Long Range Transportation Plan

Genesee-Finger Lakes Region

2045

GENESEE TRANSPORTATION COUNCIL

June 2021

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INTRODUCTION/OVERVIEW

Long range planning is at best an educated guess regarding the future. The onset of the COVID-19 pandemic in 2020 showed the world just how quickly educated guesses regarding the future can evaporate into the unknown. And yet, it is with education, examining the facts, and working together that the world is tackling the pandemic. The spring of 2021 holds much hope for the future and the end of the pandemic is in sight. It was under this guise of the unknown that GTC staff and our regional partners developed the *Long-Range Transportation Plan for the Genesee-Finger Lakes Region 2045* (LRTP 2045).

The development of LRTP 2045 started by examining the facts, looking towards the future – however uncertain, listening to the public, and working cooperatively with our partner agencies. The next several decades contain challenges – persistent poverty, an aging population, rapidly changing technologies, and limited resources to address the maintenance needs of an aging transportation system.

Despite the concerns facing the region, the region has, above all else, an entrepreneurial culture and a willingness to try new things.

The region has many advantages to draw on including natural and cultural attractions, a strong sense of history, a recognized culture of academic investment and achievement, and nationally acclaimed medical facilities. The policies set forth in LRTP 2045 ensure that the transportation system will continue to also be an asset to the region.

The Genesee-Finger Lakes Region is fortunate to have a robust transportation system that often exceeds the needs of residents and businesses. However, while the transportation system routinely surpasses the needs of the region, these needs are not always met in an equitable fashion. The system favors those with access to a personal vehicle. The future possesses immense opportunities to improve accessibility to those who depend on transit, walking, bicycling, and other transportation modes. Looking towards the future, LRTP 2045 strives first and foremost to improve the equity of the transportation system. Increasing transportation choices and protecting the most vulnerable transportation users is paramount to creating a more sustainable future and a more inclusive system.

WHAT IS GTC?

The Genesee Transportation Council, otherwise known as GTC, is the Metropolitan Planning Organization or MPO for the nine-county Genesee-Finger Lakes Region. The nine-county region includes Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, and Yates counties. The Genesee Transportation Council is responsible for federally-funded transportation policy, planning, and investment decision making as it concerns the movement of people and goods on the surface transportation system.

ROLES/RESPONSIBILITIES

All federally funded transportation planning and investments decisions for the region are guided by the cooperatively planning efforts at GTC. Federal transportation legislation guides the planning process at the MPO. Fixing America's Surface Transportation (FAST) Act, signed into law on December 4, 2015, is the current five-year surface transportation reauthorization bill. The FAST Act identifies the following ten planning factors that must be addressed through the projects and programs at the MPO:

1. Economy Vitality
2. Safety
3. Security
4. Increase Accessibility
5. Protect and Enhance the Environment
6. Enhance Integration and Connectivity
7. Promote System Efficiency
8. Emphasize System Preservation
9. Resiliency and Reliability
10. Enhance Travel and Tourism

All activities at the MPO are conducted using a continuing, cooperative, and comprehensive planning process working with local elected officials, transportation planning professionals, and the general public.

What is an MPO?

The U.S. Department of Transportation requires every metropolitan area with a population of over 50,000 to establish a designated Metropolitan Planning Organization (MPO) to qualify for the receipt of federal highway and transit funds.

MPOs conduct required transportation planning activities for their designated Metropolitan Planning Area. An MPO must produce and periodically update a Long Range Transportation Plan, a Unified Planning Work Program, and a Transportation Improvement Program.

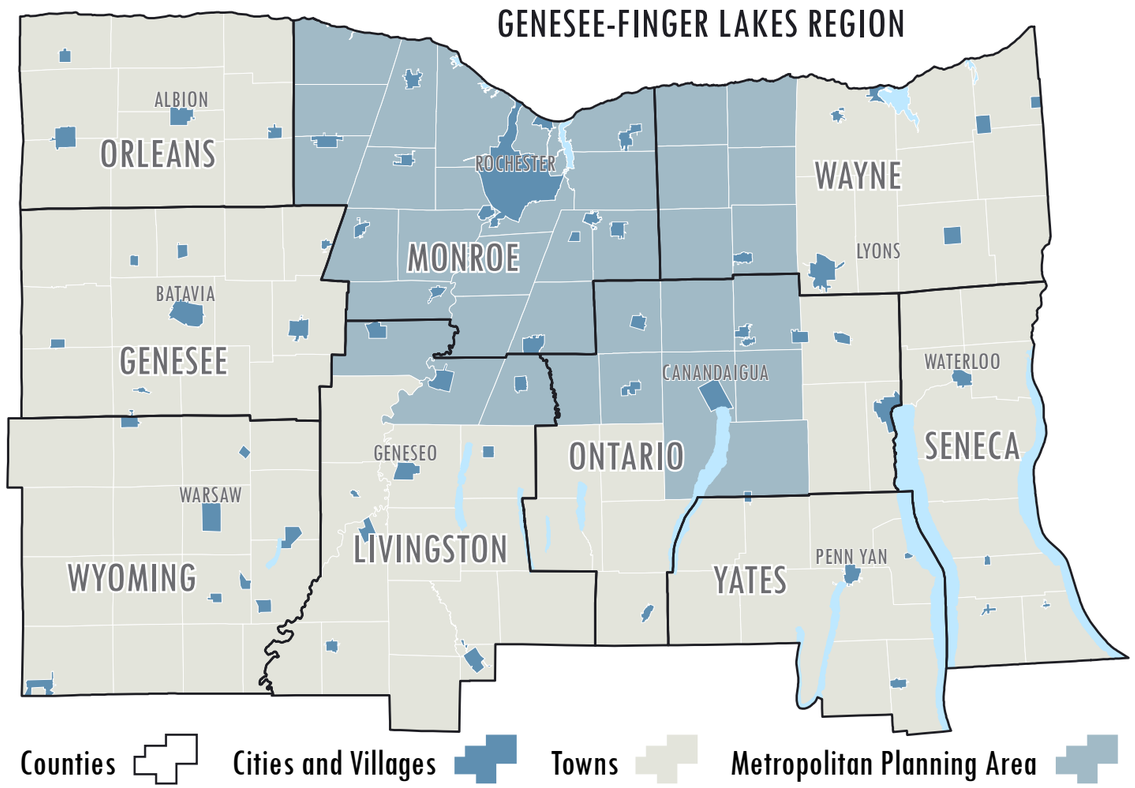
The primary focus of GTC's transportation planning efforts is the Rochester Metropolitan Planning Area (MPA). The Rochester MPA includes all of Monroe County plus the adjacent developed areas of Livingston, Ontario, and Wayne counties. However, the GTC planning region includes all nine-counties, not just the MPA. Accordingly, GTC conducts the metropolitan transportation planning process for the entire nine-county region, not just the MPA. A map of the nine-county region along with the Rochester MPA is presented at right.

All MPOs, including GTC, are responsible for three major work products. The Long Range Transportation Plan or LRTP, the Unified Planning Work Program or UPWP, and the Transportation Improvement Program or TIP. The LRTP sets the strategic direction for all GTC's actions and programs and is updated at least every five years. The policies in the LRTP are further refined in the UPWP through individual concept-level projects and programs. The UPWP serves as GTC's annual operating plan and budget. Finally, the TIP is the capital program that funds the specific transportation improvements in the region that will receive federal funding over the next four-to-five years.

ORGANIZATIONAL STRUCTURE

The Genesee Transportation Council is governed by a policy board, made up of elected representatives from local, state, and federal governments along with transportation agencies such as New York State Department of Transportation (NYSDOT), the Rochester Genesee Regional Transportation Authority (RGRTA), the Genesee-Finger Lakes Regional planning Council (G/FLRPC), and other agencies. As a policy making agency, GTC does not own or operate transportation facilities.

The GTC Board is supported by the Executive Committee, the Planning Committee, and various other committees. The Planning Committee provides professional and technical direction to the GTC Board. Following input from various individual project committees, the Planning Committee reviews and recommends action on activities and work products that are then considered for final approval by the GTC Board. GTC staff, in conjunction with key staff of GTC member agencies, provides professional and technical support for execution of the programs and policies established by the GTC Board and its committees.



GTC Goals and Objectives

1 Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency

- The transportation system should support balanced community and economic development of the metropolitan area
- 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

- Transportation designs, services, and education programs should enhance and protect life, health, and property

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

- 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
- 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
- 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
- Innovative financing/partnerships for transportation initiatives that reflect the full scope of interests impacted or served should be explored
- Transportation and transportation-related information resources should be developed and shared in a fashion that promotes informed public and private sector decision making
- 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

GTC Goals and Objectives

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

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

5 Promote efficient system management and operations

- The transportation system should be designed and managed in a fashion that minimizes lifetime maintenance and user costs
- Transportation investments should advance the Long Range Transportation Plan's goals and objectives in a fashion which maximizes benefits relative to costs *
- Transportation and land use planning should be integrated in a fashion that optimizes the use of existing transportation and other municipal infrastructure
- Transportation investments should be guided by cooperative planning, design, and maintenance standards to promote system continuity and uniformity across jurisdictional boundaries

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

- Transportation planning and decision making should support and reinforce local land use and development objectives
- Transportation planning and decision making should recognize local priorities balanced with broader community goals
- 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
- The transportation system should encourage the efficient use of non-renewable energy resources and the exploration of renewable alternatives
- 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

GOALS AND OBJECTIVES

The GTC Goals and Objectives reflect local and regional priorities within the context of the ten transportation planning factors outlined in the FAST Act. The development of the LRTP 2045, 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 previous pages.

LRTP DEVELOPMENT

Although the LRTP is a stand-alone document with a final adoption date, the development the LRTP is fluid and continuous. Each plan, study, analysis, meeting, training, and activity conducted by GTC staff and our partners since the adoption of the previous LRTP helps to shape and inform the next LRTP's recommended actions and priorities.

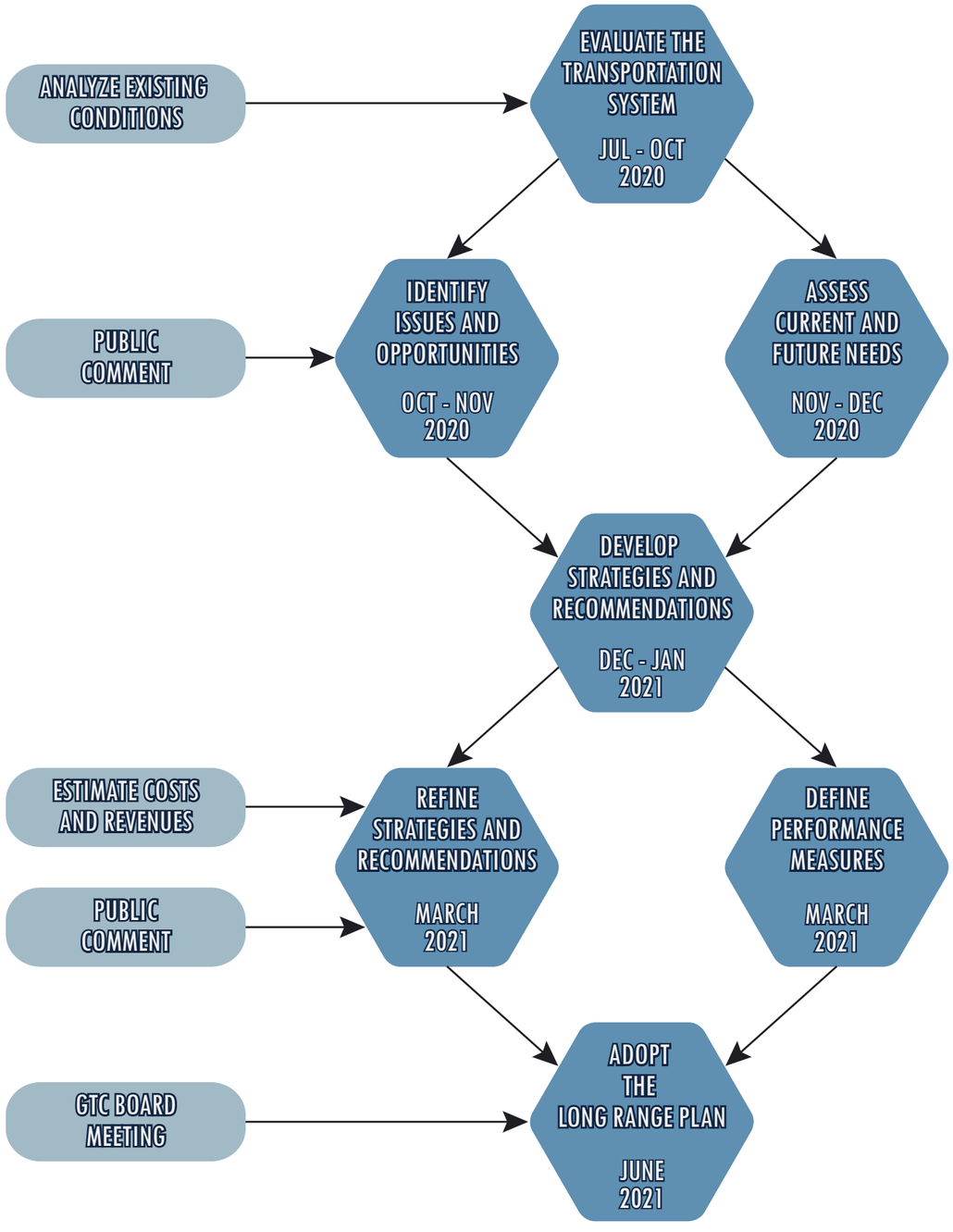
The first round of LRTP 2045 public engagement began during the COVID-19 pandemic, in the summer of 2020. Prior to the pandemic, GTC staff had prepared to engage the public in-person at farmers markets, festivals, community events, and open houses. An online engagement platform had been newly acquired to explore virtual engagement methods. Due to the public health guidelines instituted during the panemic, however, GTC was forced to pivot to a completely virtual public engagement approach.

In parallel, GTC staff began to evaluate regional demographics and the current state of the transportation system. This effort, with input integrated from the first round of public engagement, forms the backbone of the Plan's needs assessment. Shifts or trends in many factors related to residents' ability to fully access the transportation system helped to focus staff as they proceeded within the planning process to identify emerging issues and opportunities as well as specific current and future needs.

Once needs were properly assessed and described, staff developed recommended strategies, physical implementations, programs, and policies. Staff grouped recommendations into five categories with driect links to GTC goals and objectives as well as the ten federally-mandated metropolitan planning process planning factors. The recommendation groups seek to increase system safety, increase access to a greater number of mobility options, promote efficient system management, protect the natural environment, and support the economic vitality of the region.

The recommendations section was brought to the public for a 30-day review period in February and March of 2021. An online platform was created that included an explanatory video from GTC staff regarding the process, the ability to review all recommendations and signal top priorities via a survey mechanism, and two virtual public meetings, which allowed public and stakeholders to ask direct questions of staff.

With all input in hand, staff proceeded to develop cost estimates for recommendations and forecast revenues to provide effective insight for future Transportation Improvement Plans. Concurrently, staff prepared and benchmarked plan performance measures that focused on understanding future progress toward concepts established in the recommendation section. In addition, staff developed a progress update to the companion national performance measures report required by language in the two most recent federal surface transportation spending authorizations.



WHERE HAVE WE BEEN?

HIGHLIGHTS AND ACCOMPLISHMENTS

Since the adoption of LRTP 2040 in 2016, the transportation system and land use patterns in the region have remained largely the same. The region's overall growth patterns are continuing as before, including ongoing suburban expansion and revitalization of historic urban and village centers. The transportation system performs well by traditional standards with minimal traffic congestion and reliable travel times as compared to major metropolitan areas. Collectively, the region has emphasized maintaining current infrastructure assets and creating a more multi-modal active transportation system.

The region continues to hold a preservation and maintenance philosophy regarding maintaining the region's roads and bridges. Over 95 percent of federal funding is dedicated to maintaining existing transportation system assets and improving safety for all users. The 2020-2024 TIP includes transportation projects funded with approximately $410 million of federal aid, supplemented by other state and local funding sources. The preservation first mindset is consistent with the policies set forth in the previous LRTPs and mirrors feedback received from the public. However, despite the allocation of the majority of the region's federal transportation funding to preservation, regional stakeholders have implemented changes to the transportation network. Highlights from the past five years follow below.

In 2017 the City of Rochester completed the Inner Loop East Transformation Project. The Inner Loop, a sunken divided highway built during the urban renewal era, never fulfilled its transportation promise and instead divided downtown Rochester from the adjacent neighborhoods. Facing looming maintenance costs for the underutilized facility, the City of Rochester and NYSDOT worked together to transform the highway into an urban boulevard. The $22 million construction project has led to $229 million in private development by dismantling a car-first mindset, opening up land for redevelopment and connecting neighborhoods. This project earned the city national recognition and praise. Smart Growth America cited the project as a Best Complete Streets Initiative for 2017.

In spring of 2019, the Regional Transit Service (RTS) completed Reimagine RTS, a two year planning initiative undertaken to redesign Monroe County's transit system with the aim of increasing mobility options through transit. The reimagined system aims to provide more frequent and reliable service along the fixed route system with new on-demand zones. The anticipated June 2020 launch was postponed due to the pandemic, but RTS still anticipates implementing the entire service plan.

Progress on the region's multiuse trail system continues to advance. New York State is leading an effort across the state with the development of the 750-mile Empire State Trail. As part of this endeavor, the gaps along the Erie Canalway Trail that transverses the region east to west, are set to be completed. A 1.9 mile extension of the Auburn Trail connecting neighborhoods in the Town of Farmington opened in the summer of 2019, with future plans to link up with the Ontario Pathways and Finger Lakes Trail systems. The Genesee Valley Greenway, a north south rail trail running adjacent to the Genesee River Valley, is currently undergoing a $6.5 million series of improvements, including a 17 mile resurfacing project between the City of Rochester and the Village of Avon.

The City of Rochester continues to make bicycling a safer and a more accessible transportation option by implementing bike-friendly improvements. The City is home to two cycle tracks, or bike only streets. The newest lines Elmwood Avenue near Strong Hospital. In July 2017, the City of Rochester partnered with Zagster, Inc. to launch a bike share service and ridership quickly surpassed expectations. The 2019 season saw Rochester's platform lead all U.S-based Zagster-operated bike share systems in usage rate. Bike share did not operate in 2020 after the withdrawl and subsequent dissolution of Zagster. The City and RTS have since authorized agreements with a new provider and plan to relaunch a more regional bike share service in the spring of 2021.

LEVERAGING FUNDS TO SUPPORT LOCAL PLANNING — UPWP STUDIES

As an organization, GTC continues to leverage funding to support local planning. Each year GTC programs about 40-50 percent of its annual allocation of FHWA Planning (PL) funds to support transportation planning efforts undertaken by member agencies and other local municipalities, as well as major staff-led initiatives. These funds are allocated through the UPWP and support transportation planning activities that, without GTC support, might not otherwise be conducted.

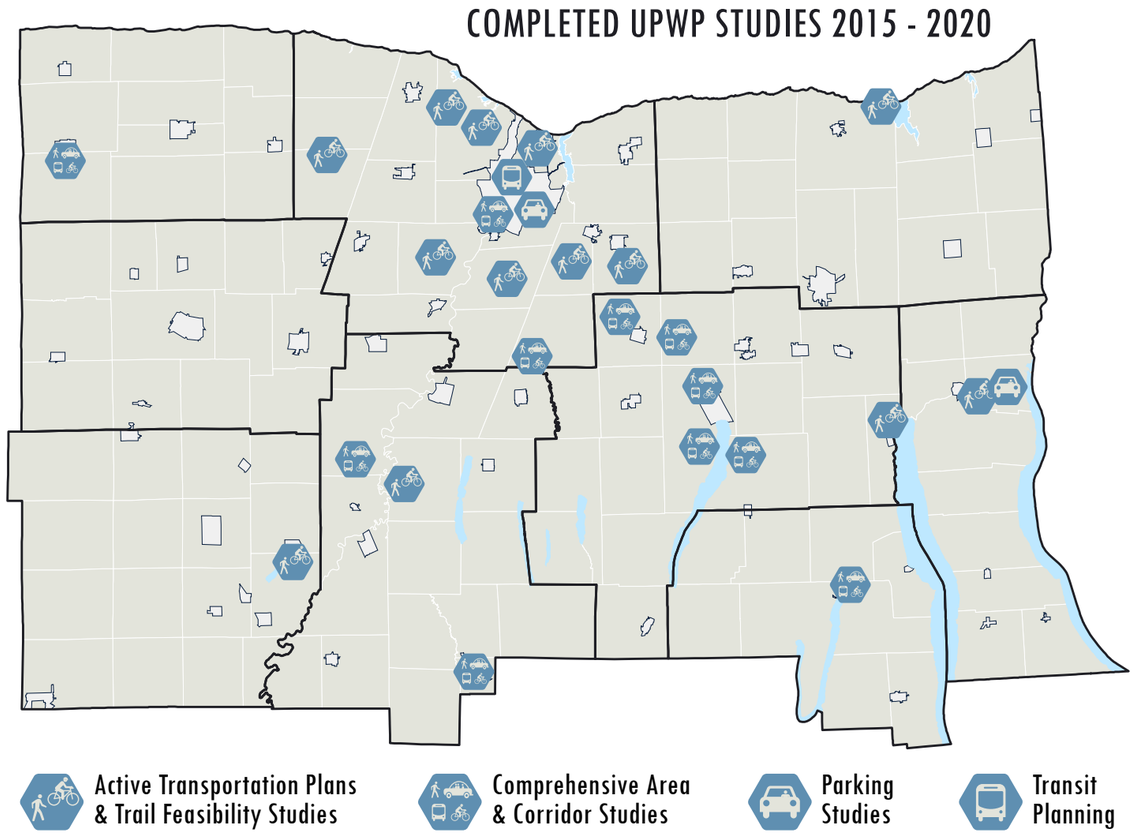
Over the five most recent federal fiscal years, GTC has programmed approximately $4.2 million to its member agencies, leveraging over $328,000 in local cash matches and $411,000 in in-kind contributions in support of transportation planning activities. For its 2020-2021 fiscal year, GTC awarded over $900,000 to new transportation planning projects sponsored by its local municipalities.

In the last five calendar years, 57 UPWP funded projects (plan/study/data collection, etc.) have been completed. The UPWP funds concept-level planning, analysis, and design initiatives that cover the following topics: active transportation, area/corridor, data collection, parking, freight, land use, management and operations (Intelligent Transportation Systems), safety, and transit. In accordance with federal regulations, UPWP funds are not used for property acquisition, site preparation, preliminary engineering, detailed design, and/or construction projects. The studies typically result in a basic level of analyses and recommendations that appropriate agencies can progress towards implementation.

New York State is a home-rule state which means each of the region's 188 municipalities is responsible for its own local land use planning, zoning, and development policies and associated regulations. Distributing funding to municipalities helps integrate highly valued local planning priorities with regional transportation goals.

ILLUSTRATIVE PROJECT STATUS

The majority of recommendations proposed in LRTP 2040 were part of the fiscally constrained plan. Fiscal constraint meant that funding for implementation of the recommendations was predicted to be available over the lifecycle of the plan. Projects that did not have an identified and confirmed funding source were considered illustrative and presented for informational purposes. These projects were considered worthy of implementation if sufficient funding became available for their advancement. Since the adoption of LRTP



2040 in 2016, significant progress has been made on the following Illustrative Projects:

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

The NYS Route 390/I-490 Interchange/Lyell Avenue Interchange has long been identified as a high priority project for the Region. The Interchange serves approximately 200,000 vehicles a day – the daily equivalent of the Brooklyn Bridge and the Manhattan Bridge combined. The interchange suffers from peak-period congestion, higher than average crash rates, and deteriorating facilities that are leading to higher operating costs. In 2016, the region was the recipient of a $32 million federal grant through the highly competitive Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies (FASTLANE) program. The remaining funding has been provided by New York State and construction is progressing. The total project cost is $150 million.

Source: New York State Department of Transportation

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

The STAMP Infrastructure and Transportation Improvements is identified by the Finger Lakes Regional Economic Development Council (FLREDC) as a 2014 High Priority Transformational Project. 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. In 2020, a $2 million investment was made to upgrade the waterlines to provide the site with over a million gallons of water a day. This upgrade makes the site 100 percent shovel ready for new development. Transportation improvements to accommodate increased freight traffic to the site along are still needed.

Support Transportation and Infrastructure Improvements Surrounding Eastman Business Park

Eastman Business Park continues to be a priority initiative of the FLREDC. Since 2011 the number of companies doing business at the Park has grown from 28 to 114. The recent improvements at the NYS Route 390/I-490 Interchange/Lyell Avenue Interchange support the development of Eastman Business Park by alleviating bottlenecks associated with accessing the site.

Genesee-Finger Lakes LRTP 2045

THE REGION

WHO WE ARE

The nine-county 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 through the southern end of the Finger Lakes. Many striking natural features and scenic vistas lie within the Region, including its namesake, the Genesee River, as well as Letchworth State Park, commonly known as the "Grand Canyon of the East", and miles of sprawling farmlands.

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 growing nation's demand for goods and provisions. The Region is still a hub of innovation demonstrated by the strength of the local optics and imaging industries, concentration of colleges and institutions of higher education, world class health care facilities, flourishing agriculture and agribusiness sectors, and the vibrancy of the local art and music scenes.

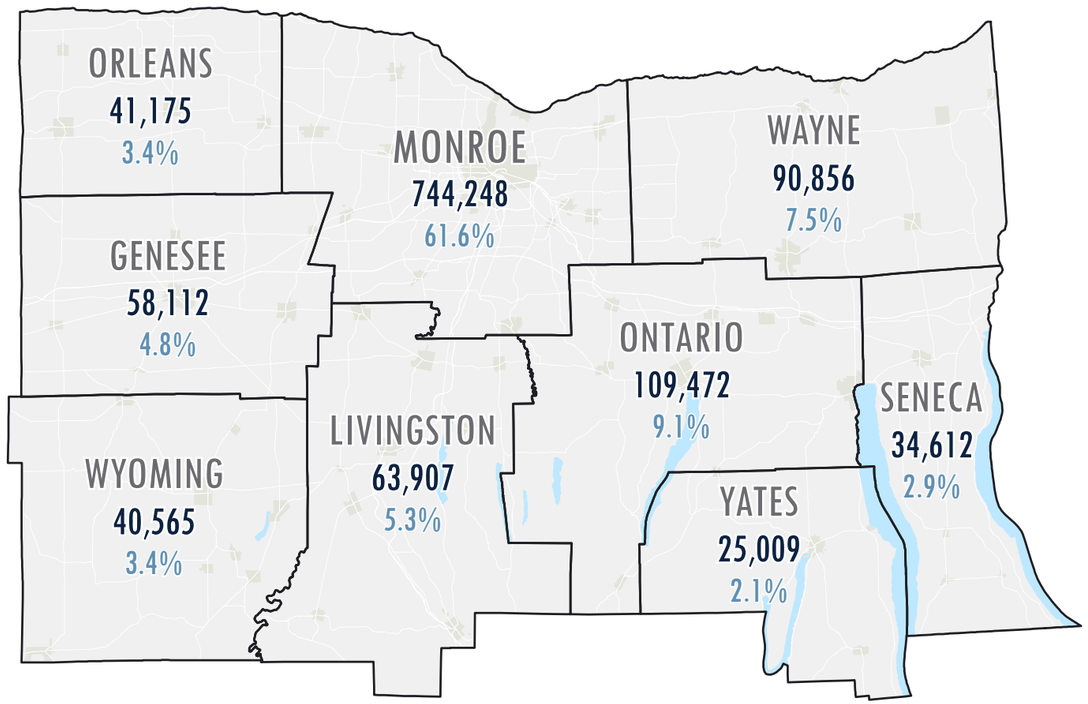
The Erie Canal eventually gave way to railroads and then highways as the primary modes of travel, but it remains an excellent example of how transportation influences the character and development of a region. Regardless of the form it takes in the future, the ability of people and freight to move safely,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

Today, the region is home to over 1.2 million, a population that is aging as it becomes more demographically diverse. A small number of regional centers contain most residences and employment opportunities, though those activities are not often spatially mixed.

