessary data to assess if traffic currently using multiple bridges in close proximity to each other could be served by a single bridge if funding is insufficient to safely maintain all of the bridges currently in service.

Alternate Fuel Vehicle-Supportive Infrastructure

The transportation sector accounts for 34 percent of GHG emissions in New York State. Reducing GHG outputs is an important step in mitigating the environmental impacts of GHG emissions. The use of alternate fuel vehicles is one action that individuals and organizations can take to reduce GHG emissions and improve air quality. In addition to the environmental benefits, other reasons for using alternate fuel vehicles include lower operating costs and improved performance over conventional fuel vehicles, and the stimulation of domestic energy production which generates economic activity and strengthens national energy security by reducing dependence on energy imports.

Alternate fuel vehicles are powered by fuels other than gasoline or diesel. Commercially available alternate fuels include electricity, natural gas, propane, ethanol, biodiesel, and hydrogen. In addition, there are several emerging alternate fuels such as renewable natural gas and synthetic liquid transportation fuels that are currently in development. At present, alternate fuel vehicles are mainly used in public and private fleets; however, increased consumer interest in these types of vehicles is leading to a rise in demand and a corresponding rise in demand for alternate fuel stations.

There are several challenges to the widespread use of alternate fuel vehicles, including: higher purchase prices than conventional fuel vehicles; the limited availability of alternate fuel stations, ultimately limiting a vehicle's range; and uncertainty about the costs and benefits of alternate fuel technologies. In addition, regulatory challenges include municipal building codes and zoning regulations that may not permit alternate fuel station installation.

The Genesee Region Clean Communities (GRCC) coalition of public and private partners has been working to overcome these challenges in the Region. One of six Clean Cities coalitions in New York State sponsored by the U.S. Department of Energy, GRCC was established in 1994 to reduce dependency on imported petroleum and improve air quality through the development of alternative fuel vehicle fleets and stations. There are currently about 40 publicly accessible alternate fuel stations in the Region. These stations are located at a variety of sites, including municipal parking garages and lots, town halls and community centers, automobile dealerships, conventional fuel stations, privately-operated fleet centers, and university campuses. Planning efforts are underway to identify the optimum future locations of alternate fueling stations as a means of addressing vehicle-range concerns among alternate fuel vehicle consumers.

Public Transportation

Public transportation is critical to providing access to employment and needed services for individuals unable to afford or operate a private automobile. A robust public transportation system can also serve as a viable alternative for those who choose not to use a private vehicle for some or all of their transportation needs.

The Rochester Genesee Regional Transportation Authority (RGRTA) is the Region's sole public transportation operator, providing fixed-route, fixed-schedule services in eight of the nine counties (except Yates). RGRTA provides transit and paratransit service via its Regional Transit Service (RTS) with each named for the county it operates in (e.g., RTS Monroe, RTS Ontario, etc.) and, in the case of complementary paratransit service in Monroe County, RTS Access.

RGRTA provides Americans with Disabilities Act (ADA) compliant service via a combination of fixed route, paratransit, route deviation, dial-a-ride, demand response, non-emergency medical, and shuttle service depending on the area served.

Map 7 presents the routes of the eight public transportation services in the Region while Map 8 presents routes located in the City of Rochester with a quarter mile buffer—a reasonable walking distance to access transit service.

In fiscal year 2014 (April 1, 2014 to March 31, 2015), approximately 18.2 million trips in the Region were made via public transportation.

RTS Monroe service is configured as a hub-and-spoke system that reinforces downtown Rochester as the Region's commercial, civic, and cultural center in a cost-effective manner.

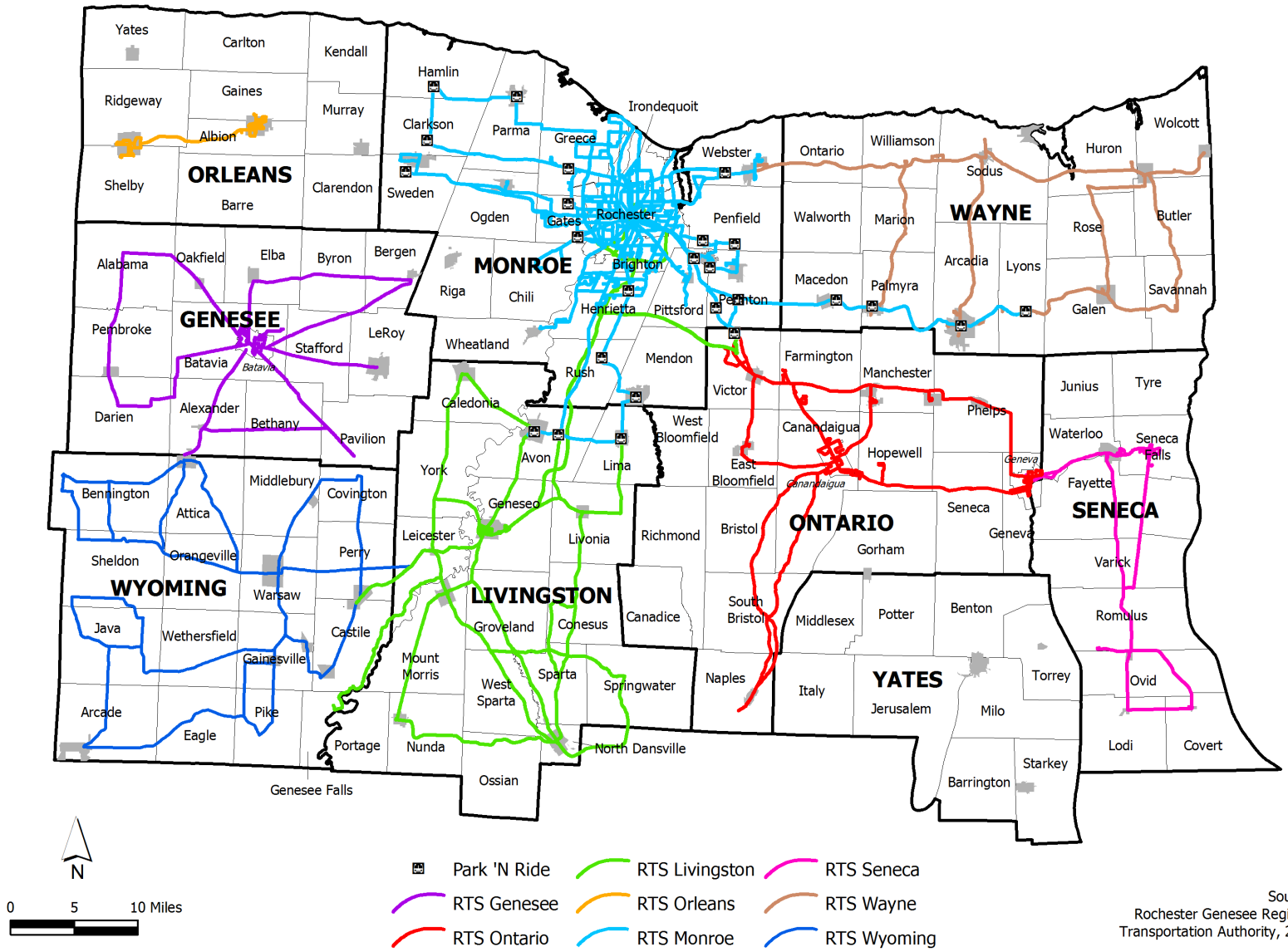
While the density of development to support the most extensive and frequent public transportation service is located in the Regional Urban Core and Mature Suburbs, the availability of service in other places (especially, Rural and Rural Centers) is critical to those that depend on it.

Service linkages across county lines exist to varying degrees. RTS Monroe provides service to Lima and Avon (Livingston County), to Eastview Mall in Victor (Ontario County), and to Macedon, Palmyra, Newark and Lyons (Wayne County). Between Seneca and Ontario County, RTS Seneca provides service to and from Geneva (Ontario County).

In partnership with SUNY Geneseo, RTS Livingston provides service on weekends to Eastview Mall in Victor (Ontario County) and to points of interest in the Rochester area including: Marketplace Mall and Rochester Institute of Technology in Henrietta, and Strong Memorial Hospital, the Greater Rochester International Airport, University of Rochester, Geva Theater, the Rochester Intermodal Station (Amtrak, Greyhound, and Trailways), the Public Market, the Little Theater, and the Memorial Art Gallery. These routes are free for SUNY Geneseo students and available to the general public with a paid fare. RTS Livingston also provides service to the Village of Perry, Wyoming County and a Medical Shuttle for appointments in Monroe County.

Public Transportation Routes in the Genesee-Finger Lakes Region

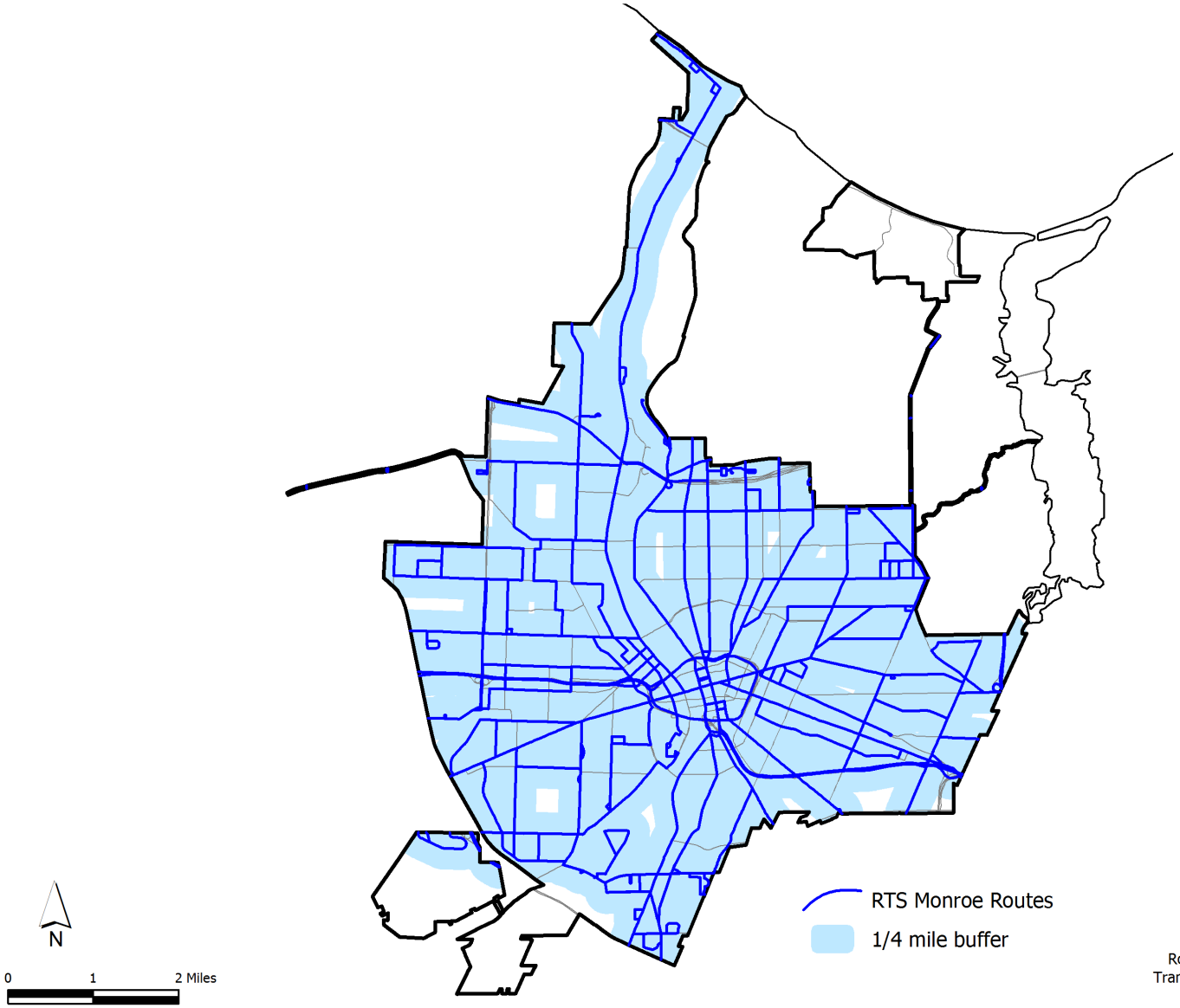
Map 7



Source:
Rochester Genesee Regional Transportation Authority, 2014

Regional Transit Service Routes in the City of Rochester

Map 8



Sources:
Rochester-Genesee Regional Transportation Authority, 2014

Paratransit services are available to persons with disabilities throughout the Region. The majority of these trips are provided in Monroe County through RTS Access, which provided 185,473 trips in fiscal year 2015. RTS Access provides paratransit service within three-quarters of a mile of RTS Monroe fixed routes in full compliance with the American with Disabilities Act.

RTS bus
Image credit: RTS

As with highways and bridges, preservation and maintenance of existing transit infrastructure to improve cost-effectiveness is a high priority. Approximately one-third of the Federal Transit Administration funds allocated directly to RGRTA for its RTS Monroe service (i.e., FTA Urbanized Area Formula Grant – Section 5307) are programmed for preventive maintenance activities to ensure that the existing fleet of buses—which provides nearly 17 million trips per year—is reliable with breakdowns kept to a minimum. Frequent breakdowns or disruptions in service will result in choice riders (i.e., those that have the option to drive themselves) opting not to use public transportation.

RGRTA has and continues to expand the use of Transportation System Management & Operations (TSMO) strategies to improve operations and customer service. Beginning in 2007, RGRTA began implementing Technology Initiatives Driving Excellence (TIDE) in its RTS Monroe service. TIDE includes: a bus operations and facility management system; automatic stop annunciation and bus sign control; real-time next bus information at stops via Advanced Traveler Information System (ATIS) signs as well as though text and e-mails, upgraded fare collection system and computer aided dispatch (CAD); vehicle in-service health monitoring and diagnostics; automatic passenger counters; and a next generation Automated Vehicle Location (AVL) system. RGRTA is also implementing technology to improve its overall customer service interactions. TIDE components are planned to be introduced on other RGRTA services, as appropriate. A CAD/AVL system is fully integrated with RTS Monroe and was recently installed on RTS Livingston buses. The system includes ATIS signs at locations with high ridership near SUNY Geneseo.

RTS Transit Center

On November 28, 2014, the RTS Transit Center opened in downtown Rochester. Located on Mortimer Street between Saint Paul Street and North Clinton Avenue, the RTS Transit Center is the most significant public transportation accomplishment in the Region since the *LRTP 2035* was adopted. The RTS Transit Center is a fully-enclosed and climate-controlled facility that allows more than 20,000 daily customers to access their desired bus in a safe, secure, and comfortable setting. Prior to the opening of the RTS Transit Center, all downtown arrivals, departures, and transfers took place outside along East Main Street, Saint Paul Street, and North Clinton Avenue in all kinds of weather conditions.

RTS Transit Center
Image credit: RTS

In conjunction with opening the RTS Transit Center, the City of Rochester and Monroe County coordinated efforts to convert Saint Paul Street and North Clinton Avenue north of East Main Street from a one-way pair for traffic operations to two-way traffic on each street. This change allows more efficient access and egress for bus operations.

Two-way traffic on these streets also allows for more efficient deployment of various transit vehicles. No longer is an individual bus required to travel a route that it is not well-suited for just so it can change direction and service the route where it is needed (this is known as through-routing). For example, a sixty-foot articulated bus is needed to serve demand on the Lake Avenue route to and from downtown. Prior to opening the RTS Transit Center, that vehicle could not easily change direction downtown and was required to continue service along the Park Avenue route where a smaller bus is more appropriate. Now RTS has the ability to deploy the most appropriate size bus available to every route since they can change direction downtown. This will allow RTS to use its bus fleet in the most efficient manner, reduce criticism of running "empty" buses, and optimize the fleet mix as buses are replaced at the end of their useful life.

The RTS Transit Center

- Can handle up to 100 buses per hour
- Measures 87,000 square feet
- Has 30 bus bays - 26 indoor and 4 spots on Mortimer Street
- Is built to Silver-level LEED certifications
- Has heated flooring for customer comfort during the cold, winter months

Amenities include

- Electronic displays of departure times
- Ticket vending machines
- Fully-staffed Customer Information Desks
- Trip Planning Kiosks
- On-site security
- Public and family restrooms

Bicycle and Pedestrian

In addition to the highway and bridge network and public transportation service, bicycle and pedestrian facilities are key elements of the regional transportation system. In order to promote active transportation and healthier communities, bicycling and walking options must be convenient and safe transportation choices.

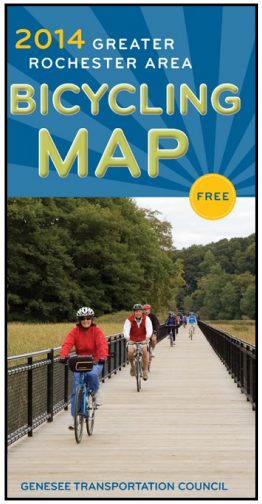
Improving bicycle and pedestrian infrastructure is critical to improving access to employment and services for individuals without private vehicles, expanding mobility for persons with disabilities, and reducing delay on the highway and bridge network. In addition, increasing bicycling and walking have the potential to create a healthier community which would reduce overall public costs for medical care and energy usage.

The bicycle and pedestrian network is especially important to certain populations. These include children, seniors, people with disabilities, and those without access to a private automobile. Many of these groups depend on the ability to safely travel to and from public transportation service and their final destinations. The Genesee-Finger Lakes Region is home to a contingent of organizations representing these groups that actively promote and advocate for the expansion of the regional bicycle and pedestrian transportation system.

The highway and bridge network serves as the main component of the bicycle and pedestrian network because roads and sidewalks provide the primary facilities for bicyclists and pedestrians.

Typical bicycle space on roads and bridges consists of a minimum of four-foot paved shoulders or curb offsets (the latter being provided by the right-hand edge line of the traffic lane being located at least four feet from the curb). Both paved shoulders and curb offsets provide delineated space for bicyclists but, because they are not intended solely for bicyclists, they are not designated (signed or marked) as bicycle lanes. Although delineated bicycle space is available along many raodways in the Region, designated bicycle lanes are limited to the following state bicycle routes:

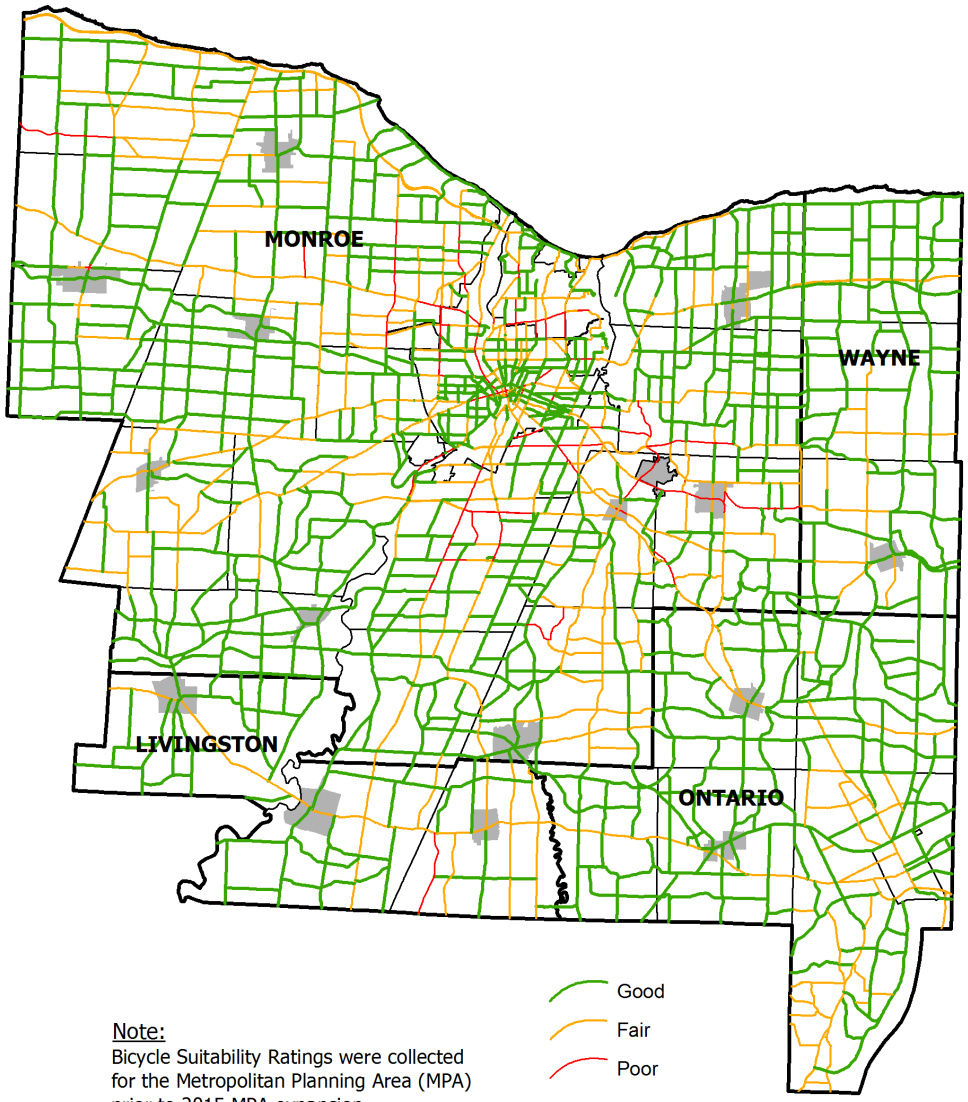
- State Bicycle Route (SBR) 5 which runs east-west parallel to the Erie Canal
- SBR 14 which runs north-south from the Seaway Trail in Sodus Point, Wayne County through Ontario and Yates Counties into the Southern Tier of New York State and Pennsylvania
- SBR 19 which runs north-south from the Seaway Trail/Lake Ontario State Parkway in Hamlin, Monroe County past Letchworth State Park into the Southern Tier of New York State and Pennsylvania



A field assessment of the suitability of highways in the Rochester MPA for bicycling (i.e., bicycle suitability ratings) was conducted by the Rochester Bicycling Club (RBC) in cooperation with GTC in 2007 and again in 2013. These ratings served as the basis for the 2009 and 2014 Editions of the *Greater Rochester Area Bicycling Map* produced by GTC and distributed throughout the community to facilitate improved bicycling behavior and to enhance safety via inclusion of safety information on the Map. Based on the most recent RBC assessment (2013), approximately two-thirds of roads were rated "good" for bicycling. Map 9 presents the bicycle suitability ratings as determined by the RBC in 2013. A more formally determined bicycle level of service (BLOS) was created during the 2010-2011 development of the City of Rochester's Bicycle Master Plan. At that time, it was determined that the BLOS of the City was 3.7 (with one being the best and five being the worst); the national average is 3.9.

Bicycle Suitability Ratings on Major Roadways in the Rochester Metropolitan Planning Area

Map 9



N

0 4.5 9 Miles

Note:
Bicycle Suitability Ratings were collected for the Metropolitan Planning Area (MPA) prior to 2015 MPA expansion.

Good
Fair
Poor

Sources:
Rochester Bicycling Club, 2014
NYS GIS Program Office, 2015

The Region has a strong commitment to developing multi-use trails. These facilities serve as expressways for bicyclists and require interconnections with roadways to optimize their usefulness. There are more than 340 miles of existing trails in the Region, including 149 miles that have been completed or rehabilitated since 1993. The development of multi-use trails is guided by the *GTC Regional Trails Initiative (RTI)* as well as concept-level Trail Plans. The *RTI Update,* completed in 2016, provided an update to the original *RTI*, Phase I within the MPA (2002) and Phase II for the remaining nine-county Region (2004). The *RTI Update* covers the complete nine-county Region and reflects changes in completed and proposed trail development, funding sources, and design guidelines, as well as provides a gap analysis of the existing trail network and a review of maintenance policies. Map 10 presents existing multi-use trails and those that are currently under development or planned in the Region.

It is important to note that the trails shown Map 10 do not necessarily end at the boundaries of the nine-county Region.

The Canalway Trail System includes a network of approximately 300 miles of multiple-use trails across upstate New York, of which approximately 75% has been completed off-road. Within our Region this includes the main stem of the Canalway Trail through Orleans, Monroe, and Wayne Counties – largely complete west of the Village of Lyons in Wayne County – as well as the Cayuga-Seneca Canal Trail, partly developed between the City of Geneva (Ontario County) and the Town of Seneca Falls (Seneca County). The Canalway Trail is the major east-west spine of the regional trail system and, when completed between Buffalo and Albany, will represent one of the longest multi-use trails in the United States.

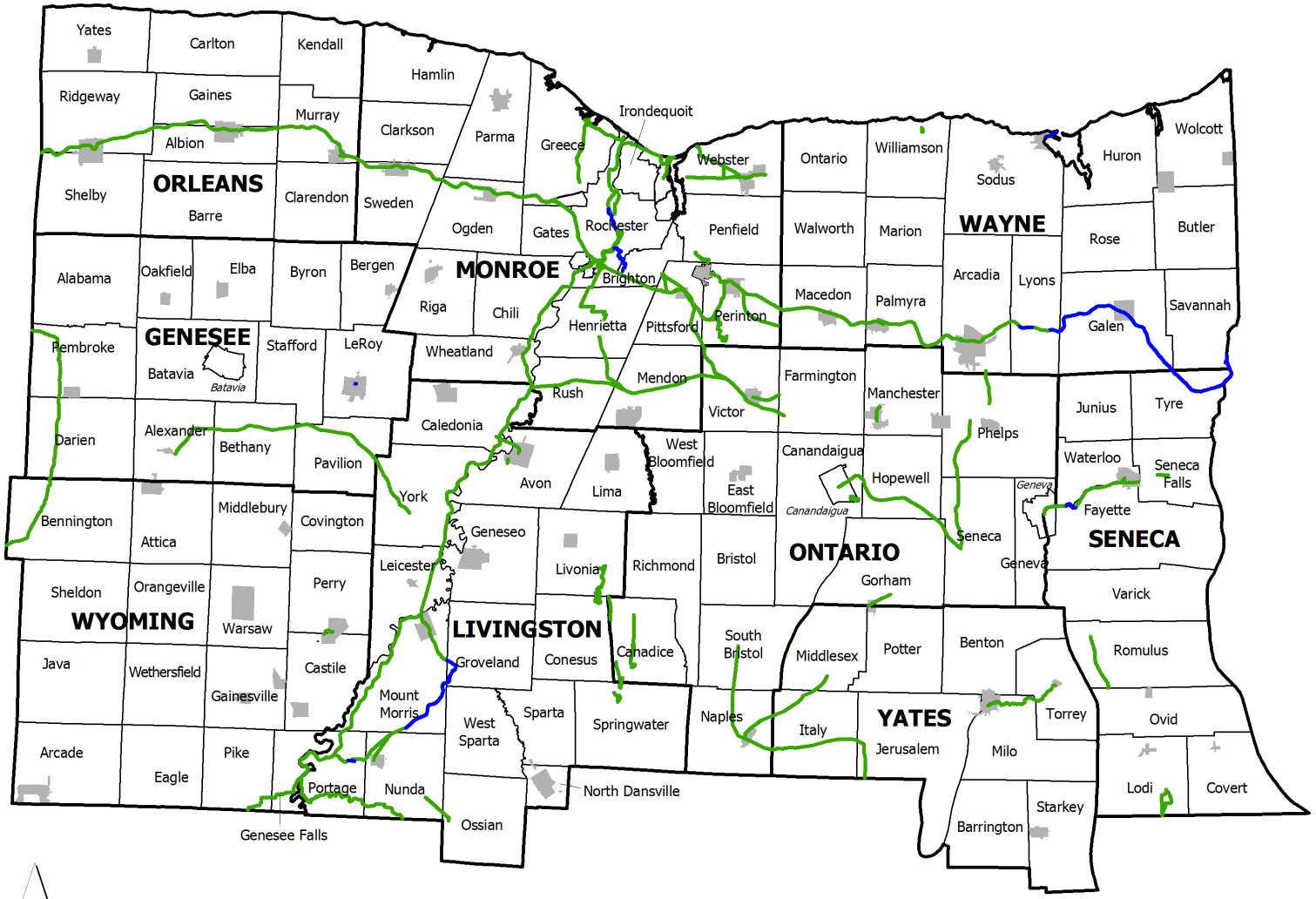
The second trail of major significance in the Region is the Genesee Valley Greenway State Park (GVG). This trail is 90-mile open space corridor that follows the route of the Genesee Valley Canal (1840-1878) and the Pennsylvania Railroad Rochester Branch (1882-1963) from the Erie Canalway Trail in Rochester's Genesee Valley Park to the Village of Cuba in Allegany County. The New York State Department of Parks, Recreation, and Historic Preservation indicates that the GVG will eventually extend to Hinsdale in Cattaraugus County; however, the concept of a trail extending from Lake Ontario to the Chesapeake Bay, and designated the Genesee-Susquehanna Greenway, has been under active discussion since its initial development in November, 2014 by federal, state, regional (including GTC), municipal and not-for-profit representatives in Williamsport, Pennsylvania.