The vastness of the region provides it with many natural cultural resources yet also many transportation challenges in traveling between home, work, school, and the outdoors.

THE REGION

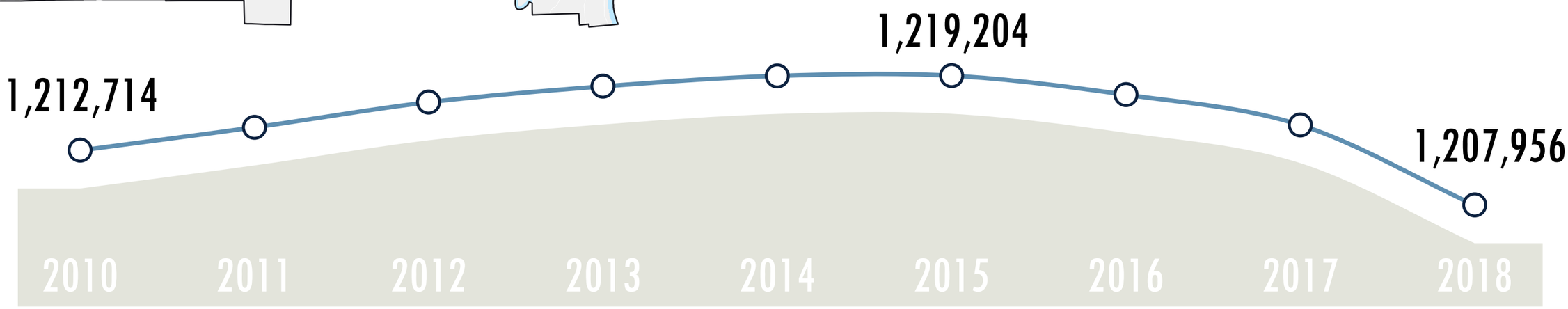
POPULATION



Approximately 1.2 million people live in the Genesee-Finger Lakes region, a number that largely holds steady throughout the last decade according to Census Bureau estimates. Rochester is New York State's third largest city (2018 population estimate: 207,778) and the core of the region (Livingston, Monroe, Ontario, Orleans, and Wayne counties) comprises the 52nd largest metropolitan statistical area in the nation.

Monroe County is by far the most populous county in the region; home to over 60 percent of the region's residents. The second largest county, Ontario, has outpaced all surrounding counties in population growth between 2010 and 2018 by adding over 3,000 residents, a three percent gain. Monroe country also added over 3,000 residents during that timeframe, a more modest proportional increase. All other counties in the region have lost population since 2010.

In 2010, 167,313 seniors called the Genesee-Finger Lakes Region home. By 2018, that number had become greater than 204,000 as those born in 1953 reached retirement age. As the rest of the baby boom cohort ages, significant consideration must be given to their ability to access services. Typically older adults are more reliant on transit for this access, but they are also more likely to have a physical disability that requires a higher level of service such as demand-response, wheelechair equipped door-to-door service. As population distributions shift, transit in the region has an opportunity to augment its ridership base, but will need to focus on convenience and reliability to retain customers used to a different mobility arrangement.

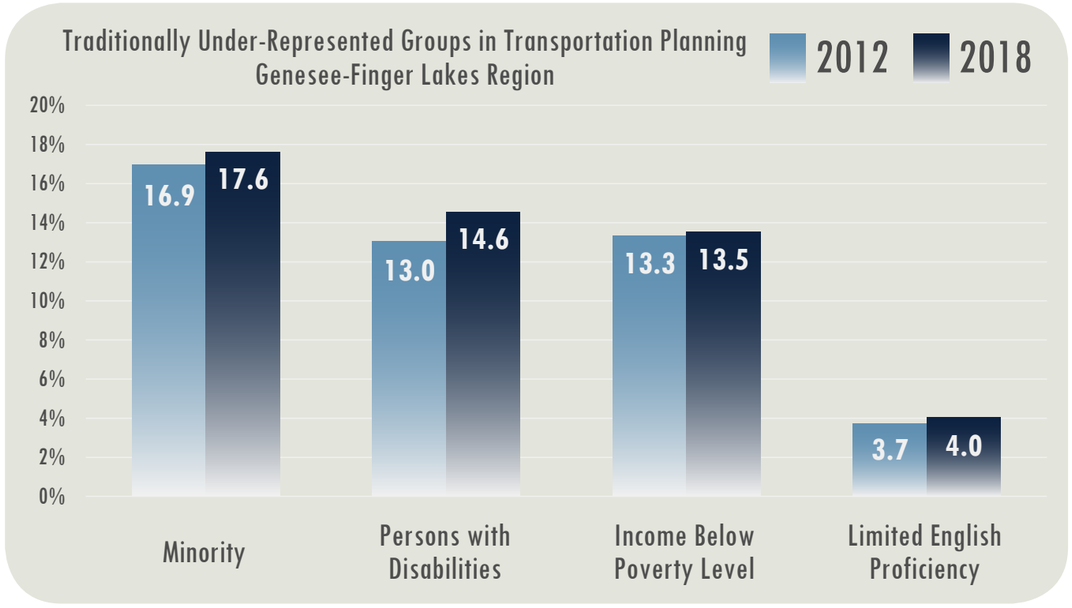


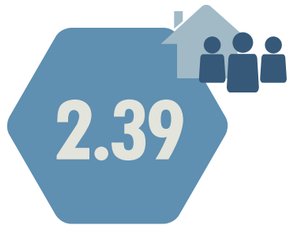
THE REGION

DEMOGRAPHICS

As the population's magnitude remains static, the region exhibits some unique demographic characteristics. The regional average hoousehold size, percentage of owner-occpuied housing units, and the percentage of minority residents are all below national averages. The Millenial generation is completely within the workforce and now represents the largest identified fifteen-year cohort of residents. Females outnumber males by almost 25,000.

Several groups of people are traditionally underrepresented in the transportation planning process including minorities, low income individuals, those with limited English proficiency, and people with disabilities. These groups, who are slowly increasing in size, face increased transportation challenges that include the ability to access employment and needed services as well as the inability to obtain or understand information related to the planning process, and thus, the inability to participate as a stakeholder. The *GTC Environmental Justice, Title VI, and Americans with Disabilities Act Involvement Plan* was adopted in December 2010 to identify these groups by location within the region and ensure opportunities for their increased involvement in the planning process.

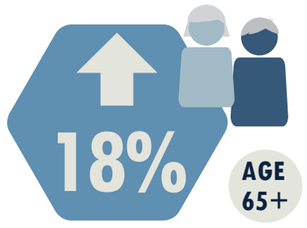




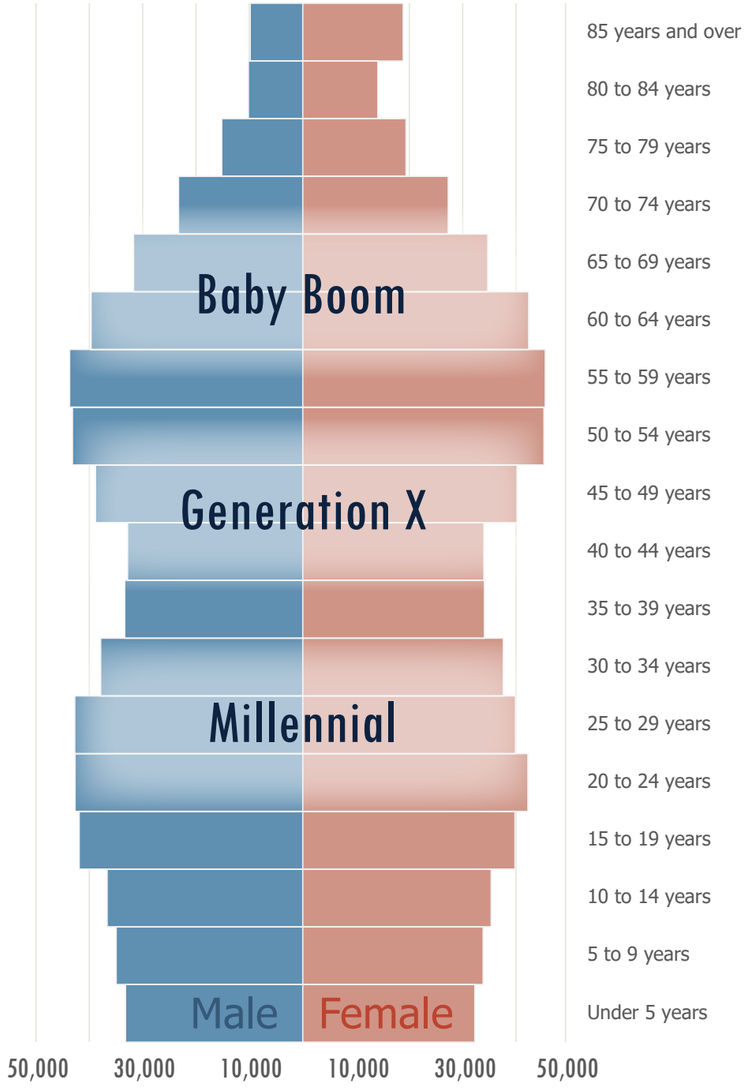
Average Household Size

Total Housing Units

Owner Occupied Units



Change in Senior Population (2010-2018)



Source: American Community Survey 2010-2018 5-Year Estimates

THE REGION

EMPLOYMENT

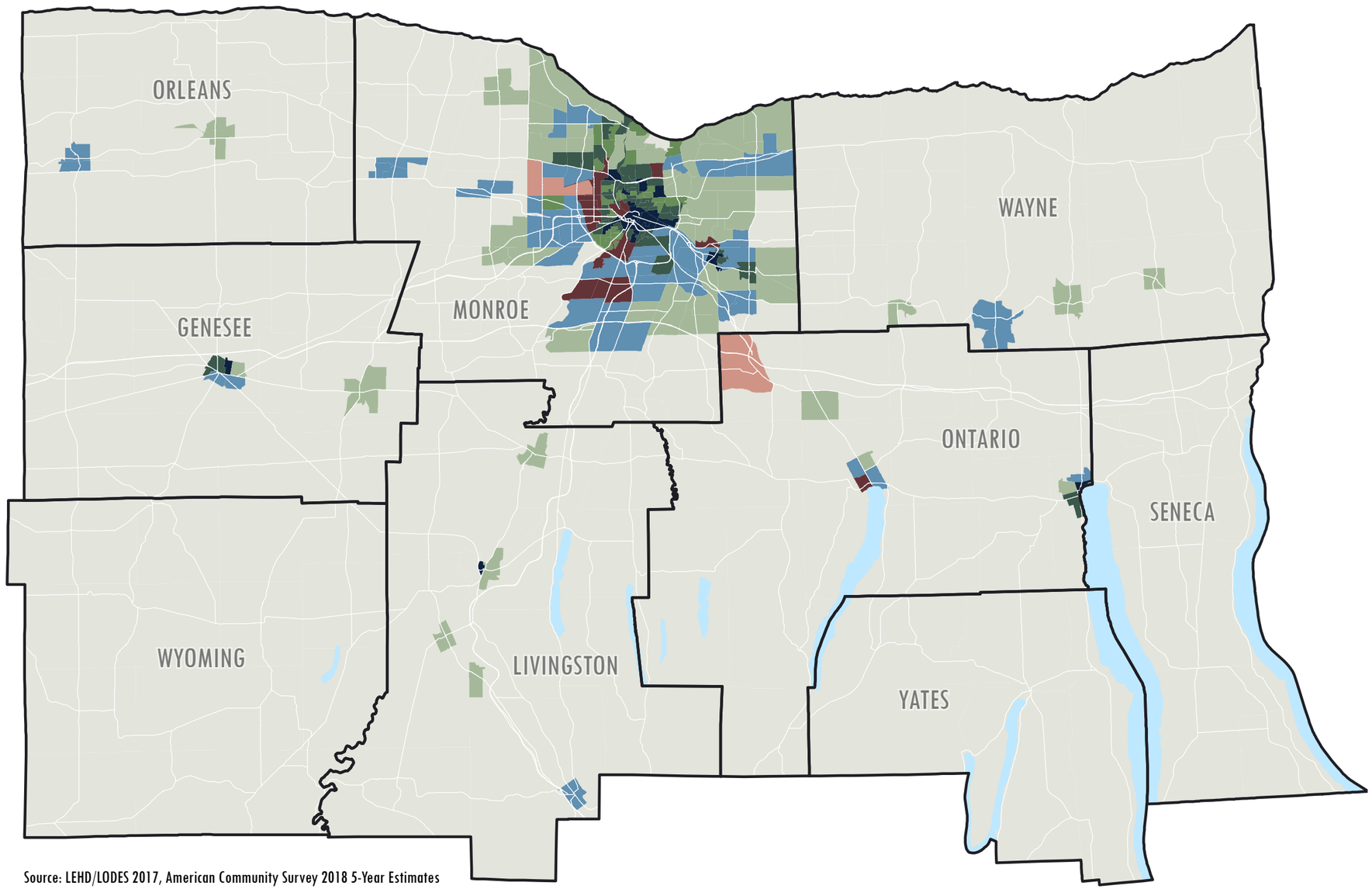
Home and employment location is concentrated in a handful of areas within the region. The largest blend of population and employment density occurs in central Monroe County as well as other regional centers including the Cities of Batavia, Canandaigua, and Geneva. A moderate mix is seen in other parts of those centers as well as select villages (Medina, Brockport, Spencerport, Lyons, and Dansville).

Top five employment sectors in the Genesee-Finger Lakes Region (2017)

- Health Care and Social Assistance (16.1%)
- Educational Services (14.3%)
- Manufacturing (11.7%)
- Retail Trade (10.4%)
- Accommodation and Food Service (7.7%)

Population/Employment Density Matrix

by Census Tract 2017/18



Source: LEHD/LODES 2017, American Community Survey 2018 5-Year Estimates

THE REGION

RECREATIONAL/CULTURAL RESOURCES

The Genesee-Finger Lakes Region is known for its stunning natural beauty and recreational opportunities that are afforded to its residents and visitors alike. From an historical standpoint, the region is renowned as the birthplace of the women's suffrage movement, the center of the abolitionist movement, the birthplace of Memorial Day, and for its Native American heritage.

The pastoral views not only offer quaint landscapes, but agricultural bounty. The Finger Lakes Wine Region is the largest wine producing area in New York State and is world-renowned for its Rieslings. The wineries, along with the budding craft beverage (beer and distilled spirits) industry 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.

The region is also home to a wide array of cultural activities including museums of science, art, and play that preserve the legacy of innovation, especially in photography and imaging. Numerous spring and summer festivals that attract thousands each year emphasize intrinsic local assets such as horticulture and canal town culture. A strong foundation in music performance and education supports an international jazz festival as well as multiple performing arts venues throught the region capable of hosting large events.

2.4%

Traveler spending in the region increased 2.4% in 2017

3.3%

of all labor income in the Finger Lakes is generated by tourism

$3B

In 2017, the economic impact of tourism across the region exceeded $3 billion, supporting over 58,500 jobs. Over $1 billion of traveler spending took place in Monroe County

Source: Visit Rochester 2017 Annual Report

The Region is home to 20 New York State Parks. The most notable being Letchworth State Park, known as the Grand Canyon 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 Erie Canalway Trail traverses east to west across the entire region, as well as the state, attracting cyclists from all over the world.

THE TRANSPORTATION SYSTEM

HOW WE MOVE

A glance at regional transportation choices in terms of travel modes and patterns reveals a common story. Most have access to a private vehicle and nine out of ten either drive or ride along in one during their daily commute.

Many workers in the region live in one community and work in another. Within those travel patterns, urbanized Monroe County exerts a strong pull on commuters. Fully 42% of workers who live outside of Monroe County commute to another county for work. Conversely, only 5.7% of Monroe County based workers leave the County to access their jobs.

There are also communities within the region where a significant share residents work in that same community. Over 40% of workers who live in the villages of Penn Yan, Medina, Geneseo, Warsaw, and Newark and the cities of Rochester, Geneva, and Batavia also work in those places. When this percentage is high, residents are more likely to commute using an alternative to the single occupant vehicle.

To support this movement, the region currently maintains almost 27,000 lane miles of highways and 1,600 bridges, ten percent of which are in poor condition.

Yet, active transportation modes are an important part of regional transporation activity. Nine fixed-route bus systems, centered on each county, and a metropolitan paratransit service transported almost 16 million passengers in 2018. Limited to a handful of long-distance trails prior to 2011, the regional low-stress bicycle network now consists of over 350 miles of facilities.

The region's transportation infrastructure serves a a vital purpose beyond moving people. Miilions of tons of freight moves around and through the region each year. A combination of limited-access expressways, freight routes, and railroads facilitates this movement though more attention is being paid to changing technology and consumer demand.

These personal and economic needs create the need for system management. Traditionally focused on system performance, more recently management involves increased focus on the security and resiliency of transportation assets.

THE TRANSPORTATION SYSTEM

REGIONAL TRAVEL CHARACTERISTICS

A vast majority of regional households have access to a vehicle, though regional centers, as well as portions of certain rural counties, contain communities where vehicle ownership is not as widespread.

Prior to recent changes related to the global pandemic, 2018 Census Bureau data showed that approximately ten percent of regional residents either commuted via an active transportation mode or worked from home. While this does not represent significant change since 2014, there has been a strong correlation between age and commute mode choice. Workers aged 16 to 24 were more than twice as likely to carpool or engage in active transportation than the regional average. Workers aged 45 to 59 were more likely to drive alone than the region as a whole. Workers over 60 years of age were already twice as likely to work from home.

COMMUTE MODE SHARE

82% DRIVE ALONE

7.8% CARPOOL

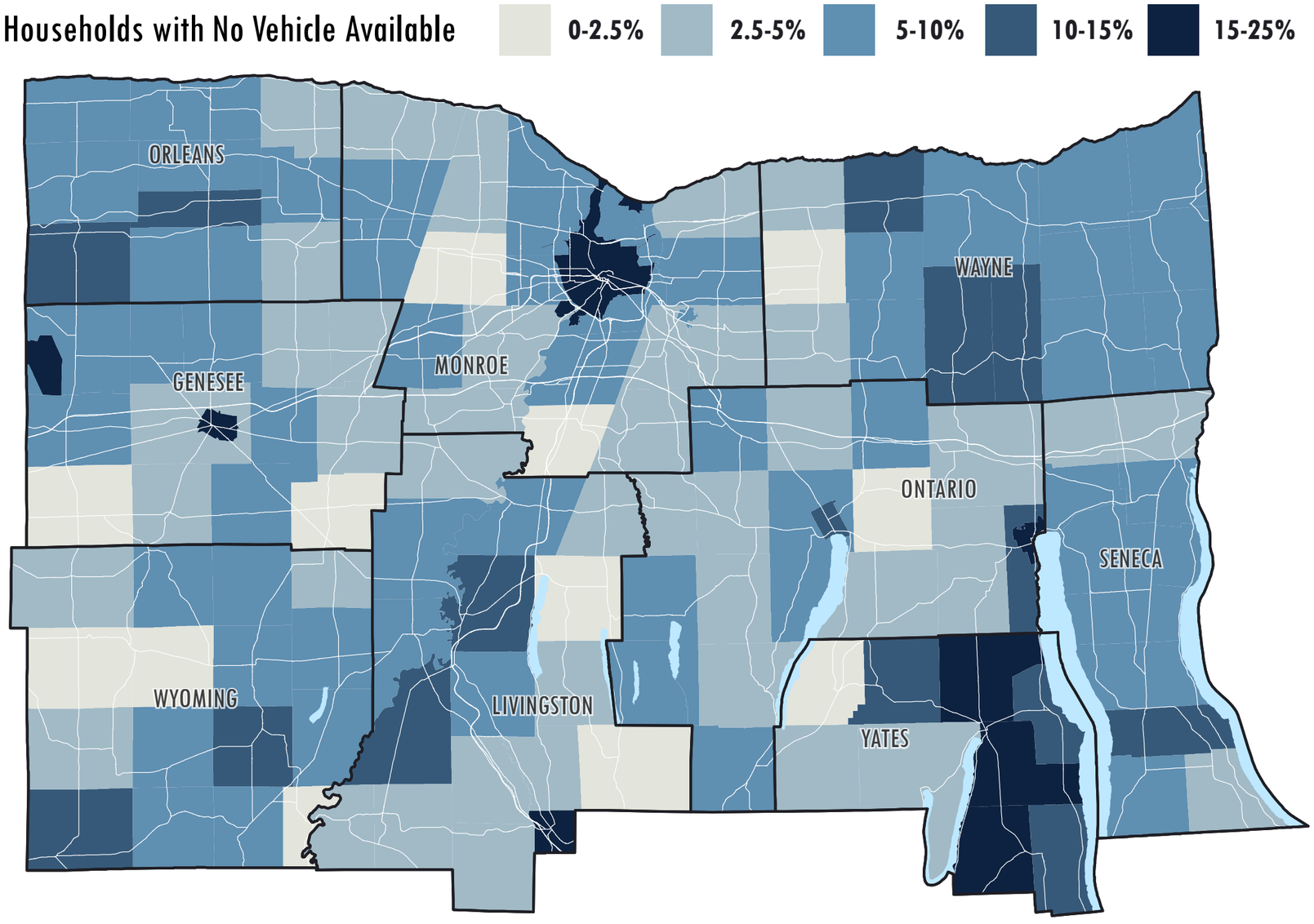
3.3% WALK

2.1% PUBLIC TRANSIT

0.5% BICYCLE

4.1% WORK FROM HOME

Source: American Community Survey 2018 5-Year Estimates

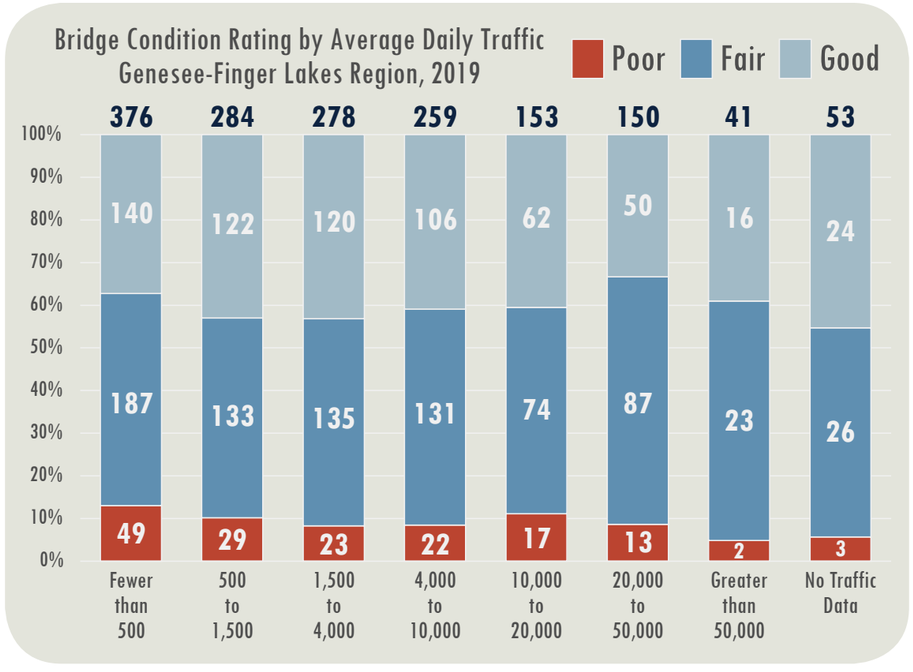


THE TRANSPORTATION SYSTEM

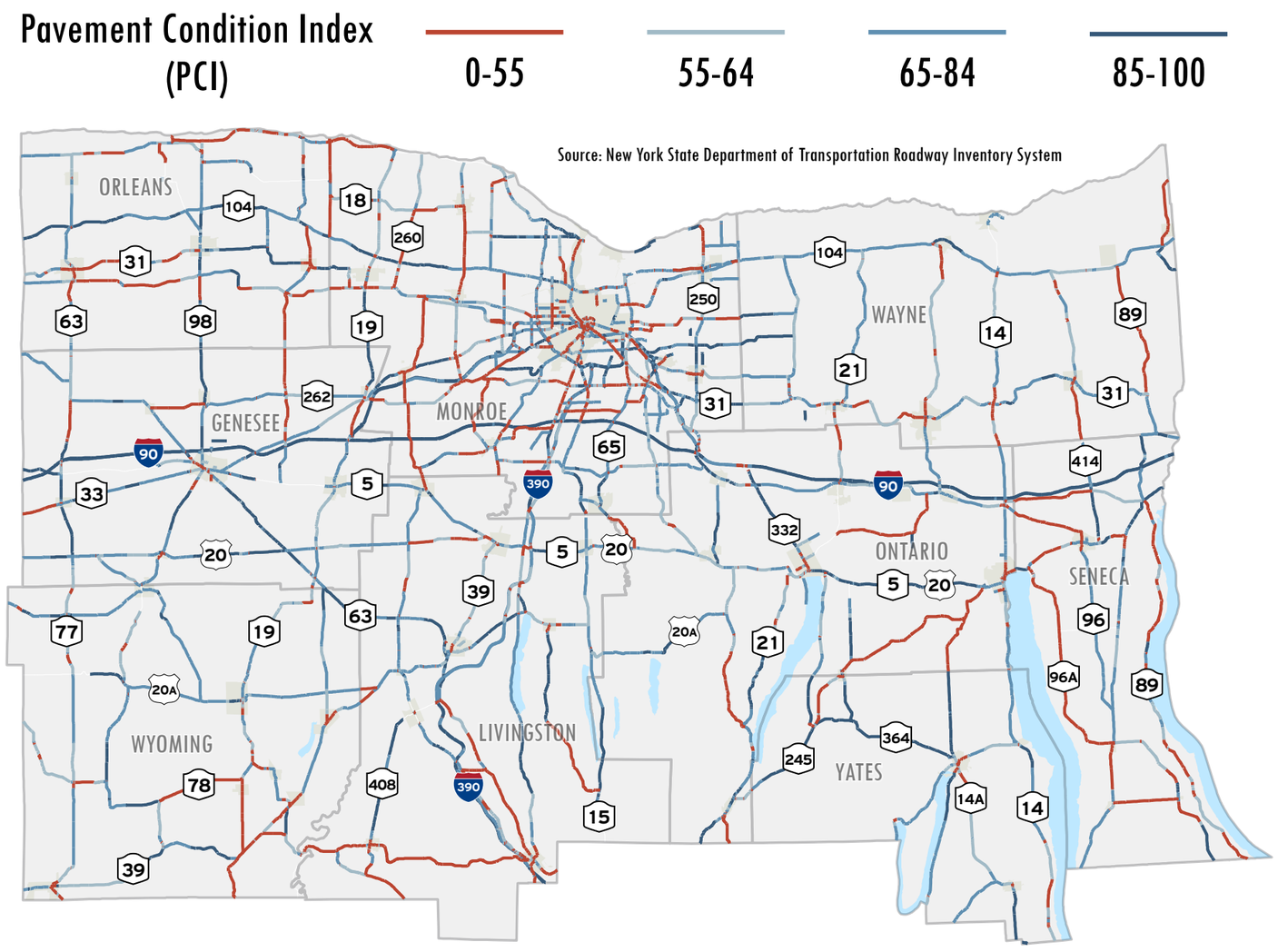
DRIVING IN THE REGION

According to Census data, about 90% of people either drive or carpool to get to work in the Genesee-Finger Lakes Region. The highway and bridge network that accommodates this activity consists of nearly 27,000 lane miles and 1,594 bridges. Within this network, approximately 7,300 lane miles are eligible to be repaired and improved with funding from federal transportation programs. Of those facilities surveyed as part of NYSDOT's Roadway Inventory System, 79% of lane miles boast a Pavement Condition Index rating of 55 or better.

Ten percent of bridges in the Region are considered to be in poor condition. Per FHWA's Pavement and Bridge Condition Performance Measures final rule (January 2017), bridge condition is determined by the lowest rating of National Bridge Inventory deck, superstructure, substructure, or culvert condition ratings. If the lowest rating is less than or equal to 4, the bridge is classified as poor.



Source: Federal Highway Administration LTBP InfoBridge



Pavement Surface Rating, Dominant Distress, and data gathered through NYSDOT's High Speed Profiler program (IRI, bump, and rut information) are combined in the Pavement Condition Index (PCI) to give a more comprehensive indicator of pavement condition. Points for each pavement defect are subtracted from a perfect rating of 100 consistent with ASTM D6433-03 "Standard Practice for Roads and Parking Lots Pavement Condition Index Survey."

THE TRANSPORTATION SYSTEM

TRANSIT IN THE REGION

A robust public transportation system is critical to providing access to employment and needed services for individuals unable to operate a private automobile and serves as viable alternative for those who choose not to use a private vehicle for all transportation decisions.

The Rochester-Genesee Regional Transportation Authority (RGRTA) operates distinct fixed-route public transportation systems in eight of the region's nine counties, with service sometimes crossing county lines. Yates County Transit, inaugurated in 2017, is operated by the Arc of Yates.

In 2018, over 15.75 million trips were made via public transit region-wide. An additional 215,000 trips were fulfilled by paratrasit services, which represents a 20% demand increase for this type of service over the last five years even as most of the regional fixed-route systems mirror declining national trends.

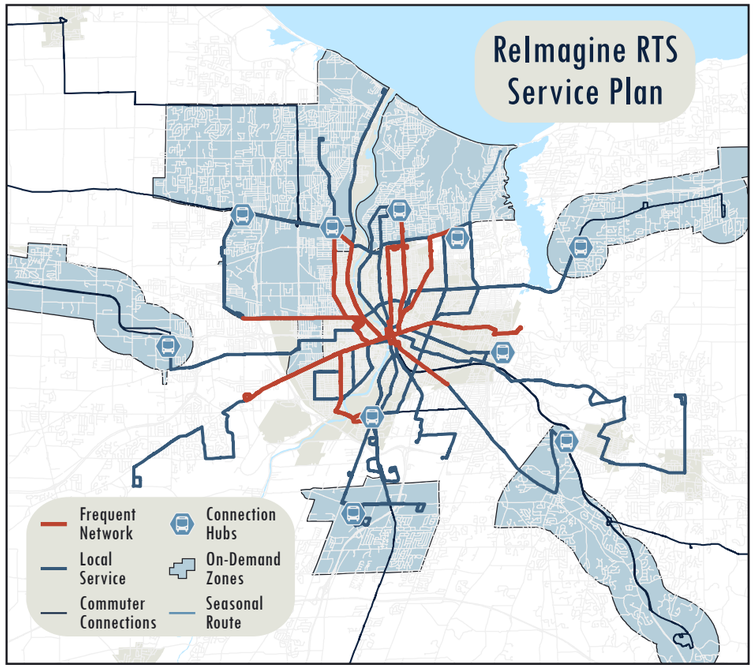
Transit Assets in the Genesee-Finger Lakes Region

9 FIXED ROUTE BUS SYSTEMS
Help people move throughout the region seven days a week

6 COMMUTER BUSES
Reach locations outside Monroe County to connect people to employment

1 DIAL-A-RIDE SERVICE
RTS Access provides curb-to-curb and door-to-door service for disabled riders

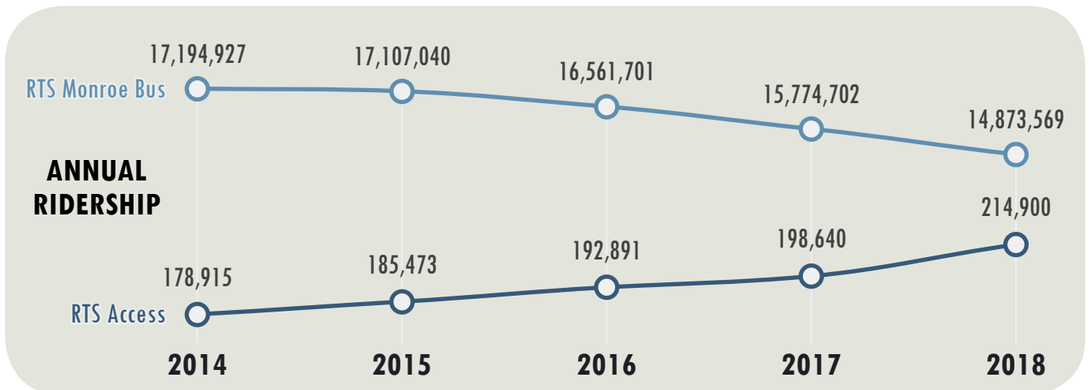
1 TRANSIT CENTER
Connects most fixed routes and commuter buses in Downtown Rochester



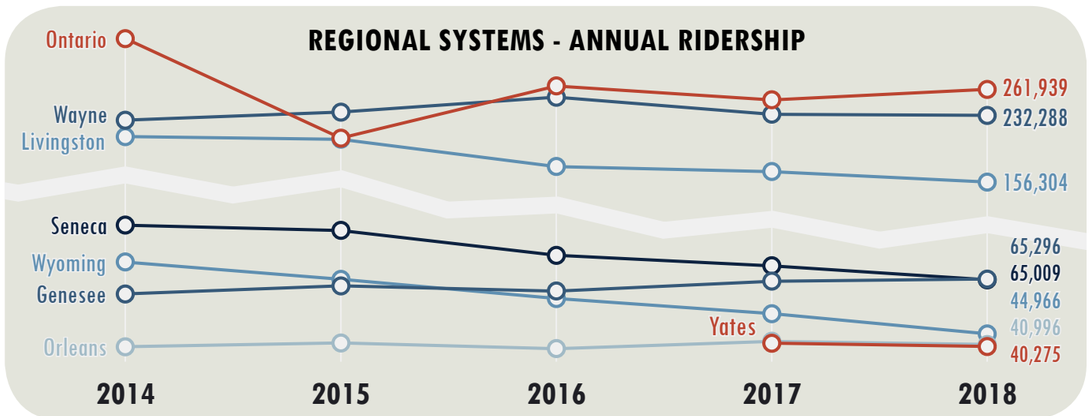
In 2017, RGRTA launched an ambitious re-envisioning of transit service in Monroe County.

The Reimagine RTS effort yielded a service plan that combines a comprehensive network of more frequent transit, realigned more direct service, and increased mobility options within on-demand zones. The plan also reconfigures the paratransit service area and service levels.

Originally intended for June 2020, the implementation of Reimagine RTS has been delayed by the global pandemic.



Source: Federal Transit Administration National Transit Database



THE TRANSPORTATION SYSTEM

CYCLING IN THE REGION

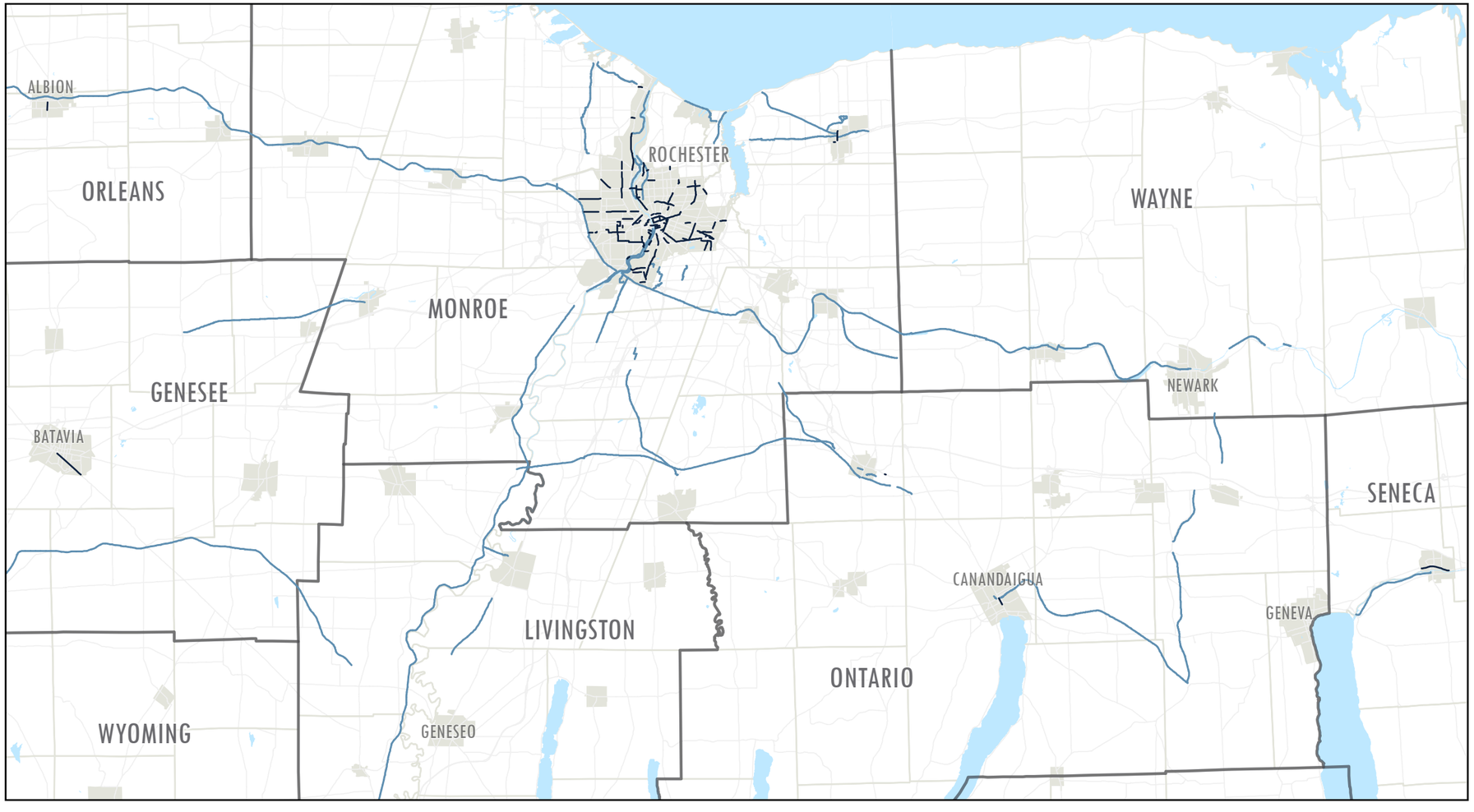
Cycling as a means of transportation has grown in popularity over the last decade. Almost 280 miles of network trails have helped to accommodate and promote this growth. The region features 77 miles of on-street bicycle facilities, all constructed since 2011. Despite this progress, the non-motorized network still features gaps that require a coherent strategy for prioritizing future facility investment.

The Genesee Valley Greenway is a 90-mile corridor and state park that follows the route of the Genesee Valley Canal and the Pennsylvania Railroad Rochester branch. An ongoing resurfacing project will improve trail conditions from Avon to Chili, further linking regional trail assets.

Existing On-Street Bicycle Infrastructure

Existing Shared-Use Paths/Trails

Cities & Villages



WALKING IN THE REGION

Whether accessing their destination from home, the bus stop, the bike rack, or a parked car, all travelers are pedestrians at some point during their journey. While sidewalks are common in the Region's cities, mature suburbs, and villages, expressways, interchanges, and multi-lane roadways with limited crossing opportunities present significant barriers to pedestrian mobility throughout the region. Existing sidewalks and curb ramps in poor condition as well as narrow to non-existant buffers between the sidewalk and the roadway are additional factors that negatively affect the walking experience and discourage walking as a form of mobility.

As shown in the following pages, hundreds of pedestrians are struck each year by vehicles on or along regional roadways. As such, continued investments in pedestrian-supportive infrastructure remain a critical consideration to improve safety for all roadway users.

Environmental context should be considered when designing and providing safe places to walk. While sidewalks are not needed along every highway in the Region, providing safe places to walk to schools, business districts, and other local destinations is crucial. In more rural areas, creative design approaches that utilize alternative walkway surface materials at large roadway setbacks may be preferred.

The regional trail network enhances opportunities for pedestrian activity, but safety can still be improved at roadway crossings

Rochester's Collegetown integrated many pedestrian friendly elements into its design, making it safer and more inviting to walk despite its location adjacent to a multi-lane state highway.

Desire paths are observed along many high-speed roadways, indicating that there is pedestrian demand despite a lack of safe facilities

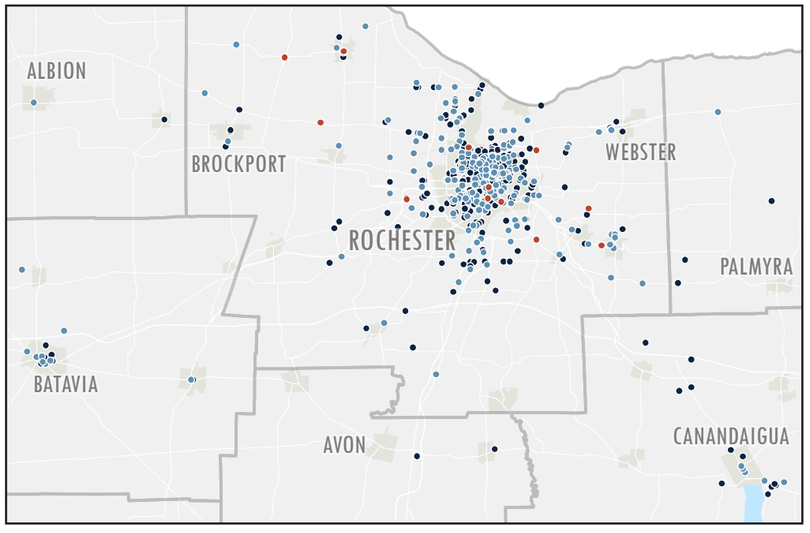
Many larger intersections have long crossing distances, but lack pedestrian safety measures such as curb cuts and refuge islands

THE TRANSPORTATION SYSTEM

TRAFFIC SAFETY

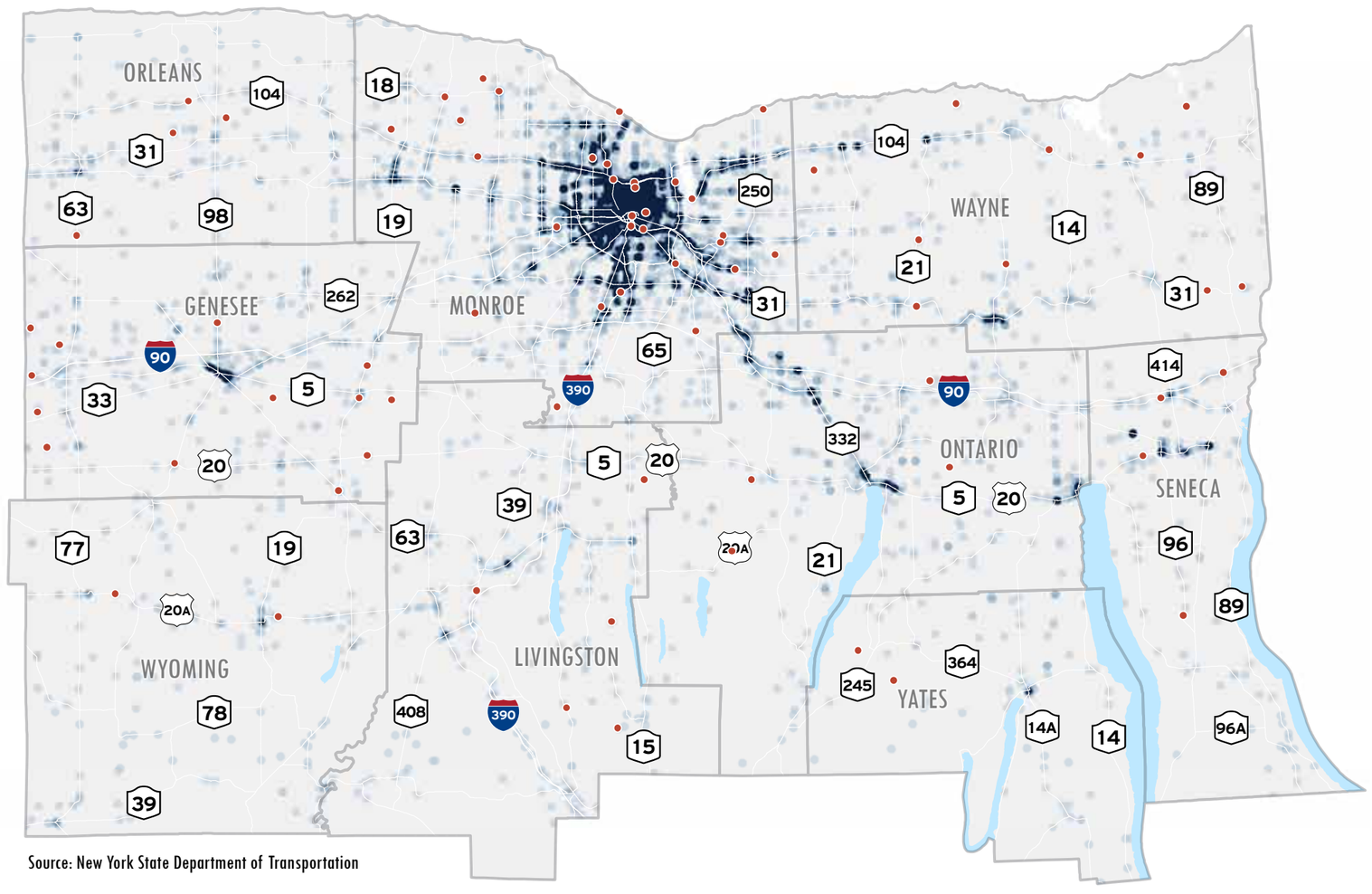
The Genesee-Finger Lakes region experienced 39,692 crashes between November 1, 2018 and October 31, 2019. Of these, 6,411 resulted in 8,576 injuries, 909 of those severe injuries, and 85 fatalities. Collisions resulting in injury are concentrated along high volume corridors in regional centers. The greatest concentrations of crashes with injury occur at intersections with limited-access expressways such State Street at the Inner Loop in Rochester and Goodman Street at NY Route 104 in the Town of Irondequoit.

Motor vehicles struck 428 pedestrians and 256 cyclists during that same calendar year, resulting in 106 serious injuries and 15 fatalities. Collisions with non-motorized users were predictably concentrated in regional centers, the areas that experience the most non-motorized use. 59% of cyclist strikes and 58% of pedestrian strikes occur in the Cities of Rochester, Batavia, Canandaigua, and Geneva.



Collisions with Pedestrians
Collisions with Cyclists
Pedestrian/Cyclist Fatalities
Cities & Villages

Crash with Injury Density
Greater
Fatal Collisions



Source: New York State Department of Transportation

THE TRANSPORTATION SYSTEM

REGIONAL GOODS MOVEMENT

987

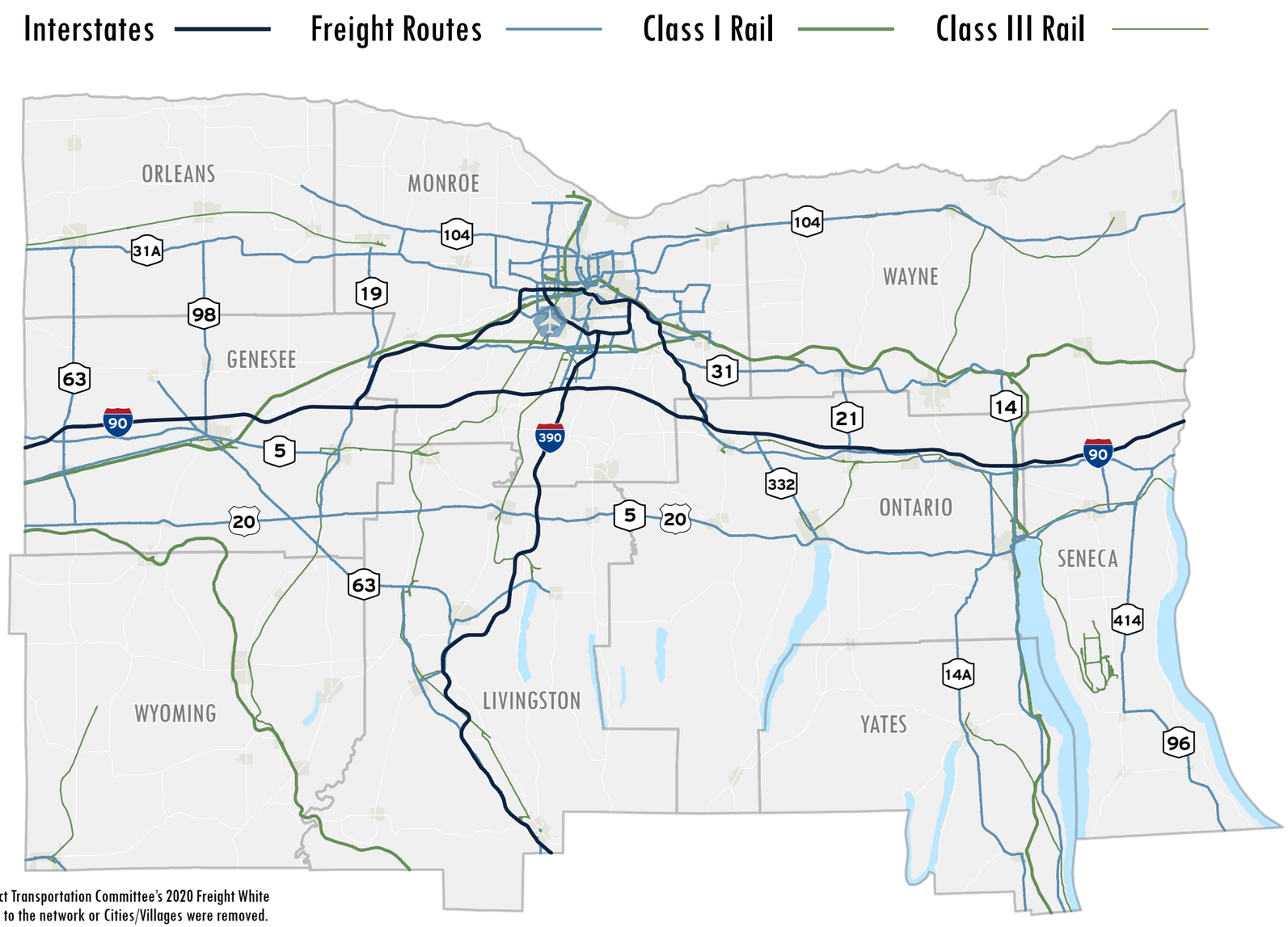
The average non-local roadway segment accommodates almost 1,000 trucks per day, representing 7% of average per-segment daily traffic

Source: New York State DOT Roadway Inventory System

Rapidly changing technology and increased consumer demand is transforming the way goods are delivered. The freight sector is typically among the first to embrace changes in technology. Before railroads were trusted to transport people, they transported freight. Companies with goods to move have already begun to experiment with autonomous delivery vehicles, utilizing drones for front door delivery and self-driving trucks for long haul shipments on the interstate.

As the economy and demand for e-commerce grows, so does the volume and value of freight moved within, to, and out of the Region. In 2010, approximately 282 million tons of freight worth over $900 billion was transported into, out of, within, and through the Region. By 2045 these freight movements are expected to increase to approximately 529 million tons and value nearly $2.4 trillion.

About 80 percent of the Region's freight moves along the highway and bridge network. The railroad network, comprised of three Class I and nearly a dozen Class III or shortlines, moves about 13 percent, and the remaining freight moves via waterways and air.



Freight Routes in the map at right are defined as non-interstate roadway segments where truck ADT according to the New York State Roadway Inventory System exceeds 400. Per guidance from the Capital District Transportation Committee's 2020 Freight White Paper, 400 trucks per day represents significant truck traffic in more rural areas. Select segments not linking to the network or Cities/Villages were removed.

THE TRANSPORTATION SYSTEM

INTERREGIONAL TRAVEL

Most Popular Regional Uber Destinations (2018)

1 Greater Rochester International Airport

3 Intercity Bus Station

8 Amtrak Station

Source: governor.ny.gov

Air Travel

The Greater Rochester International Airport (GRIA) is the Region's primary commercial passenger and cargo handling airport. According to the Federal Aviation Administration in 2019, over 1.28 million passengers boarded a plane and nearly 147,000 tons of freight landed at the GRIA. In 2018, a $79.4 million airport renovation project was completed, unveiling a new entrance canopy, a SMART phone lot, and modernizing the terminals. Public transportation to the airport, through RTS, is now available directly on airport grounds.

Passenger Rail Service

Amtrak provides passenger rail service to Rochester via 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. Ridership at the Rochester station has increased 19 percent over the last decade, peaking in 2012.

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 new station, fully compliant with the Americans with Disabilities Act (ADA), opened in 2017. Notable improvements include track upgrades, fully ADA compliant access to trains at the boarding platforms, and new circulation and parking components.

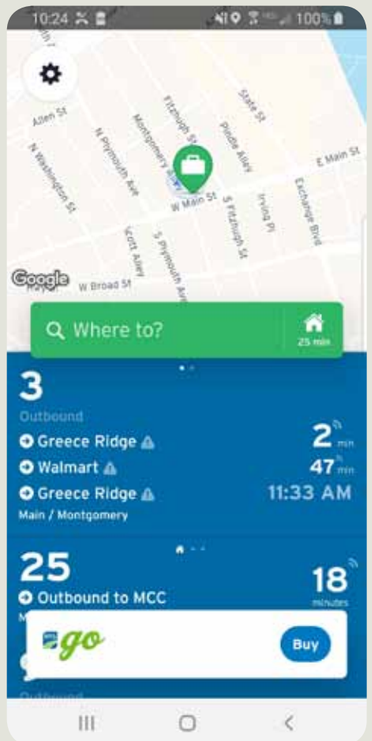
Intercity Bus

Intercity bus services are provided by Greyhound and 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 FIVE 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.

TECHNOLOGY

Means of transportation and the way in which they are accessed can change rapidly. New technology is constantly being developed and deployed to assist people in both choosing and connecting to transportation options. The 2045 Long Range Transportation Plan strives to be aware of recent developments and trends with the intention to carefully shape their influence on the regional built environment through the planning process.

Locally, RTS has partnered with the Transit smartphone application to provide reliable and easy to use real-time information. Trip planning features within the app include walking and cycling times and routes as well as ride-hailing options. Likewise, transit fare payment options have advanced to include a mobile phone option as well as reloadable fare cards, which can be managed via an online account.



SHARED MOBILITY

Pace bike share debuted in Rochester in 2017. Car and bike share systems make vehicles and bicycles readily available while reducing the need for ownership. During almost three complete seasons, over 20,000 individuals made almost 117,000 trips. While this service was discontinued, RTS and the City have reached agreements to re-establish and expand bike share throughout Monroe County via a new operator in 2021.