These two trails, already recognized as important assets to the Region, take on even more significance when their potential economic benefit to the cities, towns, villages, and hamlets along the way are considered.

In fact, the Rails-to-Trails Conservancy reports that direct annual spending by trail users along the Great Allegheny Passage Trail System (Pennsylvania) exceeds $40 million. This economic infusion has enabled a resurgence of many towns that had declined with the loss of mining jobs and the original railroad. Trail-related businesses pay out $7.5 million in wages every year,

Multi-Use Trails in the Genesee-Finger Lakes Region

Map 10



Sources: GTC, 2014
NYS GIS Program Office, 2015

and since 2007, more than 50new or expanded businesses serving trail users have created over 80 new jobs in eight small towns.

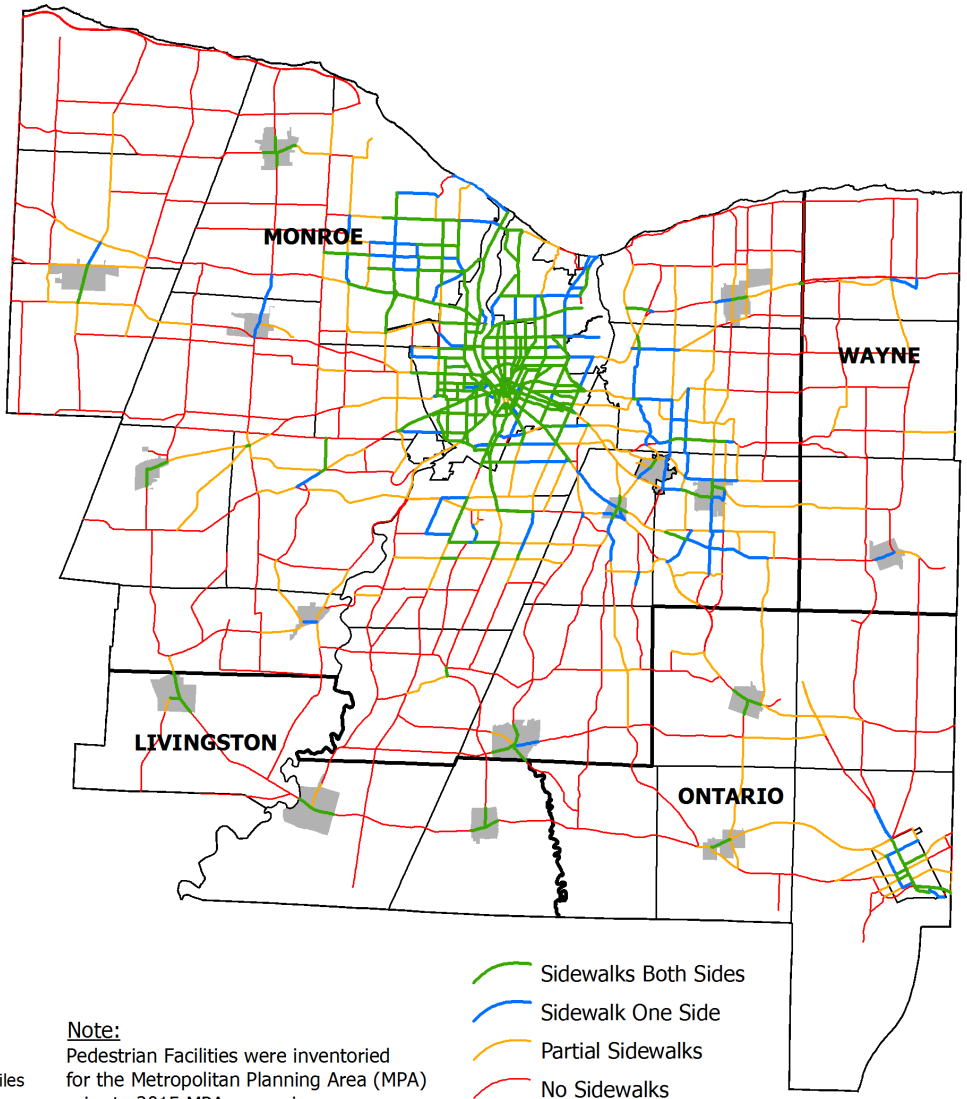
Bicycle facilities can be provided on-street by delineated or dedicated space. Pedestrians, however, require separate travel ways via sidewalks. The limited exceptions would be along certain low-traffic, low-vehicular speed roads such as residential streets and rural highways where origins and destinations are separated by distances that cannot be reasonably traversed by walking.

Sidewalks are also critical to providing access to public transportation services, especially for persons with disabilities who may require the use of assistive devices such as wheelchairs. A 2007 field survey of pedestrian facilities conducted by GTC found that 19.6 percent (203 miles) of federal-aid eligible roadways in the Rochester MPA had complete sidewalks. A 2013 Update to that survey found 21.8 percent (226 miles) with complete sidewalks, an increase of 11.3 percent during the intervening six years. While this increase represents progress, much more remains to be done, as at this rate it will take more than a generation to complete the necessary improvements. Sidewalks are most common in the Region's cities (Rochester, Batavia, Canandaigua, and Geneva), Mature Suburbs, and the villages (Sub-Regional Urban Cores and Rural Centers). The results of the GTC Pedestrian Facilities Inventory (2013 Update) are presented in Map 11.

The primary rationale for continued investments in bicycle and pedestrian supportive infrastructure is and will remain to improve safety for all users of the roads, sidewalks, and trails in the Region. As shown in Map 12, the 76 fatalities and 505 serious injuries to bicyclists and pedestrians that occurred during the 2009 through 2013 time period represent many lives changed for the worse, as the result of crashes between motor vehicles and bicyclists or pedestrians. While not all crashes can be prevented, many can, through enforcement programs, education on the rules of the road, and in some cases, investments in infrastructure such as sidewalks, multi-use trails, and bicycle facilities. For this reason, as investment decisions are made, especially with respect to relatively vulnerable and unprotected bicyclists and pedestrians, safety will continue to be a primary concern.

Pedestrian Facilities on Major Roadways in the Rochester Metropolitan Planning Area

Map 11



N

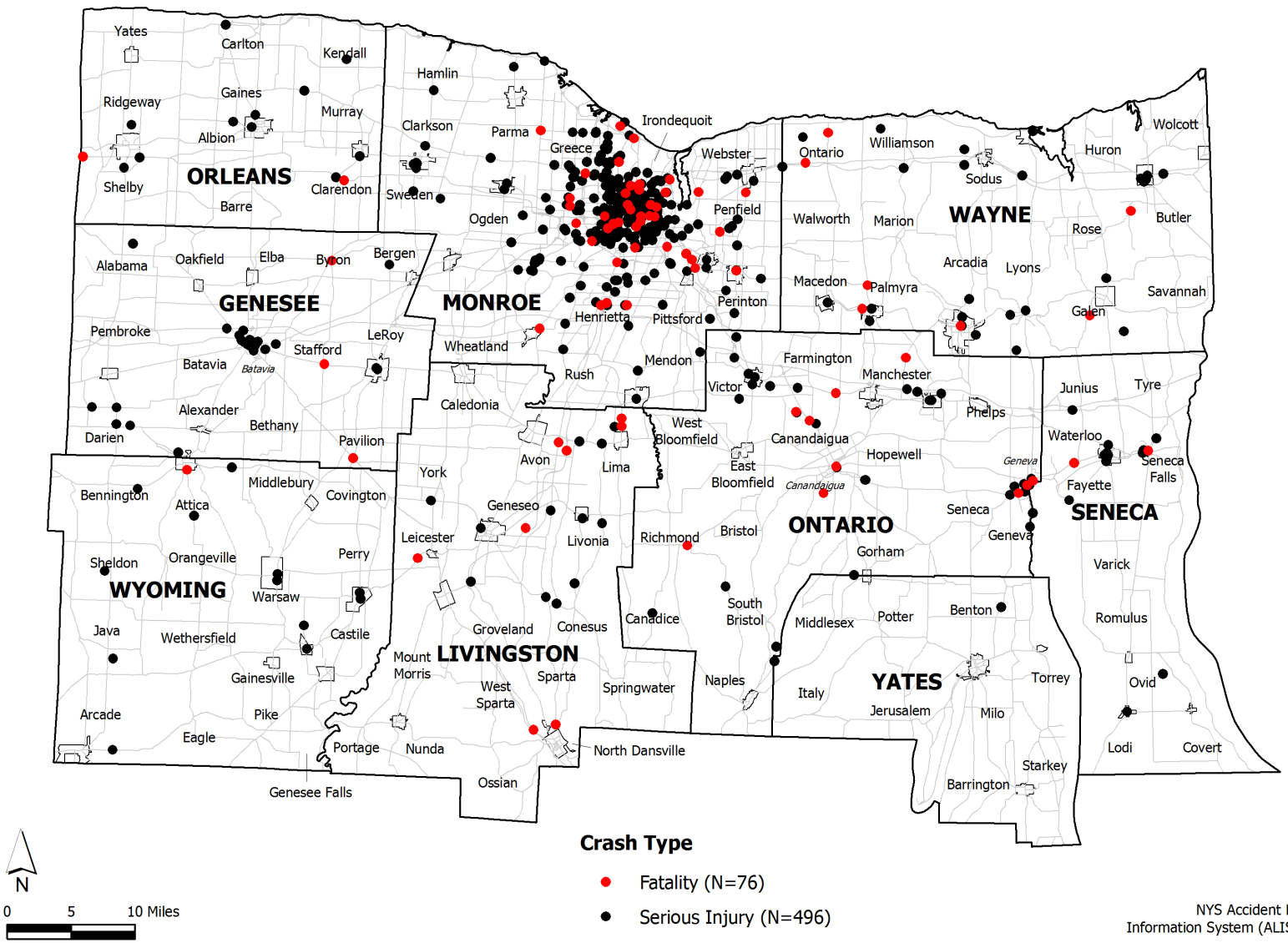
0 5 10 Miles

Note:
Pedestrian Facilities were inventoried for the Metropolitan Planning Area (MPA) prior to 2015 MPA expansion.

Sources: GTC, 2014
NYS GIS Program Office, 2015

Bicycle- and Pedestrian-Motor Vehicle Crashes Fatalities and Serious Injuries (2009-2013)

Map 12



Source:
NYS Accident Location
Information System (ALIS), 2014

Freight

Recognizing freight transportation's role in sustaining and spurring economic development, MAP-21, for the first time, enacted a national freight policy including multiple freight provisions to enhance the capability of the U.S. to compete competitively in the global economy. The FAST Act expands on MAP-21 by establishing a National Multimodal Freight Policy and the development of a National Freight Strategic Plan to implement the national policies set forth along with several new funding sources for freight-specific infrastructure improvements.

The competitiveness of a region's economy is inextricably linked to the strength of that region's transportation network.

MAP-21 encouraged, although did not require, state departments of transportation to develop state freight plans. The New York State Department of Transportation (NYSDOT) is currently developing a state freight plan. GTC is assisting NYSDOT with stakeholder outreach efforts and will continue to provide technical assistance to advance the development of the plan.

The Panama Canal is currently undergoing a $5.25 billion expansion that will more than double its current capacity. The present configuration of the Canal limits ship to 5,000 TEUs (i.e., twenty-foot equivalent unit used to measure cargo capacity of container ships). Once the expansion is completed in 2016, ships carrying 13,000 TEUs from Asia will be able to sail through the Canal bypassing longer trade routes. These co-called Post-Panamax ships will soon be docking along East Coast ports.

The Port Authority of New York and New Jersey is already preparing for the Post-Panamax ships by investing in multiple infrastructure improvements and purchasing new cranes designed to unload the larger ships. The Port Authority's chief initiative is the Bayonne Bridge Navigational Clearance Project. At $1.29 billion, the project will raise the level of the bridge from 151 feet to 215 feet to allow Post-Panamax ships the needed height clearance to enter the terminals at Port Newark—Elizabeth (New Jersey) and Howland Hook (Staten Island).

These international and state-level investments will increase the amount of freight on New York State's roadways and railroad network. Planning for growth in freight traffic is imperative to continue to maintain a state of good repair on the Region's freight transportation network and to capitalize on resulting opportunities that may arise to grow the Region's economy. Freight is a derived demand—as consumers continue to demand that a variety of products be available at the store and shipped to their home, freight needs will continue to evolve and increase. In 2010, approximately 282 million tons of freight worth over $900 billion was transported into, out of, within, and through the Region. Between 2010 and 2040, these freight movements are expected to increase 75 percent in terms of weight to approximately 494 million tons and 138 percent in terms of value to nearly $2.1 trillion. The breakdown of tonnage and value by direction in 2010 and 2040 is presented in Exhibit 14.

Employment in the manufacturing sectors may continue to decline but the volume of goods produced, and therefore goods that need to be shipped, will continue to rise. In 2013 the manufacturing industry contributed about $4 billion dollars in total annual wages accounting for nearly 17 percent of total income and 20 percent of private sector income in the Region. Manufacturing employment is the second largest share among private sector industries. Twelve of the Region's top 50 firms

Exhibit 14

Freight Tonnage and Value by Direction in the Genesee-Finger Lake Region, 2010 & 2040

	Tonnage		Percent Change	Value		Percent Change
Direction	2010	2040	2010-2040	2010	2040	2010-2040
Inbound	40,066,000	60,614,231	51.29%	$122,005,776,725	233,570,505,685	91%
Outbound	34,442,000	55,687,731	61.69%	$170,993,401,128	522,652,884,413	206%
Within	14,047,000	23,001,231	63.74%	$11,014,860,961	32,531,322,052	195%
Through	193,362,000	355,208,231	83.70%	$611,801,443,611	1,388,152,386,754	127%
Total	**281,917,000**	**494,512,615**	**75.41%**	**$915,815,482,424**	**2,176,907,098,904**	**138%**

Source: IHS/Global Insight VIA NYS Department of Transportation and the U.S. Department of Transportation 2010, extrapolated to 2040

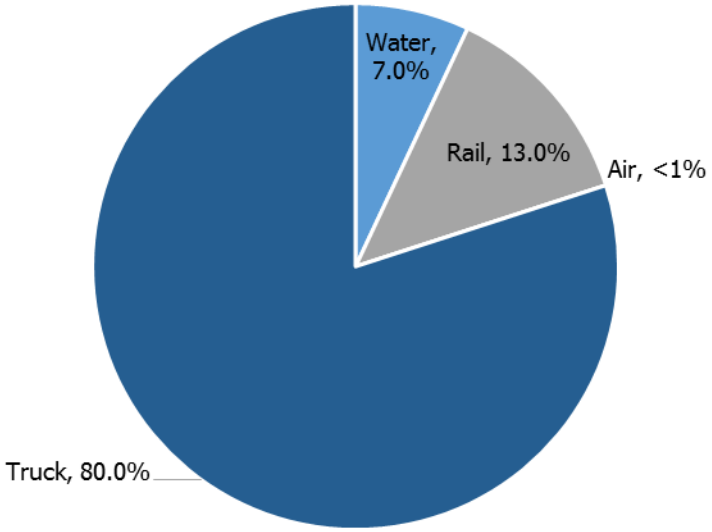
based on employment are classified as manufacturing. The Region has more persons employed in the manufacturing and supporting industries than any other large metropolitan area in Upstate New York.

How Does Freight Move in the Region?

The highway and bridge system form the foundation of the Regional freight network and carry the bulk of the freight traffic. Freight tonnage by mode in the Region for 2010 is presented in Exhibit 15. The primary mode for moving freight is truck, which accounts for over 80 percent of the tonnage transported in all directions. Thirteen percent of tonnage is transported by rail, five percent by water, and approximately one-half of one percent by air. The flexibility and accessibility that freight trucks provides to the vast majority of customers receiving raw materials, intermediate inputs, and final products will in all likelihood result in trucks continuing to be the preferred shipping mode for transporting goods.

Exhibit 15

Freight Tonnage by Mode in the Genesee-Finger Lakes Region, 2010



Source: Regional Goods Movement Strategy

Map 13 presents the Roadways with Significant Daily Truck Traffic. A roadway with significant daily truck traffic is defined as one with average daily truck traffic that is more than 20% above the regional average for a roadway segment (i.e., >=1,187 trucks per day). The findings are shown on Map 13, the Highway Trade Corridors in the Region. The trade corridors are classified as Primary Regional, Secondary Regional, and Connector based on the amount of truck traffic they carry, representing the level of access they provide to national/statewide, regional, and sub-regional markets, respectively.

The Region is located within a one-day's drive to the Greater Golden Horseshoe (home of Toronto) and the Boston-New York City -Washington mega-regions. Given the proximity to these major markets, the Region processes a high volume of through truck trips on the Interstate Highway System, particularly Interstates 90 and 390 – Primary Regional facilities.

Railroads serve as a vital component to the Regional freight network, moving high-volume and heavy weight commodities over long distances in a highly efficient manner. Railroads may not be the fastest mode but typically offer the lowest price per ton mile shipped making them the preferred shipping choice for bulk commodities (e.g., coal, paper and lumber products, chemicals, and raw agricultural products).

Three of the seven Class I railroads – those with operating revenue of $467.0 million or more in 2013 – in the United States and Canada operate in the region: CSX Transportation (CSXT), Norfolk Southern (NS) and Canadian Pacific (CP). The CSXT mainline that traverses the Region and New York State (the former Conrail Chicago Line) is the most heavily traveled of the any of the company's lines, which includes operations in 22 states. Canadian Pacific does not own any trackage in the Region but operates with an agreement on NS's Southern Tier Line allowing CP to reach additional U.S. markets. Congestion along the Class I rail corridors due to the boom in crude oil production in the Bakken Shale Fields has led not only to significant delays for passenger trains but for other heavy bulk commodities (e.g., coal, grain, and vehicles) that have traditionally relied on the railroads to provide a safe and cost effective form of transport. According to the Surface Transportation Board, America's railroads moved 415,000 rail tanker cars of crude oil in 2014 compared to just 9,500 rail tankers cars in 2008. This rapid increase in the number of tanker cars across the nation filled with violate crude oil has raised the alarm on safety and security measures along the rail line. Locally, residents have voiced concerns over the increase in crude oil tanker cars traversing through the populated communities along the CSXT mainline. Given the market volatility and the recent drop in crude prices, trains carrying oil to the coasts are estimated to be down 30 percent since their peak in December 2014.

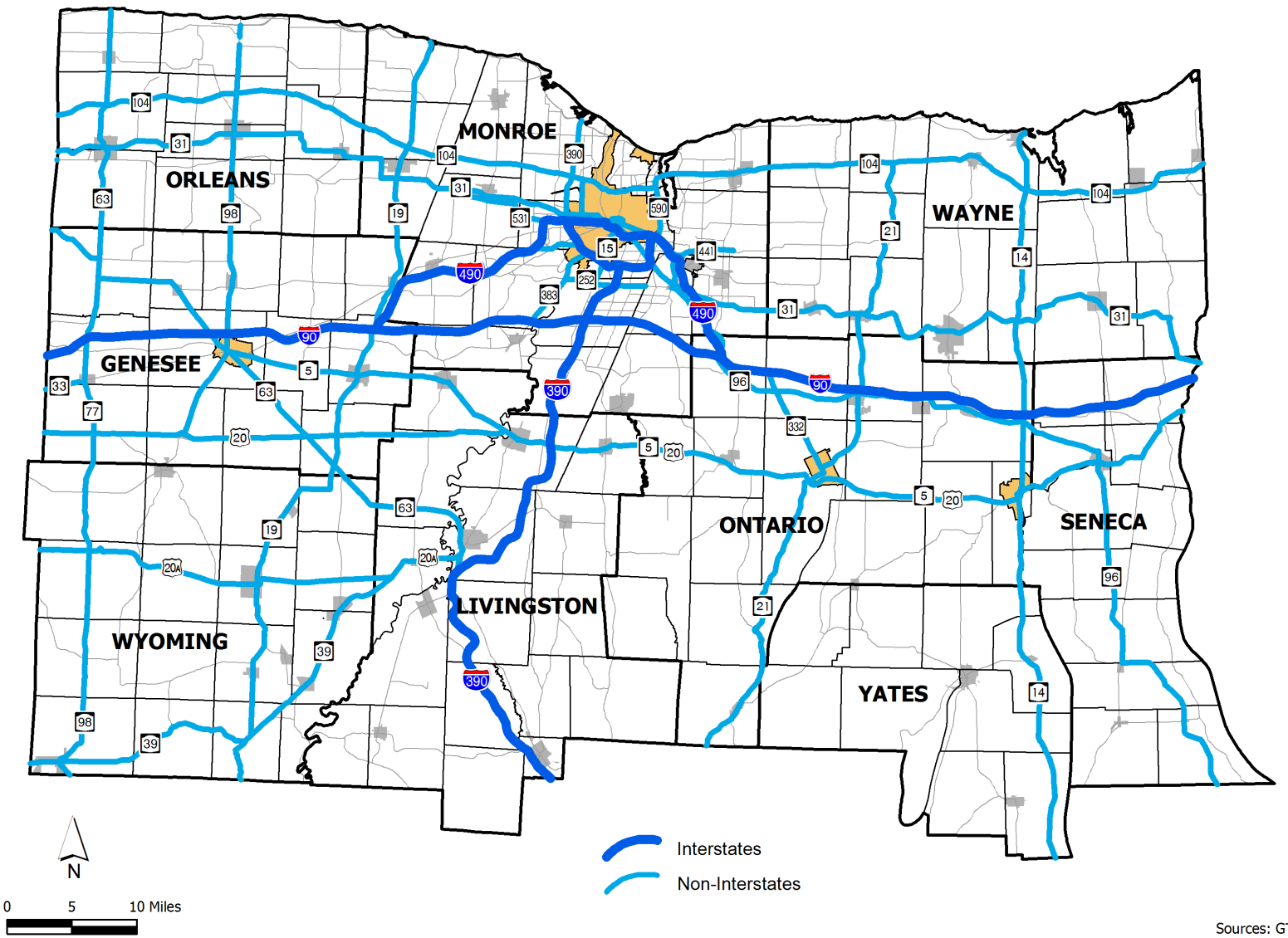
The Region is also home to nearly a dozen Class III or Shortline railroads – those with operating revenue of less than $37.4 million in 2013 – accounting for approximately one-third of the Shortlines in New York State. Map 14 presents active Class I and Class III railroads in the Region.

In addition to trucks and railroads, freight also moves via airplanes and waterborne vessels. The Greater Rochester International Airport (GRIA) is the Region's main cargo handling airport. In 2013, nearly 147,000 tons of freight landed at the GRIA. While the tonnage of freight handled via air service is minor compared to the trucks and railroads, the proportional value is significantly higher. Accordingly, air cargo capabilities comprise a vital component of the freight network that is critical to the growth of industries such as optics and imaging, and biotechnology.

The Port of Rochester was once a busy freight port but lack of direct access to major highways and the on-going revitalization of the Port as a residential and entertainment center limit its potential as a shipping facility. There are also minor freight movements along the Erie Canal but, because of varying controlling depths, major shipping activity is limited.

Regional Freight Network in the Genesee-Finger Lakes Region

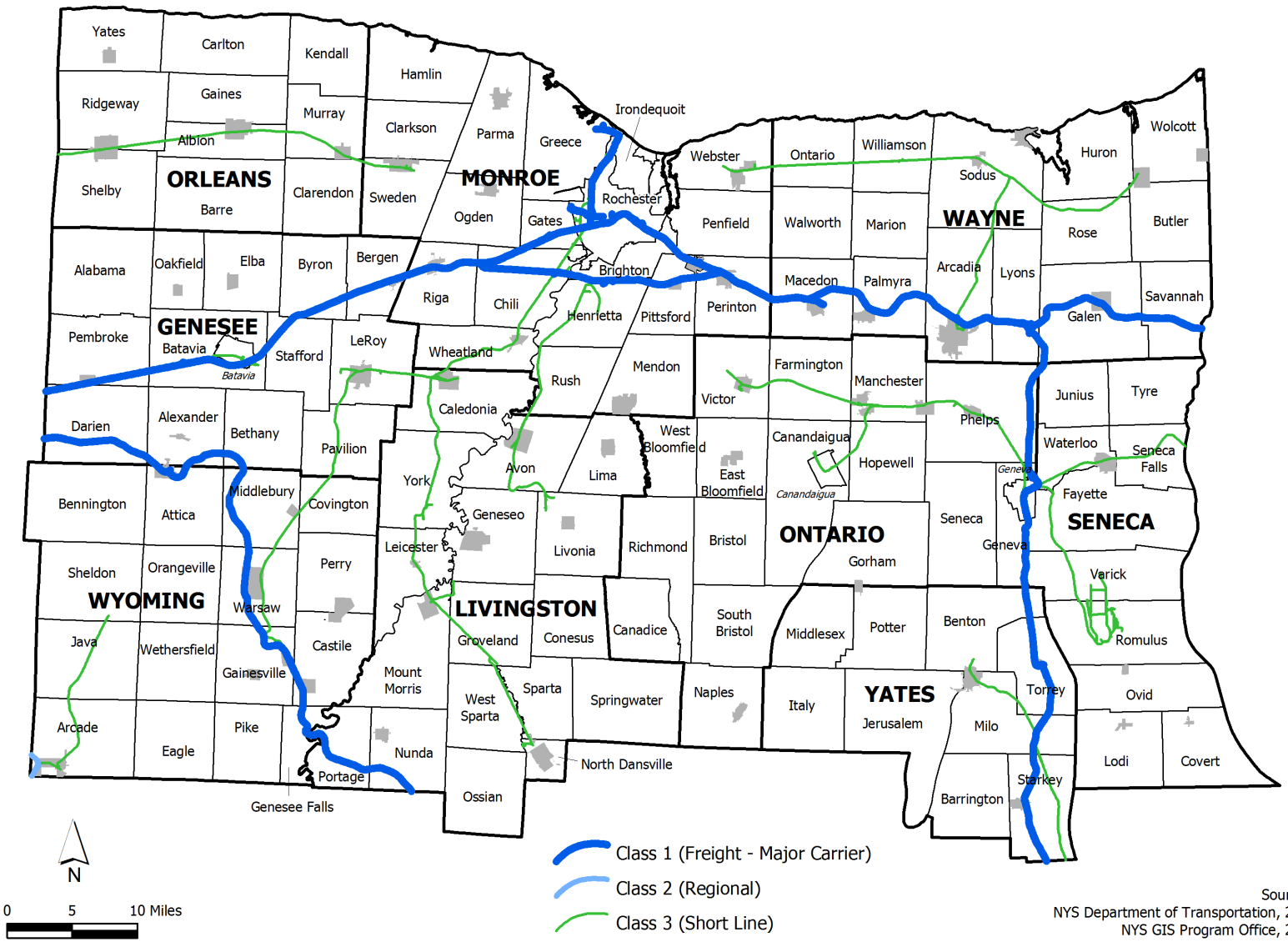
Map 13



Sources: GTC, 2015
NYS GIS Program Office, 2015

Railroads in the Genesee-Finger Lakes Region

Map 14



Sources:
NYS Department of Transportation, 2010
NYS GIS Program Office, 2015

Regional Goods Movement Strategy

Recognizing freight transportation's role in sustaining and spurring economic development, GTC and NYSDOT, in cooperation with their partners, completed the *Transportation Strategies for Freight and Goods Movement in the Genesee-Finger Lakes Region* (Regional Goods Movement Strategy), in the fall of 2012. The vitality of the freight transportation system is an important factor when retaining and attracting new manufacturing firms and agriculture industrial facilities to the Region.

The Regional Goods Movement Strategy had three primary objectives:

1. To develop freight strategies that will position the region's transportation system as a distinguishing factor in retaining and attracting both traditional and emerging-technology manufacturing firms as well as enhancing the viability of agriculture;
2. Establish relationships between GTC and the business community that will endure beyond the completion of the project; and
3. Help educate the public and key stakeholders in the region about the importance of freight transportation.

The Regional Goods Movement Strategy began with a comprehensive Regional Freight and Economic Profile summarizing the key trends and issues regarding population, employment, and freight movement in the Region. Extensive stakeholder outreach and a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis was conducted to form the Needs Assessment that directly aligned with the goals and objectives of the *LRTP 2035*. Prioritization of the Needs Assessment led to the development of 35 Near-Term, Medium-Term and, Long-Term Recommendations. Policies, strategies, and specific projects are discussed in the Recommendations Chapter. These recommendations have been fully incorporated into *LRTP 2040*.

Interregional Travel

Regions that are well connected offer easy access to and from neighboring cities, states, and international destinations. Enhancing accessibility offers greater economic development opportunities for freight, businesses, and tourism. Current residents benefit by being able to work and play far beyond Regional boundaries.

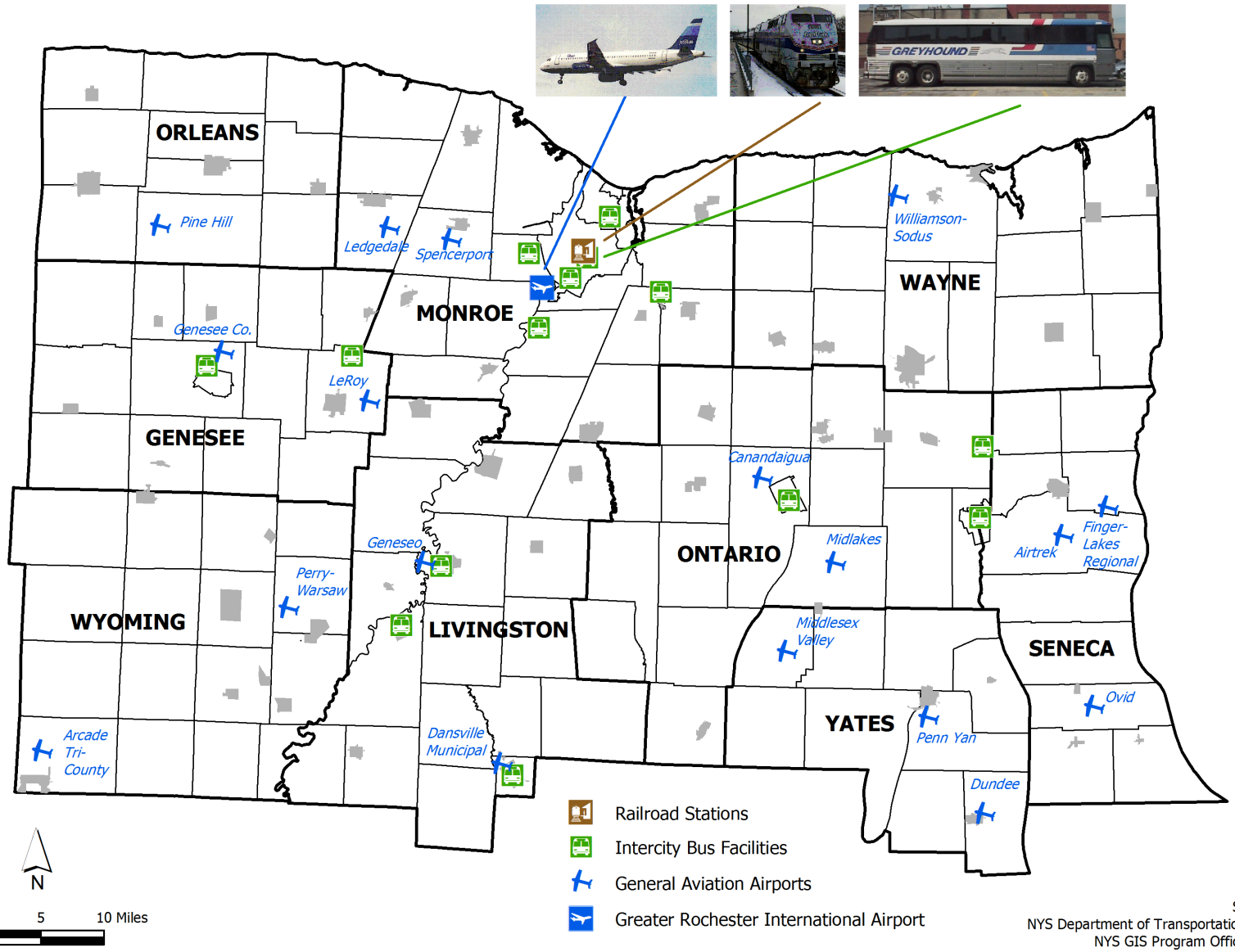
Interregional travel is provided through air, bus, and passenger rail services, as shown in Map 15. Providing connections to these services via the highway and bridge network, and the public transportation system ensures the public can reach destinations outside the Region with ease.

The GRIA is served by seven major commercial airlines offering 120 flights a day to over 17 destinations. According to the Federal Aviation Administration in 2013, over 1.2 million passengers boarded a plane GRIA. Since 2009 the number of passengers boarding a plane at GRIA (i.e., enplanements) have decreased by 5 percent.

Public transportation to the airport, through RTS, to downtown Rochester and the subsequent intercity bus and passenger rail services is available directly in front of the GRIA grounds. Presently RTS does not provide direct access to the passenger arrivals and departures drop-off facilities at GRIA. In addition to GRIA, there are 19 public-use airports in the Region that are designated as General Aviation airports. General Aviation airports serve all civil aircraft that are not classified as air carrier, commuter, or military. Five of the General Aviation airports are Reliever airports that reduce traffic at Commercial Service airports such GRIA by providing service for smaller aircraft.

Interregional Transportation Facilities in the Genesee-Finger Lakes Region

Map 15



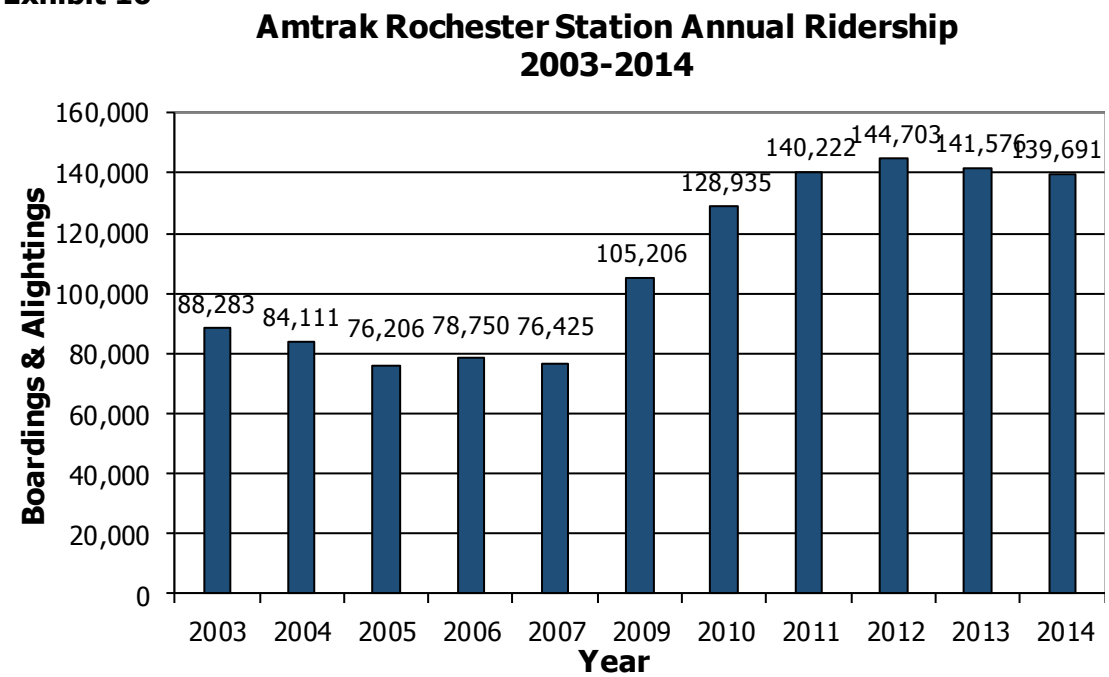
Sources:
NYS Department of Transportation, 2015
NYS GIS Program Office, 2015

Amtrak provides passenger rail service to Rochester via nine trains per day on its Empire Service (New York City to Niagara Falls), Lakeshore Limited (New York City/Boston to Chicago), and Maple Leaf (New York City to Toronto) routes. Overall Amtrak ridership in Rochester, as measured by passenger boardings and alightings, has increased approximately 37 percent since 2003. Although, for 2013 and 2014 ridership has been slightly tapering off as shown in Exhibit 16. Amtrak operates trains on the CSX Transportation (CSXT) railroad's mainline and must yield the right-of-way to CSXT traffic. The railroad typically operates 70-80 trains per day along the mainline. According to Amtrak, on-time performance along the Empire Service corridor was 78.4 percent with the majority of delays attributed to CSXT interference. Uncertainty surrounding the performance of passenger rail service may push riders to other more reliable modes of travel, if not rectified over the long term.

Seeking to increase ridership and update the current defunct Amtrak Station, the City of Rochester in partnership with the NYSDOT secured federal funding through the USDOT's National Infrastructure Investments Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant to construct a new Intermodal Transportation Center in Rochester.

The recently demolished Amtrak Station, built in 1978 as a temporary facility, lacked ADA accommodations and was in dire need of repairs. Phase one of the new project is fully funded at $29.5 million. This funding includes upgrades to the tracks, better access to boarding platforms, and construction of a fully ADA compliant facility. Construction of the new Intermodal Transportation Center began in October 2014 and is expected to be fully operational in 2017. Ridership is projected to increase as a result of these upgrades as has been the case with other station enhancements around the country.

Exhibit 16



Rendering of the Rochester Intermodal Transportation Center

Source: TIGER Application

The City of Rochester and NYSDOT are actively working to advance and secure funding for Phase 2 of the Intermodal Transportation Center. Phase 2 will provide customer direct access to interregional bus service providers, allowing a seamless travel experience along with new circulation and parking components.

In 2011, the current downtown Greyhound/Trailways Bus Station located directly across from the existing Amtrak Station handled over 220,000 boardings and alightings. In addition to the downtown Rochester terminal, there are eleven other locations in the Region where residents and visitors may access the Greyhound Lines or New York Trailways bus services. Megabus, a discount interregional bus operator, provides service from downtown Rochester to four destinations in New York State along with Toronto, Ontario.

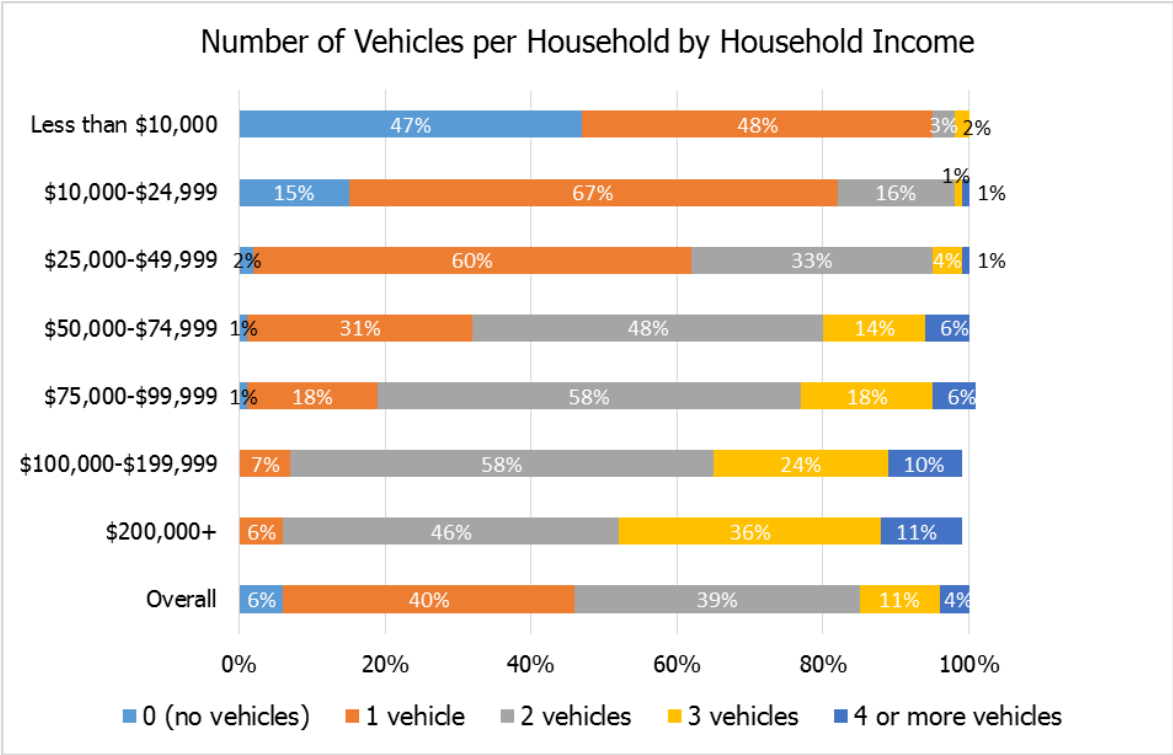
Travel Characteristics

The travel characteristics of the Region's residents are determined by where they live and where they need and want to go. Several data sources are regularly utilized to obtain and analyze such travel information, including Census Transportation Planning Products (CTPP), National Household Travel Surveys (NHTS), and local/regional household travel surveys.

GTC commissioned a household travel survey covering the Rochester MPA in 2011 (*2011 Rochester Area Transportation Study*) – a previous survey was conducted in 1993. Between 1993 and 2011, the total number of households in the MPA rose from 300,321 to 334,127 – an increase of 11 percent. Because only a small, representative sample of households are included in both surveys, expansion factors are applied to the responses to estimate overall travel characteristics of MPA residents. Based on the surveys, the total number of daily (weekday) trips in the MPA for individuals age 16 and older rose from 1,988,000 in 1993 to 2,488,564 in 2011 – an increase of 25 percent.

The number of cars owned per household in the MPA also increased between 1993 and 2011. The proportion of zero-vehicle households decreased from approximately 12 percent to 6 percent; and the proportion of one-vehicle households increased from approximately 35 percent to 40 percent. There were also slight increases in the proportions of two- and three-vehicle households. Perhaps not surprisingly, there is a strong correlation between the number of vehicles per household and household income, as shown in Exhibit 17.

Exhibit 17



This relationship can be attributed to a variety of possible factors including: lower income households are unable to afford a car or are located in areas with alternative transportation options; smaller households with fewer income-earning members do not have the need to own multiple cars; or households with higher income have more income-earning members who need access to a vehicle.

In addition to more cars on the road, people are also making more and longer trips. The average daily person trips per household rose from 6.9 in 1993 to 7.7 in 2011. The average length of a trip increased from 5.4 miles in 1993 to 6.1 miles in 2011.

According to the 2011 survey, work-related trips (i.e., those made to earn a living) accounted for nearly 37 percent of all person trips. Approximately 32 percent of person trips were for family and personal business (e.g., shopping, health care visits, etc.). Trips made for social and recreational purposes (e.g., visit friends and relatives, take vacation, etc.) made up approximately 11 percent of all person trips. A breakdown of trips by purpose is presented in Exhibit 18.

Because many work-related trips are made during the same weekday morning and evening hours, they result in weekday "peak" travel periods which account for the most intense use of the transportation system. Exhibit 19 shows the Time of Day Distribution for all trip purposes in the Rochester MPA as estimated using the *2011 Rochester Area Transportation Study.*

Exhibit 18

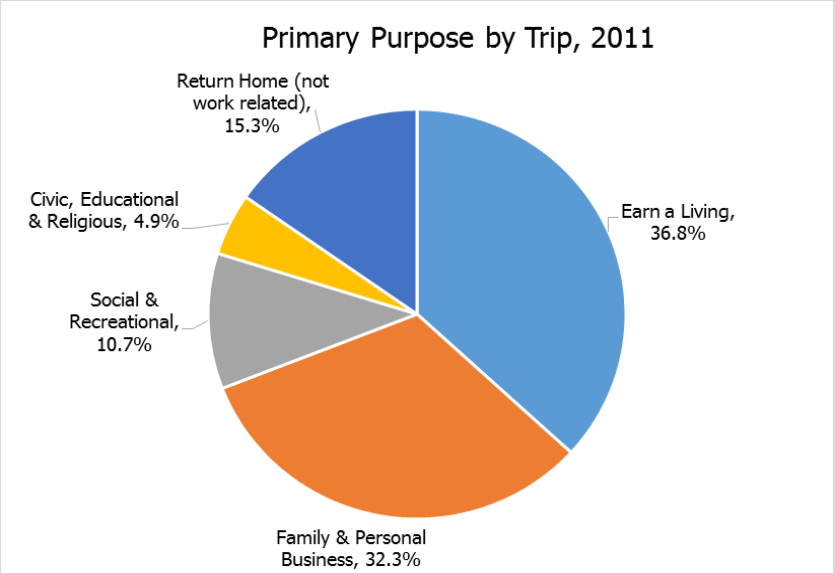
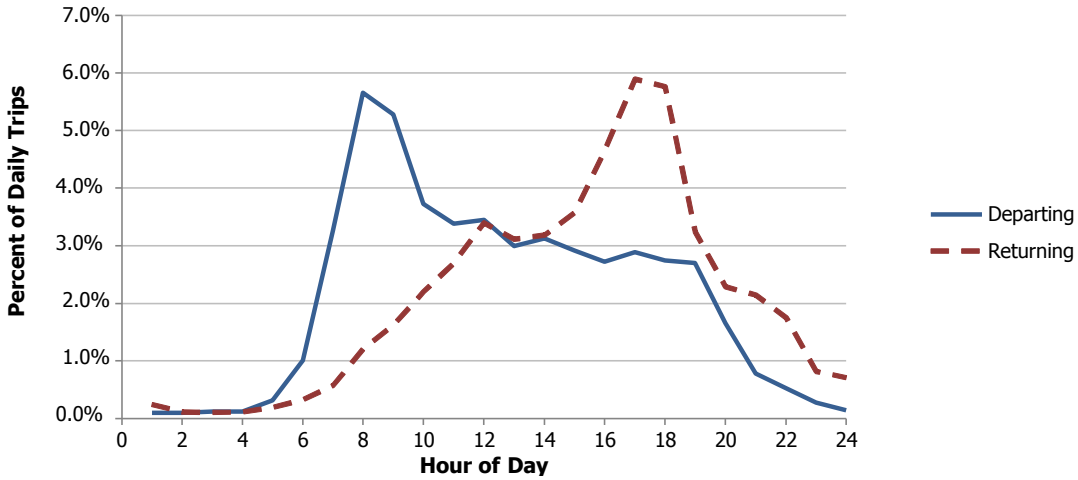


Exhibit 19

Time of Day Distribution – All Trip Purposes



The vast majority of person trips in the MPA in 2011 were made by private vehicle at 92 percent – down slightly from approximately 95 percent in 1993 (these percentages, derived from GTC household surveys, are consistent with 2010 and 2000 CTPP 5-year trend data: 89 and 91 percent respectively). The share of public bus trips remained unchanged between 1993 and 2011 at nearly two percent; while the share of walking and/or bicycling trips increased from approximately three percent to six percent (five percent walking; one percent bicycling).

The small overall proportion of trips made by modes other than the private vehicle, however, obscures the importance of alternative modes to lower-income individuals as shown in Exhibit 20.

According to the *2011 Rochester Area Transportation Study*, trips by seniors (ages 65 and over) are made almost exclusively by private vehicle, 95 percent, and their primary trip purpose is family and personal business, 71 percent. It is anticipated that seniors will continue to choose private vehicles as their preferred method for mobility but the increase in their overall numbers will require additional public transportation services.

The 2014 American Community Survey (ACS) 5-year estimate data show that very little has changed since Census 2000 in terms of how people travel to and from work – 90 percent of workers either drive alone or carpool to their place of employment. Exhibit 21 presents the means of transportation to work by employed persons residing in the Region.

Exhibit 20

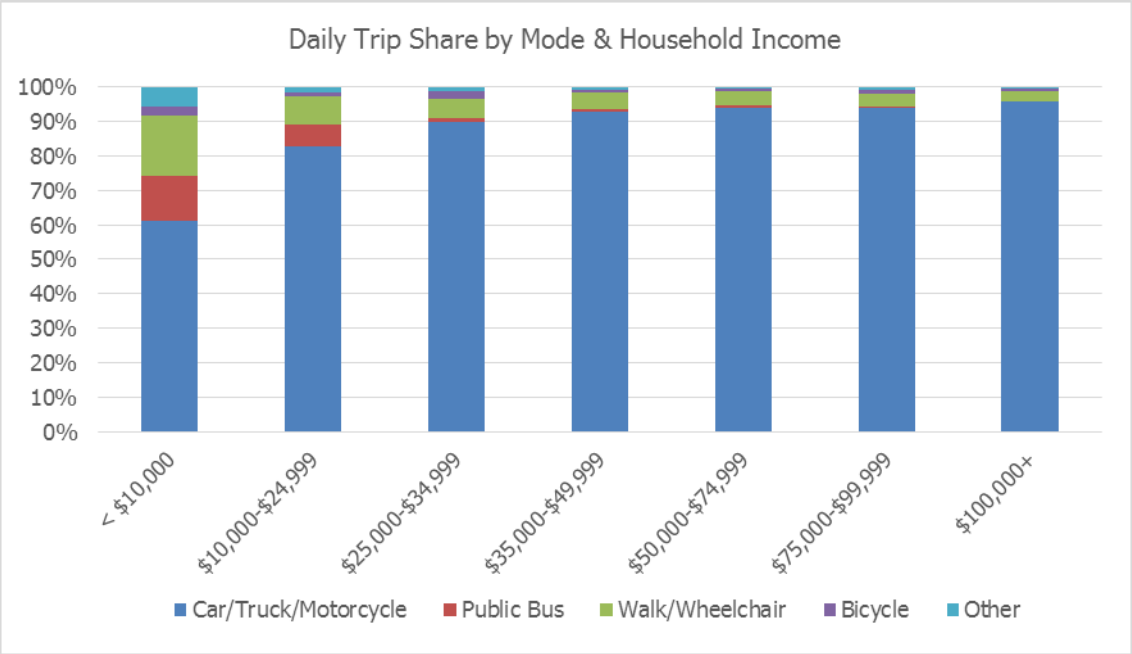
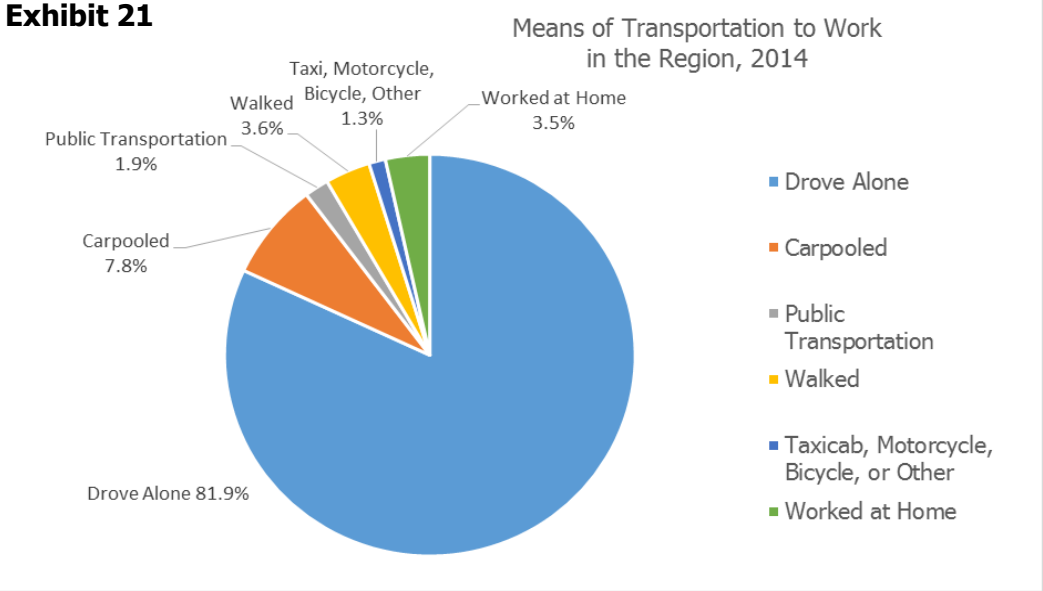
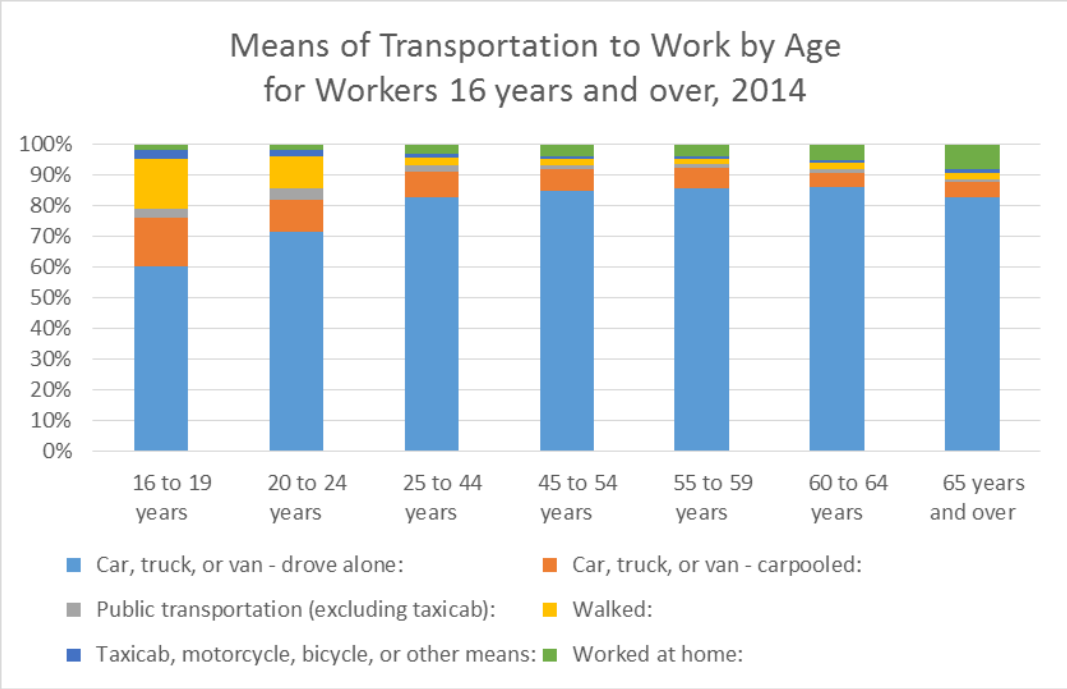


Exhibit 21



There is also a strong correlation between age and the means of transportation used to get to work. According to the 2014 ACS 5 -year estimates for the Region, while individuals ages 25 to 44 make up the majority of workers utilizing all modes, workers ages 16 to 24 are much more likely than their older counterparts to use modes other than the single-occupancy vehicle, as shown in Exhibit 22. Additionally, as workers age, working at/from home becomes more prevalent.

Exhibit 22



Travel Patterns

Many people live in one community and work in another. To measure the impact of this on the transportation system, we can look at daytime population. In places with higher concentrations of businesses, we expect the daytime population to increase while in places with lower concentrations of businesses, we expect the daytime population to decrease. The 2010 ACS 5-year includes data on Daytime Population by Town. Daytime population is an important consideration as communities with more businesses must accommodate an influx of people and increased traffic during peak periods.