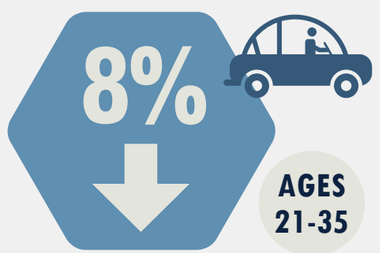
Source: Reconnect Rochester

GENERATIONAL PREFERENCES

Millenials, who now make up a full 20 percent of the regional population are significantly more likely than all other generations to use technology-based ride share, carpool, and car share services.

When controlled for demographics, Millenials' behavior related to decreased vehicle use is distinguished by their attitudes regarding the environment, perceived independence, safety, personal health, and simultaneous activity.

Sources: Montgomery/Wolske/Lyon, Arity



Millenials drive for eight percent fewer of their typical weekly trips than baby boomers or members of Generation X.

SECURITY AND RESILIENCE

Safeguarding transportation infrastructure from hazard impacts is a key concern of federal, state, and local transportation agencies. Preventing and mitigating both natural and human-caused hazards not only protects transportation infrastructure, but also safeguards the lives and property of the traveling public.

Security refers to the reduction of risk to transportation assets from hazard impacts. Resiliency refers to the ability to prepare for, withstand, and rapidly recover from hazard events. Strengthening an asset's resilience to hazard impacts improves the security of both that asset as well as the entire transportation system.

Related concepts that inform the discussion of security and resiliency include adaptation and mitigation. Adaptation refers to the process of preparing transportation assets to withstand and recover from hazard impacts. Mitigation refers to the process of reducing hazard occurrences and minimizing the severity of hazard events that do occur.

Weather and climate-related events increasingly threaten transportation facilities and require mitigation efforts such as this temprorary dam erected seasonally along New York State Route 404 in Penfield

Consideration of the security and resiliency benefits of transportation programs and projects is important for several reasons. It helps improve the transportation system's ability to withstand hazard impacts and minimizes travel disruption from those events. It addresses anticipated climate-change impacts on transportation infrastructure. Lastly, it protects public and private investments in transportation assets.

Regional Hazard Impacts

The Genesee-Finger Lakes Region has less exposure to potentially devastating natural hazards, such as hurricanes, tornadoes, earthquakes, and volcanoes, than many other parts of the country. However, the region is vulnerable to flooding, severe winter storms and ice storms, and high wind events. In the past, these hazards have damaged transportation assets by inundating roads and bridges, blocked roads by knocking down trees and power lines, and caused widespread power outages that darkened streetlights and traffic signals. The *Genesee-Finger Lakes Regional Critical Transportation Infrastructure Vulnerability Assessment*, completed in 2016, assessed the vulnerabilities of critical transportation assets and identified potential actions to mitigate hazard impacts.

COUNTERMEASURES

Countermeasures to strengthen transportation system and asset resiliency can be grouped into one of the following four categories:

Prevention – Actions to stop hazardous events from occurring.

Protection – Actions to minimize exposure to hazard events and reduce damage impacts from hazard events that occur.

Redundancy – Actions to prevent the catastrophic failure of systems and assets from a hazard event. "Micro-scale" countermeasures are asset specific while "macro-scale" countermeasures are system-wide.

Recovery – Actions to restore systems and assets to pre-hazard operating condition. Short-term actions include the emergency response to a hazard event, while long-term actions include restoration of disrupted services and the reconstruction of damaged assets.

CONGESTION MANAGEMENT

Metropolitan Planning Organizations for regions containing a Metropolitan Planning Area, as defined in this plan's introduction, are required to develop and periodically update a Congestion Management Process. The purpose of the process is to integrate congestion management strategies with broader transportation planning policies.

Congestion management mitigates the adverse impacts of travel delay on the movement of people and goods. Excessive 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 GTC Congestion Management Process identifies the location and causes of traffic congestion within the Greater Rochester area and informs regional policies aimed at improving the mobility of people and goods. These policies emphasize corridor-level and region-wide solutions to mitigate the impacts of delay and promote greater travel time reliability.

Delay Categories

Travel delays fall into one of the following three categories:

Recurring Capacity-Related Delay – Caused by predictable daily, weekly, or seasonal increases in demand for road space that exceeds available capacity. Examples include daily commuter traffic during morning and evening peak periods and seasonal traffic patterns such as increased demand for access to commercial centers during the holiday shopping season.

Planned Event-Related Delay – Caused by planned events such as construction work and special events including concerts, festivals, and sports games in major venues that place a greater than normal demand for access to those venues.

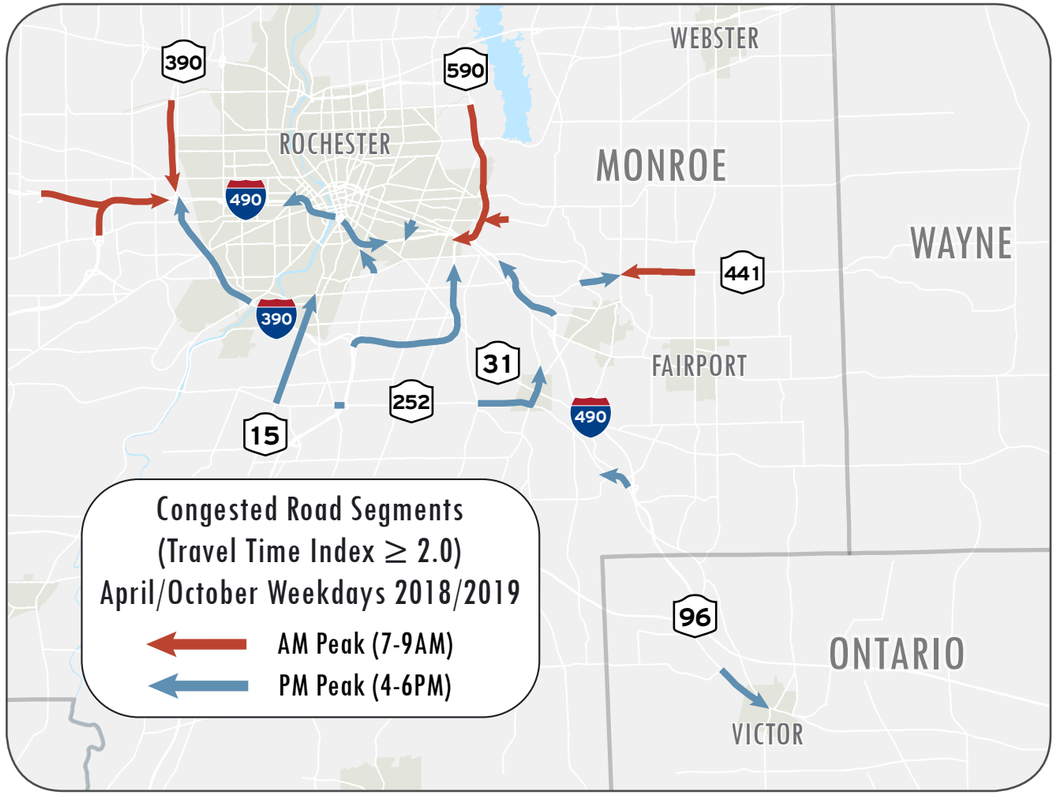
Non-Recurring Incident-Related Delay – Caused by traffic incidents that block travel lanes or cause road closures. Incident-related delay may range from a few minutes for a minor crash to a long-term road or bridge closure resulting from a major commercial vehicle crash, such as a hazardous materials spill.

The impacts of travel delay are often broadly similar regardless of category; however, each of the three types of delay has different causes. Strategies aimed at reducing congestion caused by one type may not be appropriate for managing congestion caused by other types.

Reliability

Travel Time Reliability is a measure of the amount of congestion users of the transportation system experience at a given place and time. A transportation system, road, or travel route with good travel time reliability has consistent and dependable travel times for a given operating condition each time that condition is met.

Reliable travel times are important for commuters, freight carriers, recreational travelers, delivery and courier services, for-hire vehicles, and other transportation system users because it provides them with a degree of certainty regarding the length of time a trip will take. This allows them to factor travel times into their schedules and know that, on a given road at given times and under certain operating conditions, they will be able to reach their destinations within a specified timeframe.



Source: INRIX © 2020

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

TSMO is an integrated program to optimize transportation system performance through the application of advanced technologies and interagency coordination initiatives to improve safety, efficiency, and reliability for all modes of transportation.

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

Technology – Intelligent Transportation Systems (see the ITS Call-Out Box) provide the technical tools needed to manage and operate transportation assets.

Coordination – Multi-modal and multi-jurisdictional interagency coordination initiatives that maximize the efficiency of ITS operations and service delivery.

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 regional transportation system.

TSMO programs and projects in the Technology and Coordination categories address supply (i.e., management and operations) while the Demand category addresses use (i.e., community expectations for system use).

Initiatives in all three categories are implemented in accordance with recommendations in the Genesee-Finger Lakes Regional Transportation System Management and Operations (TSMO) Strategic Plan, which establishes the strategic direction for reigonal TSMO initiatives and ITS deployments.

TSMO Benefits

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

Increased Safety – TSMO enables enhanced incident detection, verification, response, and clearance; vehicle technologies are designed to prevent crashes from occurring and minimizing the severity of those that happen.

Improved Mobility – TSMO emphasizes a multimodal approach to improving travel time reliability, including both proactive actions taken to minimize traffic congestion and delay as well as dynamic, real-time responses to problems that occur.

Reduced Costs – By enabling predictable and consistent travel times, TSMO initiatives minimize travel costs in terms of travel time and fuel consumption for people and freight.

Regional Traffic Operations Center

In the Genesee-Finger Lakes Region, TSMO-supportive technologies and services are managed from the RTOC. Opened in 2002, the RTOC houses personnel from the New York State Department of Transportation (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 in one facility, the RTOC facilitates effective interagency coordination and collaboration. RTOC personnel actively manage the transportation system by using ITS field instrumentation, which are linked to the RTOC through an extensive fiber-optic and wireless communications network, to respond to crashes, traffic congestion, adverse weather conditions, and other situations as they occur.

Rochester-Genesee Regional Intelligent Transportation Systems Architecture

Metropolitan areas that use federal funds to implement ITS projects are required to develop and maintain a Regional ITS Architecture (RITSA). The RITSA is a framework that documents the institutional agreements and technical integration needed to operate ITS. It identifies what organizations are involved in ITS, what systems are operated, what functions those systems perform, how those systems and their specific ITS components communicate with each other, and what information is exchanged.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

Current ITS deployments and services in the Genesee-Finger Lakes Region include:

511NY – A real-time information service regarding traffic conditions as well as trip planning resources.

Automatic Vehicle Location technology enables real-time operations monitoring and efficient dispatch of response vehicles.

Traffic Cameras provide real-time images of road conditions.

Coordinated Traffic Signal Operations enables operators to adjust signal timing in response to incidents, special events, and adverse weather.

Dynamic Message Signs display travel times and alerts about road conditions, congestion, closures, and detours.

Highway Advisory Radio broadcasts travel alerts to motorists about road conditions, including incidents, congestion, road and lane closures, and detours.

Road Weather Information Stations provide system operators with weather data to make informed decisions about optimal road management during inclement weather.

System Sensors detect congested conditions by monitoring the percentage of time a lane is occupied by vehicles.

EMERGING ISSUES AND OPPORTUNITIES

Identification of Emerging Issues and Opportunities was first incorporated into the GTC long range planning process in 2011. With each subsequent LRTP they have been refined and revised. The region has limited financial resources, both in planning for the future of the transportation system and for capital improvements. The identified Emerging Issues and Opportunities guide programmatic activities at the MPO along with the distribution of the planning and capital funds.

The time horizon of the LRTP covers the next 25 years. Planning for the future is somewhat uncertain and the identification of these issues and opportunities is meant to recognize and embrace this uncertainty. Never before has this principal been more apparent than in 2020 as the impacts of the pandemic continue to unfold. Daily life, and in turn how people access and use the transportation system, has been drastically altered. As such, the public's opinion related to likely future transportation impacts is integrated into this section.

LRTP 2045 introduces the broader category of Emerging Technologies, which highlights evolving technologies that are impacting the transportation system now and in the future. While the effects are unknown, GTC would be remiss not to acknowledge the impact of technology on the transportation system and mobility options over the next 25 years. Also acknowledged are the impacts of the transportation system on public health, of extreme weather events on transportation infrastructure, of increased adoption of alternative fuels, of unforeseen user behavioral disruptions, and the opportunity presented by strategic divestment of under-utilized assets.

While the MPO can not plan for unforeseen impacts from new technologies or mitigate all future risks from large disruptive events, one thing that is comparatively certain is the average lifespan of new transportation facilities. A bridge has an average useful life of 70 years, with repairs typically happening before the bridge reaches its mid-life. The average useful life of an asphalt road surface is at least 15 years before major preventative maintenance or reconstruction is needed. The consequences of modifications made to the transportation system today will be with us for a lifetime or more. It is our responsibility to steward a system that will withstand the test of time, mitigate risks, and provide equitable access and mobility options for all users.

WHAT WE HEARD

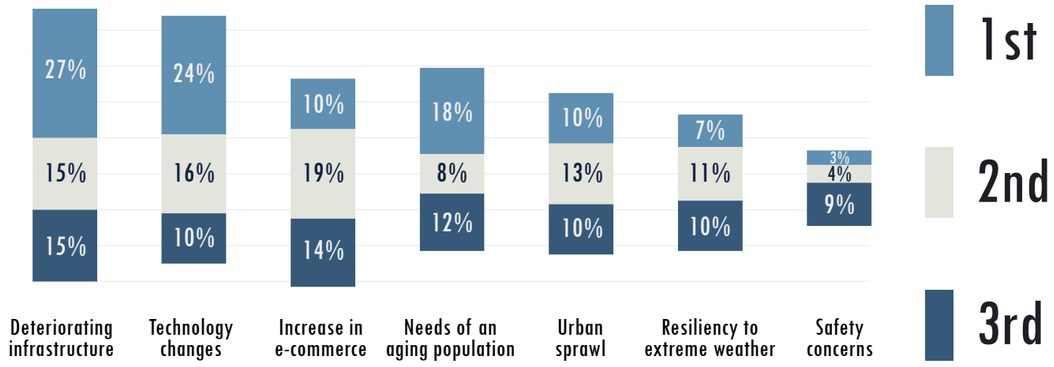
Restrictions against public meetings during the development of the plan required the use of non-traditional public engagement methods. A virtual Open House was held in August 2020 at which the public could ask questions of staff regarding the plan development process and the concurrent online survey.

The survey focused on gauging public opinion related to transportation issues and opportunities as well as impacts of the pandemic on travel patterns. The majority of respondents stated that maintaining existing roads and bridges is the top priority now and over the next 25 years. An expansion of bicycling and pedestrian options was the next highest priority. Reasons cited to increase active transportation options includes increased equity for those without personal vehicles, providing an alternative to personal vehicles, promotion of physical activity and personal health, decreased dependency on fossil fuels, and mitigating the impacts of climate change.

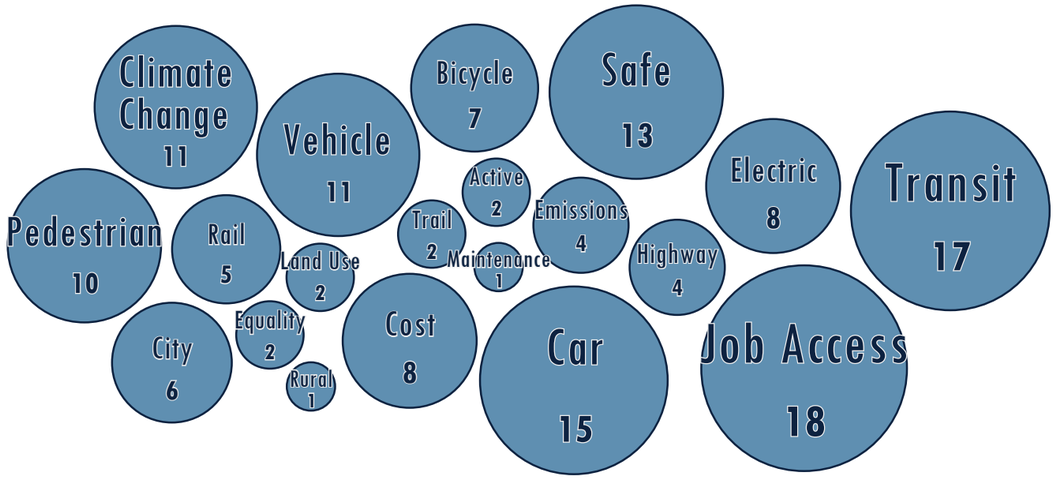
Over 80 percent of respondents cited they were driving less often and consuming less fuel since the start of the pandemic and about a quarter of those respondents expected this change to be permanent. Over 70 percent of respondents were ordering goods and services online more often to avoid in-person trips to the store. Where applicable, approximately half of respondents were still working from home as of September 2020 and 80 percent of those respondents preferred to continue to work from home.

"We need to shift to a more multi-modal and equitable transportation system...this isn't just about mode choice, it is about the health and safety of individuals, communities, and our planet."

What factors will impact the regional transportation system over the next 25 years? Rank your top three choices.



Are there other factors that you think will impact the transportation system in the region over the next 25 years?



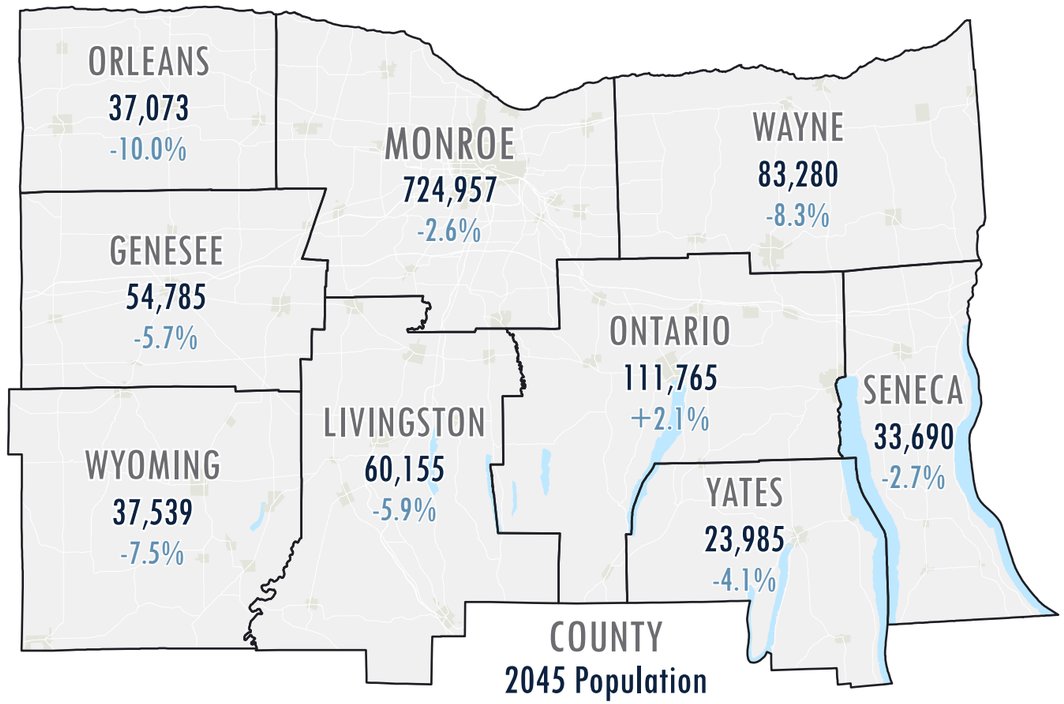
EMERGING ISSUES AND OPPORTUNITIES

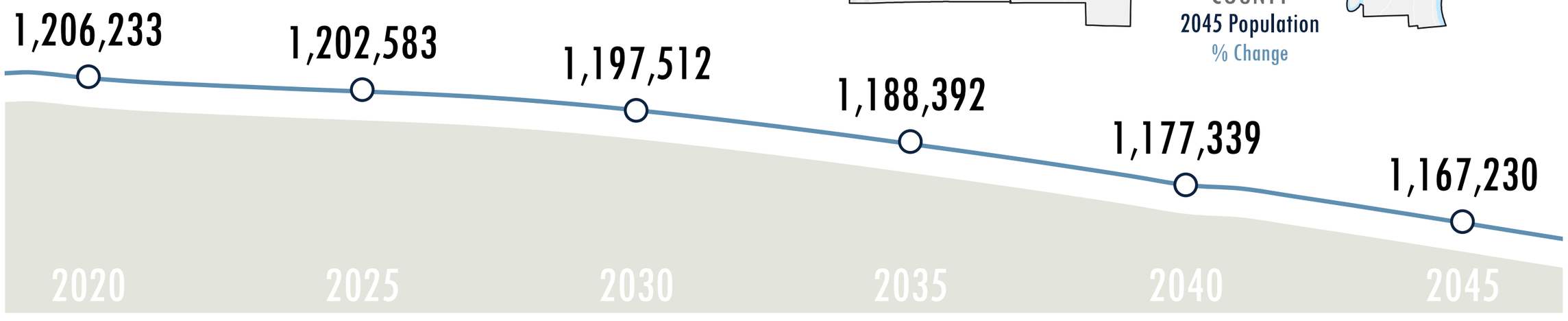
DEMOGRAPHIC PROJECTIONS

Since 1970 the region's total population has increased modestly at an average rate of 2.4 percent each decade. By 2045 it is projected that the total population of the region will slightly decrease to 1.167 million residents. Compared to 2018, the region is expected to lose approximately 3.4 percent of its total population. Over the next 25 years, only Ontario County is projected to have a slight population gain – estimated to be 2.1 percent. The remaining counties, especially the rural counties of Genesee, Livingston, Orleans, Wayne, and Wyoming, will continue to lose population. The distribution of the population throughout the nine counties is expected to remain nearly constant through 2045.

According to the 2019 U.S. Bureau of Labor Statistics' Quarterly Census of Employment and Wages, over 30,000 establishments employing more than 561,000 workers – 84 percent of whom are employed by the private sector – are located in the region. Absolute regional employment figures are expected to increase about 11 percent from 2017 to 2050, despite the population decline, due almost entirely to changes in age cohorts that comprise the workforce. Employment projections count part-time employment opportunities as well as full-time jobs. The future employment distribution is expected to follow current patterns as the vast majority of employment opportunities will continue to be located in Monroe County.

Sources: Population - Moody's, Woods and Poole, IHS Markit, Cornell Prograam on Applied Demographics
Employment - North American Industry Classification System





TRANSPORTATION AND PUBLIC HEALTH

While transportation is an economic and social factor that influences both personal and community health, health has not typically been considered in transportation planning to the same extent as physical safety and air quality. Transportation is more than simply conveyance. Transportation systems provide access to goods and services, most critically healthy food options and health care facilities. Individual mobility is linked directly to quality of life of an individual and its family as well as economic development of a community.

While safety and air quality remain prominent links between transportation and health, the impact of the prevailing transportation system on physical activity has emerged as a third major focus of policy makers. Physical inactivity contributes directly to obesity, a condition affecting over one-third of adults in the nation. This condition creates elevated risk of heart disease, diabetes, stroke, hypertension, and some forms of cancer among other diseases. Active transportation infrastructure creates transportation options that can contribute greatly to incidental physical activity by making opportunities for walking and bicycling safe and convenient. Well-designed and maintained pedestrian and bicycle facilities, including roadway crossings, encourage daily physical activity. Additionally, strong public transit systems encourage physical activity as most riders walk to and from transit stops.

There is a strong equity component to transportation design, especially when a lack of alternatives to private automobile travel disproportionately limit the ability of low income, elderly, disabled, and youth populations to access goods and services. Transportation decisions that support positive public health also support environmental justice goals related to air quality and noise.

Agencies and municipalities that are prepared to implement options that promote and prioritize physical activity in transportation will benefit by preventing avoidable diseases, injury due to modal conflicts, and environmental degredation while stimulating local economic activity by ensuring access to goods and services for underserved groups.

IMPACTS OF EXTREME WEATHER/CLIMATE CHANGE

Transportation infrastructure and services are vulnerable to extreme weather and natural hazards, which can damage transportation assets and disrupt services, threaten public safety, and cause economic loss. As a result of climate change, New York State is experiencing alterations in long-term weather patterns, including an increase in extreme weather events. Average annual temperatures have increased throughout the state, rising about 2.4 degrees Fahrenheit during the past 50 years. Precipitation has increased since 1900, with more rain and snow in the winter, less rain in the summer, and more severe storms year-round. Between 1958 and 2012, the amount of precipitation that fell in the top one percent by volume of all daily events in the northeastern United States rose by 71 percent. Sea levels, while not a direct threat to the Genesee-Finger Lakes region, have risen more than 12 inches since 1900 and are expected to rise another 18 to 50 inches by 2100.

These changes will require public agencies to adapt transportation infrastructure to better withstand the impacts of hazard events. Adaption refers to the process of making transportation infrastructure more resistant to hazard impacts. Low-lying roads and facilities like highway garages vulnerable to flooding can be elevated or relocated to reduce flood risk. Bridges and culverts can be raised and enlarged to increase the volume of water that can pass underneath them. Roadside storm drains can be enlarged to handle spikes in runoff from severe storms and minimize the ponding of water on roads. Many of these solutions can be implemented as part of reconstruction or rehabilitation projects.

In addition to safeguarding lives and property, adapting infrastructure to withstand hazard impacts protects public investments. There is substantial cost associated with building, operating, maintaining, and repairing transportation assets including roads, bridges, culverts, sidewalks, and support facilities such as highway garages or salt sheds. Likewise, managing transit vehicles, other public fleets, and roadside infrastructure such as traffic signals, lighting, and signage, and protecting these assets from hazards is a crucial means of securing the community's investments. During the lifetime of this plan, agencies responsible for managing transportation infrastructure are anticipated to increase their efforts to redesign and operate that infrastructure in ways that maximize public investments and minimize the impacts of potential hazards.

U.S. Route 20 over Oatka Creek, Pavilion

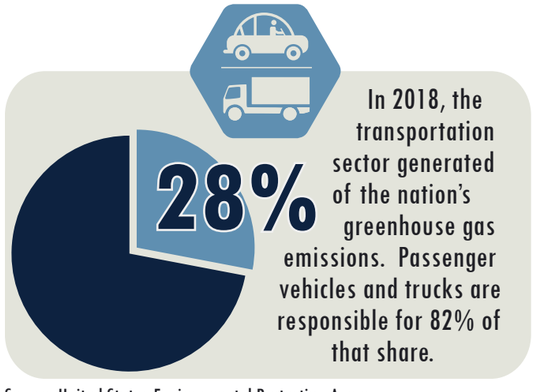
EXPANSION OF ALTERNATIVE FUELS

Alternative fuels are vehicle fuels derived entirely or partially from non-petroleum sources. They include electricity, compressed natural gas, liquefied natural gas, hydrogen, propane, methanol, and biofuels such as biodiesel. Alternate Fuel Vehicles (AFV) are vehicles that operate on alternative fuels either exclusively or on a combination of alternative and conventional fuels.

The main environmental benefit of alternative fuels is that they generate little or no air

pollution. Reduced vehicle emissions contributes to better air quality for the region, improving both the natural environment and public health. In addition, domestic production of alternative fuels contributes to national economic growth and energy security by promoting investments in manufacturing, technology innovations, and workforce development while reducing national economic vulnerability to geopolitical instability.

Federal and state energy policies are increasingly designed to support the adoption of alternative fuels. In 2015, the FAST Act identified criteria for designating Alternative Fuel Corridors along National Highway System routes. These corridors are intended to improve mobility nationwide for AFVs, specifically electric, hydrogen, propane, compressed natural gas, and liquefied natural gas. The 2015 New York State Energy Plan included several recommendations aimed at cutting vehicle emissions, including the ChargeNY program to deploy electric vehicle charging stations, the Clean Fleets NY initiative to expand AFV use among state and municipal agencies, and Smart Mobility programs such as synchronized traffic signals.



Source: United States Environmental Protection Agency

Electricity is the most popular and rapidly growing alternative fuel source. Since 2010, there has been extensive deployment of electric vehicle charging stations in City of Rochester parking garages, popular destinations such as the Public Market and the Port of Rochester, and at civic buildings, parks, public parking areas, local businesses, and automobile dealerships in suburban locations. Charging stations have also been made available in regional rural centers including the Villages of Penn Yan, Geneseo, Mt. Morris, Perry, and Medina.

Fleet electrification has also received increased emphasis as a means of advancing alternate fuel use. As an example, the Regional Transit Service (RTS) has recently added ten electric buses to its fleet, and is investigating on-route charging capabilities. The expansion of alternate fuel use and availability, especially for electric vehicles, is expected to continue during the lifetime of this plan.

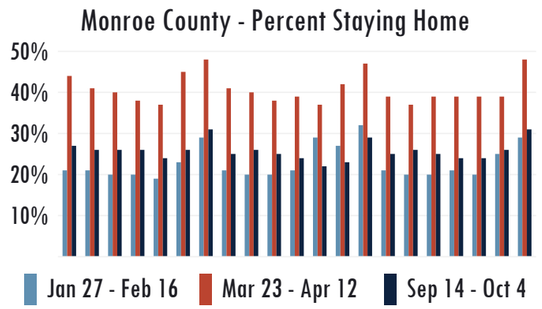
UNFORESEEN SYSTEM DISRUPTIONS

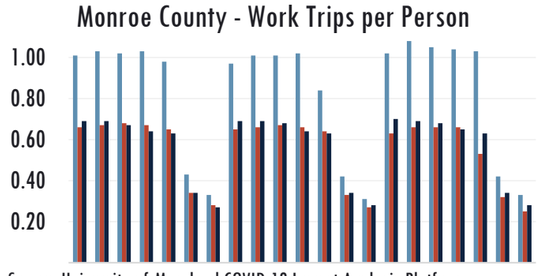
The global pandemic of 2020 has had a massive disruptive effect on regional transportation activity. In addition to immediate economic impacts, such as reduced employment levels, many were forced to enter a telework arrangement for the first time. It is important for agencies to understand that certain behavior patterns may persist beyond the time frame of the public health emergency and that similar future disruptions may elicit other lasting responses.

Fully seven months after the Governor paused non-essential activity in New York State, daily driving and transit trip counts remain depressed compared to pre-pandemic levels. Data from the University of Maryland shows that while the percentage of Monroe County residents who don't leave their homes during a given day is reapproaching pre-pandemic levels, the number of work trips per person is not. The National Transit Database shows that the number of August 2020 transit trips using the RTS-Monroe system remains at 55 percent of 2019 levels. Conversely, data from the active transportation counting equipment company Eco-Counter describes increases in year-over-year monthly bicycle use that persisted into September 2020. The northeastern United States experienced almost ten percent growth in bicycle counts compared with September 2019. The observed change is even more profound on the weekend (22% increase) than the weekday (6.75% increase).

The implications of the potential permanence of some or all of these behavioral shifts are numerous. Long-term telework arrangements may result in lower physical occupancy in activity centers. The ability of government subsidies to compensate for reduced public transportation ridership comes into question and compounds equity issues. The same factors may directly and dramatically reduce the long-term need for shared mobility services such as ride-hailing services. Land use decision making processes may change, especially related to the provision of surface parking versus development to a productive use. Decreased travel to retail locations may effect the freight system by accelerating trends in e-commerce and last-mile deliveries.

The next major system disruption may not be precipitated by a public health crisis, but long range planning must be cognizant of the potential for future disruptions, the acute system impact, and the possibility that some level of system impact persists permanently.





Source: University of Maryland COVID-19 Impact Analysis Platform

STRATEGIC DIVESTMENT

Asset management usually aims for a state of good repair of existing infrastructure. In a fiscally constrained environment, agencies must be open to non-traditional approaches to transportation improvements. One option is to strategically divest existing infrastructure at the end of its useful life. This may take the form of permanently removing a facility like a bridge, transforming a facility that has excess capacity to a more appropriately sized facility, or replacing a facility with a significantly different and simplified design such as overpass removal in favor of an at-grade intersection.

Rightsizing transportation infrastructure is not undertaken for the sake of change. It is a deliberate effort to better use our infrastructure

to meet current and expected future transportation needs while carefully considering future maintenance burden and funding. In areas with aging infrastructure, the typical course of action is to reconstruct the existing facilities while meeting contemporary design standards. As much regional infrastructure was built decades ago, it is incumbent upon agencies to revisit the original design decisions and compare them to today's conditions and tomorrow's expectations.

Some recent examples of strategic divestment projects implemented in the region include:

- Transformation of the Inner Loop Expressway in the City of Rochester
- Removal of the Clarendon Street Bridge in the Village of Albion
- Removal of the Bills Road Bridge in the Town of Carlton

At its core, Strategic Divestment entails the development and implementation of a design alternative at a location where the capacity of existing infrastructure exceeds current and projected needs. The alternative ideally better accommodates all modes of travel. Divestment can be pursued when justified by the life cycle cost-benefit analysis.

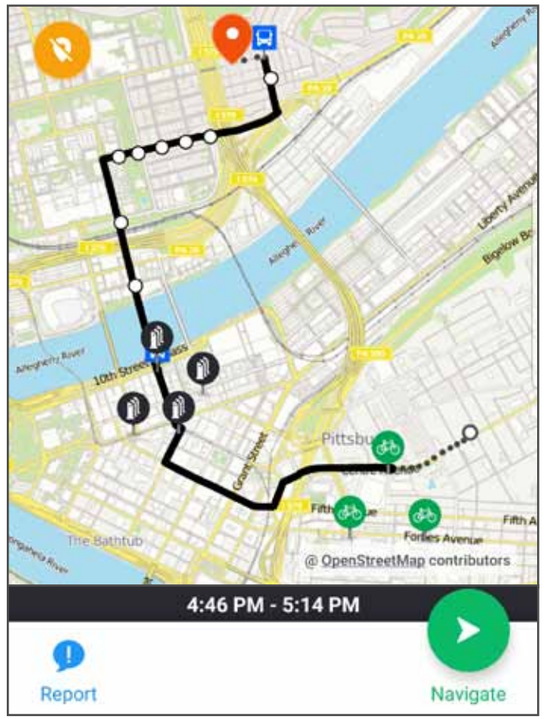
When the pavement, retaining walls, and bridges of the eastern portion of Rochester's Inner Loop Expressway were nearing the end of their useful life, the traditional approach would have been to use funds to repair or replace them with a similar design. Instead, City engineering staff and the New York State Department of Transportation worked together on an effort to reconsider the fundamental design of the corridor. The resulting project has created a road that is more suited to the neighborhood that was previously bisected by the sunken expressway. The project reconnected portions of the neighborhood for users of all transportation modes and opened land for new development that provides affordable housing, expansion of cultural opportunities, and employment opportunities.

Source: City of Rochester

EMERGING TECHNOLOGIES

MOBILITY AS A SERVICE

Mobility as a Service (MaaS) platforms integrate all aspects of travel by any mode into a single digital trip planning application. A traveler is presented with complete route and mode option information along with pricing in real time. Booking, payments, and ticketing related to any transportation service are streamlined. The user may choose to subscribe to a payment plan that allows unlimited use of certain services for a period of time or a refillable pay-as-you-go options.



The Moovit app offers trip planning options that include shared mobility providers such as bike share and classic public transportation options in a single multimodal trip itinerary.

MaaS is an aspirational transportation paradigm, directly linked to the smart communities movement. The concept, when implemented with full system connectivity, would strategically impact large and small urban communities by reducing congestion, optimizing maintenance, improve traffic management, improving the traveler experience, and providing data and insight needed to best provide new mobility services.

If adopted by more cities, operators, and end-users, MaaS may make on-demand mobility a reality that would transform the transport industry. Service providers would need to be prepared to provide real-time data to the MaaS app and negogiate service pricing for Maas users with MaaS operators. Agencies and constituent governments must consider technology barriers as direct equity issues as they decide whether to encourage adoption and cooperation with full MaaS operators.

CONNECTED, AUTONOMOUS, AND AUTOMATED VEHICLES

Connected Vehicles are vehicles that use wireless communications to relay data regarding speed, heading, position, and other status and operational conditions to and from other vehicles and roadside infrastructure.

Autonomous Vehicles are vehicles that operate independently of wireless connections to other vehicles and roadside infrastructure. The vehicle can sense its surroundings via on-board instrumentation and perform one or more elements of the driving task independently.

Automated Vehicles are vehicles with one or more functions normally performed by a driver, such as steering, braking, and lane keeping, that instead operate automatically. Automated

vehicles can function in either connected or autonomous systems.

The application of these technologies has profound implications for how the transportation system is managed and operated, as well as for how the public interacts with the system throughout the lifetime of this plan. Safety can be enhanced when vehicles detect and avoid hazards. Efficiency can be improved when vehicle operations are coordinated and integrated with infrastructure. Accessibility can be expanded when people who are unable to drive, due to age, health, or other considerations, can use these technologies to access transportation services. Mobility can be enhanced when motorists, transit passengers, and freight carriers can access real-time information on travel conditions and options. Reliability is improved when anonymous data generated by connected vehicles is transmitted to traffic operations centers, providing personnel with an additional source of information to proactively manage the system in real time.

It is important for transportation stakeholders to be aware of these technologies and understand the transformative influence they may have on the transportation system.

Source: United States Department of Transportation

e-COMMERCE

E-commerce refers to goods and/or services that are bought and sold on the internet. In 2010, e-commerce sales made up less than 5 percent of total retail sales. In 2020, e-commerce sales are estimated to make up over 16 percent of total retail sales. E-commerce sales during the second quarter of 2020 soared over 45 percent as compared to the second quarter of 2019, as more shoppers avoided in-person retail and turned to contactless delivery due to the pandemic.

While box delivery trucks are now a mainstay in residential neighborhoods, the future of home delivery remains fluid. As technology changes companies are experimenting with autonomous delivery vehicles such as drones and delivery bots for contactless delivery. Increased reliance on e-commerce also means changes for land use and transportation patterns. Brick and mortar retail becomes less relevant as warehousing and distribution centers become more relevant. Increased consumer demand coupled with disruptive technologies will continue to alter traditionally held assumptions regarding retail and freight services. Municipalities in the region need to be cognizant of these changes as zoning codes are updated and traffic impact studies are reviewed.

75%

of global online shoppers make at least one online purchase per month

By 2023, e-commerce revenue in the U.S. is projected to exceed

$740B

Source: Statista 2019 Global Consumer Survey and Digital Market Outlook

Genesee-Finger Lakes LRTP 2045

TRANSPORTATION SYSTEM NEEDS

All residents and visitors, regardless of ability or mode, deserve a safe and equitable transportation system that provides access to leisure, goods, services, and economic opportunities. The region also deserves a system in a state of good repair that is resilient to extreme weather events and does not unnecessarily contribute greenhouse gas emissions. The transportation needs that are presented in subsequent pages identify aspects of a transportation system that accomplishes the above objectives to the greatest extent possible both in the present day and through the Plan's horizon year of 2045.

The transportation system needs are derived from the existing conditions analysis of the transportation system, socioeconomic and demographic data, feedback from the public, identified emerging issues and opportunities, and the evaluation of recently completed local and regional transportation plans and studies. Federal transportation authorization legislation also guided the needs identification process.

Where people live, work, and participate in leisure activities will determine the appropriate solutions to their transportation needs. The nine-county region is home to diverse places ranging from Rochester's urban core, to car-centric suburbs, to walkable villages with traditional main streets, as well as to the pastoral farmlands and scenic vistas overlooking the Finger Lakes. The transportation needs of residents are similar across all places in the region. However, while everyone requires mobility and access to and from their home, job, stores, and services, how these needs can and should be met will differ.

Previous LRTPs defined specific types of places in the region and categorized their transportation needs accordingly. LRTP 2045 recognizes that despite broad similarities in transportation needs in each place type, the needs of specific locations within each place type may differ. For example, mobility and access needs in a rural village with a college campus are different from a village without a similar institution. Rather than presuppose similarity in place type and need, LRTP 2045 considers the expressed desires of residents of many different places across the region. Input is taken both directly regarding this plan and indirectly for prior planning efforts specific to unique places. Through these considerations, residents have a voice and are heard during GTC's transportation planning process.

ENSURING EQUITY THROUGHOUT THE TRANSPORTATION SYTEM

Equity is not the same as equality. Equality ensures that all mobility options are provided equally to all populations regardless of need. Conversely, equity ensures that the populations and geographic areas that lack mobility options are provided with fair levels of access. Providing an equitable transportation system for all users is particularly crucial given the disproportionate levels of poverty in the City of Rochester and the increasing rate of poverty in the nine-county region. Equitable transportation systems help facilitate increased economic and social opportunities for those that have been traditionally underserved. Owning a private vehicle is not possible for all users of the system due to economic and/or physical limitations. Ensuring that low- to moderate- income households, zero-vehicle households, persons of color, older adults, children, persons of Limited English proficiency, and persons with disabilities have sufficient mobility options is vital to increasing quality of life and offering a brighter economic future for all the region's residents.

Slightly more than **20%** of regional residents live above the federal poverty level, yet have incomes that are still too low to be considered self-sufficient.

Source: Poverty and Self-Sufficiency in the Nine-County Greater Rochester Area

INCREASING SAFETY FOR ALL USERS

The regional transportation system should ensure that all users, regardless of physical ability or chosen mode of transportation, are able to travel safely and securely. Best practices in pedestrian and bicycle accommodation should be followed and implemented not just in denser areas that exhibit pedestrian activity, but also in locations where demand is suppressed. Likewise motor vehicle safety can be improved by adopting roadway design guidelines that promote self-enforcing design principles. These guidelines also serve to reduce modal conflict with the most vulnerable users. Public transit facilities, especially bus stops, should be not only accessible, but also secure and inviting to patrons. The needs of long-haul freight vehicles and less common roadway users, such as agricultural machinery, to operate safely should also be considered during future roadway design and maintenance efforts in appropriate locations.

MAINTAINING THE EXISTING SYSTEM IN A STATE OF GOOD REPAIR

Given the region's anticipated stable population trend, the ongoing revitalization of historic urban and village centers, and the growing interest in multi-modal transportation solutions for suburban areas, the need for large-scale road expansion outside the region's developed areas is minimal. Additionally, the lack of sufficient federal-aid resources to maintain current transportation infrastructure presents significant challenges in any consideration of road network expansion. Therefore, transportation agencies are prioritizing federal-aid investments on preserving existing transportation infrastructure assets. These investments include preventive and corrective maintenance on roads, bridges, sidewalks, trails and the supporting infrastructure required to operate them such as Intelligent Transportation System instrumentation. These investments are also focused on infrastructure repair and rehabilitation work to extend asset service life. Furthermore, agencies will consider strategic divestment from assets that are no longer required. A strategic divestment approach helps agencies reduce long-term operations and maintenance costs while retaining existing capabilities.

ENSURING ACCESS FOR ALL TO EMPLOYMENT, GOODS, AND SERVICES

Public health and economic well-being hinge on access to employment, goods such as healthy food, and services, especially those related to medical treatment. A lack of practical alternatives to the private automobile disproportionately affects vulnerable populations, such as low-income, the elderly, and persons with disabilities, by limiting their access to these personal needs, and ultimately, to opportunity. While these needs can be partially addressed by providing more useful transportation options, physical location decisions for these important elements of everyday life are just as important. Taking steps to improve access to common needs will help to improve public health, meet sustainability goals, and allow all residents of all place types within the region to more fully participate in society.

ADDRESSING THE MOBILITY NEEDS OF AN AGING POPULATION

According to an AARP survey conducted in 2018, 76 percent of adults age 50 and older desire to remain in their current residence and 90 percent drive a vehicle themselves. While the majority of these folks have heard of ride sharing services such as Uber and Lyft, only about 30 percent have utilized these services. Alternatives to driving alone are especially vital to seniors as their ability to safely drive decreases as they age and yet the need to reach medical care and avoid isolation increases. As the region's senior population, persons 65 years and older, continues to grow additional consideration is needed regarding their access and mobility needs. While these needs are the same across different place types, how these needs are meant differs. This population is also more likely to have medical needs that necessitate specialized transportation services and a higher level of care. Accessing such services in the rural communities without the ability to drive oneself, is especially difficult as specialized medical facilities are generally located in more densely populated urban centers. Transit and paratransit services can help fill this gap, along with local non-profits that provide transportation services.

The U.S. Centers for Disease Control and Prevention defines aging in place as, "the ability to live in one's own home and community safely, independently, and comfortably, regardless of age, income, or ability level."

While 77% of Americans over 50 would prefer to remain in their current community, only **59%** anticipate to be able to do so. Just **46%** envision being able to stay in their current home.

EXPANDING MOBILITY AND CONNECTIVITY FOR ACTIVE TRANSPORTATION USERS

The region's pedestrian facility, bicycle facility, and transit networks connect many communities and provide access to schools, commercial centers, civic activites, personal services, and places of employment. However, many residents are not located within reach of these networks or are unable to use them for practical connections to desired destinations. New and reconfigured transportation facilities should connect gaps in these existing networks and strengthen multimodal interconnectivity of our communities. System enhancements that increase the usefulness and user comfort of active transportation users coupled with intelligent land use decisions will encourage greater acceptance of active modes as viable alternatives to private automobile travel.

REDUCING ENERGY USAGE AND GREENHOUSE GAS EMISSIONS

Fossil fuel consumption is a major contributor to air pollution and climate change. Since 2010, the region had made great progress in deploying alternative fuel technologies, especially electric vehicle charging stations, to reduce GHG emissions, improve air quality, and maximize energy efficiency. These new energy sources also contribute to economic development in domestic alternative energy industries. The increasing availability of cost-effective electric vehicles, combined with supportive public policies such as tax credits for vehicle purchases and grant programs for charging stations, is expected to encourage greater interest in adapting to alternative fuels during the timeframe of this plan.

Source: Rochester-Genesee Regional Transportation Authority

IMPROVING COORDINATION OF TRANSPORTATION SERVICES

Coordination of transportation services makes the most efficient use of limited transportation resources, especially those dedicated to human service transportation and demand-response transit. Today, the need for coordination extends into shared mobility, membership services that directly impact vehicle ownership dynamics, and parking supply. Coordination across modes and user groups can improve overall mobility within smaller and larger communities. Agencies in a position to coordinate transportation services should consider emerging non-traditional providers and technologies to meet the needs of a higher percentage of specialized transportation demand. Those in need also benefit from higher quality service when greater coordination leads to greater efficiency.

ENHANCING CONNECTIVITY AND ACCESS FOR FREIGHT MOVEMENT

The competitiveness of a region's economy is inextricably linked to the strength of that region's transportation network. Manufacturing and agriculture are both primary sectors of the regional economy which heavily depend on freight network and industry to function. Connectivity and access for freight transported by truck, rail, air, and water is a primary economic need for the region now and in the future. Overall, the transportation system is reliable, and congestion is not a major barrier. Consideration should be given to increasing the efficiency of the freight system along the road, bridge, railroad, and waterway networks through direct infrastructure improvements to strengthen last mile connections, expanding the use of existing and upcoming technologies, and promoting coordination among local, state, and federal partners. Economic development opportunities should be sought for users of the freight network through the coordination and better utilization of the existing networks, potentially exploring opportunities for modal shifts of certain goods movement.

INCREASING SYSTEM RESILIENCY

A resilient transportation system is crucial to the region's security and economy. Regional transportation agencies seek to minimize damage and disruption to transportation infrastructure and services from natural and human-caused hazards. Improving resiliency by relocating vulnerable infrastructure from hazard areas, strengthening assets to protect them from hazard impacts, and building in redundancy on both asset-specific and system-wide scales will enable the region to better withstand hazard impacts. Planning for recovery and adjusting to a new post-incident standard are other key elements of resiliency that will become increasingly important during the timeframe of this plan. In addition, stormwater management techniques that reduce runoff and protect transportation assets from flooding and natural waterbodies from pollutants will be considered as part of broader projects to enhance transportation infrastructure resiliency.

SUPPORTING LEISURE TRAVEL AND TOURISM

The economic impact of tourism in the region is significant, totaling over $3 billion in 2017 alone. Ensuring that travelers can easily access all the region has to offer is vital for the industry's continued success. The transportation system is the mechanism by which visitors first experience a place. Planning for a transportation system that considers the needs of the community naturally creates a sense of place with a strong identity. Enhancements such as wayfinding ensure that visitors can easily reach their destination and discover new ones. Consideration should be given to transportation projects, programs, and services that enhance access and increase mobility to regional attractions across all modes and to those that strengthen the sense of place. Special emphasis should be given to rural places and outdoor recreational attractions where on-demand transportation services are lacking or sparse.

RECOMMENDATIONS

GTC staff synthesized regional demographic and employment information, its assessment of the current transportation system, its identification of emerging issues and opportunities, and direct input from regional residents into the needs assessment in the preceding chapter. The recommendations to follow seek to address regional transportation system needs for the next 25 years.

Strategies, physical implementations, programs, and policies recommended in this chapter will help GTC deliver on the commitment to agency goals and objectives, which seek to increase system safety, increase access to a greater number of mobility options, promote efficient system management, protect the natural environment, and support the economic vitality of the region while building partnerships to execute its initiatives.

The following recommendations maintain the region's continued commitment to the preservation and maintenance of the existing surface transportation system. Recommendations that seek to add capacity to the system, primarily focus on increasing mobility and access through enhancing the public transit system and active transportation networks. Additionally, recommendations encourage the use of alternative fuels, shifting to cleaner burning fuels and electricity as the transportation sector's primary energy choice.

Technology is rapidly evolving. Over the next 25 years how we receive goods, how we move, and how we access information will continue to change. Recommendations that focus on technology are flexible, acknowledging that while we may know that change is upon us, we do not yet understand all the implications of such changes.

Across all recommendations, LRTP 2045 looks to make the region a more equitable place by increasing access and mode choice, along with reducing health disparities through investments. The future transportation system will not hinder residents' ability to pursue economic and social opportunities or negatively impact their well-being.

GTC could initiate some of these programs, but successful implementation will require strong partnerships with public agencies and community organizations. Funding the recommendations is discussed in the following chapter.

RECOMMENDATIONS

RECOMMENDATION GROUP AND TIMELINE

The recommendations on the following pages consist of an identifier, a short description of the recommendation itself, a short explanation related to the importance of the recommendation, identified potential partner agencies, and a time frame within which to begin execution of that strategy, implementation, policy, or program.

Recommendations are organized into broader topic areas listed at right and accompanied by corresponding iconography. Section 450.306 of Title 23 of the Code of Federal Regulations establishes the scope of the metropolitan transportation planning process. The code requires that the planning process provides for consideration and implementation of projects, strategies, and services that will address ten specific factors. The five recommendation groups in LRTP 2045 incorporate those planning factors.

The Health and Safety group is comprised of recommendations consistent with planning factor #2 (Increase the safety of the transportation system for motorized and non-motorized users) and factor #3 (Increase the security of the transportation system for motorized and non-motorized users) while expanding those topics to include the role of the transportation system in determining public health outcomes. The Access and Equity group seeks to satisfy factor #4 (Increase accessibility and mobility of people and freight) and factor #6 (Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight) while also framing access as an equity issue related to quality of life and personal economic opportunity. The System Management and Maintenance group successfully incorporates factor #7 (Promote efficient system management and operation) and factor #8 (Emphasize the preservation of the existing transportation system) as the Sustainability and Resilience group covers factor #5 (Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns) and factor #9 (Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation). Finally, the Economics recommendation group incorporates planning factor #1 (Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency) and factor #10 (Enhance travel and tourism) while crossing over into the freight-related aspects of factors #4 and #6.

HEALTH AND SAFETY

ACCESS AND EQUITY

SYSTEM MANAGEMENT AND MAINTENANCE

SUSTAINABILITY AND RESILIENCE

ECONOMIC DEVELOPMENT

Within each recommendation group, representative projects are highlighted that either abide by or put various individual recommendations into action. These Project Spotlights do not necessarily represent specific action to be advanced by the fiscally constrained plan, nor is implementation funding necessarily identified. In general, the projects represent the work of past or ongoing GTC-funded planning studies whose conceptual recommendations have been approved by key stakeholder agencies involved in the planning process.

The recommended strategies, projects, programs, and policies will be implemented in order of prioritization phases as funding allows. Actions related to ongoing recommendations have already begun and should continue without interruption. Actions related to Near-, Medium-, and Long-Term recommendations should begin within one-to-five, six-to-ten, and eleven-to-twenty-five years, respectively, from the adoption of this plan. Within subsequent pages of this chapter, these time frames are represented by the iconography pictured below.

Ongoing

Near-Term
1-5 Years

Medium-Term
6-10 Years

Long-Term
11-25 Years

RECOMMENDATIONS

HEALTH AND SAFETY

A well-balanced transportation system, that provides facilities for all users regardless of mode, intrinsically provides for those users' safety and promotes incidental physical activity. Transportation and its link to public health has been identified as an emerging issue. Likewise, the safety of all users has been identified as a system need. Thus, recommendations in the Health and Safety group focus on elements and processes within the existing system that can be enhanced to address future issues and meet future needs. These recommendations look beyond single projects in specific locations to policies that would influence local and regional decision making toward a health- and safety-focused framework.

These recommendations assess performance and condition of certain facilities as well as their health impacts, and guide future decisions related to design and implementation. Two overarching themes of recommendations directly related to design are to ensure that facilities are designed for all users and to design such that the built environment provides self-enforcing cues to users regarding safe operation within the system. These themes also permeate recommedations related to implementation such as specific intersection enhancements and the establishment of safe routes to community destinations.

The following tables describe the design considerations, physical projects, policies, and proposed planning efforts needed to support health and safety objectives.

New Traffic Roundabout at New York State Route 96 and Lynaugh Road in Victor

	Description	Importance	Partners	Timeline
HS-1 Design for All Users	Ensure that pedestrian and bicycle facility design as well as adjacent and intersecting roadway design considers and implements safety measures to protect all users, especially those with physical limitations.	Vulnerable users, such as seniors, the visually impaired, and those in wheelchairs struggle to fully use facilities when the crossing distance is too great, the grade is too steep, or in the absence of curb cuts.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing
HS-2 Local Complete Streets Policies	Develop guidance that will support the adoption and implementation of complete streets policies by constituent municipalities based on the most recent policy adoption by the Town of Canandaigua (2017).	A local Complete Streets policy ensures that the safety of all users of the transportation system is considered from facility planning through construction and operation.	Counties Municipalities	Ongoing
HS-3 Sidewalk Network Expansion	Follow FHWA guidance for inclusion of sidewalks along roadways. Develop new local code that requires the inclusion of sidewalk adjacent to and within new development based on nearby land use and density. Follow existing and develops new local code to retrofit sidewalk gaps adjacent to existing development.	Sidewalks improve pedestrian safety and convenience by providing a firm, stable, and slip resistant surface separate from the roadway, decreasing the likelihood of motor vehicle collisions with pedestrians.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing

RECOMMENDATIONS

HEALTH AND SAFETY

	Description	Importance	Partners	Timeline
HS-4 On-Street Bicycle Network Expansion	Prioritize on-street bicycle facility implementation that connects to existing facilities by identifying priority projects based on the short distance trip reassignment methodology described in the *Rochester Comprehensive Access and Mobility Plan*.	The presence of dedicated cycling infrastructure for the entirety of a trip provides a safer environment for cyclists while encouraging more cycling activity, which ultimately improves overall public health.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing
HS-5 Context-Suited Bicycle Facilities	Advance decisions related to on-street or roadway-adjacent dedicated bicycle facility design based on unique roadway and traffic conditions per the *NACTO Urban Bikeway Design Guide*.	High speed and volume roadways require separation between a dedicated bicycle facility and the vehicular traffic lanes. Nationally, a majority of residents have interest in cycling, but only feel secure on separated bikeways.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing
HS-6 Revitalize Multi-Use Trails	Initiate and promote studies to assess, rehabilitate, and/or reconstruct older multi-use trails to meet current design standards and improve user safety.	As the region's multi-use trail network ages, maintenance is required to ensure safe use. Facility deterioration results in surface impediments and obstructions.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing

PROJECT SPOTLIGHT

Multi-Use Trail Restoration

The Town of Greece commissioned a concept level study that would assess the 1980 Route 390 Multi-Use Trail from safety, wayfinding, and access perspectives before recommending improvements and funding strategies. The condition inventory found that the trail does not meet current design standards and many trail segments require more than routine maintenance.