In terms of county to county workflows in the Region, the 2013 ACS 5-year estimate data show only slight variation since 1990. Monroe County continues to have the highest percentage of residents who work in their county of residence at 95 percent.

Exhibit 23 shows places with a 15 percent or more increase in the daytime population. The community with the greatest net increase in daytime population is the City of Rochester with a gain of 72,486 people. The community with the largest percentage increase in daytime population is the Town of Henrietta with a gain of 47.4 percent.

Exhibit 23

Places with 15 Percent or More Increase in Daytime Population

Municipality	# Increase	% Increase
Albion town	2,450	28.3
Arcade town	1,202	28.6
Batavia city	4,094	26.3
Canandaigua city	3,682	34.5
Geneva city	2,943	22.1
Henrietta town	19,924	47.4
Lyons town	880	15.4
Rochester city	72,486	34.2
Victor town	4,314	32.1
Warsaw town	885	17.2

Some communities serve primarily as residential. Daytime population is an important consideration as communities with fewer businesses must accommodate the needs of residents without a broad tax base to support their budgets. Exhibit 24 shows places with a 15 percent or more decrease in the daytime population. The community with the largest net decrease in daytime population is the Town of Greece with a loss of 18,304 people. The community with the largest percentage decrease in daytime population is the Town of Walworth with a loss of 42.4 percent.

Exhibit 24

Places with 15 Percent or More Decrease in Daytime Population

Municipality	# Decrease	% Decrease
Canandaigua town	-1,474	-15.4
Chili town	-4,592	-16.2
Clarkson town	-1,917	-29.1
Farmington town	-2,424	-20.9
Greece town	-18,304	-19.2
Hamlin town	-3,368	-37.1
Irondequoit town	-12,892	-25.0
Livonia town	-1,830	-23.6
Ogden town	-4,216	-21.6
Ontario town	-2,183	-21.7
Palmyra town	-1,545	-19.5
Parma town	-4,825	-31.3
Penfield town	-5,524	-15.4
Phelps town	-1,275	-18.1
Riga town	-1,122	-20.3
Sodus town	-1,617	-19.1
Walworth town	-3,929	-42.4

Many communities also have residents who work in that same community. People that live and work in the same community have shorter commutes and greater potential to commute to work using an alternative to the single occupant vehicle. Communities with a higher concentration of residents working in the same community have are more likely to have a balanced tax base to support their budgets.

Exhibit 25 shows places with a 40 percent or more resident workers employed in the same place in which they live. The community with the greatest number and percent of resident workers employed therein is the City of Rochester with 49,326 and 58.1 percent, respectively.

Exhibit 25

Places with 40 Percent or More Residents Working in that Place

Municipality	Total Number of Working Residents	Number of Residents Working in Municipality	Percent of Residents Working in Municipality
Albion town	2,768	1,220	44.1
Arcadia town	6,968	3,051	43.8
Batavia city	6,577	3,463	52.7
Geneseo town	4,146	2,007	48.4
Geneva city	5,815	3,055	52.5
Milo town	3,026	1,431	47.3
North Dansville town	2,405	1,214	50.5
Rochester city	84,878	49,326	58.1
Warsaw town	2,300	1,204	52.3

Exhibit 26 shows places with a 20 percent or less resident workers employed in the same place in which they live. The community with the lowest number of resident workers employed in the same place is the Town of Clarkson with 253. The community with the lowest percentage of resident workers employed in the same place is the Town of Walworth with 7.9 percent.

Exhibit 26

Places with 20 Percent or Less Residents Working in that Place

Municipality	Total Number of Working Residents	Number of Residents Working in Municipality	Percent of Residents Working in Municipality
Batavia town	3,738	483	12.9
Brighton town	17,299	2,948	17.0
Canandaigua town	4,630	686	14.8
Chili town	14,627	2,313	15.8
Clarkson town	3,178	253	8.0
East Rochester	3,255	536	16.5
Farmington town	6,096	1,094	17.9
Gates town	13,529	2,127	15.7
Hamlin town	4,372	476	10.9
Irondequoit town	24,829	3,823	15.4
Macedon town	4,706	743	15.8
Ogden town	9,795	1,442	14.7
Ontario town	5,418	1,078	19.9
Parma town	7,535	1,128	15.0
Penfield town	17,440	2,738	15.7
Phelps town	3,799	742	19.5
Riga town	2,871	293	10.2
Walworth town	4,761	378	7.9
Wheatland town	2,575	375	14.6

Congestion Management Process

The Congestion Mitigation Process (CMP) is a systematic approach to managing traffic congestion that provides accurate, up-to-date information on transportation system performance regarding congestion and an assessment of strategies to address it. Congestion management is the application of strategies to improve efficiency and reliability by reducing the adverse impacts of congestion, on the movement of people and goods. Even though the Region enjoys relatively low levels of congestion, the management of congestion is important because excessive travel delay has adverse safety, environmental, and economic impacts, causing increases in travel times, fuel consumption, vehicle emissions, and emergency response times, as well as lost productivity.

The USDOT requires that metropolitan areas with a population greater than 200,000 people, known as Transportation Management Areas, maintain a CMP to:

- monitor and evaluate transportation system performance;
- identify alternative congestion mitigation actions;
- assess and implement cost-effective congestion mitigation actions; and
- evaluate the effectiveness of the implemented actions.

The objective of the GTC CMP is to provide practical tools to identify and implement strategies that improve the mobility of people and freight, emphasizing coordinated corridor-level and region-wide solutions that mitigate existing sources and avoid the creation of future sources of congestion that result in excess delay.

The GTC CMP identifies congested road segments with the Travel Time Index (TTI), a measurement of travel delay. The TTI is the ratio of travel time during the peak period to the time required to make the same trip at free-flow speeds. It is calculated by dividing the peak period travel time by the free-flow travel time. A TTI value of 1.3, for example, indicates that a 20-minute trip in free-flow conditions requires 26 minutes during the peak period. A road segment with a TTI of 1.25 or greater is considered congested.

According to the GTC CMP, travel delay may fall into one of the following three categories:

1. Recurring Capacity Related Delay is the predictable daily increase in demand for road space that exceeds available capacity. This type of delay is typically caused by commuters during morning and evening peak periods. It may also occur in urban and village centers as a result of demand for access to economic activities in those areas. In addition, seasonal traffic patterns such as increased traffic around regional retail during the holiday shopping season and at university campuses when students arrive and depart for the semester also contribute to recurring delay. Typical impacts include increased travel times, driver frustration, fuel consumption, vehicle emissions, and emergency response times.

   The following Congestion Scale was developed as a tool to categorize congested road segments by ranking them according to TTI and to the degree they are impacted by Recurring Capacity Related Delay:

Congestion Scale for Recurring Capacity Related Delay				
Delay			Excess Delay	
Minimal Congestion	Minor Congestion	Moderate Congestion	Congestion	Severe Congestion
<1.00	1.01-1.14	1.15-1.24	1.25-1.99	2.00>

Recurring Capacity-Related Delay typically occurs at "bottlenecks" in the transportation system, such as the approaches to and within expressway interchanges or intersections, where demand for road space is greater than the intersection's capacity to handle that demand. Map 16 shows congested locations during the morning peak period (7:00 a.m. – 9:00 a.m.) and Map 17 shows the congested locations during the evening peak period (4:00 p.m. – 6:00 p.m.) both color coded to match the congestion scale.

2. Planned Event Related Delay includes planned events and scheduled activities that can cause delay. This includes programmed construction work that reduces roadway capacity and special events such as concerts, festivals, and sports games that occur and place a greater demand on the roads around those venues. Planned Event Related delays occur in the vicinity of the MPA's special event venues, including: stadiums, theatres, and performing arts centers; parks and fairgrounds; and college campuses. In addition, planned events include scheduled road work in designated work zones. Typical impacts include increased travel times, fuel consumption, vehicle emissions, and emergency response times. In addition, this type of delay may restrict access to special event venues. Like Recurring Capacity-Related Delay, this type of delay decreases the efficiency, reliability, and safety of the transportation system.

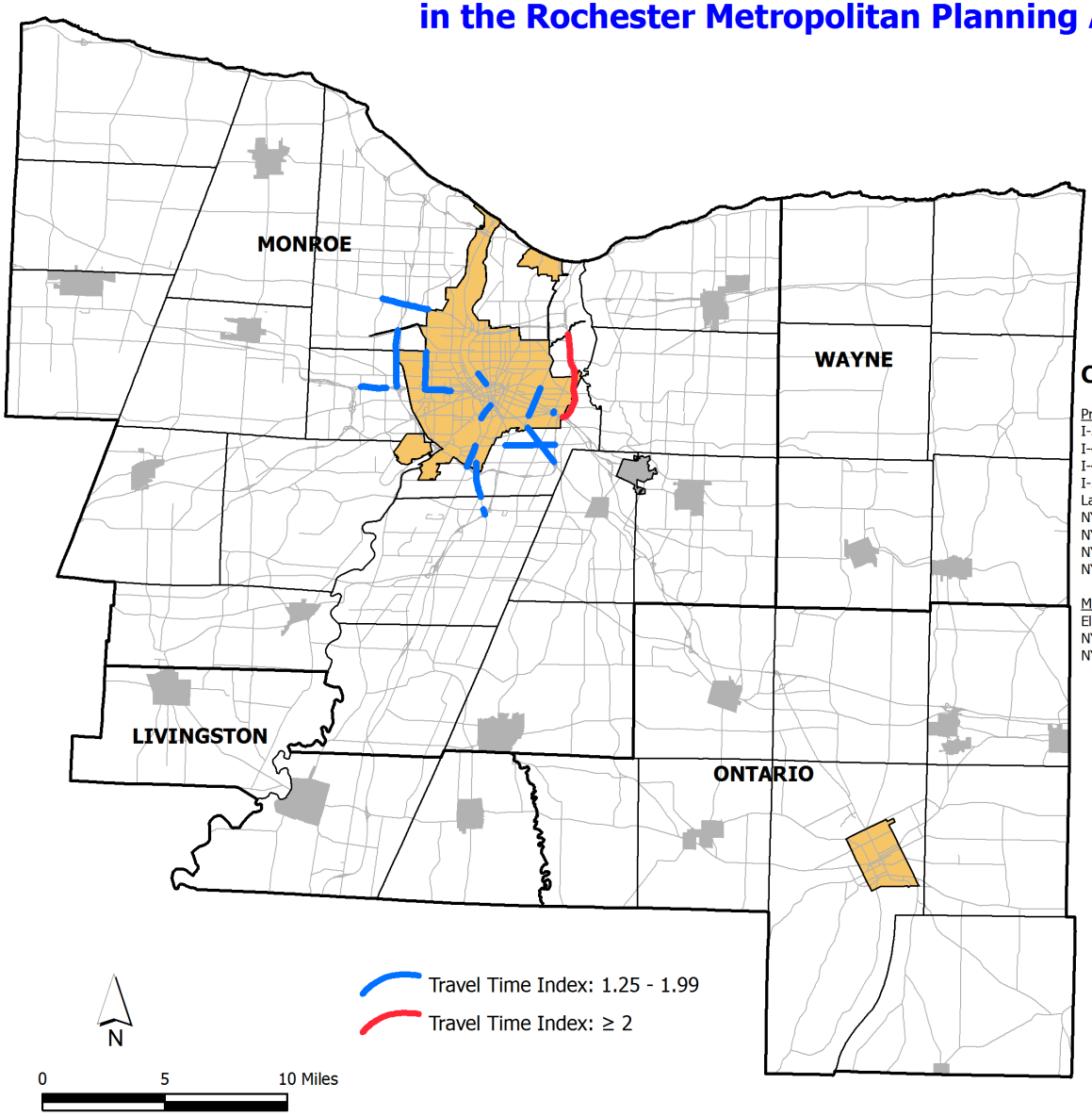
3. Non-Recurring Incident Related Delay occurs as the result of traffic incidents that block travel lanes or cause road closures. Incident related delay may range from a few minutes for a minor vehicle crash to a long-term closure, such as a hazardous materials spill.

   Due to its unpredictable nature, this type of delay is the most disruptive and frustrating for travelers. Recurring congestion can be factored into trip planning, but there is no way to anticipate the location or duration of incident related delay. This is especially true for incidents that occur during peak periods on roads that already experience Recurring Capacity Related Delay. The combination of these two delay types may have serious impacts on travel times, causing significant disruption.

   Like the other types of delay, typical impacts of Non-Recurring Incident Related Delay include increased travel times and fuel consumption, as well as uncertainty about when travelers and freight will arrive at their destinations. This type of delay increases the risk of secondary incidents, which are incidents that occur as a direct result of the disruptions caused by a primary incident. These impacts collectively decrease the safety, efficiency, and reliability of the transportation system by imposing additional costs and uncertainties on system users.

Congested Links in the Morning Peak Period in the Rochester Metropolitan Planning Area

Map 16



Congested Links (Travel Time Index ≥ 1.3)

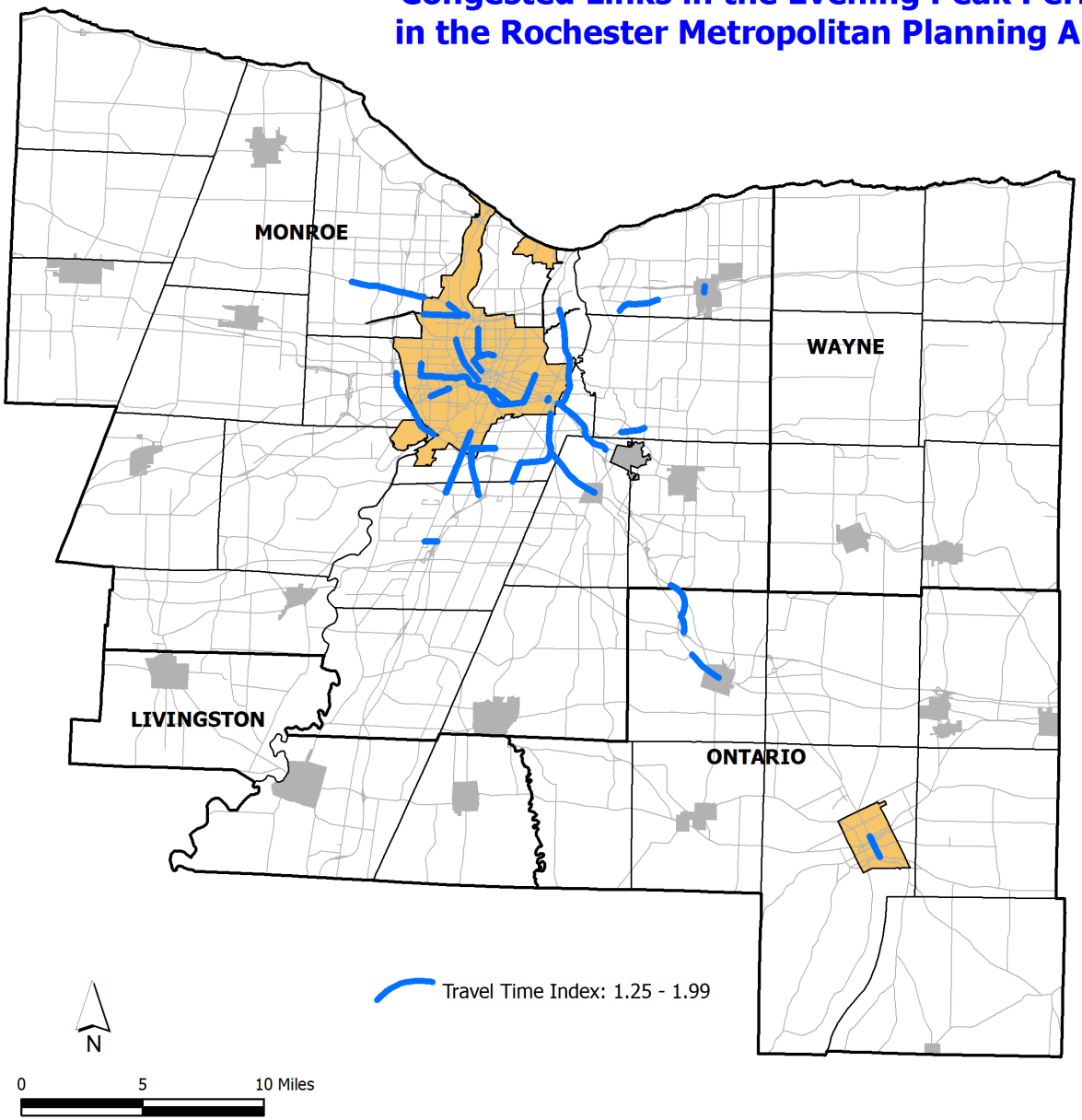
Principal Arterials
I-390 - Southbound from Exit 22, Lexington Ave to Exit 17, Scottsville Rd.
I-490 - Eastbound from Exit 7, Buffalo Rd. to Exit 10, Mount Read Blvd.
I-490 - Westbound from I-590 Split to Exit 17, South Goodman St.
I-590 - Southbound from Exit 11, East Ridge Rd. to Exit 6, Blossom Rd.
Lake Ave. - Southbound from NYS Rt. 104 / West Ridge Rd. to Lyell Ave.
NYS Route 104 - Eastbound from I-390 to Lake Ave., Rochester
NYS Route 204 / Chili Ave. / Brooks Ave. - Eastbound from I-490 to I-390
NYS Route 204 / Chili Ave. / Brooks Ave. - Westbound from I-390 to I-490
NYS Route 441 - Westbound from NYS Rt. 250 to I-490

Minor Arterials & Collectors
Elmwood Ave. - Westbound from Clinton Ave. to NYS Route 383
NYS Route 31 - Eastbound from Highland Ave. to Elmwood Ave.
NYS Route 31 - Westbound from I-490, Exit 26 to French Rd.

Sources: INRIX © 2015
NYS GIS Program Office, 2015

Congested Links in the Evening Peak Period in the Rochester Metropolitan Planning Area

Map 17



Congested Links (Travel Time Index ≥ 1.3)

Principal Arterials
I-390 - Southbound from Exit 22, Lexington Ave to Exit 17, Scottsville Rd.
I-490 - Eastbound from Exit 7, Buffalo Rd. to Exit 10, Mount Read Blvd.
I-490 - Westbound from I-590 Split to Exit 17, South Goodman St.
I-590 - Southbound from Exit 11, East Ridge Rd. to Exit 6, Blossom Rd.
Lake Ave. - Southbound from NYS Rt. 104 / West Ridge Rd. to Lyell Ave.
NYS Route 104 - Eastbound from I-390 to Lake Ave., Rochester
NYS Route 204 / Chili Ave. / Brooks Ave. - Eastbound from I-490 to I-390
NYS Route 204 / Chili Ave. / Brooks Ave. - Westbound from I-390 to I-490
NYS Route 441 - Westbound from NYS Rt. 250 to I-490

Minor Arterials & Collectors
Elmwood Ave. - Westbound from Clinton Ave. to NYS Route 383
NYS Route 31 - Eastbound from Highland Ave. to Elmwood Ave.
NYS Route 31 - Westbound from I-490, Exit 26 to French Rd.

Sources: INRIX © 2015
NYS GIS Program Office, 2015

Congestion Mitigation Strategies

Exhibit 27 presents congestion mitigation strategies that can be applied to each of the three types of congestion as a means of reducing delay and improving travel time reliability.

Exhibit 27

Recurring Capacity Related	Planned Event Related	Non-Recurring Incident Related
Supply-Driven Strategies		
Advanced Parking Management	Advanced Parking Management	Traffic Incident Management
Traffic Signal Coordination	Traffic Signal Coordination	Traffic Signal Coordination
Multi-Modal Traveler Information Systems	Multi-Modal Traveler Information Systems	Multi-Modal Traveler Information Systems
Roadway Monitoring and Management	Roadway Monitoring and Management	Roadway Monitoring and Management
Intersection/Interchange Improvements	Traffic Enforcement	Traffic Enforcement
Access Management	Reversible Traffic Lanes	Work Zone Management
Bicycle and Pedestrian Networks	Temporary Lane Restrictions and Turn Prohibitions	Temporary Lane Restrictions and Turn Prohibitions
Expanded Public Transportation Services	Work Zone Management	
Ramp Metering		
Transit Signal Priority		
Demand-Driven Strategies		
Transit-Supportive Development	Alternate Modes of Transportation	
Alternative Modes of Transportation		
Alternative Hours to Travel		
Alternative Workplace Locations		

*definitions for the strategies listed above may be found in the CMP Technical Documentation at www.gtcmpo.org

Reliability

Travel Time Reliability is a measure of the amount of congestion users of the transportation system experience at a given place and time. Reliable travel times are important because they provide system users with a degree of certainty regarding the length of time a trip will take. This allows users to build travel times into their schedules and know that, on a given road at given times, they will be able to reach their destinations within a specified timeframe. Businesses benefit from reliable travel times through consistent freight deliveries and pick-ups. Regardless of the mode of transportation used for these activities, reliable travel times provide businesses with a consistent schedule to build their operations around. Reliability is less about the amount of traffic and more about consistency from day to day.

Transportation Systems Management and Operations

TSMO is an integrated program to optimize the performance of existing transportation infrastructure through the implementation of systems, services, and projects designed to preserve capacity and improve safety, efficiency, and reliability. TSMO initiatives emphasize dynamic, real-time management of the transportation system and offer cost-effective alternatives to traditional capacity expansion through the addition of new travel lanes, whether through the construction of new roads or the widening of existing ones.

TSMO-supportive initiatives can be grouped into one or more of the following three categories:

- Technology – Intelligent Transportation Systems (ITS) provide the technical tools needed to manage and operate transportation assets. ITS field instruments (see Call-Out Box on page 85) are deployed in strategic locations;
- Coordination – Multi-modal and multi-jurisdictional interagency coordination initiatives that maximize the efficiency of ITS operations and service delivery; and
- Demand – Real-time travel information is provided to help motorists, transit passengers, freight carriers, and others make informed decisions about where, when, and how to use the transportation system.

Initiatives in all three categories are implemented in accordance with recommendations in the *Intelligent Transportation Systems Strategic Plan for Greater Rochester*, which establishes the strategic direction for TSMO initiatives and ITS deployments in the Greater Rochester area. The Technology and Coordination categories address supply (i.e., how the transportation system is managed and operated) while the Demand category addresses use (i.e., what are community expectations for use of the transportation system).

Benefits of TSMO initiatives can be grouped into one or more of the following three categories:

- Improved Mobility: Mobility is the ability of people and freight to reach their destinations. TSMO improves personal mobility by providing travelers with information they can use both before and during a trip to determine the optimal way to reach a destination. TSMO improves freight mobility by enhancing the efficiency of freight operations and provides up-to-date information on the status of shipments.
- Increased Safety and Security: TSMO improves emergency response by enabling faster incident detection, verification, response, and clearance. In addition, notification of an incident can be broadcast to the public, which gives drivers the option of using a different route to avoid delay at the incident scene.
- Reduced Costs: TSMO initiatives generate many financial benefits for individuals, businesses, and governments. Individuals benefit from fuel and time savings. Businesses benefit from reduced freight delivery costs, as well as more efficient dispatching and routing services. Governments benefit from the relatively low implementation costs of TSMO initiatives.

Intelligent Transportation Systems and Services

Examples of Intelligent Transportation Systems and Services currently deployed in the Region in support of TSMO initiatives include, but are not limited to:

- 511ny: NYSDOT maintains and regularly updates the 511ny website, which is New York State's official traffic and travel information source. Real-time information about traffic conditions, as well as trip planning resources, construction updates, and other pertinent information are available on this website.
- Automatic Vehicle Location (AVL): AVL technology enables fleet managers to monitor vehicle operations through the use of a Global Positioning System (GPS). The GPS allows fleet operators to track vehicle locations and dispatch vehicles in real-time.
- Closed Circuit Television (CCTV) Traffic Cameras: Strategically placed traffic cameras provide operators and the public with real-time images of road conditions.
- Coordinated Traffic Signal Operations: Remote-controlled traffic signals allow operators to set signal timing plans that maximize the efficiency of traffic flow during normal operating conditions and adjust signal timing to lessen the impacts of delay on traffic flow.
- Dynamic Message Signs (DMS): A DMS is an electronic sign that displays alerts to motorists regarding travel conditions. A DMS can either be installed permanently or portable so that it can be moved from one site to another.
- Highway Advisory Radio (HAR): NYSDOT and the New York State Thruway Authority broadcast travel updates over their HAR systems. The broadcasts, provide real-time information on incidents, road closures, traffic congestion, and other conditions that might impact travel.
- Highway Emergency Local Patrol (HELP) Program: HELP trucks patrol four designated patrol areas, or "beats", on the region's expressways during the morning and evening peak periods. They respond to incidents ranging from disabled vehicles to major crashes and can provide a range of services, to lessen the impact on travel time.
- Road Weather Information Stations (RWIS): RWIS are sensors installed on or alongside a roadway that monitor weather conditions. The data is relayed to the RTOC to help system operators make informed decisions about how to optimally manage roads during inclement weather.
- System Sensors: System sensors detect congested conditions by monitoring the percentage of time a lane is occupied by vehicles.

<u>Regional Traffic Operations Center (RTOC)</u>

TSMO-supportive technologies and services are managed from the RTOC. Opened in 2002, the RTOC houses personnel from NYSDOT, the New York State Police (NYSP), the Monroe County Department of Transportation (MCDOT), and the Monroe County Airport Authority. By co-locating personnel from these agencies at one site, the RTOC facilitates effective interagency coordination and collaboration as operations personnel constantly monitor the Region's road and bridge network. RTOC personnel actively manage the transportation system by using ITS field instrumentation, which are linked to the RTOC through fiber-optic and wireless communications networks, to respond to situations as they occur.

Connected and Automated Vehicles

Connected and Automated Vehicle technologies have the potential to fundamentally transform the nation's transportation system. These emerging technologies are expected to be deployed within the timeframe of this plan, so it is important for transportation management agencies to begin planning for their impacts on the regional transportation system.

Connected Vehicles are vehicles that use wireless technology to interface with other vehicles and roadside infrastructure. These wireless interfaces relay information regarding vehicle speed, heading, and position between vehicles (vehicle-to-vehicle or V2V) and infrastructure (vehicle-to-infrastructure or V2I). This allows vehicles to maintain situational awareness of surrounding traffic conditions at all times and alert motorists of potential hazards.

Automated Vehicles are vehicles with safety features that function automatically (i.e., without driver input). For example, automated vehicles may be equipped with sensors that detect when other vehicles ahead of them in traffic brake. If the driver of the automated vehicle does not brake within specified parameters, the automated braking function will stop the vehicle before it collides with the vehicle in front of it. Automated vehicles do not need to be connected to other vehicles or infrastructure; they simply monitor traffic conditions and automatically respond to changes in those conditions.

Safety

The ability for people to travel safely, across all modes, is a key determinant of the success of our transportation system. This is especially true for the elderly, youth, bicyclists, and pedestrians – who tend to suffer more serious injuries and fatalities than motorists due to their enhanced vulnerability – and for people with lower incomes, who bicycle and walk more often than others by economic necessity. Enhancing and improving transportation safety is GTC's highest priority.

The popular phrase to describe incidents involving motor vehicles that result in injury, fatality, or property damage is that "accidents happen". However, many of these incidents are anything but accidental. The New York Governor's Traffic Safety Committee (GTSC) reports that during 2013, out of 83 fatalities recorded in the nine-county Region, 26 (31 percent) were alcohol-related and 27 (32 percent) were speed-related. Underscoring the importance of "human factors" the GTSC reports that law enforcement officials identified unsafe driver behavior as a factor in more than 90 percent of all such "accidents" in the Region during 2013.

As the behaviors leading to these events can in many cases be predicted, understood, reduced and ultimately eliminated, they are better referred to by their results: crashes. During 2013, the GTSC reports that more than 25,000 crashes occurred in the Region. These include the 83 fatalities noted above as well as more than 7,000 crashes involving personal injuries and 18,000 non-injury crashes involving property damage of more than $1,000 in value.