An implementation strategy details immediate improvements that address user safety and comfort, but are not long term or permanent trail improvement solutions. Future improvements would meet current multi-use trail design standards, improve accessibility and safety, and enrich the user experience.

The project supports the following recommendations:

- HS-1 - Design for all Users
- HS-6 - Revitalize Multi-Use Trails
- HS-12 - Fully Integrated Cycling Network

TOP: Existing Trailhead at Vintage Lane
Source: Route 390 Multi-Use Trail Restoration Study

BOTTOM: Potential Trailhead Improvements at Vintage Lane
Source: Route 390 Multi-Use Trail Restoration Study

RECOMMENDATIONS

HEALTH AND SAFETY

	Description	Importance	Partners	Timeline
HS-7 Health Impact Assessments	Conduct Health Impact Assessments on existing regional transportation facilities to better understand the effects of transportation projects on the health of a population and the distribution of those effects on that population.	Health Impact Assessments provide planners with information used to mitigate potentially adverse health impacts and leverage the potential health benefits of transportation policy and infrastructure.	Regional Health Planning	Ongoing
HS-8 Health-Focused Planning Framework	Recognize the effects of participating in active transportation and the overall transportation system's impact on health outcomes. Increase the connection between transportation planning and health through revised project selection criteria.	Transportation is a factor impacting both personal and community health. The promotion of physical activity benefits the larger community by alleviating avoidable disease.	GTC Counties Municipalities	Near-Term 1-5 Years
HS-9 Rural Highway Intersection Safety Evaluation	Evaluate candidate rural intersections for redesign based on collision data, observed speeds, and physical factors. Identify priority locations for roundabout implementation along State and County highways.	Rural intersections controlled by stop signs, are prone to severe vehicle collisions due to sight obstructions coupled with high approach speeds. Roundabout design ensures reductions in speed from all directions.	New York State Department of Transportation County Departments of Transportation	Near-Term 1-5 Years

	Description	Importance	Partners	Timeline
HS-10 Pedestrian Intersection Assessment	Perform a Pedestrian Level of Service (PLOS) analysis and collect pedestrian count information at intersections that have recorded motor vehicle-pedestrian collisions in the previous five years.	The collection of safety, service, and use data at key intersections throughout the region helps decision makers prioritize reconfigurations and safety enhancements.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years
HS-11 Mid-Block Crossing Safety	Perform a region-wide analysis on both marked and potential mid-block crossing locations. Identify and prioritize locations for pedestrian actuated traffic controls exceeding the standards set in the *New York State Pedestrian Safety Action Plan*.	The perceived ability to safely and efficiently cross roadways is a key determining factor in the decision to travel as a pedestrian. Yield-to-pedestrian compliance varies dependent on the crossing treatment and implemented control devices.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years
HS-12 Fully Integrated Cycling Network	Reinforce the safety and visibility of the bicycle system by including bicycle facility markings through roadway intersections, and at junctions where off-road bicycle facilities intersect roadways, in street design policies.	Bicyclists experience the most significant conflict and the highest likelihood of collisions with vehicles at interesections or trail crossings.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years

RECOMMENDATIONS

HEALTH AND SAFETY

	Description	Importance	Partners	Timeline
HS-13 Self-Enforcing Street Design	Employ self-enforcing design principles in roadway design. Deliver a roadway system that allows for intutitive understanding of reasonable travel speed through design controls. Elements include lane widths, turning radii, and street edge features.	Street users are more likely to comply with operating expectations when following environmental cues compared to signage obeyance or police enforcement. This improves the level of safety for all users.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years
HS-14 Safe Routes to Community Destinations	Explore initiation of Safe Routes to School and Transit Programs. Provide technical resources related to funding sources and physical/ policy implementation to partners.	Safe Routes programs promote safe and accessible walking and bicycling routes to schools, community centers, transit stops, and other key destinations through infrastructure improvements and education.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years
HS-15 Pedestrian Intersection Enhancements	Reconfigure pedestrian facilities at intersections indentified and prioritized by the Pedestrian Intersection Assessment. Focus interventions on crossing distance via curb design, curb radii, refuge islands, and signalization.	Even well-connected segments of the pedestrian network experience collisions resulting in injury. Facilities that are perceived as unsafe or difficult to cross discourage walking as a form of mobility.	New York State Department of Transportation County Departments of Transportation Municipalities	Medium-Term 6-10 Years

PROJECT SPOTLIGHT

Geneseo Intersection Reconfiguration

The 5-way intersection of U.S. Route 20A, Crossett Road, Groveland Road, and Temple Hill Street was identified as a priority intersection for safety intervention as part of the Geneseo Active Transportation Plan. While a mid-block crossing was installed 350 feet west of the intersection, community input and data analysis illustrated a need for a pedestrian facility-focused reconfiguration.

The roundabout conceptual alternative advanced in the plan responds to high volume traffic and limited visibility. A roundabout would reduce traffic speeds, reduce unprotected pedestrian crossing distances, and simplify potential conflict points between all modes of travel.

The project supports the following recommendations:

- HS-1 - Design for All Uses
- HS-9 - Rural Highway Intersection Safety Evaluation
- HS-13 - Self-Enforcing Street Design
- HS-15 - Pedestrian Intersection Enhancements

TOP: Existing Intersection Conditions
Source: Google Map Data

BOTTOM: Proposed Roundabout
Source: Geneseo Active Transportation Plan

RECOMMENDATIONS

ACCESS AND EQUITY

The quality of a transportation system is diminished when it is not accessible to all regardless of physical ability, income, ethnicity, or language skills. Constantly evolving features of the transportation system, such as the data intensive Mobility as a Service (MaaS) concept, have been identified as an equity consideration. Additionally, the system needs assessment identified ensuring equity, ensuring access to employment, goods, and services, and addressing the mobility needs of seniors. Therefore, recommendations in the Access and Equity group concentrate on investigating service and coordination deficiencies as well as reconsidering municipal and agency policy considerations.

Design and implementation considerations persist as part of this group of recommendations. Emphasis on equity in design and maintenance along with more widespread ADA compliance attempt to ensure access at a wider range of facilities for the entire year. Other encouraged design practices make more equitable transportation modes, such as transit and cycling, more accessible. Finally, direct improvements to intermodal connections and on-demand mobility access, previously planned as part of the ReImagine RTS initiative, are supported.

The following tables describe the assessments, design principles, proposed programs, and prepartory policies required to support access and equity goals.

Opening Day at the RTS Transit Center in Rochester

	Description	Importance	Partners	Timeline
AE-1 Primary Equity Considerations	Strive for equitable outcomes when rehabilitating existing infrastructure and designing new facilities by considering mobility challenges of typically under-represented groups.	Equitable transportation systems facilitate increased economic and social opportunities for those that have been traditionally underserved.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing
AE-2 Equity in Design and Maintenance	Incorporate equity considerations, including winter maintenance concerns affecting those with mobility challenges, into transportation facility design and maintenance plans by following guidance collected by the U.S. DOT/FHWA.	An equitable transportation system facilitates access to opportunities for low-income communities and populations who have historically have been left out of transportation planning decision making.	New York State Department of Transportation County Departments of Transportation Municipalities RGRTA	Ongoing
AE-3 System ADA Compliance	Enhance access to public rights-of-way by installing ADA-compliant treatments on new and existing transportation facilities in accordance with the U.S. Access Board's *Public Rights-of-Way Accessibility Guidelines*.	Providing ADA-compliant accommodations increases mobility while ensuring that persons with disabilities are not discriminated against in their use of roadways and pedestrian facilities.	New York State Department of Transportation County Departments of Transportation Municipalities RGRTA	Ongoing

RECOMMENDATIONS

ACCESS AND EQUITY

	Description	Importance	Partners	Timeline
AE-4 Augmented Regional Trail Network	Seeks to implement the near- and medium-term trail project recommendations found in the *Genesee-Finger Lakes Regional Trails Initiative (RTI) Phase III* by conducting trail feasibility studies and initial design activities.	The presence of dedicated cycling infrastructure for the entirety of a trip provides a safer environment for cyclists while encouraging more cycling activity, which ultimately improves overall public health.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing
AE-5 Regional Trails Initiative	Assess progress on RTI near- and medium-term network recommendations and reassess long-term planning and management recommendations by updating the Regional Trails Initiative.	As a unifying trails plan for the region, periodic updates allow decision makers to measure progress of system connectivity and accessibility while applying up-to-date best practices to revised recommendations.	New York State Department of Transportation New York State Parks County Planning Departments	Near-Term 1-5 Years
AE-6 Direct Non-Motorized Connections	Seek opportunities to make non-motorized transportation more direct and convenient by identifying candidate locations for shared-use paths and/or limiting vehicular traffic on existing network links.	Residents are dissuaded from using active modes for daily useful trips when dedicated facilities do not serve the entire length of the trip or when distances are too long.	Municipalities	Near-Term 1-5 Years

PROJECT SPOTLIGHT

Trail Feasibility Studies

Seneca County sponsored an effort by the Cayuga-Seneca Canal Trail Association to evaluate concepts and alternative route scenarios for a three mile trail extension of the Cayuga-Seneca Canalway Trail from Waterloo to Seneca Falls.

Consultants evaluated topography, soils, ecological character, habitat, drainage, wetlands, land use and property ownership, destinations, access, transportation/circulation, trail user profile, infrastructure and utilities to identify any significant constraints to trail implementation.

The final recommendations define a preferred alignment for the trail, identify required private property easements, and estimate costs to construct trail infrastructure.

TOP: Existing Bridge over Silver Creek
Source: Cayuga-Seneca Canalway Trail Phase II Study

BOTTOM: Recommended Trail Alignment
Source: Cayuga-Seneca Canalway Trail Phase II Study

The project supports the following recommendations:

- AE-4 - Augmented Regional Trail Network
- AE-6 - Direct Non-Motorized Connections

RECOMMENDATIONS

ACCESS AND EQUITY

	Description	Importance	Partners	Timeline
AE-7 Core Transit Frequency	Support continued assessment and implementation of high frequency, direct transit service in the core of the Metropolitan Planning Area as described in the *Reimagine RTS Service Plan*.	Reimagine RTS focuses on growing ridership and improving transit productivity through faster, more direct service. Increased bus frequency seeks to reduce customer wait times.	RGRTA	Near-Term 1-5 Years
AE-8 Transit Supportive Street Design	Tie street design to transit supportive enhancements by encouraging municipalities to develop a bus stop hierarchy that establishes standards for the inclusion of seating, lighting, shelter, waste receptacles, and other amenities.	Buses carry tens of thousands of regional residents every weekday. Infrastructure investments along the routes both better serves existing customers and increases the attractiveness of transit as a transportation option.	RGRTA Municipalities	Near-Term 1-5 Years
AE-9 Regionally Connected Transit	Explore ways to increase county to county transit connections by reviewing and updating the strategic plans for public transportation for each county within the region.	Increased transit service improves access to services, health care providers, and employment opportunities, especially those not found in rural communities.	RGRTA	Near-Term 1-5 Years
AE-10 Coordinated Transportation Services	Develop a more efficient, integrated, and coordinated network of human services transportation options by updating the *Genesee-Finger Lakes Region Coordinated Public Transit-Human Services Transportation Plan*.	An update provides a current assessment of unmet needs and service gaps, and recommends strategies based on best practices for providing specialized transportation services.	RGRTA County Agencies Human Services Transportation Providers Stakeholder Groups	Near-Term 1-5 Years
AE-11 Land Use Decision Making	Encourage the adoption of policies at various tiers of government to revise zoning codes and site selection criteria in order to realize full service neighborhoods that place less demands on powered transportation infrastructure.	Mobility is a primary quality of life factor. Access to goods, services, and employment options at a lower transportation cost strengthens equity within a community.	Counties Municipalities	Near-Term 1-5 Years
AE-12 Transportation Management Association	Provide transportation services to employees of businesses not currently or not expected to be well-served by transit. Study the potential for the establishment of a Transportation Management Association (TMA) in the Metropolitan Planning Area.	TMAs are typically non-profit, member controlled organizations that provide transportation services in a particular area. A TMA has the potential to connect people to employment when transit is not practical.	RGRTA Chamber of Commerce Workforce Development Private Transportation Providers	Near-Term 1-5 Years

RECOMMENDATIONS

ACCESS AND EQUITY

	Description	Importance	Partners	Timeline
AE-13 On-Demand Mobility	Support implementation of the Community Mobility Zones as described in the *Reimagine RTS Service Plan* to serve areas that do not support fixed-route transit due to low density or poorly connected development patterns.	Commmunity Mobility Zones are intended to provide more customized and flexible transit options within those zones while maintaining access to the larger fixed-route system.	RGRTA Shared Mobility Providers	Near-Term 1-5 Years
AE-14 Shared Mobility Management	Attempt to minimize system disruption while promoting the availability of new mobility options such as bicycle share, car share, powered bicycles/ scooters, and microtransit. Encourage adoption of new curbside management policies while identifying funding sources for new implementation.	Shared mobility services could provide new and innovative ways to get around the region. These services must be managed carefully, however, to ensure they respect public space and support local objectives.	RGRTA Municipalities	Near-Term 1-5 Years
AE-15 Mobility as a Service	Consider equity issues related to the emergence of Mobility as a Service (MaaS) applications. Seek solutions to technology barriers that preclude the use of advanced trip-planning features.	MaaS applications have the potential to greatly simplify access to transit and shared mobility options, but require users to subscribe to mobile real-time data plans.	RGRTA	Near-Term 1-5 Years

PROJECT SPOTLIGHT

Community Mobility Zones

The ReImagine RTS system redesign initiative introduced the concept of Community Mobility Zones (CMZ) as areas where fixed-route service will be replaced by more flexible, customized solutions.

Connection hubs will link the fixed-route system to the new mobility solutions, such as RTS On Demand, vanpools, and bicycle share stations, in the CMZs at key network convergence points.

RTS On Demand service will operate as microtransit, providing customer requested trips, and serving any number of origins and destinations within each CMZ. RTS On Demand trips are curb-to-curb with no set route or schedule like a conventional transit service.

The project supports the following recommendations:

- AE-13 - On-Demand Mobility
- AE-14 - Shared Mobility Management
- AE-16 - Intermodal Connections

TOP: Small Transit Vehicle
Source: ReImagine RTS Final Recommendation Report

BOTTOM: Planned Mobility Zones and Connection Hubs
Source: ReImagine RTS Final Recommendation Report

ACCESS AND EQUITY

	Description	Importance	Partners	Timeline
AE-16 Intermodal Connections	Support projects at intermodal hubs such as airports, train stations, and inter-city bus stations that facilitate transfers to local transit and other modes. Considerations include transit stop proximity and bicycle parking.	Access to community resources, including inter-city transportation facilities, via multiple modes, is foundational to fostering social equity in the regional transportation system.	RGRTA Shared Mobility Providers Inter-City Transportation Operators	Near-Term 1-5 Years
AE-17 Transit Facility Support	Support transit operations through the configuration of other physical facilities such as curb extensions, bus turnouts, dedicated transit lanes, transit signal priority, and layover facilities. Provide for the clearance of snow and ice from bus stop landing zones and pathways.	Transit agencies have limited control over the physical facilities on which they operate. Localities can maximize the value of regional transit investments and enhance year-round access by adopting transit supportive policies related to the built environment.	RGRTA New York State Department of Transportation County Departments of Transportation Municipalities	Medium-Term 6-10 Years

SYSTEM MANAGEMENT AND MAINTENANCE

A well-maintained and efficiently operated transportation system is vital to the region's public safety, economic opportunity, and overall quality of life. Due to the age of the region's infrastructure and the corresponding maintenance challenges for the agencies responsible for operating it, recommendations in the System Management and Maintenance category emphasize actions to preserve transportation infrastructure and associated services and capabilities. These recommendations include actions to optimize transportation system performance through Intelligent Transportation System (ITS) deployments that enable operators to monitor and manage transportation infrastructure. ITS implentation also maximizes the value of limited public resources through joint service delivery.

In addition, these recommendations address related issues such as conducting strategic divestment studies to determine whether infrastructure elements can be decommissioned instead of replaced. Improving transportation system connectivity by better linking existing streets, sidewalks, and trails instead of implementing costly capacity expansion projects is encouraged. Finally, the recommendations promote the application of Access Management solutions to help resolve safety, accessibility, and mobility challenges.

The following recommendations describe programs and policies to support transportation system management and maintenance activities.

Control Room at the Regional Traffic Operations Center on Scottsville Road

	Description	Importance	Partners	Timeline
MM-1 TSMO Programs and Services	Implement programs and services in accordance with the recommendations in the *Genesee-Finger Lakes Regional Transportation System Management and Operations (TSMO) Strategic Plan*.	TSMO programs and services focus on operational improvements that optimize transportation system performance before extra capacity is considered.	New York State Department of Transportation New York State Thruway Authority County Departments of Transportation	Ongoing
MM-2 ITS Integration	Integrate Intelligent Transportation System (ITS) design elements into transportation assets during the planning, design, and construction phases to facilitate future ITS deployments.	ITS aims to reduce travel time and enhance safety and comfort of commuters by minimizing traffic problems. Building ITS-supportive elements into new infrastructure expands ITS services and reduces future costs.	New York State Department of Transportation New York State Thruway Authority County Departments of Transportation	Ongoing
MM-3 ITS Communication Infrastructure	Expand and upgrade regional fiber optic and wireless communications infrastructure to enhance ITS service delivery.	Improved communications capabilities enable agencies responsible for managing transportation infrastructure to more effectively respond to and coordinate ITS services.	New York State Department of Transportation New York State Thruway Authority County Departments of Transportation	Ongoing

SYSTEM MANAGEMENT AND MAINTENANCE

	Description	Importance	Partners	Timeline
MM-4 Core TSMO Programs	Continue federal-aid funding for core TSMO-related programs, including the Regional Traffic Operations Center (RTOC) and the Highway Emergency Local Patrol (HELP) program.	HELP trucks, dispatched via the ROTC, decrease delay and increase safety by providing emergency roadside service to disabled vehicles on high volume expressways.	New York State Department of Transportation County Departments of Transportation	Ongoing
MM-5 Traffic Signal Synchronization	Coordinate traffic signal timing at interchanges and intersections, along corridors, and for special events to enhance safety, efficiency, and reliability.	Traffic signal synchronization allows drivers to move efficiently through a corridor, reducing the number of stops and delay.	New York State Department of Transportation County Departments of Transportation	Ongoing
MM-6 Interagency Operations Coordination	Facilitate interagency coordination committees to encourage cooperation and collaboration among agencies responsible for managing transportation assets and services.	Interagency coordination allows for faster project and service delivery resulting in less disruptions to the traveling public.	New York State Department of Transportation New York State Thruway Authority County Departments of Transportation	Ongoing

PROJECT SPOTLIGHT

Integrated Corridor Management (ICM)

Interstate 490 is a major metropolitan transportation corridor. Its busiest sections carry over 100,000 vehicles per day. The I-490 ICM plan seeks to coordinate operations along the corridor to proactively manage the highway and enhance traffic safety, minimize delay, and improve travel time reliability.

The ICM planning process identifies opportunities for transportation departments, first responders, and other agencies to collaborate on service delivery such as Work Zone and Traffic Incident Management. ICM planning identifies the ITS deployments required to monitor traffic operations and minimize the impacts of incidents along the corridor.

The project supports the following recommendations:

- MM-1 - TSMO Programs and Services
- MM-3 - ITS Communications Infrastructure
- MM-6 - Interagency Operations Coordination
- MM-15 - ITS Asset Management

TOP: Interstate 490 Westbound
Source: I-490 Integrated Corridor Management Plan

BOTTOM: Highway Emergency Local Patrol
Source: NYS Department of Transportation

RECOMMENDATIONS

SYSTEM MANAGEMENT AND MAINTENANCE

	Description	Importance	Partners	Timeline
MM-7 Traffic Incident Management	Promote interagency Traffic Incident Management (TIM) techniques for safeguarding the traveling public and first responders, as well as minimizing incident-related delay.	TIM training prepares first responders with the tools to quickly respond to and clear an incident scene, which clears congestion faster and reduces secondary incidents.	New York State Department of Transportation County Departments of Transportation Law Enforcement	Ongoing
MM-8 Connected and Autonomous Vehicles	Monitor advancements in emerging Autonomous, Automated, and Connected Vehicle technologies and deployments to ensure the benefits of these developments accrue to the community.	Informed planning agencies and decision makers regarding the advancements and impacts of emerging technologies on the transportation system are better able to adapt to distruptive changes caused by new technology.	New York State Department of Transportation New York State Thruway Authority County Departments of Transportation	Ongoing
MM-9 Congestion Management Process	Identify the location and causes of traffic congestion, in accordance with federal requirements, through the regional Congestion Management Process.	Awareness of the location and causes of recurring congestion enables transportation management agencies to design and implement solutions aimed at minimizing travel delay.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing

	Description	Importance	Partners	Timeline
MM-10 System Connectivity	Focus new infrastructure construction on connecting gaps in the regional transportation system. Link streets and roads to complete grid patterns, or extends nearby trails to make connections, rather than implementing costly capacity expansion projects.	Closing accessibility and mobility gaps in the transportation system maximizes infrastructure investments while minimizing future operations and maintenance costs.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing
MM-11 Access Management	Invest federal-aid resources in transportation infrastructure projects and services that include access management solutions, such as limits on driveways, shared parking inventory, turning lanes, median openings, and traffic signal spacing.	Integrating access management solutions into infrastructure projects benefits transportation system users and business owners by enhancing the safety and efficiency of travel flow.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing
MM-12 Active Transportation Enhancement	During transportation infrastructure repair, rehabilitation, and replacement projects, enhance assets with active transportation elements such as sidewalks, trail connections, and pedestrian crossings where appropriate.	Integrating active transportation elements into transportation infrastructure expands accessibility and mobility for all modes, and maximizes the investment.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing

SYSTEM MANAGEMENT AND MAINTENANCE

	Description	Importance	Partners	Timeline
MM-13 Preventive Maintenance	Maintain a system state of good repair by conducting preventive maintenance projects to proactively address maintenance problems before they emerge.	Preventive maintenance projects are a cost-effective method to avoid future corrective maintenance or full repair and rehabilitation projects.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing
MM-14 Strategic Divestment	Conduct strategic divestment assessments to determine whether specific roads, bridges, interchanges, and other transportation facilities can be decommissioned with acceptable impacts on safety, efficiency, reliability, access, and mobility.	Strategic divestment studies enable transportation management agencies to determine the optimal investment strategy for maintaining or decomissioning assets.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years
MM-15 ITS Asset Management	Replace current ITS field instrumentation, including but not limited to traffic cameras, dynamic message boards, traffic sensors, and communications elements at the end of their useful lives.	Regular replacement of ITS field instrumentation maintains current TSMO capabilities and enables effective service delivery.	New York State Department of Transportation New York State Thruway Authority County Departments of Transportation	Near-Term 1-5 Years

PROJECT SPOTLIGHT

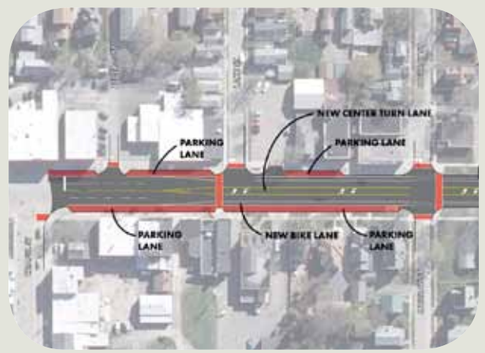
New York Route 36 Corridor Study

Local officials in Mt. Morris and Leicester in Livingston County had concerns regarding safety, accessibility, and wayfinding along the Route 36 corridor. They commissioned a corridor study with help from state, county, and not-for-profit agencies to assess needs and propose solutions.

The study provides state, county, and local officials with a guide for investing in transportation infrastructure improvements along the corridor. In addition to addressing safety concerns at multiple intersections, the plan emphasizes access management solutions for minimizing vehicular conflicts, enhances pedestrian connections within village centers, and strengthens linkages between the regional trail system and adjoining infrastructure.

The project supports the following recommendations:

- MM-11 - Access Management
- MM-12 - Active Transportation Enhancement
- MM-17 - Locally Implemented Access Management



TOP: Letchwork State Park Entrance Roundabout Concept
Source: New York Route 36 Corridor Study

BOTTOM: Main Street Mt. Morris Improvements
Source: New York Route 36 Corridor Study

RECOMMENDATIONS

SYSTEM MANAGEMENT AND MAINTENANCE

	Description	Importance	Partners	Timeline
MM-16 Non-Motorized ITS	Deploy ITS field instrumentation at crosswalks, along shared-use trails and sidewalks, and at intermodal transfer centers to support non-motorized modes of transportation.	ITS deployments in support of non-motorized transportation emphasize safety enhancements, and traveler information systems to encourage expanded use of non-motorized modes.	New York State Department of Transportation County Departments of Transportation	Near-Term 1-5 Years
MM-17 Locally Implemented Access Management	Encourage municipalities to adopt land use policies and regulations that require site access management solutions.	Local municipalities are responsible for a significant share of the transportation system. Access Management concerns extend to these facilities not always eligible for federal aid.	County Planning Departments Municipalities	Near-Term 1-5 Years
MM-18 Corrective Maintenance	Maintain a state of good repair by conducting corrective maintenance projects to address emerging maintenance problems before they require more costly repairs.	When preventive maintenance is infeasible, corrective maintenance projects are a way to avoid the need for costly full repair or rehabilitation projects.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years

	Description	Importance	Partners	Timeline
MM-19 Repair and Rehabilitation	Maintain a state of good repair by conducting repair and rehabilitation projects to preserve and extend the useful life of transportation infrastructure assets.	When corrective maintenance projects are infeasibile, repairing and rehabilitating transportation assets is a cost-effective approach to preserve transportation system safety, efficiency, and capacity.	New York State Department of Transportation County Departments of Transportation Municipalities	Medium-Term 6-10 Years
MM-20 Infrastructure Replacement	Maintain a system state of good repair by replacing infrastructure assets at the end of their useful life to ensure continuity of service.	Transportation assets should be replaced with new facilities when the cost of repair or rehabilitation exceeds the benefits of keeping the facility in service.	New York State Department of Transportation County Departments of Transportation Municipalities	Long-Term 11-25 Years
MM-21 Advanced ITS Field Instrumentation	Replace current ITS field instrumentation with next-generation ITS devices as part of a coordinated deployment of new technologies and services.	Expanding coverage and enhancing ITS capabilities improves transportation safety, efficiency, and relability through direct communication with roadway users.	New York State Department of Transportation New York State Thruway Authority County Departments of Transportation	Long-Term 11-25 Years

SUSTAINABILITY AND RESILIENCE

Minimizing disruptive impacts of climate change and hazard events on transportation infrastructure and services is key to safeguarding the lives and property of the traveling public. Minimization involves protecting federal-aid transportation investment, ensuring supply chain continuity, and preserving natural and community resources. Recommendations in the Sustainability and Resilience category focus on actions to prevent hazards from damaging assets and disrupting services. They seek to protect infrastructure from anticipated hazard impacts and ensure that impacted systems and structures have redundant elements to avoid catastrophic failure. Finally, the recommendations consider how post-hazard recovery activities, including both short-term response and long-term restoration, can be integrated into the transportation planning process.