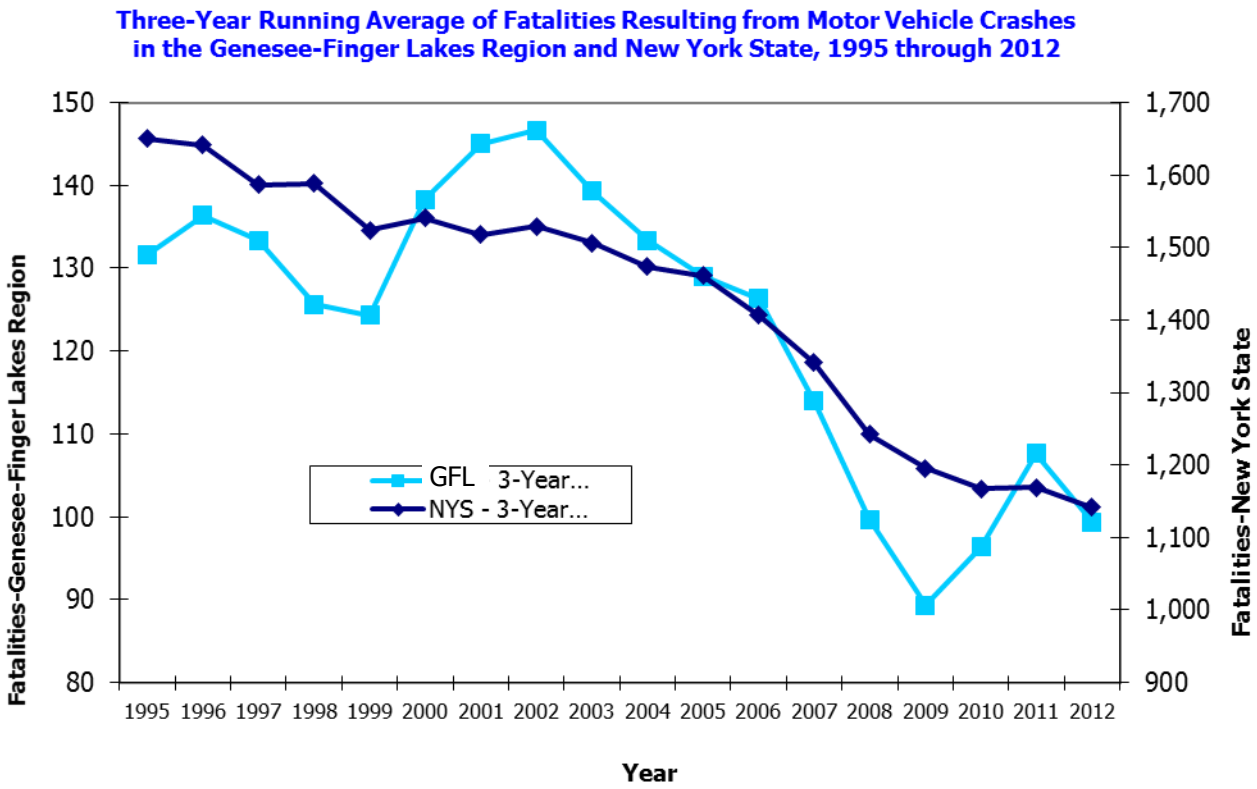
In its November 2011 report *Crashes vs. Congestion*, the AAA estimated that during the year 2009, the societal cost of crash fatalities in the Rochester urbanized area was $360 million and the cost of injuries was more than $1 billion. These totals reflect the staggering economic cost of fatalities and injuries but cannot begin to account for the human pain, suffering and loss affecting crash victims, families, and friends.

To identify the long-term trend and account for unusual variations in a single year, fatalities resulting from motor vehicle crashes in the Region and in New York State were analyzed using a three-year rolling average. As presented in Exhibit 28, there has been a long-term decrease in the number of fatalities resulting from motor vehicle crashes statewide, matching national trends, since 1995. However, at the regional level the trend is not consistent even with the smoothing provided by the use of a rolling average. The cause for the decline in fatalities in 2009 is unable to be determined without further research.

While required improvements to vehicle safety technology are mandated by the National Highway Traffic Safety Administration (NHTSA) at the federal level, state and local initiatives to reduce and eliminate the injuries and fatalities resulting from crashes are key in addressing causes related to the roadway environment and unsafe actions by pedestrians, bicyclists, and motorists. These state and local level efforts follow two general approaches: 1) safety improvements to infrastructure, and 2) reducing unsafe human behaviors, also referred to as "human factors."

The statewide Strategic Highway Safety Plan (SHSP) prepared by NYSDOT and submitted to FHWA is intended to promote best practices and strategies that, if implemented, could have a substantial impact on reducing fatal and injury crashes. The 2010 SHSP identifies seven emphasis areas including driver behavior,

Exhibit 28



pedestrians, large trucks, motorcycles, highways, emergency medical services, and traffic safety information systems. Although the SHSP describes and includes behaviorally-focused initiatives its most critical role is guiding the implementation of the Highway Safety Improvement Program (HSIP) in advancing infrastructure improvements that improve safety. In New York State, NYSDOT administers the HSIP on behalf of FHWA and with the participation of the MPO's in a data-driven process intended to identify and implement cost-effective improvements to transportation safety for all users. Examples of the types of improvement funded by the HSIP include installing pedestrian countdown timers to improve crossing safety and rumble strips to help reduce run-off-the-road crashes. The HSIP implements site-specific improvements to address identified opportunities to reduce crashes at particular locations as well as systemic safety improvements (such as the rumble strips and countdown signals described above) to improve safety system-wide.

Human behavior including consumption of alcohol, excessive speed, and driver distraction is a contributing factor in many crashes and can be addressed by a variety of countermeasures, primarily relevant laws and associated enforcement. Attempts to discourage these unsafe behaviors are extremely important to improving traffic safety and balance infrastructure-based improvements.

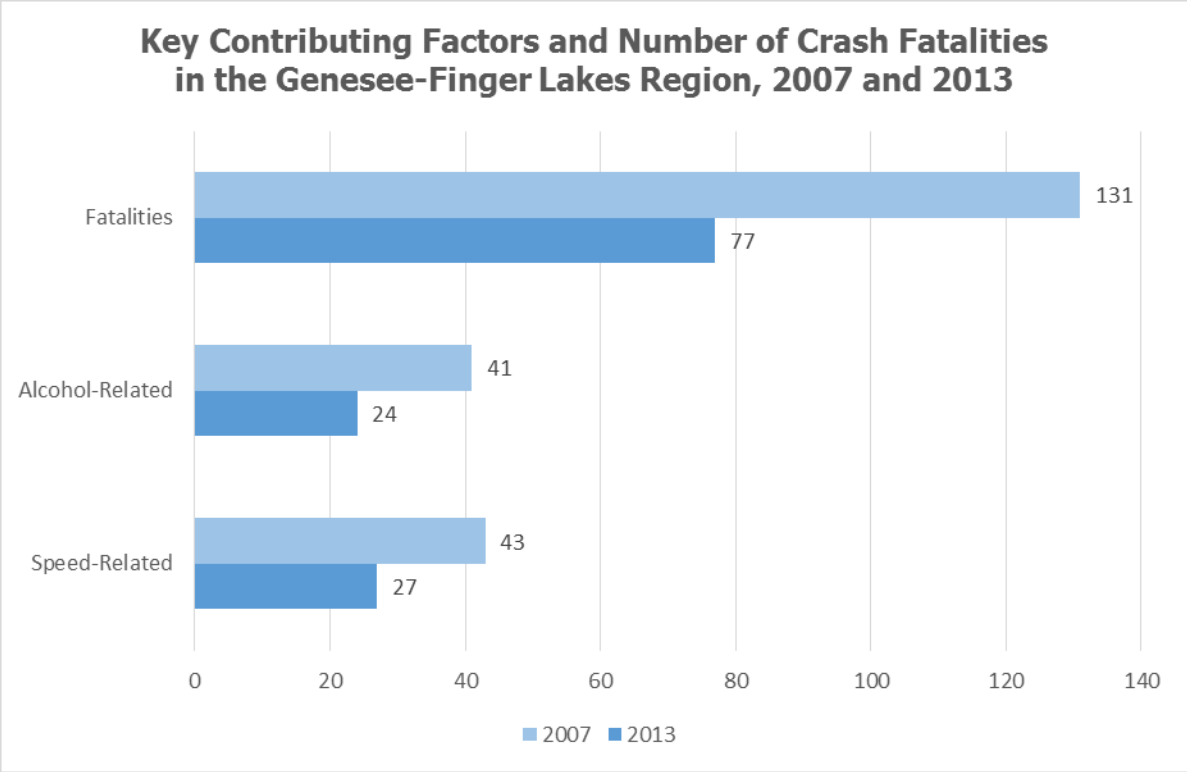
Behaviorally-related safety initiatives are the primary focus of the New York State Highway Safety Strategic Plan (HSSP), prepared by the GTSC and submitted to the NHTSA. The HSSP articulates the state's traffic safety priorities at both the state and local level and the state's performance-based plan for achieving its goals. The 2015 HSSP addresses the following program areas: Impaired Driving; Police Traffic Services; Motorcycle Safety; Pedestrian, Bicycle and Wheel-Sport Safety; Occupant Protection; Traffic Records; and Community Traffic Safety Programs and Program Management.

The HSSP emphasizes data-driven programs to increase safe behaviors such as seat belt and child restraint use and to reduce dangerous behaviors such as impaired driving and speeding. The HSSP guides the implementation of the State and Community Highway Safety Grant Program (Section 402) focusing on programmatic countermeasures. In New York State, the GTSC administers the Section 402 funds on behalf of NHTSA, with the participation of the County Traffic Safety Boards.

The need to implement programs to reduce distracted driving is pressing, and many programs are in progress at the federal, state, and local level. Success for these programs, being newly-implemented, is difficult to assess. However, two areas where "human factors" have long been addressed, excessive speed and impaired driving, do show promising results, as Exhibit 29 illustrates. Efforts to reduce speed- and alcohol-related fatalities have had a positive influence (declines from 41 to 24, and 43 to 27 fatalities, respectively for alcohol- and speed-related crashes).

The HSSP and SHSP share the common goal of improving highway safety while recognizing the need for a balanced approach to achieving that goal. GTC programs and activities are intended to advance both plans through complimentary infrastructure- and program-based countermeasures and by working with partner agencies as well as stakeholders to reduce the burden of motor vehicle crashes on individuals and society.

Exhibit 29



Source: NYS Governor's Traffic Safety Committee

Security and Resiliency

In the context of transportation planning and asset management, security is the reduction of risk to transportation assets from the impacts of hazardous events. Resiliency refers to the ability to prepare for, withstand, and rapidly recover from hazardous events. Strengthening an asset's resiliency to hazardous impacts is a means of improving the security both of that asset and the transportation system as a whole. The concepts of security and resiliency are integrated into the LRTP to establish the policy basis for planning recommendations that:

- Strengthen the transportation system's ability to withstand the impacts of natural and human-caused disasters;
- Accommodate anticipated climate change impacts on transportation infrastructure; and
- Safeguard public investments in transportation infrastructure.

Related concepts that inform the discussion of security and resiliency include adaptation and mitigation. Adaptation refers to the process of better preparing for anticipated hazardous impacts, including extreme weather events. Mitigation refers to the process of minimizing the impacts of hazardous events by reducing the severity of their impacts.

Security and resiliency considerations should be integrated into the transportation planning process on two scales, system-wide and asset-specific. System-wide actions are aimed at improving the ability of the entire transportation system to withstand hazard impacts. Asset-specific actions are aimed at improving the ability of specific assets within of a transportation system, such as a bridge, to withstand hazard impacts.

Critical Transportation Assets are those assets so vital to the safety, efficiency, and reliability of the regional transportation system that their damage or destruction would have a debilitating impact on public health and safety, the regional economy, and general community well-being. All transportation assets (e.g., infrastructure, facilities, equipment, and personnel) are vulnerable to one or more hazards.

Impacts of Hazards

The Region is fortunate in that it is not exposed to natural hazards such as hurricanes, tornadoes, earthquakes, and volcanos to the same degree as other parts of the United States. However, the Region is vulnerable to severe winter storms and ice storms, flooding, and high wind events.

Severe winter storms and ice storms can impact the entire Region. These storms may cause white-out driving conditions, temporary road blockages due to icing or snow accumulation, and place a strain on highway and emergency response personnel and equipment as they work to keep roads clear and respond to incidents.

Flooding can occur throughout the Region, but is a particular concern along streams, rivers, and lakes, especially in floodplains; in low-lying areas with poor drainage; in areas with high water tables such as wetlands and locations with poor soil drainage; and in areas near drainage channels, culverts, dams, and other water control structures when runoff exceeds drainage capacity. Flooding may cause minor damage to assets, such as leaving a layer of mud and debris on a road, or it can completely wash out roads, bridges, and culverts. Floods may also cut off access to support facilities, preventing highway crews and emergency response personnel from accessing an incident scene.

High wind events may knock down trees, power lines, and other objects into roads, causing a temporary obstruction. In addition, high wind events pose a special hazard for trucks and other high profile vehicles, which may be blown over.

Two human-caused hazards that pose the greatest threat to the region are hazardous materials spills and terrorist acts. Hazardous materials spills are a special concern on roads handling a high volume of truck traffic. They may result in fires and explosions, posing a severe hazard both to emergency responders and the public. Impacts from a hazardous materials spill may range from minor damage to a road surface to the complete destruction of an asset that requires large-scale reconstruction and replacement. A particular source of concern in recent years is the potential for serious infrastructure and environmental damage should a train carrying crude oil derail and explode. Obtaining access to a derailment site is a critical concern for transportation management and emergency response personnel. Acts of terrorism are most likely to be directed against key links in the transportation network, as well as facilities where large numbers of people routinely assemble.

Berne, NY (09/19/2011) Road Damaged by Irene
Image credit: FEMA-Elissa Jun

Countermeasures to strengthen transportation system and asset security fall into one of the following four categories:

1. Preventive actions are aimed at stopping incidents from occurring. For example, a transit agency may restrict access to its bus garage and use security systems to monitor the garage for unauthorized access.
2. Protective actions are taken to minimize damage to assets should an incident occur. This includes asset hardening, such as the use of blast-proof glass in windows.
3. Redundancy countermeasures seek to integrate back-up components into a system or structure to prevent catastrophic failure in the event of an incident.
    - Micro-scale countermeasures are asset specific. For example, a structure such as a bridge is designed and built with multiple support elements so there is no possibility of a single-point failure.
    - Macro-scale countermeasures are system wide. For example, transportation agencies may identify alternate routes so that, in the event of a major flood that leaves a key road impassable, other roads will available to reach a site that would be otherwise inaccessible.
4. Recovery countermeasures are taken to recover from the impacts of an incident event.
    - Short Term actions include the emergency response to an incident event, such as the deployment of police, fire, and emergency medical services to a disaster scene.
    - Long Term actions include the restoration of disrupted services and reconstruction of damaged assets, such as the replacement of a road, bridge, or culvert that was washed out by a flood.

GENESEE TRANSPORTATION COUNCIL

Long Range Transportation Plan for the Genesee-Finger Lakes Region 2040

Chapter 5 - FINANCIAL PLAN

Federal requirements mandate that the *LRTP 2040* include a financial plan that demonstrates how the recommendations can be implemented based on system-level estimates of costs and reasonably expected revenues. Further, both costs and revenues must be expressed in year of expenditure (YOE) dollars to accurately account for the anticipated revenues available to the region and the impact of inflation on the costs of materials and labor to implement projects through 2040. These fiscal constraint requirements are critical to ensuring that the *LRTP 2040* is credible and provides realistic expectations of what can be accomplished; not simply a wish list that has little to no chance of being advanced.

The federal funding mechanisms in place are not meeting current system needs. The *2017-2020 Transportation Improvement Program* (GTC's capital program) was only able to fund about 60 percent of the transportation projects that were submitted. As transportation projects continue to go unfunded a backlog of rehabilitation and maintenance work builds up. What once was a simple repaving job, if unfunded over many years, eventually leads to more costly complete reconstruction. Current funding in the Region helps the transportation system limp along but will never offer the opportunities for transformative projects that will shape the Region's future and provide additional mobility options that the Region's residents are seeking. Additionally, fixing our roads and bridges puts people to work, provides better quality of service for users of the system, and contributes to our economy. It is imperative going forward that all levels of government—federal, state, and local work towards fully funding transportation needs given the importance of the transportation system to the social and economic vitality of the Region.

The primary driver of cost increases for transportation infrastructure and services will be global demand for materials and supplies. Data used to estimate future inflation in transportation costs was obtained from NYSDOT. NYSDOT purchases highway contract cost index special tabulations from IHS Global Insight. These tabulations are one of several inputs into the escalation factors used by NYSDOT in preparing cost estimates for future projects. The IHS Global Insight tabulations include three weighted indices of future materials and labor: baseline, trendline, and business cycle.

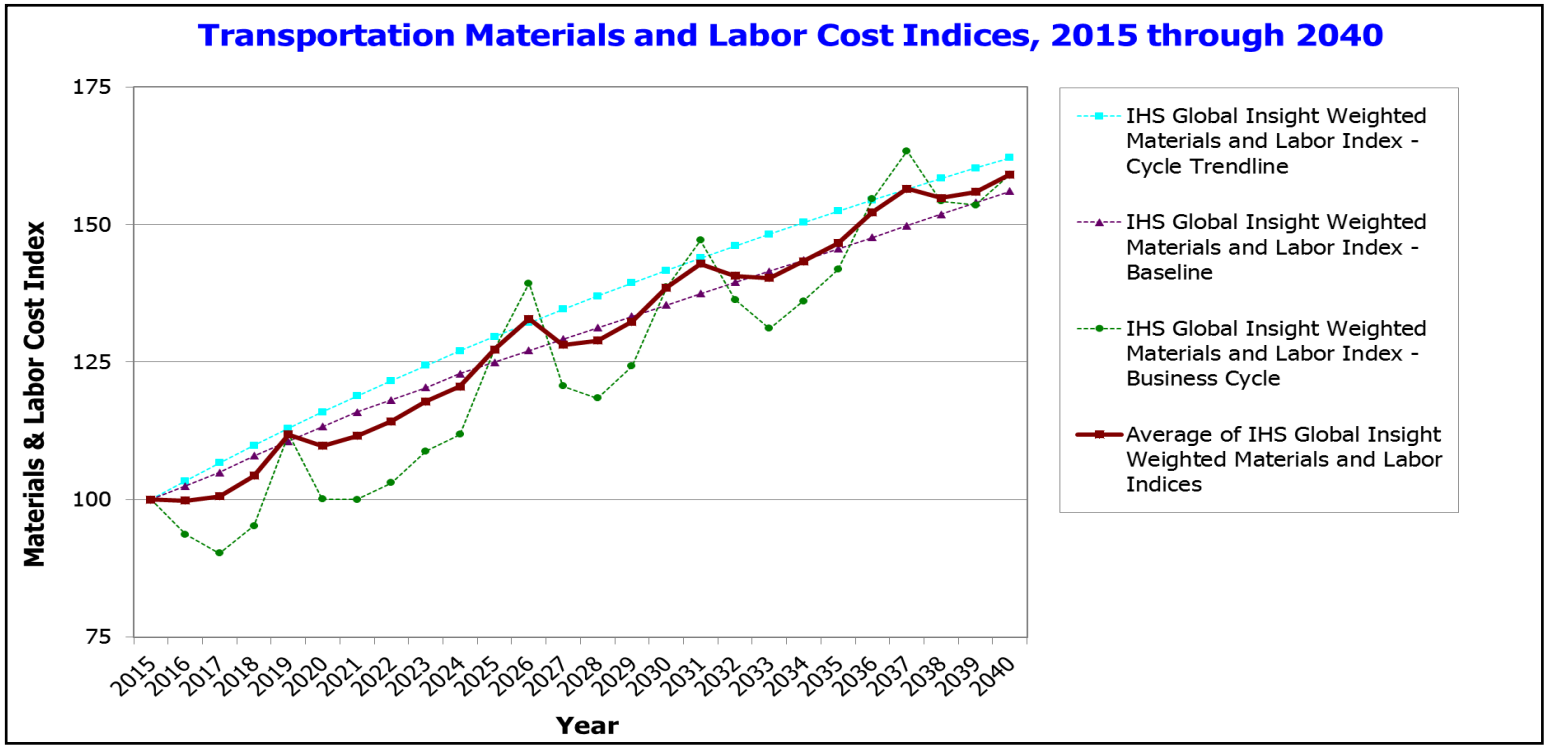
Given the uncertainty over such a long time period and the unique advantages and disadvantages of using various historical trends and future projections, the annual increase in costs through 2040 is estimated to be the average of all three indices – 2.36 percent. Exhibit 30 presents the rate of change for the various indices (displayed as broken lines) as well as the average (displayed as the solid line) that is being used to escalate current costs to YOE dollars

There is just as much, if not more, uncertainty regarding the availability of future revenues for transportation projects and programs in the Region through 2040.

To account for the uncertainty in the composition of federal transportation funding programs (including the potential consolidation of existing programs), reasonably expected future revenues were combined to create the following categories:

- Highway and Bridge – includes the FHWA National Highway Performance Program (NHPP), Surface Transportation Program (STP), and Highway Safety Improvement Program (HSIP)
- General Public Transportation – includes the Federal Transit Administration (FTA) Urbanized Area (Section 5307, 5339) and Other than Urbanized Area (Section 5311) programs
- Human Service Public Transportation – includes the FTA Elderly Persons and Persons with Disabilities (Section 5310)
- Flexible – includes the Transportation Alternatives and the Recreational Trails Program set-asides

Exhibit 30



Programs that are not apportioned by legislated formula are discretionary and typically allocated by Congress. These non-recurring revenues include earmarks and are not included in the estimates of reasonably expected revenues given the uncertainty of their availability over the period covered by the *LRTP 2040.*

The projections of reasonably expected federal revenues in YOE dollars through 2040 are presented in Exhibit 31.

The GTC TIP area includes the counties of Genesee, Livingston, Monroe, Ontario, Orleans, Wayne, and Wyoming. Federal funds programmed in Seneca and Yates counties are determined by NYSDOT and are not included in this analysis as it is not anticipated that GTC will be involved in these deliberations. Nearly all of the federal-aid-eligible transportation system in the GTC TIP area is owned, operated, and maintained by state, regional, county, and city departments and authorities that are members of GTC. As an example, 95 percent of the 1,484 bridges in the GTC TIP area are under the jurisdiction of GTC member agencies. Each of these agencies makes substantial investments in the regional transportation system with non-federal revenues complementing the federal highway or transit funding available to the Region.

The New York State Thruway Authority (NYSTA) does not receive any federal funding for the approximately 75-mile portion of Interstate 90 that crosses the GTC TIP area. Because this portion of the NYS Thruway is tolled, federal legislation requires an agreement with the U.S. Department of Transportation for NHPP funds to be programmed for projects on it.

Exhibit 31

Projected Reasonably Expected Federal Aid Transportation Program in the GTC TIP Area, 2016 to 2040

(in millions of YOE dollars)

Combined Federal Aid Category	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	Total
Highway & Bridge	$ 321.69	$ 331.34	$ 341.28	$ 351.52	$ 362.06	$ 1,707.89
Public Transportation	$ 69.98	$ 74.89	$ 77.13	$ 79.45	$ 81.83	$ 383.27
Specialized Public Transportation	$ 5.77	$ 5.94	$ 6.12	$ 6.31	$ 6.50	$ 30.64
Flexible	$ 9.27	$ 9.55	$ 9.83	$ 10.13	$ 10.43	$ 49.20
Total Reasonably Expected Federal Aid	$ 406.71	$ 421.72	$ 434.37	$ 447.40	$ 460.82	$ 2,171.01
Required Non-Federal Match[1]	$ 101.68	$ 105.43	$ 108.59	$ 111.85	$ 115.21	$ 542.75
Total Matched Federal Aid Program	**$ 508.38**	**$ 527.15**	**$ 542.96**	**$ 559.25**	**$ 576.03**	**$ 2,713.76**

[1] Assumes 20 percent non-federal match on entire program.

The most significant non-federal transportation funding sources include:

- New York State Dedicated Highway and Bridge Trust Fund – This is the primary source of non-federal funding that is invested in the region's federal-aid highway and bridge network.
- NYSTA Capital Program – Includes capital investments for the New York State Thruway
- State Transportation Operating Assistance (STOA) – This is the primary state funding source for public transportation operations.

As presented in Exhibit 32, approximately $4.4 billion in revenues are projected to be available for federal-aid-eligible projects in the GTC TIP area through 2040. Again, non-capital maintenance and operating activities on the federal-aid system have and are expected to continue to be accomplished with other state and local funding sources.

Exhibit 32

Projected Reasonably Expected Revenues for Federal-Aid-Eligible Projects and Programs by Source in the GTC TIP Area through 2040[1]

(in millions of YOE dollars)

Federal Transportation Aid Program	$	2,171.01
State Dedicated Highway and Bridge Program	$	707.18
State Transportation Operating Assistance	$	1,042.07
NYS Thruway Capital Program	$	474.21
Total Reasonably Expected Revenues	$	4,394.47

[1]Does not include revenues for non-capital maintenance and operating activities on the federal-aid system.

GENESEE TRANSPORTATION COUNCIL

Long Range Transportation Plan for the Genesee-Finger Lakes Region 2040

Chapter 6 - RECOMMENDATIONS

The recommendations presented herein seek to utilize the limited resources we expect to receive through 2040 in the most cost-effective manner. Absent a change in priorities at the Federal and State levels, fiscal constraint dictates that we maintain the existing condition and performance of our most crucial assets as best we can, manage the decline of lesser facilities and structures without compromising safety, and implement limited expansions whenever feasible. Unfortunately, this means that the transformation of our current transportation system to one that fully addresses our needs and preferences will not occur to the degree or at the pace the community deserves.

The Region's basic transportation needs through 2040 will not be able to be met with the reasonably expected revenues.

Transportation Needs

Per the guiding principles of the *LRTP 2035* and *LRTP 2040,* the transportation needs of the Region's residents, businesses, and institutions vary and will continue to do so based on type of place (see "The Region" page 27 for a discussion regarding place types). Transportation needs by type of place were first identified in *LRTP 2035*.

Combined with the reasonably expected revenues discussed previously in the Financial Plan, the needs presented below and their priority by type of place serve as the basis for the recommendations of *LRTP 2040.* The relative priority of each of the needs by type of place is presented in Exhibit 33.

Increase Safety for All Users

Regardless of age, physical ability, or mode, all users need to be assured that they can travel safely. Pedestrian safety needs are more prevalent in the Urban Cores and Rural Centers than other places just as the need for agricultural equipment to traverse public roads safely is primarily applicable to Rural places.

2017-2020 Transportation Improvement Program

Based on the amount of federal-aid-eligible projects for which funding has been solicited from GTC for the *2017-2020 Transportation Improvement Program* (*2017-2020 TIP*), GTC's capital program, requests in the amount of $182 million will go unfunded. This figure does not fully depict the true need for transportation projects as many project sponsors chose only to submit their most urgent requests. Approximately 60 percent of the projects that were submitted will be able to receive funding through the *2017-2020 TIP*.

Preserve and Maintain Existing Infrastructure and Services

The preservation and maintenance of the existing transportation infrastructure and services is a primary need of all users and all places in the Region. Highways, bridges, buses, trails, and sidewalks should, at a minimum, continue to serve residents, businesses, and institutions in a safe, efficient, and reliable manner. While this will be a challenge given deterioration of existing infrastructure and services relative to reasonably expected revenues, it is a challenge that must be met by transportation agencies and organizations at all levels.

Improve Mobility for Vehicles

The primary means of travel for persons and freight is anticipated to continue to be cars, buses, and trucks. Accordingly, improving the mobility of vehicles through improvements that incorporate better design and fuller use of technology will be a primary transportation need for persons, businesses, and institutions. This balance will be different based on place but improved mobility for vehicles will be most needed in the Recent/Emerging Suburban,

Rural, Employment Centers, Regional and Sub-Regional Retail, Medical/Health, and Airport places. This need (if properly planned, designed, and implemented) can and should be met through improvements that also enhance and expand mobility for bicyclists.