In addition, sustainability recommendations address efforts to expand the availability and use of alternative fuels to reduce vehicle emissions and improve air quality, as well as to encourage domestic energy production. Other environment-focused topics seek to minimize pollution through improved stormwater management and promote infill development as means of reinvesting in communities while maximizing land use efficiency.

The following recommendations lay out programs and policies to enhance the sustainability and resilience of the regional transportation system.

Electric Vehicle Charging Stations at I-Square in Irondequoit

	Description	Importance	Partners	Timeline
SR-1 Climate Change and Hazard Impacts	Minimize anticipated climate change and hazard impacts on transportation assets and services by implementing the recommendations in the *Regional Critical Transportation Infrastructure Vulnerability Assessment*.	Integrating resiliency and sustainability considerations into planning, design, construction, operation, and maintenance safeguards facilities, minimizes service disruptions, and protects lives and property.	New York State Department of Transportation New York State Thruway Authority County Departments of Transportation RGRTA	Ongoing
SR-2 Stormwater Management	Adopt stormwater managment best practices, such as minimizing runoff and removing pollutants, at agencies and municipalities throughout the region.	Effective stormwater management minimizes flooding, pollution, erosion, sedimentation of waterways, and other negative impacts of stormwater runoff.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing
SR-3 Infill Development Supportive Investment	Invest federal-aid resources in transportation infrastructure projects and services that support infill development.	Infrastructure and service improvements that support infill development maximize the viability of existing assets and shift federal-aid investments away from costly new construction.	New York State Department of Transportation County Departments of Transportation Municipalities	Ongoing

RECOMMENDATIONS

SUSTAINABILITY AND RESILIENCE

	Description	Importance	Partners	Timeline
SR-4 Alternative Fuel Benefit Promotion	Continue to coordinate with stakeholders to educate individuals, households, and families regarding the benefits of alternative fuel vehicles.	Reliable information allows residents to make informed purchasing decisions related to alternative fuels, increasing the likelihood of household carbon footprint reduction.	NYS Energy Research & Development Agency Greater Rochester Clean Cities Municipalities	Ongoing
SR-5 Alternative Fuel Supply Expansion	Deploy alternative fuel supply infrastructure, including but not limited to electric charging and hydrogen, propane, and natural gas fueling infrastructure, in strategic locations around the region.	The increased availability of alternative fuel facilities enables increased use of alternative fuel vehicles and decreased emissions, improved air quality, and reduced fossil fuel dependency.	NYS Energy Research & Development Agency Greater Rochester Clean Cities Municipalities	Near-Term 1-5 Years
SR-6 Alternative Fuel Fleet Expansion	Expand the use of alternative fuel vehicles, such as municipal DPW trucks, transit buses, and delivery vans, in public and private fleets.	Alternative fuel vehicles decrease emissions and improve air quality. During the time frame of this plan, the automobile industry is expected to increase electric vehicle production while phasing out combustion engines.	NYS Energy Research & Development Agency Greater Rochester Clean Cities Municipalities	Near-Term 1-5 Years

PROJECT SPOTLIGHT

Electric Transit Bus Deployment

In the fall of 2020, Regional Transit Service-Monroe (RTS) added ten new electric buses to its fleet. These buses are the first vehicles in a larger electric bus fleet RTS plans to deploy during the time frame of this plan. Like other upstate transit agencies, RTS is working to meet state goals of having zero emission vehicles make up 25 percent of its bus fleet by 2025 and 100 percent by 2035.

The benefits of electric buses include reduced operations costs for transit agencies, improved air quality for communities, and quieter rides for passengers. By replacing ten diesel buses, the new electric buses will reduce greenhouse gas emissions by 905 metric tons per year, the equivalent of removing 197 personal vehicles from the road.

The project supports the following recommendations:

- SR-5 - Alternative Fuel Supply Expansion
- SR-6 - Alternative Fuel Fleet Expansion

TOP: New RTS Electric Bus
Source: Genesee Transportation Council

BOTTOM: Charging Stations at the RTS Bus Storage Facility
Source: Genesee Transportation Council

RECOMMENDATIONS

SUSTAINABILITY AND RESILIENCE

	Description	Importance	Partners	Timeline
SR-7 Local Implementation of Infill Development	Encourage municipalities to adopt land use policies and regulations, potentially part of the site review process, that prioritize infill over greenfield development.	Infill development maximizes existing transportation system capacity, promotes efficient land use, encourages reinvestment, and improves energy efficiency.	County Planning Departments Municipalities	Near-Term 1-5 Years
SR-8 Hazard Impact Prevention	Prevent hazard impacts on vulnerable transportation assets by relocating, elevating, and limiting access to those assets.	Preventing hazard impact can reduce or eliminate asset damage and service disruption due to hazard events.	New York State Department of Transportation County Departments of Transportation RGRTA	Near-Term 1-5 Years
SR-9 Vulnerable Asset Protection	Protect transportation assets by hardening them to better withstand anticipated hazard impacts.	When hazard prevention methods are unfeasible, strengthened assets can better resist anticipated hazard impacts.	New York State Department of Transportation County Departments of Transportation RGRTA	Medium-Term 6-10 Years
SR-10 Redundancy	Incorporate redundant elements such as duplicate structural members and alternate routes to prevent asset and system failure from hazard impacts.	Redundancy can prevent catastrophic infrastructure and service failures by ensuring that assets and systems have multiple structural and operational backups.	New York State Department of Transportation County Departments of Transportation Municipalities	Medium-Term 6-10 Years
SR-11 Recovery Considerations	Integrate recovery considerations such as traveler information dissemination and alternate route planning into transportation infrastructure and service design.	Recovery considerations minimize the effects of hazard impacts by enabling faster restoration of damaged infrastructure and disrupted services.	New York State Department of Transportation County Departments of Transportation RGRTA	Long-Term 11-25 Years

SUSTAINABILITY AND RESILIENCE

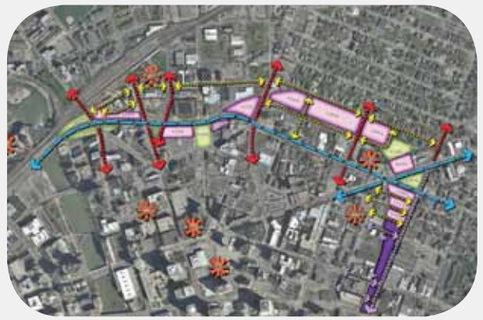
PROJECT SPOTLIGHT

Rochester Inner Loop Transformation

By the beginning of the 21st century, Rochester's Inner Loop had become an underused sunken highway facility that separated neighborhoods and required costly bridge maintenance. Scoping studies determined that removal of the eastern portion of the loop was feasible.

In 2014, the City applied a federal grant to decommission and deconstruct the highway, restore elements of the original street network, and install the City's first protected cycle track along the corridor. The project reclaimed six acres of land that have acted as a catalyst for over $200 million in development investment.

A scoping study evaluating potential transformation of the northern segment, further promoting multimodal connectivity, accessibility, and opportunity, is in progress.



TOP: New Development and Complete Street Facilities on Former Inner Loop Site
Source: Genesee Transportation Council

BOTTOM: Inner Loop North Preliminary Concept
Source: City of Rochester

The project supports the following recommendations:

- HS-1 - Design for All Users
- MM-14 - Strategic Divestment
- SR-3 - Infill Development Supportive Investment
- SR-6 - Local Implementation of Infill Development

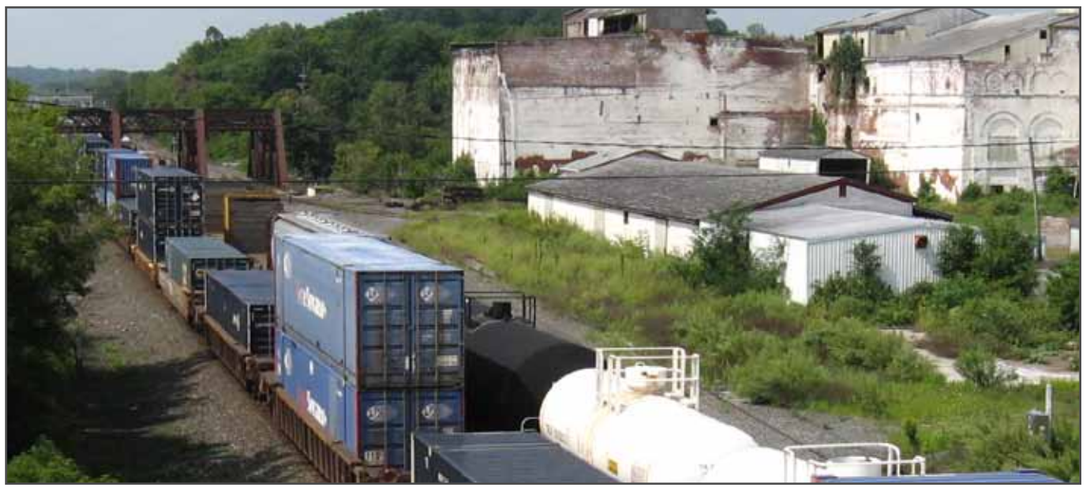
Genesee-Finger Lakes LRTP 2045

ECONOMIC DEVELOPMENT

An efficient multimodal transportation system supports the region's economy and allows users to seamlessly experience all the region has to offer. Our region benefits from low levels of congestion, quick travel times, a well-connected interstate system, and many natural and historic wonders. The transportation system as currently configured is not a barrier to economic development and growth. As we look to the next 25 years, it is essential that the region continues to maintain the existing system in a state of good repair, augments last mile connections, and improves access to destinations.

The COVID-19 pandemic taught the world just how fast the traditional way of doing business can change and evolve. The long-term impacts of the pandemic on everyday life have yet to be realized. The shift to e-commerce had slowly been gaining ground over the last decade, only to take a massive leap due to the reluctance to shop in-person and stay-at-home orders. The future of work remains fluid as telework becomes a viable long-term option. LRTP 2045 acknowledges the uncertainties surrounding the impacts of the pandemic and provides flexibility in our response.

The following recommendations lay out programs and policies that support economic development through the transportation system.



CSX Mainline Class I Railroad in Lyons

	Description	Importance	Partners	Timeline
ED-1 Freight Corridor Reliability	Support reliable travel times across the surface transportation system, especially along interstates and freight corridors, utilizing all available management tools and roadway design elements.	The private sector struggles to consistently estimate the duration of freight trips due to hours-of-service rules and rigid delivery windows. Unforeseen congestion costs time and money.	New York State Department of Transportation County Departments of Transportation Municipalities Railroads	Ongoing
ED-2 Rail Enabled Business	Support rail enabled business through the development of new rail sidings and adopt land use regulations that support industrial uses in proximity to rail facilities and reduce conflicts with residental properties.	Shifting goods shipment to rail reduces emissions, decreases conflicts with truck traffic, and utilizes existing infrastructure. Support of local businesses promotes regional economic growth.	Economic Development Agencies Railroads	Ongoing
ED-3 Rail Infrastructure	Maintain and modernize railroad infrastructure to allow maximum weights at the highest permitted operating speeds. Enable short line railroads to remain competitive.	Short lines provide critical access to Class 1 railroads for local businesses. Railroads need to maintain and modernize their infrastructure to operate efficiently and competitively.	Railroads	Ongoing

RECOMMENDATIONS

ECONOMIC DEVELOPMENT

	Description	Importance	Partners	Timeline
ED-4 Rights-of-Way	Preserve existing linear rights-of-way by following the preservation strategies identified in the 2015 *Regional Rights-of-Way Study*. Coordinate with land owners to maintain potential future access.	Existing right-of-way offers options for future transportation needs that may not be currently realized. Procuring new right-of-way is difficult. Once right-of-way is disassembled, it is often impossible to restore.	Utilities Municipalities	Ongoing
ED-5 Last Mile Access	Improve the ability of freight to move from expressways to local freight-related facilities via local roads and intersections, known as last mile access, and typically the most complicated move of a freight trip.	Freight facilities often lack properly designed ingress/egress points. Long queues may develop, including through incompatible residential areas, if operational needs are not properly planned.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years
ED-6 e-Commerce Support	Ensure that last mile e-commerce deliveries can continue to be made safely and timely. Reconsider traditional commercial land use policy as brick-and-mortar retail demand evolves. Plan for future implications of autonomous delivery methods.	E-commerce's market share continues to grow, signaling a shift away from traditional retail. An evolving transportation system that meets the needs of a changing economy creates a regional competitive advantage.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years

PROJECT SPOTLIGHT

Freight Corridor Development Plan

The 2017 Ontario County Freight Corridor Development Plan examined the opportunities for development of rail-oriented, freight businesses along the railroad corridor within the Town of Manchester and Farmington, and the Villages of Manchester, Shortsville, and Clifton Springs.

In 2019, Leonard's Express converted the former Great Lakes Kraut facility to a warehousing space. Interest continues in the redevelopment of the historic Lehigh Valley Railroad Roundhouse. A buildings assessment is underway to determine redevelopment viability while the Environmental Protection Agency has documented contamination and needed mitigation measures.

The project supports the following recommendations:

- ED-2 - Rail Enabled Business
- ED-3 - Rail Infrastructure
- ED-9 - Regional Destination Promotion

TOP: Potential Manchester Yard Redevelopment Plan
Source: Ontario County Railway Corridor Development Plan

BOTTOM: Lehigh Valley Railroad Roundhouse - Manchester
Source: Genesee Transportation Council

RECOMMENDATIONS

ECONOMIC DEVELOPMENT

	Description	Importance	Partners	Timeline
ED-7 Curbside Management Policy	Ensure that delivery vehicles have adequate curbside accommodations for commercial deliveries in urban areas. Likewise accommodate the safe operation of transit, shared mobility, and private transportation services in these areas.	Curbside access is valuable along denser corridors found in city and village centers. Municipalities that actively manage use of this space are best able to capture that value while realizing their access priorities.	Municipalities Shared Mobility Providers Private Transportation Providers	Near-Term 1-5 Years
ED-8 Interregional Travel Facilities	Support and maintain current interregional travel options. Promote projects that enhance the traveler's experience within station facilities.	Travel by air, rail, and bus provides critical connections to economic and social opportunities outside of the region. The quality of station facilities has a direct impact on intercity travel mode choice.	Intercity Bus Providers Amtrak Greater Rochester International Airport County Departments of Transportation	Near-Term 1-5 Years
ED-9 Regional Destination Promotion	Portray the transportation system as a distinguishing feature in providing access to events, natural attractions, historically significant places, and nationally acclaimed multi-use trails.	Affordable and easy access to an efficient transportation system increases the attractiveness of regional assets as destinations to visit, generating economic activity.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years
ED-10 Rural Mobility Option Expansion	Increase active transportation and multimodal connections to destinations in rural communities, especially where personal vehicles are the dominant mode.	Increasing multimodal options provides additional access to rural residents without vehicle access. This can further support rural economies that may be dependent on tourism.	New York State Department of Transportation County Departments of Transportation Municipalities	Near-Term 1-5 Years
ED-11 Wayfinding Systems	Study, design, and implement physical and technology-based wayfinding systems in downtowns, in neighborhoods, and along historic districts and routes throughout the region.	Wayfinding systems establish a coherent sense of place and allows users of a space to easily navigate to and from destinations which promotes feelings of comfort, safety, and security.	Business Associations Economic Development Agencies Municipalities	Near-Term 1-5 Years
ED-12 Parking Management	Revise traditional parking requirements and management techniques given recently observed shifts in travel behavior. Change local land use regulations and codes to reflect changing parking needs among new, infill, and existing development.	The emergence of telework, and other travel behavioral changes, diminishes the dominance of work trips as the primary trip type. A meaningful response will require codified rules that favor more productive land uses over parking facilities.	Land Owners Major Employers Municipalities	Medium-Term 6-10 Years

RECOMMENDATIONS

ECONOMIC DEVELOPMENT

	Description	Importance	Partners	Timeline
ED-13 Shared Parking	Encourage shared parking among new and infill development as well as existing districts. Develop and employ models that aide planning efforts to identify parking demand for sites and districts areas based on land use and time of day.	Shared parking results in more productive land use, allows for increased flexibility in site design, reduces impervious surfaces, and improves stormwater management.	Business Owners Municipalities	Medium-Term 6-10 Years
ED-14 Workforce Development	Support workforce development through educational and training opportunities related to careers in the transportation, freight, logistics, and manfacturing industries.	Employers require a skilled workforce to effectively operate and grow their business. Living-wage jobs lift disadvantaged residents out of poverty and increase community self-sufficiency.	Workforce Development Agencies Economic Development Agencies	Long-Term 11-25 Years

PROJECT SPOTLIGHT

Upstate Revitalization Initiative

The Finger Lakes' Upstate Revitalization Initiative (URI) plan, developed cooperatively through the Finger Lakes Regional Economic Development Council, focuses on economic development in the nine-county Finger Lakes Region. URI priority locations for job growth include three top next-generation manufacturing and technology hubs: Eastman Business Park, the Rochester Downtown Innovation Zone, and the Western New York Science & Technology Advanced Manufacturing Park (STAMP) in Genesee County. Transportation infrastructure investment within and around these sites will continue to support new business development opportunities, job growth, and provide our region with a competitive advantage.

The project supports the following recommendations:

- ED-2 - Rail Enabled Business
- ED-3 - Rail Infrastructure
- ED-5 - Last Mile Access
- ED-14 - Workforce Development

TOP: Eastman Business Park
Source: Finger Lakes Regional EDC

BOTTOM: Potential STAMP Site Buildout
Source: Upstate Revitalization Initiative Plan

RECOMMENDATIONS

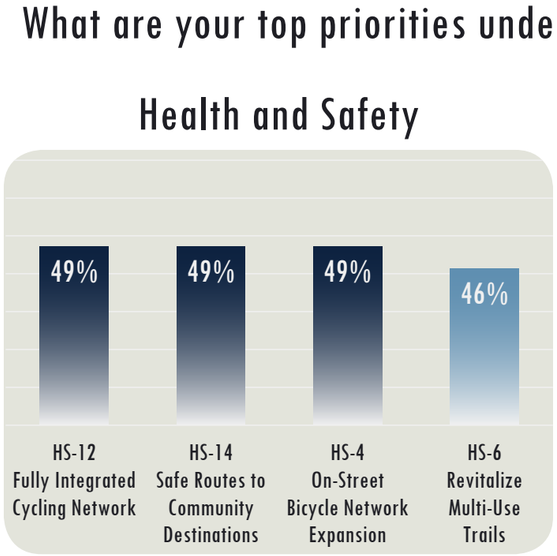
WHAT WE HEARD

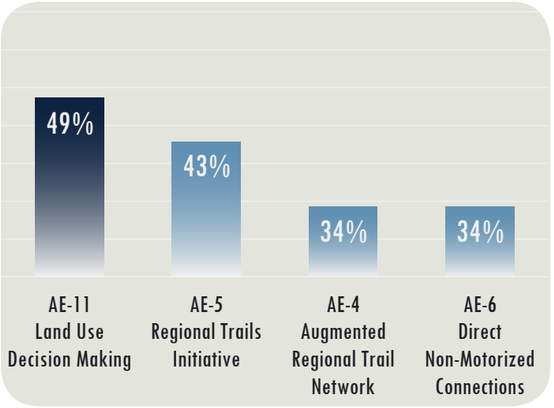
The second round of public engagement for LRTP 2045 remained online due to public health guidance. This time the public was invited to comment for 30 days from mid-February to mid-March on the recommendation section. All recommendations were presented in full and members of the public were requested to indicate up to five priority recommendations in each group. Participants were also able to leave open-ended comments for each recommendation group. A pair of virtual public meetings were held during the comment period to allow individuals an opportunity to interact directly with staff.

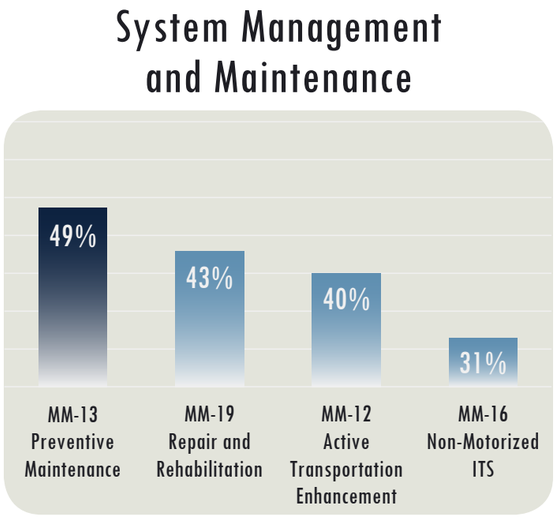
Participants spread their support for individual priorities across the entire list of recommendations. Of the 78, 74 were identified by at least one individual as a priority. The recommendation most identified as a priority was *SR-1 Climate Change and Hazard Impacts*, which was identified by fully three-fifths of all participants. Recommendation *ED-3 Rail Infrastructure* was the most often chosen Economic Development recommendation. Written responses also emphasized a wide variety of topics. Respondents described desires to rehabilitate un- or under-used rights-of-way, ending economic incentives for greenfield development, and vehicle fleet electrification as sustainability and equity issues.

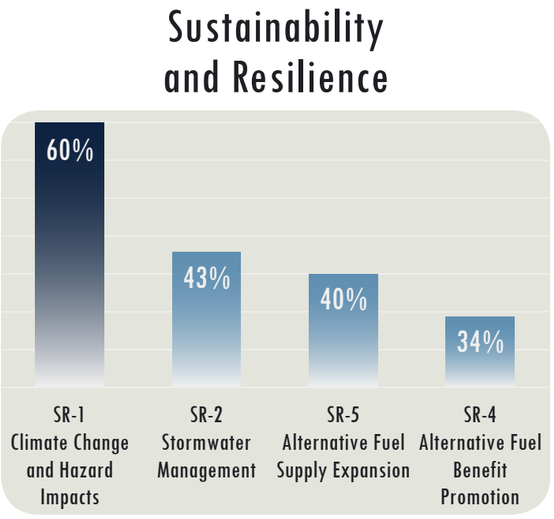
"We need multiple multi-use trail and route options to get to our destinations – similar to the breadth of choice offered in vehicular routes. For many of us, especially with children, riding bicycles next to cars on vehicular streets will never be a safe substitute."

What are your top priorities under each category? Choose up to five.









FINANCIAL PLAN

The financial plan is intended to demonstrate that the priorities of LRTP 2045 can be implemented while assuring fiscal constraint. The Plan will provide for a range of implementation programs and activities by a range of agencies at the Federal, State, and Local levels. The financial plan provides an illustration of how each of the respective levels of government have a role in the provision of funding and implementation of highway, transit, and other modes.

The emphasis of LRTP 2045 is on investments that maintain, rehabilitate, and reconstruct the highways, bridges, transit, and other assets that have been constructed in past decades. The financial plan is directed towards ensuring that the transportation network will continue to support the safe and efficient movement of people and goods. The investment priorities are those that best emphasize the Recommendations of the Plan. Adhering to fiscal constraint ensures that the LRTP can be used as a tool for GTC and its member agencies to strategically establish priorities that match the financial resources expected to be available over the planning horizon. The plan must be fiscally constrained so that the cost of investments does not exceed the reasonably expected amounts projected to be available to the region. The projected revenue table on the following page summarizes forecasted revenue sources and amounts through 2045.

The LRTP *does not* fully provide funding for every need identified but illustrates how available funding can be programmed in the current and future Transportation Improvement Programs. It provides a framework for short-term implementation decisions that align with long-range plans and performance targets. The LRTP intends to strike a balance between the management of existing highway and transit assets while taking advantage of opportunities to retrofit the network to meet the evolving needs of the region. GTC and its partners will continue to maximize the types and amount of funding available while positioning the region to meet the challenges of future changes in transportation revenues.

The LRTP and Financial Plan can be amended by the GTC Board to reflect significant changes to funding that may result from the replacement of the *Fixing America's Surface Transportation* (FAST) *Act* that is due to expire at the end of Federal Fiscal Year 2021 (September 30, 2020).

FINANCIAL PLAN

PROJECTED REVENUE (in millions)

The reasonably expected revenues for implementing the recommendations of LRTP 2045 are based on existing sources and levels of federal, state, and local expenditures for roads, bridges, public transportation vehicles and services, sidewalks, and trails. GTC expects these sources to generate $10.8 billion through 2045.

The projections are based on conservative estimates of growth of existing sources – approximately 1% compound annual growth in total revenues. The projections were based upon past and current federal, state, and local funding levels.

LRTP 2045 does not assume that any project will receive discretionary awards through modal administrations such as FHWA or FTA, the USDOT Office of the Secretary (OST), or Congress. However, to the extent that any projects proposed for discretionary funding are consistent with the LRTP, those projects will be supported by GTC through any MPO actions needed to advance the project.

The GTC Region has been the successful recipient of multiple discretionary awards in the past ten years, including the Inner Loop East and I-390 at I-490 Interchange Improvements. It is anticipated that project sponsors will actively pursue these opportunities in the future for implementation.

SOURCES	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031-2035	2036-2040	2041-2045	TOTAL
Federal	167	137	157	142	147	153	152	155	155	161	850	930	1,019	4,324
Highway	101	105	125	114	117	119	121	124	126	129	683	754	833	3,451
NHPP	49	55	56	57	58	59	60	62	63	64	340	376	415	1,713
STBG Flex	17	20	21	21	22	22	23	23	24	24	127	141	155	640
STBG LG URB	9	9	9	10	10	10	10	10	11	11	57	63	69	288
STBG OSB	5	6	6	6	7	7	7	7	7	7	38	43	47	194
HSIP	16	12	12	12	12	12	13	13	13	13	72	79	87	366
NHFP	-	-	18	5	5	5	5	5	5	5	27	30	33	142
TAP	5	3	3	3	3	3	3	3	3	4	19	21	23	96
CMAQ	-	0	0	0	0	0	0	0	0	0	3	3	3	13
Transit	66												186	873
FTA 5307	59	26	26	24	25	25	25	25	25	25	132	139	147	702
FTA 5339	1	3	3	3	3	3	3	3	3	3	17	19	20	86
FTA 5311	6	2	3	0	3	6	2	3	1	3	17	18	19	85
State	147	150	167	167	169	171	173	175	177	182	897	929	998	4,503
Highway	92	96	113	113	111	113	115	117	119	121	589	603	652	2,956
CHIPS	36	36	36	37	37	38	38	38	39	39	201	211	222	1,009
PAVE-NY	8	8	8	8	8	9	9	9	9	9	46	48	51	230
Marchiselli	4	4	4	4	4	4	5	5	5	5	25	28	31	128
TCI	-	-	12	12	13	13	14	14	14	15	31	-	-	138
H-SDF	15	16	19	18	18	18	19	19	19	20	106	116	129	532
Thruway	29	31	33	33	31	31	32	33	33	34	180	199	220	919
Transit	67	66	79	79	83	84	84	85	85	89	408	399	422	2,029
ATC	7	8	8	9	9	9	9	9	9	10	51	56	62	257
T-SDF	4	3	3	3	3	3	3	3	3	3	16	17	18	83
STOA	44	43	43	43	45	45	45	45	45	48	241	253	265	1,206
Local	64	72	70	73	74	73	74	74	74	76	388	405	423	1,940
Highway	28	37	35	37	36	36	37	37	37	37	191	197	204	949
H-Local	28	37	35	37	36	36	37	37	37	37	191	197	204	949
Transit	36	35	35	35	37	38	37	37	37	39	198	208	219	991
Farebox	17	16	16	16	17	17	17	17	17	17	88	92	97	441
MRT	12	12	12	12	13	13	13	13	13	14	69	72	76	344
T-Local	8	7	7	7	7	8	7	7	7	7	38	40	42	192
CAP RES	1	1	0	0	1	0	0	1	1	0	3	3	3	13

FEDERAL REVENUE SOURCES

Program	Abbrev.	Eligible Activities
National Highway Performance Program	NHPP	Roads and bridges located on the National Highway System.
Surface Transportation Block Group	STBG	Federal-aid highway, pedestrian and bicycle facilities, and transit capital projects. Flex funds can be used anywhere. Off-System Bridge (OSB) program funds can only be used for bridges carrying roads that are off the Federal-Aid system. Large Urban funds can only be used in the Rochester Urbanized Area.
Highway Safety Improvement Program	HSIP	Capital safety improvements.
National Highway Freight Program	NHFP	Roads and bridges on the National Highway Freight Network.
Transportation Alternatives Program	TAP	Bicycle and pedestrian improvements.
Congestion Mitigation and Air Quality Improvement Program	CMAQ	Capital projects and programs that improve air quality.
Urbanized Area Formula	FTA 5307	Capital Funding for rolling stock and facilities in the Rochester Urbanized Area.
Buses and Bus Facilities	FTA 5339	Capital funding to replace buses, related equipment, and construct bus-related facilities.
Rural Area Formula	FTA 5311	Capital and operations in rural areas.