Increase Frequency of Existing Public Transportation Service

Public transportation service is reasonably available to the majority of the Region's residents (excluding Yates County). A reasonable improvement to public transportation in all types of places will consist of increasing the frequency of existing service as opposed to adding new service.

Add New Public Transportation Service

Expanding fixed-route public transportation service represents less of an overall need than increasing the frequency of existing service but is still an identified need through 2040. Specifically, increased public transportation service to the Employment Centers and Medical/Health places should be considered first and foremost. Expansion should be tied to investments from those entities that will gain from the additional service, reflecting the need for all sectors to contribute in a manner relative to the respective benefit obtained.

Enhance and Expand Mobility and Access for Bicyclists

Too often transportation planning combines bicyclists and pedestrians due to the fact that neither utilizes a vehicle. However, the differences in mobility, as measured by the distances able to be traveled, are distinct. Improving conditions for bicyclists provides different (but not necessarily better) opportunities than doing the same for pedestrians. At the same time, both require access – specifically in the Regional and Sub-Regional Urban Cores, Mature Suburbs, Rural Centers, Employment Centers, Local Retail, and Higher Education places.

There is a regional need to improve the conditions that facilitate bicycling as an active transportation mode.

Enhance and Expand Connectivity and Access for Pedestrians

All trips begin and end via walking. There is a particular need to enhance and expand connectivity and access for pedestrians in Regional and Sub-Regional Urban Cores, Mature Suburbs, Rural Centers, Employment Centers, Local Retail, and Higher Education places. However, all places will benefit from improved pedestrian facilities which would promote walking as a form of active transportation.

Expand Connectivity and Access for Freight

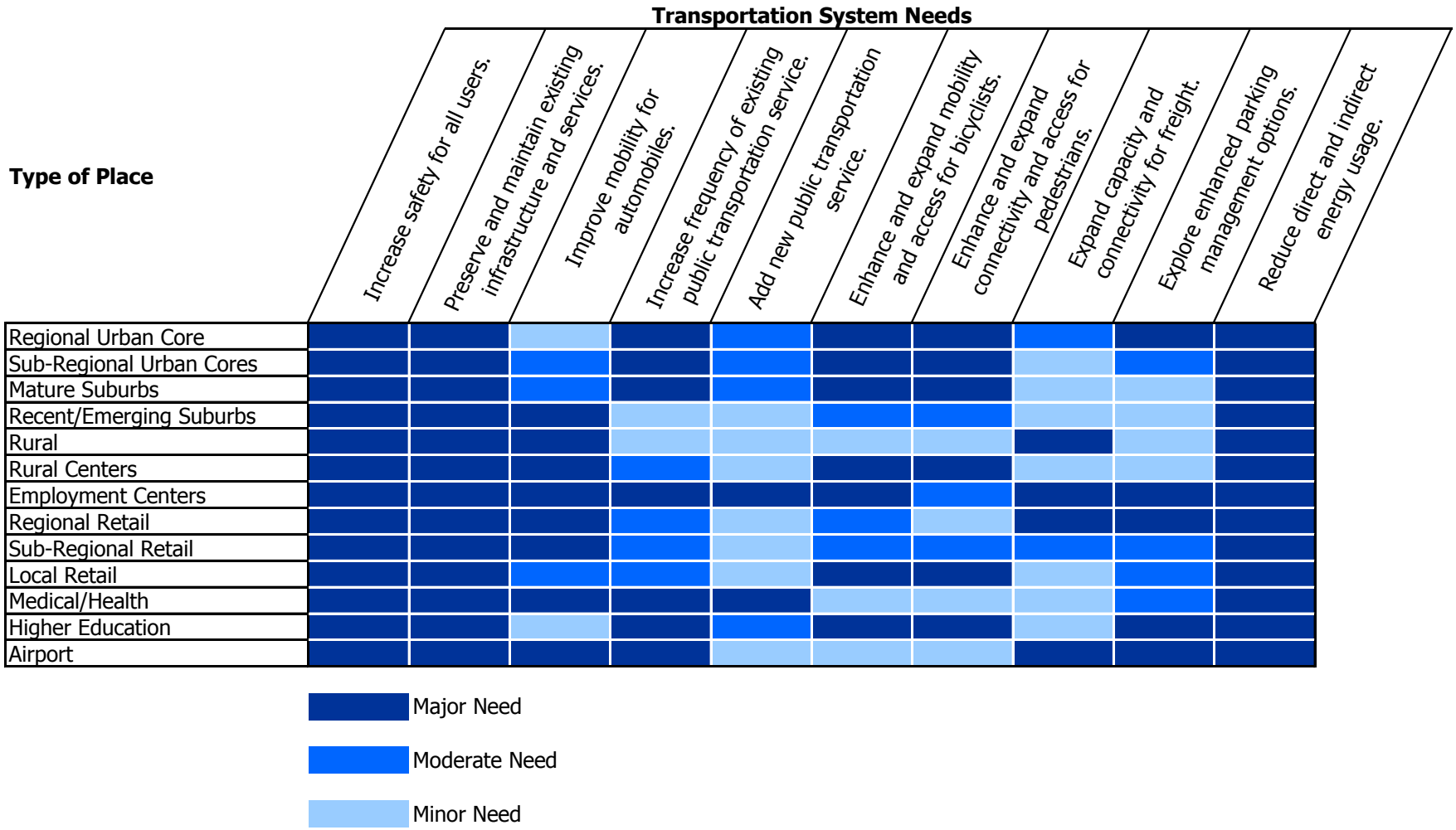
Connectivity and access for freight transported by truck, rail, air, and water is identified as a primary economic need for the Region now and in the future. This need is critical to the economic development of the Region given the importance of manufacturing and agriculture in Rural, Employment Centers, Regional Retail, and Airport places.

Explore Enhanced Parking Management Options

Better managing parking for both private vehicles, bicycles, and freight trucks allows the existing supply to be better utilized, increasing capacity and ensuring that businesses can accommodate customers and maintain operations. The need for improved parking management is and will continue to be most prevalent in the Regional Urban Core (including the Port of Rochester), Employment Centers, Regional Retail, Higher Education, and Airport places.

Exhibit 33

Transportation Needs by Place in the Genesee-Finger Lakes Region through 2040



Reduce Direct and Indirect Energy Usage

Providing opportunities to reduce the amount of energy consumed in the use and construction of transportation facilities and services can reduce dependence on foreign oil and decrease harmful fossil fuel and GHG emissions throughout all types of places. Actions to reduce energy use can address both national security and environmental concerns (including mitigating climate change) by finding a common ground that addresses the other transportation needs of the Region.

LRTP 2040 Recommendations

Recommendations included in *LRTP 2040* serve as a framework for investment decisions made through future TIPs where proposed projects and programs are evaluated to determine their benefits relative to other proposals. Projects and programs selected to receive federal transportation funds represent the tactics that will realize the strategy of the *LRTP 2040.* It is anticipated that additional planning will be conducted through future UPWPs to further refine and develop proposals for advancement with both federal and non-federal funds.

The existing regional emphasis on extending the useful life of highway and bridges through preventive and corrective maintenance, supporting increased system management and operations, and devoting fiscal resources to public transportation, bicycle, and pedestrian networks has been determined to be the optimal approach given the limited financial resources.

The capacity of the highway and bridge network is currently sufficient for the needs of people and freight and is expected to be so throughout the period covered by the *LRTP 2040.* Accordingly, the need for new highways and bridges for the sole purpose of improving mobility is not warranted. Ensuring the continued structural integrity of existing facilities is paramount. Physical expansion of highway and bridge infrastructure via altogether new through lanes is discouraged. Management of both the existing system across all modes and the demand placed on it is considered the most cost-effective means for improving mobility and access. Expansion of the system will be limited but additional investments in the public transportation as well as the bicycle and pedestrian networks represent the best opportunities to address the needs of an aging population and improve public health through opportunities that promote active lifestyles and reduce emissions.

Not all of the reasonably expected revenues are available immediately. As such, the recommendations have been prioritized based on need and when funds for their implementation are expected. The timeframe for implementation of the recommendations discussed below is as follows:

Ongoing = Federal Fiscal Years (FFYs) 2017-2040 (all FFYs of the *LRTP 2040)*
Immediate = FFYs 2017-2020 (aligns with the TIP)
Near-Term = FFYs 2017-2021
Medium-Term = FFYs 2022-2028
Long-Term = FFYs 2029-2040

Recommendations have been numbered for reference purposes and are not a reflection of priority.

Preservation and Maintenance

Beginning in *LRTP 2035*, Preservation and Maintenance recommendations encompass not only the maximization of existing assets but also improvements to these assets when they are reconstructed or replaced at the end of their useful life, *LRTP 2040* carries this forward. Given the length of time between reconstruction and/or replacement of facilities, simple in-kind replacement of infrastructure and the vehicles that currently serve our transportation needs represents a lost opportunity to improve the system. In addition, these opportunities represent the ability of the transportation system to meet the challenges of sustainability and climate change adaptation through the use of new materials and design elements that were not available when the facilities were first built or last reconstructed. There are two primary initiatives that serve as the basis for the Preservation and Maintenance recommendations of the *LRTP 2040:* Asset Management and Improved Design. These recommendations constitute the majority of projects to which reasonably expected federal transportation funds will be allocated through 2040.

Asset Management

At its core, Asset Management is about maximizing the service life of necessary infrastructure. Effectively applying this approach requires the selection of appropriate treatments at the proper times in the lifecycle of individual assets. A fundamental goal of asset management is to keep assets from deteriorating to a condition where they have to be reconstructed or replaced for as long as possible. Significant savings can be realized by conducting preventive and corrective maintenance on a facility at a fraction of the cost of reconstructing or replacing it. Additionally, asset management projects and programs will inherently consider improving safety for all users.

1. Conduct preventive and corrective maintenance treatments on highways and bridges to extend the useful life of infrastructure without requiring more costly rehabilitation and reconstruction before absolutely necessary – Ongoing

Preventive and corrective maintenance treatments can cost in the hundreds of thousand dollars per lane-mile compared to rehabilitation and reconstruction projects that typically cost upwards of $1.5 million per lane mile. These treatments maximize previous investments, including not only the roadway but also safety and security related features such as signage, lighting, striping, and guiderails. Communities throughout the Region have embraced preventive and corrective maintenance as the primary means for effectively managing their assets – the current TIP includes projects of this type in both major population centers (Monroe County) and areas where agriculture is the primary industry (Wyoming County).

2. Reconstruct and rehabilitate highways and bridges to accommodate all modes – Ongoing

Not all highways and bridges are candidates for preventive and corrective maintenance treatments. When infrastructure that provides for safe and efficient use by all modes (i.e., is a complete street) reaches the end of its useful life, its replacement should ensure that this functionality is maintained. When infrastructure that does not adequately accommodate all modes reaches the end of its useful life, its replacement should ensure that suitable space for cars, trucks, bicycles, and pedestrians is added within the context of Place (i.e., Context Sensitive Solutions).

For example, communities that wish to provide complete streets should consider low-cost design modifications such as adjusting lane and/or shoulder widths, or adding bicycle space such as bike lanes or curb offsets, simply by changing the location of pavement markings where feasible (i.e., where current and projected traffic characteristics, surrounding land uses, and community interest are compatible with bicycle traffic).

Similar consideration should be given to increasing clearances of bridges that have had multiple incidents involving trucks becoming stuck underneath them.

3. Increase the use of recycled materials and incorporate green technologies in the rehabilitation and reconstruction of highways and bridges – Ongoing

Opportunities to increase sustainability through the use of reused and recycled materials continue to grow and become more affordable. Use of these materials and technologies reduces the amount of refuse deposited into landfills and can allow for more porous pavements which improve storm water management and have other environmental benefits.

4. Conduct preventive maintenance on public transportation vehicles to ensure reliability and attractiveness of services - Ongoing

As with highways and bridges, preventive maintenance on public transportation vehicles is central to their long-term, cost-effective operation. Users of public transportation expect that services be reliable, taking them where they need to go consistent with published schedules – this is especially true of individuals dependent upon public transportation for daily commuting. Additionally, "choice users" (i.e., individuals who have a choice to either use public transportation or travel via privately-owned automobile) will not utilize public transportation if the service's reliability is in question. It is therefore essential that the vehicles providing public transportation are properly maintained and not prone to mechanical problems that directly impact reliability and attractiveness of the service. Per the current TIP, RGRTA will invest over one-third of the FTA Urbanized Area (Section 5307) Program funds in vehicle preventive maintenance activities.

5. Explore adjusting the RTS Monroe fleet mix as buses are replaced to take advantage of the operational flexibility provided by the Downtown Transit Center – Ongoing

With through-routing of vehicles no longer necessary, RTS-Monroe has the ability to deploy different types of buses on routes where they are most suitable. There is an opportunity to optimize the mix of bus types in the fleet with capacity that meets customer demand. The change in fleet mix should occur as buses are replaced at the end of their useful life to maximize the economic value of existing investments.

6. Maintain and improve the condition and functionality of public transportation facilities throughout the Region – Ongoing

The age of public transportation facilities in the Region varies. The RGRTA/RTS East Main Street Campus, originally constructed in 1974, recently underwent an $18M renovation and expansion project to improve and modernize some campus facilities. The RTS Campus still requires additional renovations to properly service the bus fleet including conducting basic maintenance, expanded bus parking facilities, and bus washing all while providing additional room to expand the fleet in the future. These facilities and others will need not only to be preserved and maintained but also improved with respect to their security, energy efficiency, safety, and operational functionality over the next 25 years.

7. Preserve and maintain dedicated bicycle and pedestrian facilities, including multi-use trails and sidewalks – Ongoing

The more than 500 miles of multi-use trails and the sidewalks in the Region are vital to promoting public health via active transportation. The ability to travel safely by bicycling and walking would be severely compromised if these facilities are not maintained and kept in a state of good repair. While ownership of these facilities is often more diverse than that of highways, bridges, and public transportation services – with local governments and not-for-profit entities playing a larger role in ensuring their continued functionality – providing the necessary resources to preserve and maintain multi-use trails and sidewalks cannot be overlooked in the Region's comprehensive, multimodal asset management strategy.

8. Evaluate the need to replace bridges that carry low-traffic volumes – Ongoing

Many bridges in the Region carry significantly less traffic than can be accommodated with minimum design standards. Given the limited financial resources to properly maintain all public bridges in the Region, bridge owners should evaluate the need to replace a bridge if the traffic it carries can be accommodated on nearby bridges without significant impact to public safety or economic vitality. GTC has developed a Bridge Prioritization Screening Tool that can assist with this evaluation. Any impact to emergency response time should be evaluated against recognized standards.

Portageville Bridge

The 2012 Regional Goods Movement Strategy and *LRTP 2035* fully supported reconstructing the Portageville Bridge, identified as one of the top ten statewide rail bottlenecks in the 2009 New York State Rail Plan. Built in 1875 the bridge crosses the Genesee River Gorge in Letchworth State Park and is a critical component of NS's Southern Tier Line. The bridge has been in need of replacement to remove weight and speed restrictions that negatively impact freight movements between the Midwest and Northeast along the NS corridor. Construction on the new, $70 million, bridge alignment began in the summer of 2015 and is expected to be completed in the winter of 2017/2018. Realigning and replacing the Portageville Bridge is a critical step to enhance safety and bring the Southern Tier Line's capacity up to the current industry standard of 286,000 pounds. The rail line represents an important connector for intermodal container traffic going to and from the Port of the New York and New Jersey. The new rail bridge is a vital connection along the corridor.

9. Reconstruct and rehabilitate rail infrastructure to allow for the efficient movement of freight into, out of, and within the Region – Ongoing

While privately owned, operated, and maintained, rail infrastructure is an important component of the regional transportation system. The maintenance and upgrades (via reconstruction and rehabilitation) to tracks, ties, ballast, and bridges along with signaling, switching, and crossing equipment should be continued and increased as private and public resources allow. Representative projects in the Region include rehabilitation and improvements to both Class I and Shortline infrastructure to allow maximum weights at the highest operating speeds allowed.

CSX Mainline in Lyons

Improved Design

The physical design of transportation infrastructure can appreciably improve the safety, efficiency, and reliability of the transportation system. Access management, interchange reconfigurations, and provision of space for public transportation and non-motorized travelers (i.e., complete streets) can enhance the existing system and better serve regional transportation needs now and in the future. Specifically, physical measures that improve mobility, safety, and predictability for vehicles (including freight) and non-motorized modes, when and where appropriate, increase economic opportunities and quality of life. These improvements require coordination and cooperation with local governments who have land use planning and decision making authority.

10. Adapt the design of transportation infrastructure to integrate security and resiliency considerations – Ongoing

When reconstructing, rehabilitating, or otherwise upgrading and improving transportation assets, agencies should consider the vulnerabilities of these assets to anticipated hazards and include features that improve resiliency and recovery (e.g., the ability of existing highway and bridge designs to handle rising sea levels and extreme weather events). Given the large costs of reconstruction and rehabilitation projects, federal aid will continue to be the primary source for these types of projects and it is expected that this will be reflected in future TIPs.

The *Genesee-Finger Lakes Regional Critical Transportation Infrastructure Vulnerability Assessment*, currently underway, will include recommendations for strengthening the security and resiliency of transportation system infrastructure (e.g., highways and bridges) as well as facilities (e.g., operations centers, highway garages, fuel storage) to natural and human-caused hazards.

Storm clouds over Medina

11. Improve the function of interchanges on major roadways through design that reduces delay and enhances safety and mobility – Immediate/Near-Term

Interstate highways and other expressways have the greatest impact on regional mobility. Recurring delay that results where highways intersect with one another has significant implications including increased emissions and reduced productivity. Improving the design of these interchanges through reconstruction when they reach the end of their useful life will result in benefits to mobility, air quality, and safety.

The operational performance of major interchanges along identified freight corridors and at congestion hot spots should continue to be monitored and the implementation of congestion management strategies should be advanced as necessary.

Representative projects in the Region include the reconstruction of the I-490/I-390/NYS Route 390 interchange and the current western terminus of NYS Route 531.

12. Improve the function of intersections through improved design that increases safety, reduces delay, and improves mobility for all users – Ongoing

The safety and efficiency of high volume intersections can sometimes be improved through the incorporation of dedicated turning movements (e.g., turn-only lanes and signalization). Other options include reconfiguring intersections using roundabouts and/or new alignments. Truck turning movements and nearby freight operations should be taken into consideration. Regardless of the type of improvement, appropriate pedestrian safety considerations must be included in any intersection planning and design. Further, improving safety at rail crossings through maintenance and/or replacement of signaling equipment and gates, as well as redesign of the geometry of crossings where necessary, should be advanced.

Representative projects in the Region include: safety improvements at intersection of Route 252 (Jefferson Road) at John Street/Brighton-Henrietta Town Line Road in Henrietta; the construction of roundabouts at the County Road 10 & County Road 46 and the County Road 4 & County Road 46 intersections in Ontario County.

Diverging Diamond
Image credit: Stratus Imaging

13. Advance recommendations contained in completed UPWP studies as part of highway preventive/corrective maintenance, rehabilitation, and reconstruction projects – Near-Term/Medium-Term

GTC has provided funding for and technical assistance to numerous communities to conduct plans and studies that have integrated transportation and land use planning (e.g., Access Management, and Circulation, Accessibility, and Parking). These plans include recommendations that should be advanced as part of preventive/corrective maintenance, reconstruction and rehabilitation projects.

GTC initiated the Circulation, Accessibility, and Parking (CAP) program to improve livability and economic vitality in villages, city neighborhoods, and hamlets by identifying physical and operational improvements, as well as regulatory changes, to enhance traffic circulation, accessibility, and parking for all transportation system users. Representative projects include lane reconfigurations and/or reductions in the number of lanes and addition of on-street parking and bicycle space – recent examples include East Avenue in the City of Rochester and Phillips Road in the Town of Webster.

Access Management plans seek to proactively manage access between highways and adjacent development to improve efficiency and reduce crashes, mitigating both recurring delay and incident-related (non-recurring) delay without requiring the physical expansion of infrastructure.

14. Establish a Regional Complete Streets Commitment – Immediate/Near-Term

The transportation network in the Region will become measurably better connected, safer, and more accessible for all users as transportation projects are designed and constructed using complete streets principles. Complete streets are those where all current and projected users of the system are able to safely and conveniently reach their destinations along and across a street or road, regardless of their chosen mode of transportation. This includes pedestrians, bicyclists, transit and school bus riders, people with disabilities, motorists, freight haulers, service personnel, and emergency responders. GTC should develop guidance that will support the adoption and implementation of complete streets policies by member agencies.

Bike Lane in Palmyra

Complete Streets

Recognizing the important qualify of life, safety, and connectivity benefits provided by facilities such as sidewalks, bicycle accommodations, and shared-use paths, several communities in the region including the City of Rochester (December 2011), the City of Canandaigua (June 2013), and the Town of Williamson (January 2015), have adopted Complete Streets Policies. These policies can help local communities to advance the statewide goals of the New York State Complete Streets Act, as well as advance the goals and meet the needs of their own residents. Typical Complete Street Policies include the following:

- A vision and requirements for agency-funded activities to ensure that the safety and convenience of all customers are fully considered from planning through construction and operation of the facilities
- An assurance and means to ensure that these considerations are applied to all customers regardless of how they choose to travel (mode) or their abilities
- A recognition that Complete Streets must be sensitive to the context of their surroundings (i.e., a 4-foot shoulder may be sufficient along a rural road but not in a downtown area with high pedestrian traffic and bicycle traffic)
- Codification of the municipality's existing planning and programming processes consistent with complete streets principles
- Coordination with other local initiatives and the NYS Complete Streets Act

15. Design responsively to facility users, their needs, and the facility's current and future context - Ongoing

Context sensitive design recognizes that street and highway projects should be responsive to adjacent land uses, local needs, traffic volumes and speeds, current and projected demand, and should consider incorporating the most up-to-date, widely-accepted design standards to determine the appropriate level and type of treatment necessary.

Given that bicyclists, pedestrians, and transit users need to travel safely between the same origins and destinations as motorists, the need for complete streets is greatest along corridors that connect residential settings with popular and important destinations, including, but not limited to medical, shopping, employment, educational and recreational destinations. Planning and design for these high demand areas should strive to accommodate the needs and characteristics of all users.

The **Inner Loop North Transformation Feasibility Study** would include a review of alternatives along with an associated benefits/costs analysis for highway removal and/or other strategies to reduce impacts of the Inner Loop on the north side of Downtown Rochester and the surrounding neighborhoods. The Finger Lakes Regional Economic Development Council's Upstate Revitalization Initiative (URI) – *Finger Lakes Forward* references redeveloping the Inner Loop and creating future investment opportunities along the northern portion as a Full Implementation Initiative. Means to conduct the alternatives analysis may be secured through the URI process and/or additional transportation funding opportunities at the federal level. Additionally, the Inner Loop North Transformation Feasibility study is wholly consistent with *LRTP 2040* of recommendation **15. Design responsively to facility users, their needs, and the facility's current and future context – Ongoing**.

16. Pursue the retrofit and/or new installation of American with Disabilities Act (ADA)-compliant treatments - Immediate/Near-Term

Improvements to pedestrian facilities, including crosswalks, sidewalks, and curb cuts, need to be prioritized so that they can be addressed not only as part of rehabilitation and reconstruction projects but also as stand-alone improvements. State, county, and local governments that receive federal funding are required to have ADA transition plans. These plans should fully address pedestrian and other transportation considerations that limit mobility and access for persons with disabilities, including access to public transportation. Making these improvements will also increase the attractiveness of walking as a preferred mode of travel for persons of all abilities. GTC staff will provide technical assistance to communities as needed.

17. Continue to support development that considers and integrates transportation needs (e.g., transit-supportive, cluster development, etc.) – Immediate/Near-Term

Local land use decisions are a major determinant of transportation system performance. When the demand created by land uses outstrips the supply provided by transportation infrastructure and services, the potential for delay, crashes, and other negative events increases. To improve understanding among local governments of the impacts their decisions have on the transportation system, GTC has developed and funded technical resources and studies to assist in more fully integrating transportation with land use planning and development. GTC will continue to support such studies and share the results with other communities.

18. Regularly assess and refine public transportation services based on current and projected needs, demand, and market potential – Ongoing

RGRTA has developed a nationally-recognized route analysis system that allows for better optimization of bus routes and schedules. Routes and schedules are adjusted quarterly based on analyses of trip-level and stop-level ridership, and fare data. RGRTA is currently conducting comprehensive audits of the seven public transportation systems operated outside of Monroe County to identify improvements that maximize efficiency, minimize costs, and provide a positive customer experience. Adjustments to maximize the effectiveness of regional transit service consistent with operational service audits should be conducted. The large increase in the number of seniors and the growing importance of universities and colleges will necessitate a regular review of how route structures are developed and adjusted.

19. Support efficiency, access, and safety improvements along major regional freight corridors - Near-Term/ Medium-Term

A number of plans and studies along major freight corridors have been completed throughout the Region, with location-specific recommendations along the highway, bridge, and railroad networks calling for a variety of efficiency, access, and safety improvements. Traffic calming measures, streetscape improvements, and enforcement of existing speed, weight, noise, and turning restrictions are cost-effective mitigation techniques that help enhance quality of life for residents living along or near freight corridors. Such improvements increase the viability of these corridors by promoting economic development opportunities while minimizing the negative impacts of freight on nearby residential neighborhoods.

Transportation System Management and Operations

Transportation System Management and Operations or TSMO recommendations provide the best opportunity to maximize the efficiency of the current transportation system at the lowest cost. There are three primary initiatives that serve as the basis for the TSMO recommendations in the *LRTP 2040:* Technology, Coordination, and Demand. These initiatives are not mutually exclusive (e.g., there are Technology elements that are critical to and included in Coordination and Demand initiatives and the same is true for Coordination and Demand elements as they relate to Technology and each other).

The majority of delay in the Region is non-recurring and is the result of crashes, weather, and other irregular events. TSMO programs and projects can effectively address non-recurring delay through improved incident response, more efficient deployment of resources to clear snow and ice, and timelier information to travelers. Even in cases where the delay is recurring due to peak demand and fixed capacity, TSMO programs and projects that inform travelers of less costly options or alternative routes that could be more convenient have the potential to reduce demand on the system when use is at its highest level.

TSMO programs and projects can increase safety by providing timely and accurate information to make travelers aware of hazards such as adverse weather conditions, work zones, crashes, and other incidents. By improving incident response and management, TSMO programs and projects can also shorten clearance times for crashes which reduces the likelihood of secondary crashes. This improves safety, reduces resulting delay, and decreases emissions.

Technology

Technology provides multiple opportunities to improve safety, efficiency, and reliability for transportation users while reducing the need for expansion of physical infrastructure or introduction of new services. Utilizing continuously improving information and communication technologies via Intelligent Transportation System (ITS) instrumentation will allow transportation agencies to better manage and operate the existing system, including parking in areas where it is limited. The usefulness of technology in TSMO will increase substantially over the period covered by the *LRTP 2040.*

At present, transportation agencies in the Region emphasize the use of ITS to determine what is occurring on the system and make corresponding adjustments remotely, to the extent possible. In the near future, it is anticipated that ITS can be used to identify not only what *is* happening on the transportation system but what *will* happen. Technology will allow transportation agencies to conduct not only diagnosis but, more importantly, prognosis to proactively address the safety, efficiency, and reliability of the system.

ITS offers the opportunity to improve preservation and maintenance of infrastructure and vehicles by monitoring and reporting on the structural integrity of roadways, bridges, and buses. As part of the TIDE program, RGRTA has outfitted RTS buses with sensors that are able to identify issues with the functioning of buses prior to breakdowns that would inconvenience travelers and may result in choice riders electing not to use public transportation. Using ITS to detect deterioration of transportation system infrastructure that compromises the structural integrity of a facility can allow for appropriate repairs to be undertaken before weight limits need to be enacted or closures are required.