STATE REVENUE SOURCES

Program	Abbrev.	Eligible Activities
Consolidated Local Street and Highway Improvement Program	CHIPS	Apportionments to Counties, Cities, Towns, and Villages for facilities not on the State system.
PAVE-NY	PAVE-NY	Apportionments to Counties, Cities, Towns, and Villages for facilities not on the State system.
Marchiselli Program	Marchiselli	State support for covering the non-federal share of locally sponsored federal aid projects.
Transportation Climate Initiative	TCI	Receipts of interstate greenhouse gas emissions allowances for mitigation projects.
Highway - State Dedicated Fund	H-SDF	Capital and operations on the State system.
Thruway Authority	Thruway	Toll and other revenues supporting capital and operations on the Thruway system.
Accelerated Transit Capital	ATC	Allocation to transit agencies for capital assets.
Transit - State Dedicated Fund	T-SDF	Support for agency sponsored Federal Aid projects.
State Transit Operating Assistance	STOA	Allocation of operations funding to transit agencies.

LOCAL REVENUE SOURCES

Program	Abbrev.	Eligible Activities
Highway - Local	H-Local	Match for Federal Aid projects and Capital Improvement Programs (Rochester/Monroe).
Farebox Revenues and Partnerships	Farebox	Revenue from farebox collection and contract agreements for services.
Mortgage Recording Tax	MRT	Apportionment to transit agencies for capital and operating assistance.
Transit - Local	T-Local	County contributions to RGRTA.
RGRTA Capital Reserve	CAP RES	Capital reserve funding.

IMPLEMENTATION - PROGRAM CATEGORIES

The financial plan divides the projected funds into 18 programmatic categories that implement the Recommendations for Health and Safety, Access and Equity, System Management and Maintenance, Sustainability and Resilience, and Economic Development. These categories encompass the broad range of capital and operations projects that are currently programmed in the Transportation Improvement Program or implemented with local revenues.

The estimates for these categories were derived from both system level plans and projections based upon current expenditures. The amounts of each category are a balance between the need and reasonably available funds. The fiscal constraint of the Financial Plan limits the amount of potential funding that could fully address any one specific category. The categories will be used to inform programming levels of Federal funding programs among the range of various of projects.

The categories also take into account emerging project types that address the evolving needs of the region. Transit electrification, shared mobility, and critical asset resiliency support recommendations that seek to provide more equitable access or mitigate against climate change. These projects have been already begun to be implemented in the region and more sustained investment is included in the financial plan.

Individual projects will be solicited for consideration through the Transportation Improvement Program. Future funding programs, amounts, and years of implementation will be determined through the TIP process. There are no individual regionally significant projects identified in the financial plan. Illustrative Projects are identified and will require separate action at a later date.

PROJECTED PROGRAM EXPENSES ($ millions)

PROGRAM	EXPENSE
NHS Assets - Pavements	724
NHS Assets Bridges	1,176
Thruway Capital	919
Regional Pavements	1,121
Regional Bridges	637
Local Roads and Bridges	1,582
Freight Mobility	158
Critical Asset Resiliency	100
Safety Enhancements	266
Safety Emphasis Areas	160
Systems Management and Operations	130
Active Transportation Expansion	187
Regional Trails Initiative	42
Shared Mobility	54
Transit Rolling Stock	998
Transit Facilities	96
Transit Electrification	100
Transit Services and Operations	2,317
TOTAL	10,767

Category	Description
NHS Assets - Pavements	Preservation and renewal of National Highway System pavement assets per the *NYSDOT Transportation Asset Management Plan*
NHS Assets - Bridges	Preservation and renewal of National Highway System bridge structures per the *NYSDOT Transportation Asset Management Plan*
Thruway Capital	Implementation of the NYS Thruway Authority Capital Plan
Regional Pavements	Preservation and renewal of Federal Aid-eligible roads
Regional Bridges	Preservation and renewal of Federal Aid-eligible bridges
Local Roads and Bridges	Preservation and renew of local roadway and bridge facilities
Freight Mobility	Preservation of assets identified as National Highway Freight Network and other Critical Urban Freight Corridors
Critical Asset Resiliency	Improvements to critical assets to mitigate against hazards per the GTC Critical Transportation Infrastructure Vulnerability Assessment
Safety Enhancements	Site-specific countermeasure implementation to reduce crashes
Safety Emphasis Areas	Systemic safety improvements for pedestrians and others identified through NYS Strategic Highway Safety Plan Emphasis Area programs
Systems Management and Operations	Highway management and support for operations to ensure reliability and safety per the GTC TSMO Strategic Plan
Active Transportation Expansion	Bicycle and pedestrian improvements and expansions where facilities do not currently exist.
Regional Trails Initiative	Enhancement of existing trails and development of new connections as identified in the GTC Regional Trails Initiative
Shared Mobility	Capital and operational support for bicycle sharing and other emerging shared mobility modes
Transit Rolling Stock	Preventive maintenance and replacement of buses serving both urban and rural services per the RGRTA Transit Asset Management Plan
Transit Facilities	Passenger and maintenance facilities included
Transit Electrification	Rolling stock and capital equipment necessary to achieve a NYS goal of a 100% electric fleet at RTS Monroe by 2035
Transit Services and Operations	Operations of RTS Monroe, Ontario, Orleans, Genesee, Wyoming, Livingston, and Wayne fixed-route and paratransit services.

ILLUSTRATIVE PROJECTS

The following projects have not been programmed for improvements at the adoption of LRTP 2045. Illustrative projects may be considered for future programming contingent upon additional resources becoming available. An LRTP amendment would be required to add them to the fiscally-constrained financial plan.

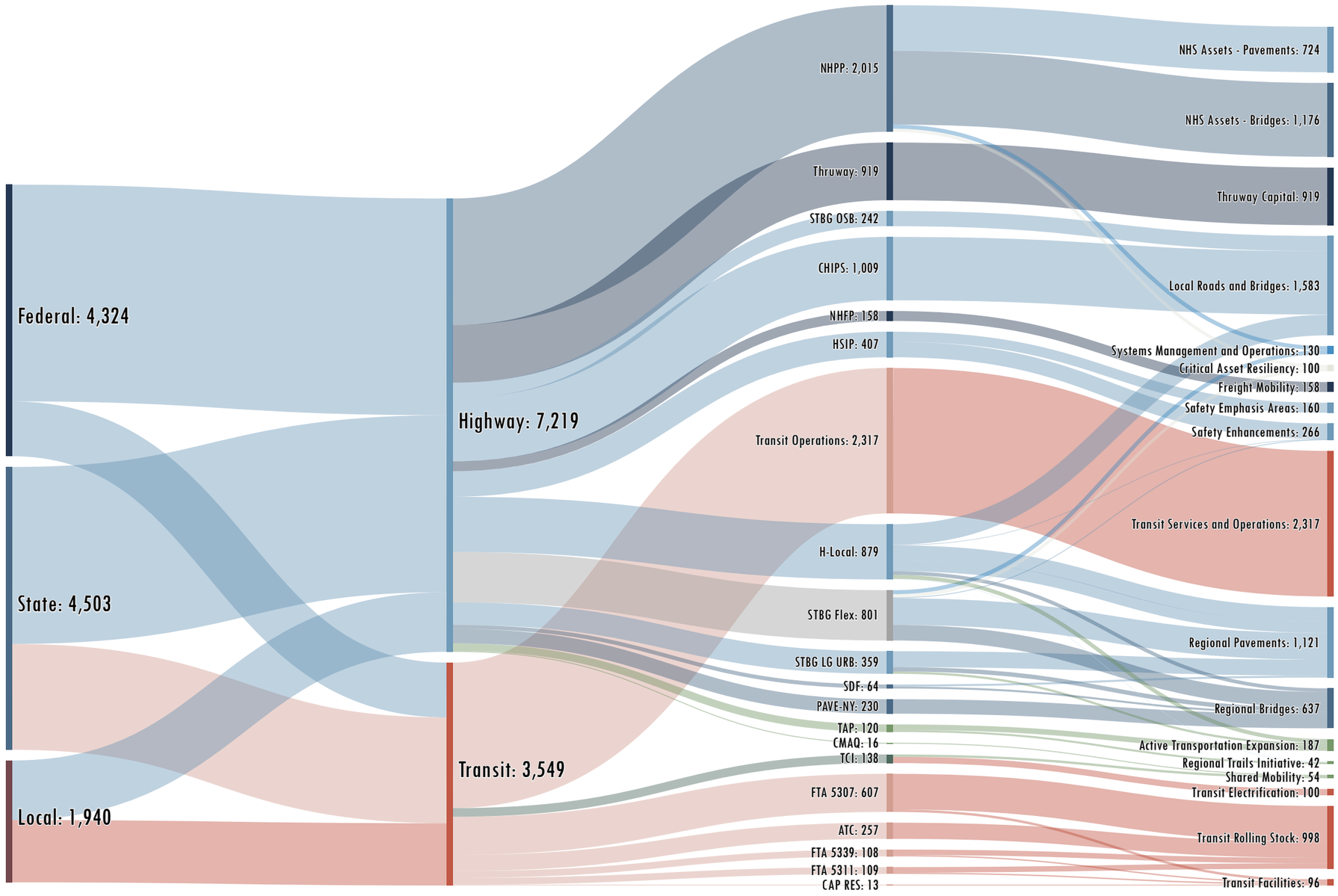
Among regionally significant projects, the Inner Loop North project would result in the implementation of the locally preferred alternative developed by the *Inner Loop North Feasibility Study* from Main Street to I-490 in the City of Rochester. Likewise, the City's large ROC the Riverway initiative envisions currently unfunded bridges across the Genesee River for non-motorized transportation users.

Addditional investments to consider that would be pursued with the help of regional, state, and federal partners include New York State's intention to provide high-speed passenger rail within the Empire Corridor and a statewide network of electric vehicle charging stations through the Charge NY initiative.

REVENUE CHANGES

The Financial Plan is based upon a continued interest by the Federal, State, and Local government in maintaining and enhancing the transportation network. It is expected that there will continue to be an emphasis on the asset management of the National Highway System (NHS) and to enhance safety on all roads. Multi-modal accessibility and reducing greenhouse gas emissions will likely play an increasingly larger role in future legislation within expanded transit and active transportation funding.

FUNDING TO PROGRAM FLOWS



LRTP 2045 recognizes that there will most likely be changes to sources of revenues for transportation at both the Federal and State levels over the planning horizon. The projected fund sources in this Financial Plan are based upon the current programs in the FAST Act. The current authorization reflects a past effort to consolidate the number of programs from previous packages and is likely the basis for a new multi-year package.

The financial plan reasonably expects that both the Federal government and New York State will take actions to pursue revenue streams to continue existing and develop new funding mechanisms. The Federal Highway Trust Fund is assumed to continue to decline with growing fuel efficiency and the projected increase of the share of electric vehicles into the market. However, the overall amount of Federal support for surface transportation is not expected to fall below existing levels. Potential Federal and State revenue sources could include:

- **Vehicle Miles Traveled (VMT) Fees –** Charges to users based upon the number of miles driven. Fees could be adjusted based upon time of day and other travel demand strategies.

- **Greenhouse Gas Markets –** Revenues raised through a Federal-level greenhouse gas emissions auction process, in addition to the regional Transportation and Climate Initiative.

- **General Fund Transfers –** Continue Congressional actions that transfer a portion of the General Fund to supplement the Highway Trust Fund.

A number of potential new revenue sources have been piloted in other cities and regions across the United States. Additional study and coordination among local jurisdictions and regional partners is needed to determine if they are appropriate in this region:

- **User Fees –** Charges to individual users, transportation network companies, and freight transporters that may both maximize revenue generation while supporting effective provision of limited assets.

    - Parking – Variable pricing based upon demand

    - Curb Space – Designated areas that are reserved for goods delivery and transportation networking companies

- **Land Value –** Property taxes and fees that are focused on the financing of specific improvements.

    - Tax Increment Financing – Dedicating a portion of the assessed property tax revenues to finance transportation improvements that drive redevelopment along a corridor or area.

    - Transportation Management Districts – Special assessments related to the improvement and maintenance of roads.

GTC will continue to support the planning and coordination of potential new revenue sources through the UPWP. The Financial Plan may be amended to account for these evolving issues and to account for significant changes brought about by the successor to the FAST Act.

Genesee-Finger Lakes LRTP 2045

EVALUATING PROGRESS

Carefully tracked performance measures indicate how well the transportation system is meeting regional goals and expectations. They are useful in monitoring the achievement of specific saftey, access, maintenance, sustainability, and economic goals, such as minimizing traffic fatalities and serious injuries, serving the largest population possible conventiently via public transit, preserving roadway and bridge facility condition, minimizing energy use and emissions, and ensuring reliability of the freight delivery network. A performance-based planning approach intends to improve project and program delivery, inform decision-making, keep priorities at the forefront, and provide for greater transparency. Decisions are backed by data, facilitating jusification of realistic and achievable transportation investments.

MAP-21 originally established requirements related to performance-based planning to increase accountability and transparency. The 2015 FAST Act continues to support the implementation of mandated performance measures and planning targets. Subsequently, Metropolitan Planning Organizations (MPO) must employ a transportation performance management approach in carrying out their federally-required planning and programming activities. 23 U.S.C. § 134 (B)(i)(1) requires that each MPO establish Performance Targets that address the Performance Measures to use in tracking progress toward attainment of critical outcomes for the region.

On July 13, 2018, a Performance Management Agreement between GTC, the New York State Department of Transportation (NYSDOT), and the Rochester-Genesee Regional Transportation Authority (RGRTA) was executed. Under the federal requirements, RGRTA and NYSDOT are responsible for establishing specific performance targets. As the designated MPO for the region, GTC has exercised the option of adopting the targets set by RGRTA and/or NYSDOT and programming projects towards achieving those targets.

GTC will also continue to document progress against the National Performance Measures in a separate report, incorporated by reference into the Long Range Transportation Plan. The companion *National Performance Measures Report* will allow GTC to continue to nimbly respond to changes in performance targets established by NYSDOT and RGRTA.

TRAFFIC SAFETY

NYSDOT is responsible for establishing targets for federal safety performance measures. The measures chosen for inclusion in LRTP 2045 assess the absolute number of individuals affected by reportable crashes. The measures for the number of fatalities and serious injuries include all system users. The measure for non-motorized system users include only pedestrians and bicyclists.

What constitutes a fatality and/or serious injury is defined by the Model Minimum Uniform Crash Criteria, approved by United States Department of Transportation (USDOT). Fatalities include all deaths which occur within thirty days following a motor vehicle or other crash. Serious injuries include skull fractures, internal injuries, broken or distorted limbs, unconsciousness, severe lacerations, severe burns, and individuals unable to leave the scene without assistance.

Crash totals are provided by the New York State Accident Location Information System (ALIS) database managed by the NYS Department of Motor Vehicles. In 2019, the Genesee-Finger Lakes region witnessed 88 traffic fatalities and 916 serious injuries. Non-motorists represented 120 of those killed or seriously injured in vehicle collisions.

PHYSICAL ACTIVITY

As a comprehensive active transportation network positively contributes to overall public health, quantifiying the number of people utilizing that network provides a glimpse into physical activity levels in the region. Future network expansion and improvements are intended to make walking and biking preferred modes of travel and thus increase the number of indidvuals engaged in physical activity as part of their daily routine.

GTC has already begun an active transportation count program and proposes to record annual recurring bicycle and pedestrian counts at key locations on the regional trail network to measure progress against this performance measure. The recurring count locations and time frames are as follows:

- Genesee Riverway Trail @ Turning Point Park (May)
- El Camino Trail @ Avenue D, Rochester (May)
- Empire State Trail @ Lehigh Valley Trail (May)
- Genesee Valley Greenway @ State Street, Mt. Morris (June)
- Route 390 Multi-Use Trail @ Basil Marella Park, English Road, Greece (August)

In 2020, during the time frames specified, 66,360 walkers and cyclists passed by the locations identified for recurring measurement.

TRANSIT EFFECTIVENESS

Passenger trips per revenue vehicle mile is a standard transit productivity metric that all transit operators must report annually to the Federal Transit Administration. This measure helps to understand system-wide ridership as a function of resources expended; in service route miles in this instance. In 2019, RTS Monroe reported providing 2.8 passenger trips per mile on their fixed-route bus service, down from 2.9 in 2018 and 3.0 in 2017.

The 2020-2023 RGRTA Comprehensive Strategic Plan defines on-time performance as the percentage of total time points encountered by a transit bus inside the parameters of two minutes early to five minutes late. The metric functions as an indicator of reliability of transit as a viable and consistent transportation option. The transit on-time performance as reported by RGRTA for the RTS Monroe system for the 2019 fiscal year is 92.3 percent. This figure exceeds the service standard goal for fiscal year 2020 of 88 percent listed in the Comprehensive Plan.

BICYCLE FACILITY INVENTORY

The number of miles of multi-use trails and on-street or street-adjacent bicycle facilities measure the magnitude of the regional non-motorized transportation network. As recently as November 2011, the region had no on-street dedicated bicycle lanes. The inventory has since grown to include 82.7 lane miles as of the summer of 2020. Additionally the regional trail network grew to include 279 miles of dedicated non-motorized right-of-way.

Despite this growth, gaps do remain in the network, identified by the *Regional Trails Initiative* and various cycling master plans. These gaps present challenges to more complete regional access for cyclists. Increased expansion of the dedicated cycling network as described in previous planning is a desired system performance outcome directly related to the Health and Safety, as well as Access and Equity, recommendation groups.

CONNECTIVITY

Connectivity refers to the directness of links and the density of connections in a path or road network. A well-connected network has many links, numerous intersections, and minimal dead ends or culs-de-sac. As connectivity increases, route and mode options increase, allowing more direct and convenient travel between destinations, and creating a more accessible system that is more resilient to volume pressures.

The most appropriate connectivity measure for the Metropolitan Planning Area (MPA) has proven to be the Connected Node Ratio (CNR) because it does not show bias against less dense portions of the MPA. Nodes are defined as the endpoint of a link. A Real Node is a node that connects to other links; an intersection. A dangle node is an endpoint with no other connections. CNR is calculated by dividing the number of Real Nodes by the sum of Real and Dangle Nodes. The maximum CNR value is 1.0. Higher numbers indicate fewer dead ends and a higher level of connectivity.

CNR was calculated for all non-limited access roadways and multi use trails within the MPA using the New York State GIS Clearinghouse's Streets layer and trail data collected and validated by GTC staff. As the MPA features 21,503 three-way intersections, 3,575 four-way or greater intersections, 290 trail crossings or access points, and 6,860 unconnected links, the CNR in 2020 was 0.79. This number can be increased through a focus on connecting gaps in the regional transportation system with any new infrastructure construction rather than projects to increase isolated through-capacity.

TRAVEL TIME AND DELAY

Minimizing travel time delay and encouraging reliable travel times are key considerations for managing the regional transportation system. Reducing delay saves travel costs, such as time and fuel, while reliable travel times improve safety and facilitate trip planning.

Travel Time Index (TTI) is a ratio between

free-flow speeds and measured speeds that measures relative travel time delay. A TTI value of 1.3 indicates that a trip that takes 10 minutes to complete at free flow speed took 13 minutes to complete when the TTI was measured. Likewise, a TTI value of 1 indicates that traffic was moving at free-flow speed at the time of the measurement.

Using data generated by INRIX for April and October in 2018 and 2019, the TTI was calculated for all roads throughout the region, including state, county, and local roads, where vehicle probe-based travel time data was available. The average TTI for major roadways in the region was 1.03, indicating that travel times on these corridors were generally reliable and not significantly impacted by delay.

TRANSIT FLEET ASSET MANAGEMENT

All transit providers that are recipients or subrecipients of Federal financial assistance under 49 U.S.C. Chapter 53 and own, operate, or manage transit capital assets used in the provision of public transportation are required to develop Transit Asset Management (TAM) Plans to achieve and maintain a State of Good Repair. RGRTA, the Tier I transit provider for this region, establishes performance targets.

The transit asset management performance measures assess the condition in which a transit capital asset is able to operate at a full level of performance. For age-based assets, the metric quantifies the percentage of assets per class that exceed the RGRTA-defined useful life benchmarks. RGRTA has opted to adjust the industry standard Expected Useful Life crietria to reflect the anticipated useful life of assets based on operational experience. These benchmarks list a 12-year useful life for 40 foot and 60 foot transit buses and a 5-year useful life for paratransit vehicles. RGRTA has established targets that no more than 15% of revenue vehicles within a class should exceed the useful life benchmarks. The 2019 report to the National Transit Database shows that 11% of vehicles serving the urbanized area exceed their useful life benchmarks.

Category	Quantity	Exceed ULB	Percent
RTS 40-ft	190	16	8%
RTS 60-ft	30	0	0%
RTS Access	53	15	28%
Total	273	31	11%

BRIDGE AND PAVEMENT CONDITION

Pavement condition determines the daily trip quality of regional residents more so than any other performance measure as it represents the physical integrity of the surface of the roadway. Poor pavement condition accelerates wear and tear on vehicles, increasing maintenance and operating costs, and frustrating drivers who must avoid hazards created by crumbling roadways.

The percent of federal-aid highways with pavement condition rated fair or better is calculated from a dataset collected by NYSDOT and GTC, which includes the vast majority of roadways in the region that are eligible for federal funding. Pavement condition is rated "fair" or better for 95.97 percent of measured federal-aid roadways as of 2019.

Ensuring the structural integrity of bridges is absolutely vital to safety and connectivity.

According to the Federal Highway Administration, bridge condition is calculated using the lowest rating of National Bridge Inventory condition ratings. Inspectors evaluate the condition of a bridge's deck, superstructure, substructure, and culvert on a scale of one to seven. In 2019, 90.09 percent of regional bridges were rated 5 or higher, corresponding to "fair" or "good" condition.

ENERGY USE AND EMISSIONS

Further reduction of the transportation system's dependence on fossil fuel as the main source of energy will lead to better air quality for all and mitigate the impacts of climate change. Environmental performance measures were first reported ten years ago with the adoption of LRTP 2035. Methods used to calculate environmental impacts have evolved since 2011. For LRTP 2045 greenhouse gas emissions along with on-road direct energy usage were calculated for the Metropolitan Planning Area (MPA) using the latest EPA Motor Vehicle Emission Simulator (MOVES3).

Using 2017 data provided by NYSDOT related to vehicle type, age distribution, fuel formulation, and other factors, on-road direct energy usage was calculated at 137,785 million Btu per day. This usage corresponds to 10,557 metric tons per day of carbon dioxide equivalent emissions calculated by quantifying carbon dioxide, nitrous oxide, and methane emissions and adjusting by the corresponding global warming potential factor of each contributing pollutant.

ALTERNATIVE FUEL ADOPTION

Expanding the availability and use of alternate fuels is a key strategy for reducing emissions and improving air quality throughout the region. To facilitate expanded use of electric vehicles, public and private charging stations have been installed throughout the region. At the end of 2020, NYSERDA records indicate that the region boasts 230 public and private charging stations, containing 520 individual outlets. The majority of these stations are publicly accessible, but some are limited to private access for fleet operations.

Based on DMV records, approximately 6,000 battery and plug-in hybrid electric vehicles have been registered in the region between 2012 and 2020. This number is expected to increase as the availability and popularity of electric vehicles increases during the time frame of this plan. As with the availability of charging stations, the registered electric vehicle count will be a key metric to track progress in meeting regional sustainability goals.

FREIGHT RELIABILITY AND DELAY

As previously stated, pavement condition is the top determinant of trip quality. Poor pavement conditions result in accelerated deterioration of equipment. Greater required maintenance increases operating costs for freight carriers. Pavement condition was rated "fair" or better for 88.74 percent of the regional freight network in 2019.

Efficient goods movement also depends on reliable travel times. Using travel time data generated by INRIX for April and October in 2018 and 2019, the TTI was calculated for the Regional Freight Corridors as defined on Page 40 as roadway segments where truck ADT according to the New York State Roadway Inventory System exceeds 400. The average TTI for these corridors was 1.02, indicating that travel times on these corridors are reliable and not significantly impacted by delay.

EVALUATING PROGRESS

LRTP 2045 PERFORMANCE MEASURES

The performance framework summarized below will help GTC monitor progress toward addressing the needs and implementating the recommendations described in LRTP 2045. The table lists a benchmark for each performance measure along with a target direction that indicates improvement, or the maintenance of an already well-performing metric, consistent with the GTC Goals and Objectives.

Group	Metric	Benchmark	Target
Health and Safety	Number of traffic fatalities	88 (2019)	↓
	Number of serious injuries resulting from vehicle collisions	916 (2019)	↓
	Number of fatalities and serious injuries: Non-motorized transportation system users	120 (2019)	↓
	Monthly bicycle and pedestrian volumes at key locations on the regional trail network	66,360 (2020)	↑
Access and Equity	Passenger trips per revenue vehicle mile (RTS-Monroe)	2.8 (2019)	↑
	Transit on-time performance percentage (RTS-Monroe)	92.3 (2019)	↔
	Miles of multi-use trails and marked on-street bicycle facilities	279, 82.7 (2020)	↑
	Connected Node Ratio of the non-limited access network	0.79 (2020)	↑
System Management and Mainenance	Travel Time Index (INRIX) on major roadways	1.03 (2019)	↔
	Percent of federal-aid roadways with pavement condition rated "Fair" or better	96 (2019)	↔
	Percent of regional bridges with condition rated "Good" or "Fair"	90 (2019)	↔
	Percent of revenue transit vehicles that have met or exceeded useful life benchmarks	11 (2019)	↔
Sustainability and Resilience	Millions of Btu per day directly used by on-road transportation in the Metropolitan Planning Area	137,785 (2017)	↓
	Metric tons per day of Carbon Dioxide Equivalent emissions in the Metropolitan Planning Area	10,557 (2017)	↓
	Number of electric vehicle charging stations and registered electric vehicles	230, 6000 (2020)	↑
Economic Development	Travel Time Index (INRIX) on the regional freight network	1.02 (2019)	↔
	Percent of the regional freight network with pavement condition rated "Fair" or better	88.74 (2019)	↑

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