Regional Traffic Operations Center

20. Upgrade regional communications infrastructure to support greater integration of transportation agency operations – Ongoing

The key to fully utilizing technology to improve TSMO is dependent upon the transfer of information among and between personnel and devices that are deployed to monitor travel conditions and make necessary adjustments. This communication can and should be accomplished by an appropriate combination of hardwired and wireless technologies. As new capabilities become available, existing and expanded communications devices connecting instrumentation and TSMO agency staff will be implemented.

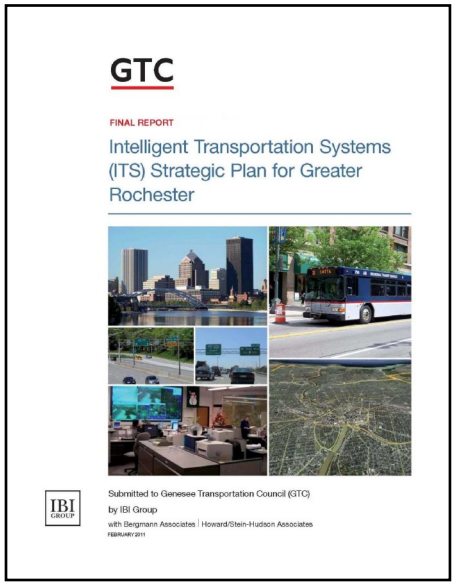
Representative projects include the ongoing expansion and upgrades to the regional fiber optic and wireless communications network - which links traffic signals and other ITS elements to each other and to the RTOC - and the expansion of communications and ITS elements along corridors that have been assessed for future deployments, such as the NYS Route 96 corridor in Victor, Ontario County.

21. Deploy ITS instrumentation in accordance with the *ITS Strategic Plan for Greater Rochester* – Ongoing

The *ITS Strategic Plan for Greater Rochester* identifies Group 1: Critical Operations Target Areas and Group 2: Areas of Regional Operations Significance.

Group 1 locations include the urban core of Monroe County and the expressways and arterial roads radiating from it. These locations are identified as Critical Operations Target Areas due to traffic volume, access to commercial and employment areas, and their susceptibility to delay from non-recurring events. ITS-enabled safety and mobility improvements in these locations will benefit the greatest number of travelers and volume of freight. The emphasis of ITS deployments in these locations is on infill, upgrade, and integration to maximize system management capabilities.

Group 2 locations include those areas with limited, or without any ITS deployments. The focus of ITS deployments in Group 2 is on expanding the regional ITS network to maximize its effectiveness.


GTC

FINAL REPORT

Intelligent Transportation Systems (ITS) Strategic Plan for Greater Rochester

Submitted to Genesee Transportation Council (GTC)
by IBI Group
with Bergmann Associates | Howard/Stein-Hudson Associates
FEBRUARY 2011

22. Replace ITS instrumentation with next generation technologies as identified in the *ITS Strategic Plan for Greater Rochester* – Ongoing

Many of the ITS instruments currently deployed in the Region are first or second generation equipment. As this equipment ages, it becomes increasingly difficult to maintain. The latest generation technologies that will be available when current ITS instrumentation requires replacement will provide increased management and operation capabilities.

23. Integrate cybersecurity considerations into ITS deployment projects - Ongoing

Cybersecurity measures prevent unauthorized use of and access to the information technology components used to operate ITS field instrumentation. Protecting these assets from intrusion is a critical security function of regional transportation management agencies.

24. Monitor advances in Connected and Automated Vehicles and implement supportive ITS projects as appropriate – Medium-Term/Long-Term

The ongoing evolution of the connected vehicle environment has the potential to dramatically improve transportation system safety, efficiency and reliability, as well as generate substantial economic and environmental benefits. By facilitating vehicle-to-vehicle and vehicle-to-infrastructure communications, wireless technology enables travelers to obtain more and better travel information, maximize vehicle and fuel efficiency, and minimize their exposure to weather and safety hazards. Regional transportation management agencies should be mindful of emerging Connected and Automated Vehicle-supportive technologies and integrate these technologies into their ITS deployments as appropriate.

25. Further expand electronic payment options for on-street, garage, and surface lot *parking* in the City of Rochester, including a pilot electronic toll tag for garages – Near-Term

Currently, electronic payment options (e.g., credit card, online, etc.) for parking in the City of Rochester are available on select city streets and some city-owned garages. These options should be expanded to all city parking facilities, and privately-owned garages and lots should be encouraged to adopt them as well. Offering electronic payment options can improve the efficiency of parking administration and make visiting Downtown Rochester easier as payment is not limited to currency, for on-street meters. The installation of multi-space on-street parking meters that accept both coins and credit cards should be expanded.

26. Investigate establishing a single payment system for multiple transportation-related *mobility* options – Long-Term

Consider implementing a single payment system that provides users with the option of paying for access to multiple modes and services (e.g., transit fares, parking, tolls, bike share, and car share). Implementation of such a system would have to be coordinated on the national and state level as well as locally among multiple stakeholders and facility operators, but could potentially provide a seamless user experience among multiple modes and increase access to a range of transportation services.

27. Install Automatic Vehicle Location (AVL) and weather information instrumentation on public fleets to optimize vehicle routing and serve as floating, real-time data sensors – Immediate/Near-Term

The data provided from AVL technology installed on publicly-owned fleet vehicles such as snow plows and refuse trucks allows operating agencies to optimize routing of these vehicles as they provide needed services. Improved routing based on this data can make service delivery more efficient, reducing labor and fuel costs and allow the fleet size and mix to be optimized. Installing sensors that provide data on weather conditions can, when combined with data on changes in the locations of vehicles equipped with AVL instrumentation, provide valuable information to the public informing them of delay and hazards. The City of Rochester has equipped its Department of Environmental Services vehicles with AVL technology.

Crossing the street — Downtown Rochester

28. Install appropriate pedestrian ITS instrumentation at identified intersections and crossings to reduce vehicle-pedestrian conflict – Ongoing

Installation of pedestrian countdown signals, audible/tactile devices, and similar ITS elements can improve pedestrian safety and accessibility. Pedestrian countdown signals inform pedestrians of the time allotted for crossing; this is especially important for persons with limited mobility, including seniors. Audible/tactile devices provide guidance and assistance to persons with disabilities as to when it is appropriate to cross streets. All signalized locations in Monroe County are being converted to include countdown pedestrian indications, and audible/tactile

accessible pedestrian devices are being installed at more than 100 signalized locations to assist persons with disabilities. Near-term deployments should be determined based on the volume of pedestrians and data on vehicle-pedestrian incidents to ensure the instrumentation is deployed where it is most needed.

29. Continue the implementation and expansion of Technology Initiatives Driving Excellence (TIDE) for RTS – Ongoing

TIDE is a comprehensive Advanced Public Transportation Systems (APTS) suite that improves operational efficiency and customer service. The benefits derived from TIDE aid in attracting choice riders and reducing delay on the highway and bridge network. As technology advances, additional capabilities will become available and incorporated as the system matures.

APTS implementation plans based on TIDE experiences and lessons learned should be developed for RTS' regional operations. Automatic Vehicle Location systems are in use on RTS Access and RTS Livingston buses. Additional APTS elements and associated instrumentation will be considered as appropriate on all RTS regional services to improve operational functionality and improve customer service.

30. Introduce Transit Signal Priority (TSP) on heavily traveled RTS routes to decrease travel time and improve reliability – Near-Term

TSP allows buses to signal their arrival at an intersection and, as overall operations requirements allow, receive a green light as they approach to continue through. TSP works best in combination with the consolidation of stops and incorporation of queue jump lanes (i.e., lanes dedicated to transit vehicles at the approach to a signalized intersection allowing buses to jump to the front of queuing cars and trucks). TSP and associated roadway configuration improvements can serve as a precursor to more robust transit services, including Bus Rapid Transit. The *RTS Signal Prioritization Study* has identified the Lake Avenue (RTS Route 1) and Dewey Avenue (RTS Route 10) routes as the optimal routes to introduce TSP. The introduction of queue jump lanes should be accomplished as part of highway reconstruction projects, as appropriate, and in coordination with RTS.

31. Use the Systems Engineering approach to implement ITS projects. – Ongoing

Systems Engineering considers the entire life cycle of a project, including the design, deployment, operation, maintenance, retirement, and replacement phases. This approach maximizes agency resources and ensures integration among systems and system components (e.g., hardware, software, policies, procedures, and personnel), thereby increasing the probability that ITS projects will be delivered on-time and within budget, and will meet user needs.

Coordination

TSMO programs and projects also include the Coordination of transportation infrastructure and services and the associated relationships among all transportation agencies, including but not limited to NYSDOT and NYSTA, counties, the City of Rochester, and other municipalities. How transportation agencies coordinate their respective activities can maximize the investment of public resources and the delivery of services that clear crashes, address weather-related consequences, and provide connections between public transportation services operated by public and not-for-profit providers. The structure of interagency collaboration between transportation, emergency management, and law enforcement entities is critical to efficient management and operation of the transportation system.

32. Continue federal funding for Regional Traffic Operations Center (RTOC) staffing, including continued 24 -hour operations and cross-training of NYSDOT and Monroe County staff – Ongoing

To take full advantage of the capabilities provided by current and future ITS instrumentation, trained personnel need to be available at all times to monitor and process the information provided. Improving interoperability is an important component that can be addressed through cross-training of NYSDOT and Monroe County operators, with the expectation that greater consistency between ITS instruments, software, and associated applications can occur in the future.

HELP Truck

33. Continue federal funding for the NYSDOT Highway Emergency Local Patrol (HELP) Program to decrease delay and increase safety on major highways by providing emergency roadside service to disabled vehicles – Ongoing

The HELP Program is an important initiative in minimizing non-recurring incident-related delay. The program provides assistance to motorists experiencing vehicle problems on major roadways that, without quick action, will limit capacity and cause congestion. The *NYSDOT-Region 4 Advanced Transportation Management System Local Evaluation Report* found that the HELP Program had one of the highest cost/benefit ratios of any initiative assessed.

34. Develop interagency agreements, such as Regional Concepts of Transportation Operations (RCTOs) and Concepts of Operations, to improve collaboration and coordination – Immediate/Near-Term

Formalized interagency agreements help stakeholders to more efficiently operate and manage their infrastructure and are important to the successful operation of jointly managed ITS deployments. A RCTO provides a shared strategy among transportation agencies representing all modes, law enforcement, and emergency responders to better coordinate system operations and management. Concepts of Operations define a systems' operational requirements and facilitate interagency understanding of project goals. For example, the City of Rochester has developed a Concept of Operations for coordination of ITS operations at the Port of Rochester among City, County, and State agencies.

35. Coordinate relevant training opportunities between transportation, law enforcement, fire and medical, and other agencies to improve incident response, management, and clearance – Ongoing

Clearing crashes as quickly as possible while providing for the safety of emergency responders and law enforcement agents requires significant coordination. The Genesee-Finger Lakes Regional Traffic Incident Management Symposium, held in October 2015, provided technical training for regional law enforcement, first responders, transportation system management agencies, and the local towing industry. This event or a similar training opportunity should be offered in the Region on a regular basis.

Genesee-Finger Lakes Regional Traffic Incident Management Symposium

36. Support and promote informational programs to reduce distracted driving – Ongoing

Studies have shown that distracted driving is comparable to operating a vehicle while impaired by alcohol or drugs. Traffic safety boards that include transportation agencies, law enforcement, and other organizations should develop and implement educational and enforcement programs to reduce distracted driving.

37. Ensure that public transportation facilities are accessible to all users – Immediate

If reasonable access to bus stops or shelters is compromised (e.g., snow and ice have not been cleared and/or sidewalks are impassable), the viability of public transportation is also compromised. The responsibility for ensuring this access is typically borne by the adjacent property owner or municipality in which the sidewalk is located however, rules vary across municipalities. There should be greater awareness of responsibility for keeping bus stops fully operational. Sidewalks that provide access to public transportation should be prioritized for sidewalk preservation and maintenance activities.

38. Preserve existing rights-of-way for future transportation uses that may be needed – Ongoing

Existing linear rights-of-way – including active and abandoned rail corridors and utility corridors – that are suitable for transportation purposes should be preserved as corridors for potential future use. When portions of these corridors are used for non-transportation purposes, it is very challenging and often cost prohibitive to reestablish or create a new corridor. The *Regional Rights-of Way Study* (2015) identifies 16 priority corridors that are no longer used for their original intent. Through stakeholder outreach, eight of the 16 corridors were identified as a high-priority. Detailed corridor profiles including potential future uses, associated costs, and preservation strategies were developed for these eight high-priority corridors. Coordination between land owners and agencies will be required to maintain potential future access.

Demand

These initiatives provide users with better and additional information to manage the Demand that is placed on the system. In some cases, technology is the primary enabler of the provision of the information (e.g., text alerts regarding incidents and next bus arrival times, etc.). In other cases, information is provided to travelers on printed materials (e.g., color coordinated wayfinding signage to assist visitors in reaching their destination, marketing fliers promoting a new transportation service, etc.).

Making full and complete information on options and conditions widely accessible allows users to choose how they travel based on their individual needs. Providing access to travel time, route, and cost information for multiple modes (specifically, non-single occupancy vehicles) in a single place permits users to

comparatively assess their full range of options. Doing so via the internet is currently the most effective means for users to adjust their travel choices.

39. Continuously identify ways to increase and improve real-time travel information – Ongoing

Providing real-time travel information is an important component of managing travel demand and getting the most out of existing infrastructure and services. Improved information on travel options via Dynamic Messaging Signs, the proliferation of smart-phones with apps displaying real-time traffic conditions along with transit arrival and departure times, and the ability of transportation agencies to access real-time and historic travel times will lead to better decision making across all modes. Technologies surrounding travel time data are changing in ways that cannot be predicted over the coming decades. Distilling "big data" resources via massive historic travel time datasets into comprehensible snapshots of information will prove challenging for transportation agencies.

40. Promote use of the Greater Rochester Regional Commuter Choice Program (Roceasyride) to provide up-to -date, consolidated information on transportation options and allow for comparative assessment - Ongoing

GTC established Roceasyride in April 2012 as an online service (Roceasyride.org) where commuters can find other commuters with proximate origins and destinations for carpooling, identify optimal public transportation routes and schedules, and determine preferred bicycling routes. Roceasyride.org provides information and opportunities to save money and reduce emissions via the various non-single-occupancy vehicle travel options available. Use of Roceasyride should be promoted and marketed to increase its overall effectiveness by maintaining the user levels necessary to facilitate relevant matches.

41. Integrate the Greater Rochester Regional Commuter Choice Program (Roceasyride) with the 511NY Program – Near-Term/Medium-Term

The Roceasyride program and 511NY program share common goals. The 511NY program is maintained by NYSDOT and is the state's official traffic and travel resource. The program is accessible through the internet or by phone, and provides current traffic and weather conditions. It includes a public transportation trip planner, that has carpooling and vanpooling resources. The program is enhanced regularly and should continue to provide relevant, timely information to transportation system users. Integrating these two programs will increase traveler benefits by providing a "one-stop shop" for users to obtain information and assess options for trips originating or ending within the Region.

42. Support integrated/coordinated interchange and arterial signal timing plans – Ongoing

Optimizing signal timing along and between major corridors improves the efficiency of traffic operations, helping to reduce delay and vehicle emissions. The replacement of fixed-time signals with actuated ones (i.e., light cycles change when triggered by traffic detectors monitoring actual demand) allows for quicker, more flexible responses to changing traffic conditions. Both fixed-time and actuated signals can be adjusted remotely from the Regional Traffic Operations Center rather than manually in the field. Traffic signal synchronization along corridors must also include input from agencies whose roadways intersect with the corridor so that the needs of adjacent and parallel facilities are considered.

43. Improve or install wayfinding signage in business, cultural, and other unique districts as well as in interregional travel facilities – Near-term/Mid-Term

Providing information at key locations is an important element in providing access to specific destinations and can reduce delay and visitor angst. Districts and interregional travel facilities that would benefit from the introduction of new or improved wayfinding signage should assess needs/requirements and then determine an appropriate form of signage that is simple, effective, multi-modal, and aesthetically consistent with the area. Wayfinding signage for and along multi-use trails should also be considered.

Wayfinding signage — Downtown Rochester

44. Implement electronic parking guidance systems – Medium-Term/Long-Term

Electronic parking guidance systems help to maximize the existing supply of parking by increasing the efficiency by which motorists are able to locate an appropriate parking space, be it in a garage, surface lot, or on-street. These systems can be particularly useful during planned events such as concerts, festivals, and sports games. Options for implementing such systems include utilizing dynamic messaging signs and developing smart phone applications and in-vehicle communication technologies to provide relevant parking information.

Expansion

Based on the identified transportation needs of the Region through 2040, Expansion of the bicycle, pedestrian, and public transportation networks is necessary. The level to which this can occur is limited by the reasonably expected revenues available for investment in the system over the next several decades and the need to preserve, maintain, and better manage and operate the existing system. Accordingly, investments in additional infrastructure and services must build upon the existing system by either increasing connectivity (i.e., bridging gaps) or offering increased access. The objective of these recommendations is to *expand* travel choices available to residents, visitors, and freight – not to replace current options. There are three primary initiatives that serve as the basis for the Expansion recommendations in the *LRTP 2040:* Bicycle and Pedestrian, Public Transportation, and Vehicle and Energy Options.

45. Improve connectivity within and between transportation modes and networks – Ongoing

Gap filling projects should serve multiple modes and infrastructure types when appropriate by connecting sidewalks to bus stops, providing park and ride locations, providing bike-on-bus opportunities, and making convenient connections from multi-use trails to the street network. These connections should ensure accessibility to people with disabilities, and should consider the lifespan of the connected networks taking into account the needs of both current and projected users.

46. Study the feasibility of siting future rail sidings and cross dock facilities at regionally significant locations to attract, promote, and support rail-enabled businesses – Near-Term/Medium-Term

Opportunities may exist for the siting of new rail sidings and cross dock facilities at strategic locations to more efficiently and cost-effectively ship bulk goods. Rail sidings offer direct access to rail-enabled businesses and cross dock facilities allow bulk commodities to be shipped longer distances via rail reducing the dependency on long-haul trucking. Increasing opportunities to ship bulk commodities along rail facilities offers businesses cost savings, lowers vehicle emission rates, saves wear and tear on highway and bridge facilities, and increases rail-enabled economic development and job opportunities.

Bicycle and Pedestrian

Based on current and projected development patterns and trip making characteristics in the Region, expanding the Bicycle and Pedestrian networks offer the greatest opportunity to improve public health, reduce greenhouse gas emissions, and provide additional mobility and accessibility to the majority of residents. Regional highway project proposal criteria, through the TIP, favor reconstruction and rehabilitation projects that add or improve on-street bicycle space and sidewalks versus those that do not. The Region has used federal transportation funds to make a significant investment in planning and implementing a comprehensive regional multi-use trails network that is dedicated to providing an efficient and safe bicycle and pedestrian network for both commuting and recreation. In addition, offering the opportunity for individuals to have access to a bicycle without owning one or having theirs immediately available can also assist in reducing energy use and emissions.

47. Expand and increase the connectivity of the Region's multi-use trail system per the Regional Trails Initiative – Ongoing

The Regional Trails Initiative (RTI), first published in 2002-2004, guides trail development in the Region. The RTI was recently updated in 2016 to account for the considerable progress in "filling the gaps" that has occurred in the 10-plus years since it was completed. Accordingly, investments in expanding the multi-use trails system should focus on the gaps identified in the RTI update as this strategy is expected to best meet current and future demand, and, by addressing the areas of highest existing and anticipated use, maximize the investment of limited resources. In cases where off-road trail alignments are not available, on-street facilities should be implemented if complete streets can be provided along the affected segments.

Trail signage — Town of Ontario

48. Increase the availability of sidewalks along federal-aid eligible highways in major need places (see Exhibit 33) to expand connectivity and access for pedestrians – Ongoing

With the majority of retail, commercial, and civic uses located along major roadways that are eligible to receive federal-aid, the provision of sidewalks is critical to accessing these destinations. Beyond adding them as part of federally-funded highway reconstruction and replacement projects, sidewalks should be improved where their condition deters walking and added, where appropriate, considering the need and type of place. Particular emphasis should be given to closing gaps in network and extending existing sidewalks.

49. Promote Safe Routes to School (SRTS) programs and the availability of technical resources to implement them – Ongoing

SRTS programs promote deliberate efforts to increase the number of children that can safely walk and bicycle to school in all places (e.g., urban, suburban, and rural). By encouraging "active transportation", they complement ongoing community- and school -based programs and activities intended to improve the overall health and wellness of children.

Many SRTS also serve as safe routes to play, doubling their purpose in promoting active lifestyles and reducing the tendency towards increased instances of childhood obesity and diabetes. In addition, SRTS programs can reduce delay during drop-off and pick-up periods. While federal funding exclusively dedicated to SRTS is no longer available, these projects remain eligible under a variety of federal, state, and local funding sources, and some can be implemented at a relatively low cost, providing mobility and health benefits as active transportation.

Bikes at Fairport school

50. Ensure that all fixed route buses can accommodate bicycles - Immediate/Near-Term

Bicycle racks on buses promote increased use of bicycling and public transportation by allowing riders to travel further distances to/from the bus stop than if they had to walk. Bicycle racks are currently installed on all RTS Monroe buses and being added to RTS regional services. In all places where fixed-route bus service is available, bicycle racks are a cost-effective means to improving intermodal connections. Bus operators should be trained in the use of these racks and encouraged to assist customers in utilizing them. When upgrading and/or replacing bicycle racks, RTS should look at options to increase their capacity beyond the current two bike limit.

51. Increase the amount of bicycle parking in key places throughout the Region (specifically Urban Cores, Employment Centers, Retail, and Higher Education locations) - Near-Term/Medium-Term

Bicycles provide a low-cost, active means of transportation and are financial assets to both commuter and recreational users. Bicycle use can be discouraged, however, if places to park or store them securely are not available. Short- and long-term bicycle parking should be highly visible, advertised, and located in well-lit areas (preferably with surveillance to deter theft and vandalism). Associated signage should be included wherever appropriate.

52. Assist in the implementation of a regional bike sharing program to expand access to bicycles without requiring ownership - Immediate/Near-Term

The *Rochester Area Bike Sharing Program Study*, completed in March 2015, has determined that a bike sharing program is feasible for the Center City and surrounding areas. The study provides a strategic plan for implementing the program utilizing public, private, and not-for-profit-contributed funding, and administered by a yet-to-be-identified sponsoring organization. As bike sharing programs promote increased use of not only bicycling but also public transportation (by allowing program members to travel further distances to/from the bus stop than if they had to walk), GTC should work with local partners to identify a suitable sponsoring/administering organization and assist in the advancement of the initiative.

Active Transportation Plans

A number of municipal-scale plans supporting bicycling and walking have been completed in the Region in recent years, beginning with the Town of Penfield Bicycle Facilities Master Plan in 2008, the City of Rochester Bicycle Facilities Master Plan (self-funded) in 2011, and Bicycle and Pedestrian Master Plans for the Towns of Brighton and Greece, respectively, in 2012 and 2014. A Bicycle Boulevard Plan for the City of Rochester was completed in December 2015. Bicycle and Pedestrian Master Plans have been completed for the Town of Chili, the Village of Brockport, the Town of Henrietta and are currently underway for the City of Geneva, the Town of Perinton, the Town and Village of Pittsford, and the Town of Irondequoit.

With the exception of the City of Rochester's Bicycle Facilities plan, all these projects were funded by GTC under its UPWP, along with a local cash match or in-kind services from the project sponsors.

These plans facilitate local advancement of bicycle and pedestrian-supportive projects, policies, and programs by providing concept-level planning and design guidance linking the overarching goals of the LRTP with local needs, goals, and capabilities.

Public Transportation

To effectively serve the needs of the Region through 2040, a fundamental shift in what is considered Public Transportation will need to occur. The fixed-route and dial-a-ride services of RGRTA will need to be supplemented to a greater degree by specialized transportation services supplied by not-for-profit agencies and private providers. Ensuring access for persons with disabilities, seniors, and other transit-dependent populations to medical appointments, employment, and social events will be a major determinant of their independence, quality of life, and the overall livability of the Region.

In 2014, RGRTA conducted a Bus Stop Optimization Study for RTS Monroe. RTS Monroe had approximately 3,400 stops which is comparable to several larger transit systems across the Country. RGRTA found that over time, the use of some bus stops has changed and some stops are no longer ideal or convenient for customers. RGRTA assessed each bus stop against several criteria to identify which stops are underutilized and which stops are not well-suited for customers. RGRTA also identified over 600 critical bus stops that should be kept in place to provide comfort and convenience to a large number of customers. Another factor was to determine optimal spacing along routes so that buses can run more efficiently, noting that too many stops will actually result in poorer service times. As a result of the study, RTS Monroe planned to phase out approximately 25 percent of the bus stops by the end of 2015 with equal proportions in the City of Rochester and Monroe County suburbs. The optimization of bus stops is expected to result in more efficient operations and improved service to customers.

53. Increase the frequency of fixed-route public transportation services where customer demand dictates – Near-Term/Medium-Term

Fixed-route public transportation service supports and is supported by adjacent land uses that provide density in both population and employment. Determinations of when and where to increase frequency of service should consider lower-income residents' employment prospects, retail and commercial businesses' operating hours, and access to medical facilities. There is also potential to increase service via "interceptor routes" (i.e., routes that intersect and provide a minimal layover period) and reduce trip length by eliminating the need to transfer downtown.

54. Construct satellite transit facilities in the City of Rochester and assess their feasibility in Mature and Recent/Emerging Suburbs – Near-Term/Medium-Term

Mixed-use developments are transit-supportive and more attractive to both residential and commercial tenants when serviced by fixed-route public transportation. This interaction can lead to increases in choice riders (i.e., individuals who have a choice to either use public transportation or travel via privately-owned automobile). RGRTA recently developed transit facilities as part of the University of Rochester's College Town development. In addition, a feasibility assessment of the RTS Park and Ride route structure with respect to service to suburban areas through mixed use developments that include a satellite transit facilities has been conducted and has identified suburban locations with the greatest potential for development that supports public transportation use.

55. Explore the feasibility of increased public transportation service across county lines to provide customers with greater access to services and jobs – Near-Term

With RGRTA as the sole public transportation provider in the Region, there are increased opportunities to coordinate transit services across county lines. Through its operating subsidiaries RGRTA should seek to reduce regulatory barriers to inter-county service and explore the potential to provide more efficient service near county boundaries.

56. Explore opportunities to provide service directly to Mount Hope Station from areas with high concentrations of customers, including express service to and from the Downtown Transit Center – Immediate/Near-Term

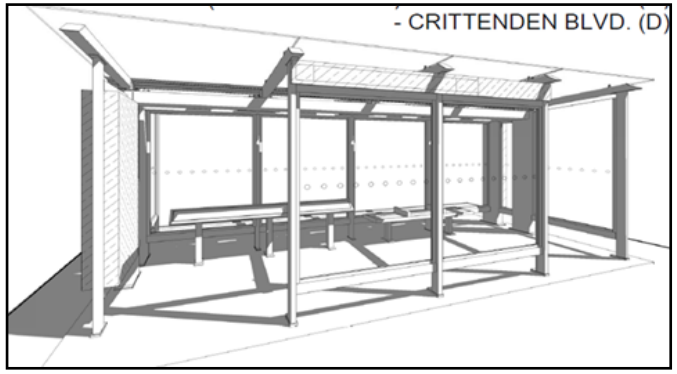
The UR, including its college and medical center, is the largest employer in the Region. The area around the UR has many smaller employers providing services to UR visitors, employees, and students as well as area residents. Several bus routes converge on the UR campus and it is the second busiest location in the RTS Monroe service area. Mount Hope Station is a distributed station concept on the UR campus that provides a higher level of service than typical bus shelters. Opportunities may exist for increased transit service at and near Mount Hope Station.

57. Explore opportunities to provide bus shelters with enhanced passenger amenities that serve large trip generators – Medium-Term

In order to attract choice riders, bus shelters serving large trip generators should offer enhanced amenities that provide additional security, comfort, and information. Such amenities would make taking the bus a more attractive option and improve the experience for all riders. Representative project: Such amenities are currently being implemented as part of Mount Hope Station.

In early 2011, the UR announced the selection of a private firm as prime developer for its proposed College Town. The project is a community-oriented development containing retail, residential, office, and recreational uses. College Town represents a major economic development opportunity for the community. The UR medical center is the second most active destination in the RTS Monroe system. In anticipation of this development, RGRTA began discussions with the University and its chosen developer on including the Mount Hope Station bus facility near the center of the medical facilities.

RGRTA continued discussions with the University to structure a transit component to serve the many thousands of people who now and in the future will travel to this area daily for employment and health services. The plan has evolved to a distributed station concept with heated transit stations installed around the medical center and college campus that include real-time bus arrival information in the form of ATIS signs. Given the level of demand across the entire UR campus, a distributed station concept will provide a higher level of service for customers than a larger, centralized station could.



Rendering of a station at University of Rochester's College Town.
Image credit: RTS

58. Continue to support mobility management initiatives that coordinate services of public, not-for-profit, and private transportation providers for the elderly, low-income individuals, and people with disabilities – Immediate

Mobility management involves meeting individual needs through the variety of services offered by multiple transportation providers. County- and regional-level mobility management initiatives, including information sharing, inter-county operations, and scheduling and ride matching technology improvements, offer opportunities to improve the effectiveness of existing services and meet increasing needs.

In the near-term, efforts should focus on supporting and enhancing county-level initiatives already underway, with region-wide coordination between counties as a longer-term goal. This bottom-up approach will allow a gradual increase in transportation system coverage as participating agencies share knowledge and build the capacity to implement mobility management programs.

59. Implement vanpooling services as a demonstration project – Immediate/Near-Term

A Vanpool allows groups of people (ideally consisting of groups of five to 12 people) to share a ride from a common origin to a common destination, typically for work commuting purposes. This allows people to share the cost of fuel and operating costs and realize individual commuting cost savings. Vanpools help bridge the gap to employment sites, typically in the suburbs or rural areas, that may be underserved by public transit. The *Rochester Area Vanpool Feasibility Study* determined that vanpooling is feasible in the Region and recommended that RTS implement demonstration vanpools to determine their viability.

60. Explore the feasibility of High-Capacity Transit (HCT) to serve the urban core and surrounding suburbs – Long-Term

Compared to traditional fixed-route bus service, HCT (e.g., bus rapid transit, streetcar, light rail) can provide a higher level of service for a greater number of passengers in a particular corridor by offering frequent service with fewer planned stops. Depending on the selected service model, HCT may also operate along a dedicated right-of-way for all or part of its route. Over the next 25 years potential alignments and development patterns that would allow for HCT service to be realized in the Region may emerge.

Vehicle and Energy Options

To address energy, air quality, climate change, and cost concerns, the migration of energy sources for public fleets from gasoline and diesel to domestically-produced, cleaner options need to be accelerated. The expanded availability of alternative energy sources for vehicles is largely dependent on actions at the national level but options that are immediately available are fully considered as part of this initiative. The establishment of alternative fuel dispensing and electric vehicle recharging infrastructure for public fleets can spur the use of more sustainable energy sources by other public operators, as well as private automobiles, creating private sector demand to provide the service. Given the global nature of crude oil pricing and recent volatility in the market, it is important to diversify energy sources to avoid being overly dependent on any single source.

61. Encourage and support the expanded use of more energy efficient, alternative fuel vehicles (e.g., electric and hybrid) and retrofitted vehicles in public and private fleets – Ongoing

Encouraging the use of cleaner, more energy-efficient vehicles by providing information on their capabilities and limitations, and

financially supporting their purchase for use in public fleets (including school buses), can significantly increase their use in both public and private sectors. GTC has and continues to partner with Genesee Regional Clean Communities, including providing funding through the TIP, to incentivize the replacement of gasoline and diesel vehicles with those that are more energy efficient and environmentally friendly, as well as retrofit existing vehicles to reduce emissions.

Representative projects include: funding to retrofit CSX Transportation switcher locomotives with more efficient engines that increased operating efficiencies and significantly reduced emissions in and around the Goodman Street Yard, improving air quality in the surrounding neighborhood and the purchase of plug-in hybrid electric vehicles for the City of Rochester.

62. Assess the feasibility of a regional car sharing program to expand access to automobiles without requiring ownership - Immediate/Near-Term

Many individuals want to enjoy the benefits of a private vehicle but may not have enough of a need to warrant the costs of ownership. In addition, lower-income individuals may not be able to afford a vehicle but would benefit from access to one for trips not served by other modes. Individuals who participate in car sharing programs typically have a desire to lower overall transportation costs, drive less, and use other modes more frequently. Additionally, many public agencies do not use or need passenger vehicles on a full-time basis (excluding police and emergency responders). Car sharing may allow these agencies to reduce vehicle purchase and maintenance costs while allowing for access when needed.

63. Increase the number of Truck Stop Electrification (TSE) facilities to reduce idling emissions – Immediate/Near-term

Operators of long-haul trucks often idle their vehicles when stopping overnight to provide heating or cooling in their cabs and to maintain the charge of vehicle batteries while using appliances leading to increased diesel emissions. Expanding the number of facilities that provide TSE options can improve air quality, reduce fuel use, and decrease maintenance costs. The New York State Energy Research and Development Authority (NYSERDA) may have funding opportunities in the future to study the feasibility of and/or assist with siting TSE facilities. GTC should explore partnerships with NYSERDA if an opportunity arises.

Illustrative Projects

The recommendations discussed above will be advanced with the reasonably expected revenues available through 2040. In addition, other projects have been identified that the Region would pursue implementation if and when additional funding becomes available. These projects are provided for illustrative purposes and represent actions above and beyond those that can reasonably be expected to be accomplished given limited federal resources. Financial partnerships with private and not-for-profit entities should be explored; specifically, those that would directly benefit from the projects. Each of these projects have been discussed and vetted through the regional transportation planning process and are considered worthy of implementation if sufficient additional revenues were to be made available for their advancement. A timeline for implementation is not given as these projects are unable to be achieved with the reasonable expected revenues as part of the fiscally constrained plan. If and when funding becomes available timelines can be established.

64. NYS Route 390/I-490 Interchange/Lyell Avenue Interchange

The NYS Route 390/I-490 Interchange/Lyell Avenue Interchange is the FLREDC's Infrastructure and Transportation Workgroup's 2014 Highest Priority Transformational Project and is identified as a near-term recommendation in the 2012, *Regional Goods Movement Strategy*. The Interchange serves approximately 200,000 vehicles a day – the daily equivalent of the Brooklyn Bridge and the Manhattan Bridge combined or the entire population of the City of Rochester. The interchange suffers from peak-period congestion, higher than average crash rates, and deteriorating facilities that are leading to higher operating costs. The Lyell Avenue Interchange with Route 390 serves the southern end of Eastman Business Park and the Rochester Technology Park – both freight generators and major employment centers. The FLREDC's highest economic development priority remains fully revitalizing the Eastman Business Park, and the congestion and access issues surrounding the Lyell Avenue/Route 390 Interchange is a limiting factor to redevelopment. This project would address safety concerns, current and future capacity issues, and operational constraints over four phases at an estimated total cost of $157 million. The replacement of the Lyell Avenue bridge over I-390 and the realignment of the northbound exit ramp is already funded.

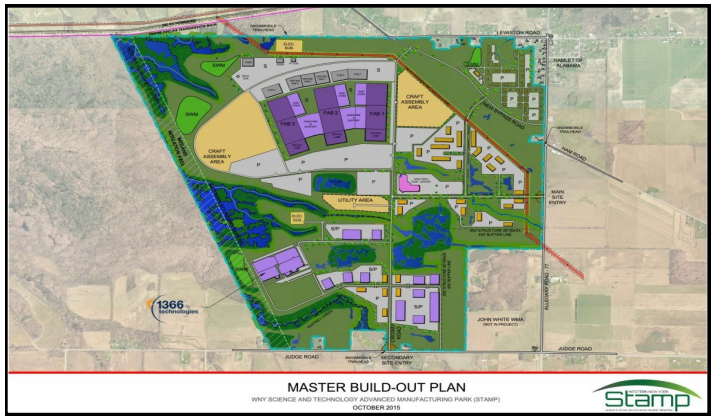


Image credit: http://wnystamp.com/

Rendering of NYS Route 390/I-490 Interchange/Lyell Avenue Interchange
Image credit: 2014 FLREDC Report

65. Western New York Science and Technology Advanced Manufacturing Park (STAMP) - Infrastructure and Transportation Improvements

The STAMP Infrastructure and Transportation Improvements is identified as by the FLREDC as a 2014 High Priority Transformational Project. The 2012, *Regional Goods Movement Strategy*, previously identified improving access to regional priority economic development sites, including the STAMP site and the Buffalo East Technology Park located in nearby Pembroke, as a near-term recommendation. The STAMP site is a shovel-ready 1,250-acre mega site currently under development located five miles from the NYS Thruway in Genesee County that will support nanotechnology and advanced manufacturing – potentially creating thousands of jobs. The installation of infrastructure to support the first advanced manufacturing tenant is underway. In order to accommodate increased freight traffic to the site, transportation infrastructure improvements are needed along NYS Route 77 between NYS Route 5 and NYS Route 63 in Genesee County. Additional funding through the FLREDC will be sought to continue roadway improvements as the site is further developed.

66. Support Transportation and Infrastructure Improvements surrounding Eastman Business Park

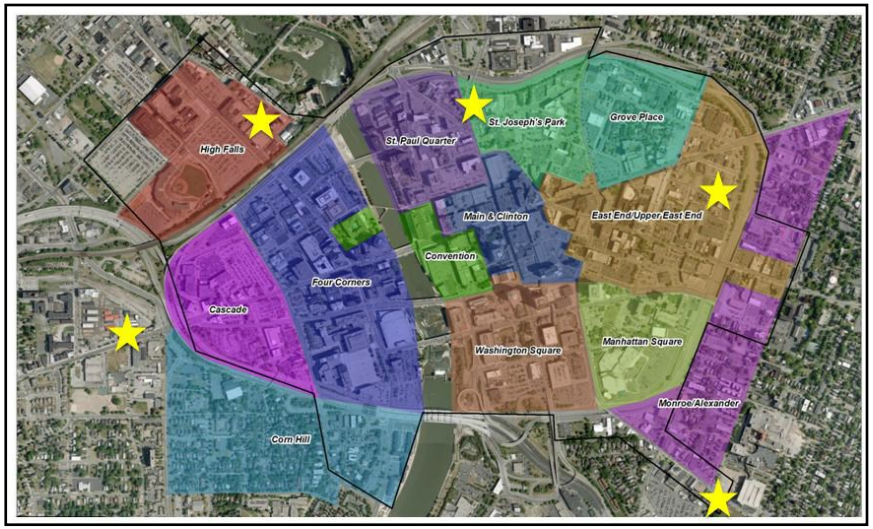
Supporting the revitalization of Eastman Business Park has remained the FLREDC's highest priority since the inception of the council and firmly supports Rochester's past and present as an industrial center. The Eastman Business Park, currently home to Kodak and a number of technology firms, is located in the City of Rochester. It is a 1,250 acre industrial park with on-site generation capability for utilities, including a 125 megawatt electric power station, and a wastewater treatment facility. The park also includes 17 miles of railroad track. The NYS Route 390/I-490 Interchange/ Lyell Avenue Interchange (recommendation #64) supports the development of Eastman Business Park by alleviating bottlenecks associated with accessing the site. Additional required infrastructure and transportation system improvements should continue to be supported to redevelop the site.

67. Establish a Center City Circulator Service to serve daily commuters, visitors, and tourists

The circulator service would be designed to serve the needs of morning and evening peak period commuters, daytime workers and tourists, and evening/late-night visitors and tourists. The service would link major employment destinations, entertainment venues, and parking in Downtown Rochester, extending into the East End, High Falls, and Cascade districts. At present, it is recommended that this service initially utilize buses that could be purchased for $1.5-$1.75 million and be operated for $2-$3 million per year in current dollars. The feasibility of converting the service to modern streetcars or some other fixed-guideway system should be considered based on ridership and continued growth Downtown.

68. Support efforts to establish high-speed passenger rail service on the Empire Corridor

Improved passenger rail service between Buffalo and Albany (with connections to Toronto and New York City) that is faster and more reliable than current Amtrak service should be provided as it offers the opportunity to increase connections within the larger megaregion. As part of this, the Rochester Intermodal Transportation Center (i.e., Downtown Train Station) is being built and the development of a station in central Wayne County should be considered. To be feasible, this service must save time for existing riders, attract new riders from other modes, and not interfere with freight operations. NYSDOT has undertaken planning for proposed higher-speed passenger rail service along the Empire Corridor. Once the associated corridor-wide Environmental Impact Statement is drafted, the Region will be able to consider whether the proposed service meets future transportation needs.



Center City Circulator Study Area

Chapter 7 - PERFORMANCE MEASURES

Performance Measures

LRTP 2035 identified performance measures that are outcome-based, clearly defined, and utilize real-world data. Using quantitative metrics to measure the performance of the transportation system over time helps maintain transparency and accountability to the taxpayers, given the large amount of public funds used for its construction, maintenance, and operation.

GTC sought to ensure that the selected performance measures would be both meaningful (having significance) and understandable (capable of being comprehended) to users and policymakers, providing a common basis to discuss changes in how the transportation system is meeting or not meeting regional needs. *LRTP 2040* continues this commitment to a performance-based planning process by including a subset of performance measures presented in *LRTP 2035* and introducing new measures.

LRTP 2035 provided a benchmark for each performance measure along with the desired direction consistent with the GTC Goals and Objectives and the likely direction based on what can realistically be accomplished within the reasonably expected revenues. Given the changes in available data, data collection methods, the reclassification of the MPA with an expanded geographical footprint, along with planning and policy work completed to date, not all of the *LRTP 2040* performance measures are directly comparable to the benchmark provided in *LRTP 2035*. Changes to the measures and data sources, where applicable, are noted below in the text.

GTC does not have direct influence over all of the performance measures (i.e., GTC cannot directly improve Amtrak's passenger train on-time performance). However, as the organization charged with setting the policy direction and overseeing the regional transportation system, it is GTC's responsibility to measure how well the system is performing. The *LRTP 2040* performance measures are meant to inform and guide policy decision making.

Performance-Based Planning in Action

GTC implemented an updated set of scoring criteria for capital projects included in the TIP. All transportation projects that apply for federal funding through the TIP process are subject to the following evaluation criteria: safety, mobility, community and economic development, system continuity and optimization, environment, and fiscal responsibility. A subset of evaluation criteria is further applied by mode: highway and bridge, public transportation, bicycle and pedestrian, system management and operations, and goods movement.

The influence a potential project has on a performance measure is directly evaluated through this scoring criteria. For example, system management and operations projects are evaluated based on the following four criteria:

1. Reduce travel times on major roadways
2. Reduce incident clearance time
3. Increase the productivity of regional transportation agencies/providers (e.g., cost savings, time savings, etc.)
4. Support or advance existing and/or proposed ITS elements

Scoring criteria 1. and 2. directly influence the travel time index and the median incident clearance time on major roadways.

PERFORMANCE MEASURES

MAP-21 established, for the first time, a performance-based planning program to increase accountability and transparency through the implementation of mandated performance measures and planning targets. The FAST Act continues to support this approach to transportation planning. In order to meet the performance-based programming approach, MAP-21 established the following seven national performance goals:

1. Safety
2. Infrastructure Conditions
3. Congestion Reduction
4. System Reliability
5. Freight Movement & Economic Vitality
6. Environmental Sustainability
7. Reduced Project Delivery Delays

These seven goals must be met by the state departments of transportation, MPOs, and public transportation providers. Additionally, GTC will be federally required to include a system performance report in future LRTPs. This report must include the anticipated effect of the Region's capital program (the TIP) on the nationally mandated performance measures. Once the rulemaking is finalized GTC will establish performance targets that address national performance measures in coordination with NYSDOT and public transportation providers. Until the final rulemaking is released, GTC will continue to measure the performance of the transportation system as presented in *LRTP 2040*.

LRTP 2040 performance measures, included in Exhibit 34, along with changes since *LRTP 2035*, are presented below.

Number of Fatalities (3 year rolling average)

The number of fatalities resulting from motor vehicle crashes in the nine-county Region is calculated using a three-year rolling average based on information provided by the National Highway Traffic Safety Administration. A three-year rolling average was selected to ensure that longer-term trends were not lost due to a significant fluctuation in a single year. The fatality rate has remained steady at 99 fatalities as previously reported in *LRTP 2035* and 100 fatalities as currently reported.

Not Structurally Deficient Bridges

Bridges with a condition rating of five or above are considered not structurally deficient. It is important to reiterate that deficient bridges are not intrinsically unsafe – unsafe bridges are closed before presenting a danger to the public. In 2014, 67.2 percent of the bridges in the Region were considered not structurally deficient. This is a slight gain compared to 64.8 percent presented in *LRTP 2035*.

Percent of Federal-Aid Roadways with Pavement Conditions Rated "Fair" or Better

Every single day residents around the Region drive or ride on the roadways to get to work, school, and other activities. The pavement condition determines their trip quality more so than any other performance measure as it represents the physical integrity of the surface of the roadway. Poor pavement conditions result in accelerated wear and tear on vehicles, generating increased maintenance and operating costs, and frustrations for drivers trying to navigate crumbling roadways. The percent of federal-aid highways with pavement conditions rated fair or better was calculated based on data collected by NYSDOT and GTC that includes the vast majority of roadways in the Region that are eligible for federal funding through GTC.

The *LRTP 2035* pavement condition rating was unknowingly, at the time, calculated with overlaps in the data. This has been rectified for *LRTP 2040*. However, do the discrepancy in the data calculation methodologies this performance measure is not comparable between *LRTP 2035* and *LRTP 2040*. The *LRTP 2035* pavement condition rating without overlaps would have been 89.66% for 2009 (not 90.3% as reported).

Average Age of Transit Buses

The Federal Transit Administration (FTA) establishes a service-life requirement for transit buses that public transit operators must follow to properly maintain their fleets without fiscal penalties. According to FTA the average 40-foot bus, typically used by RGRTA, has a full service-life of approximately 12 years. Other vehicle classifications have different service-life standards. The current average age of a 40-foot RTS bus is 5.9 years (reported as 7.65 years in *LRTP 2035*) suggesting that RGRTA has found an optimal balance averaging an equal number of buses being replaced and taken out of service.

Travel Time Index on Major Roadways

Newly acquired GPS-based vehicle probe data was used to calculate the Travel Time Index (TTI) on major roadways in the nine-county planning Region for *LRTP 2040*. The average AM peak (7 A.M. – 9 A.M.) and PM peak period (4 P.M. – 6 P.M.) TTI for 2014* is 1.085, well below a TTI of 1.3 which indicates the roadway is congested and that the trip takes a third longer than normal (i.e., a 20 minute trip takes 26 minutes). *LRTP 2035* previously reported data for Principal Arterials therefore, this measure is not directly comparable to *LRTP 2040*.

*Average two week sample of Mondays-Thursdays in October for all roadways in the nine-county Region with an existing Traffic Message Channel (TMC) code in INRIX Analytics software.

Transit On-Time Performance

On-time is defined as transit buses being between 2:59 minutes early and 5:59 minutes late. The transit on-time performance as reported by RGRTA for the RTS Monroe system for the 2014 fiscal year is 89.8 percent [reported as 84 percent for *LRTP 2035*].

Passenger Rail On-Time Performance

According to Amtrak, passenger trains traveling the Empire Corridor (New York City to Niagara Falls) in January 2015 were on -time 74.8 percent of the time [reported as 70 percent for December 2010 in *LRTP 2035*]. Amtrak calculates the on-time performance by calculating the total number of trains that arrive on-time at the end of the route divided by the total number of trains operating along it. A train is on-time if it arrives at its final destination within an allowed number of minutes based on the total miles the train traveled.

Median Incident Clearance Time on Major Roadways

Median incident clearance time on major roadways for the 2015 calendar year was 51 minutes an improvement of 1 minute when compared to *LRTP 2035*. GTC calculated the measure using e-mail traffic alerts provided by the NYSDOT through the New York State Emergency Management Office's NY-Alert system and the New York State Thruway Authority's TRANSalert system.

Average Maximum Load

The average maximum load, provided by RGRTA for RTS Monroe urban routes, indicates how many passengers on average are on a bus route at its busiest point. This measures helps to determine if there are any capacity issues along the route. The average maximum load of 27.2 for the morning peak, 6:00 AM - 10:00 AM, and 28.91 for the evening peak, 2:00 PM - 6:00 PM, both indicate that overall the routes are functioning at an optimal level of capacity. Routes may be underutilized or approaching maximum capacity depending on the average maximum load.

Gaps in Core Multi-Use Trail Network

Gaps in the Core Multi-Use Trail Network decreased by 7.4 miles, compared to *LRTP 2035*, as the following trail segments were completed:

EL Camino Trail in the City of Rochester (2 miles)
Newark to Clyde segment along the Canalway Trail (4 miles)
Auburn Trail (1 mile)

The Core Multi-Use Trail Network includes the Canalway Trail, Riverway Trail, Genesee Valley Greenway, Auburn Trail, Lehigh Valley Trail, and several other shorter trails representing two-thirds of the entire regional trail network. When fully completed, the Core Multi-Use Trail Network will total approximately 260 miles.

Federal-Aid Highways in the MPA with Complete Sidewalks

The federal-aid highways with complete sidewalks include roadways that have sidewalks on both sides of the street with no gaps. This data was collected by GTC through the Pedestrian Facilities Inventory—a field survey of the over 1,000 miles of federal-aid roads in the Rochester MPA. Since *LRTP 2035* a slight gain of 2.2 percent was noted, bringing the total percent of complete sidewalks on the federal aid system to 21.8.

Environmental – Emissions of Nitrogen Oxides, Emissions of Volatile Organic Compounds, Emissions of Carbon Dioxide, and Direct Energy Use

Environmental performance measures continue to focus on emissions and energy use from the transportation system. The methodology to derive the benchmarks differs between *LRTP 2035* and *LRTP 2040*, therefore reported values are not directly comparable. The measures for *LRTP 2035* were derived from post processing volume and speed data from the GTC Travel Demand Model using methodologies approved by FHWA, FTA, and the EPA and for the MPA. GTC calculated the environmental measures for *LRTP 2040* using the EPA Motor Vehicle Emission Simulator (MOVES) 2014 for the MPA.

Exhibit 34

LRTP 2040 Performance Measures

Performance Measure	What it Evaluates	LRTP 2040 Benchmark	LRTP 2035 Benchmark	Desired Change	Actual Change	Likely Change
Number of Fatalities (3 year rolling average)	Safety	99 (2012)	100 (2008)	Decrease	1	Slight Decrease
Percent of Federal-Aid Roadways with Pavement Conditions Rated "Fair" or Better	System Preservation	92.03% (2012)	90.3% (2009 w/overlap)	Increase	Not comparable due to data collection methods	Slight Decrease
Not Structurally Deficient Bridges	System Preservation	67.2% (2014)	64.8%	Increase	2.4%	Slight Decrease
Average Age of Transit Buses	System Preservation	5.9 years	7.65 years	Decrease	1.75	Slight Decrease
Travel Time Index on Major Roadways (Principal Arterials in the MPA)	Mobility	1.085	Not comparable due to data collection methods	Decrease	Not comparable due to data collection methods	Slight Increase
Transit On-Time Performance	Mobility	89.8%	84%	Increase	5.8%	Slight Increase
Passenger Rail On-Time Performance	Mobility	74.8% (January 2015 NY - Niagara Falls)	70% (December 2010 NY-Niagara Falls)	Increase	Increase of 4.8%	Slight Decrease
Median Incident Clearance Time on Major Roadways	Mobility	51 minutes (2015)	52 minutes (2010)	Decrease	Decrease of 1 minute	Slight Decrease
Average Maximum Load	Accessibility	27.2 - 6:00 AM - 10:00 AM; 28.91 - 2:00 PM - 6:00 PM	New for *LRTP 2040*			
Gaps in Multi-Use Trails Network	Accessibility	28.6 miles	36 miles	Decrease	Completion of 7.4 miles	Slight Decrease
Federal-Aid Highways in MPA with Complete Sidewalks	Accessibility	21.80%	19.60%	Increase	Not comparable due to geographic expansion of the MPA	Slight Increase
Emissions of Nitrogen Oxides	Environment	24,341 Kg/Day	Not comparable due to geographic expansion of the MPA	Decrease	Not comparable due to geographic expansion of the MPA	Decrease
Emissions of Volatile Organic Compounds	Environment	11,809 Kg/Day		Decrease		Decrease
Emissions of Carbon Dioxide Equivalent	Environment	9,915,077 Kg/Day		Decrease		Slight Decrease
Direct Energy Usage	Environment	130,154 MMBtu/Day		Decrease		Slight Decrease

ACRONYMS

AAA	American Automobile Association
AADT	Average Annual Daily Traffic
ACS	American Community Survey
ADA	The Americans with Disabilities Act of 1990
APTS	Advanced Public Transportation Systems
ATIS	Advanced Traveler Information System
AVL	Automated Vehicle Location
BLOS	Bicycle Level of Service
C/AV	Connected and Automated Vehicle
CAD	Computer aided dispatch
CAFE	Corporate Average Fuel Economy
CAP	Circulation, Accessibility, and Parking
CCTV	Closed Circuit Television
CMAC	Constellation Brands Marvin Sands Performing Arts Center
CMP	Congestion Management Process
CP	Canadian Pacific
CSXT	CSX Transportation
CTPP	Census Transportation Planning Products
DMS	Dynamic Messaging Signs
EPA	Environmental Protection Agency
FAST Act	Fixing America's Surface Transportation Act
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FLREDC	Finger Lakes Regional Economic Development Council
FTA	Federal Transit Administration
GDP	Gross Domestic Product
GGH	Greater Golden Horseshoe
GHG	Greenhouse Gas
GPS	Global Positioning System
GRCC	Genesee Regional Clean Communities
GRIA	Greater Rochester International Airport
GTC	Genesee Transportation Council

GTSC	New York State's Governor's Traffic Safety Committee
GVG	Genesee Valley Greenway State Park
HAR	Highway Advisory Radio
HCT	High-Capacity Transit
HELP	Highway Emergency Local Patrol
HSIP	Highway Safety Improvement Program
HSSP	New York State Highway Strategic Plan
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITS	Intelligent Transportation Systems
LEED	Leadership in Energy & Environmental Design
LEP	Limited English proficiency
LRTP	Long Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century
MCDOT	Monroe County Department of Transportation
MPO	Metropolitan Planning Organization
MOVES	EPA Motor Vehicle Emission Simulator
MPA	Metropolitan Planning Area
MSA	Metropolitan Statistical Area
NHPP	National Highway Performance Program
NHTS	National Household Travel Survey
NHTSA	National Highway Traffic Safety Administration
NS	Norfolk Southern
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSP	New York State Police
NYSTA	New York State Thruway Authority
QCEW	Quarterly Census of Employment and Wages
RBC	Rochester Bicycling Club
RCTO	Regional Concept of Transportation Operations
RGRTA	Rochester Genesee Regional Transportation Authority
RTI	Regional Trails Initiative
RTOC	Regional Traffic Operations Center
RTS	Regional Transit Service

RWIS	Roadway Weather Information Systems
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SBR	State Bicycle Route
SHSP	Strategic Highway Safety Plan
SNAP	Supplemental Nutrition Assistance Program
SRTS	Safe Routes to School
STAMP	Western New York Science and Technology Advanced Manufacturing Park
STOA	State Transportation Operating Assistance
STP	Surface Transportation Program
SWOT	Strengths, Weaknesses, Opportunities, Threats
TEA-21	Transportation Equity Act for the 21st Century
TIDE	Technology Initiatives Driving Excellence
TIGER	Transportation Investments Generating Economic Recovery
TIP	Transportation Improvement Program
TMC	Traffic Message Channel
TSE	Truck Stop Electrification
TSMO	Transportation System Management and Operations
TSP	Transit Signal Priority
TTI	Travel Time Index
UPWP	Unified Planning Work Program
UR	University of Rochester
USDOT	United States Department of Transportation
VMT	Vehicle Miles Traveled
YOE	Year of Expenditure dollars

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