

**GENESEE TRANSPORTATION COUNCIL**



**Long Range Transportation Plan for the Genesee-Finger Lakes Region 2035**

## Chapter III - THE REGION

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## The Region

Located in western-central New York State, the nearly 4,700 square-mile Genesee-Finger Lakes Region stretches south from the shores of Lake Ontario to the low rolling hills of the Appalachian Highlands. Many striking natural features and scenic vistas lie within the Genesee-Finger Lakes Region including the western Finger Lakes, the Genesee River, and Letchworth State Park, commonly known as the "Grand Canyon of the East."

Founded in 1803 and incorporated in 1834, Rochester is New York State's third largest city (2000 population: 219,773) and the internationally recognized corporate and cultural center of the nine-county region that includes the counties of Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, and Yates. Home to approximately 1.2 million residents and over one-half million workers, the region's population and employment exceed that of eight of the fifty states in the nation.

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

The Erie Canal eventually gave way to railroads and then highways as the primary modes of travel, but it remains an excellent example of how transportation influences the character and development of a region. Regardless of the form it takes in

the future, the ability of people and freight to move safely, efficiently, and reliably will continue to be a major factor in determining the quality of life and economic success of the region.

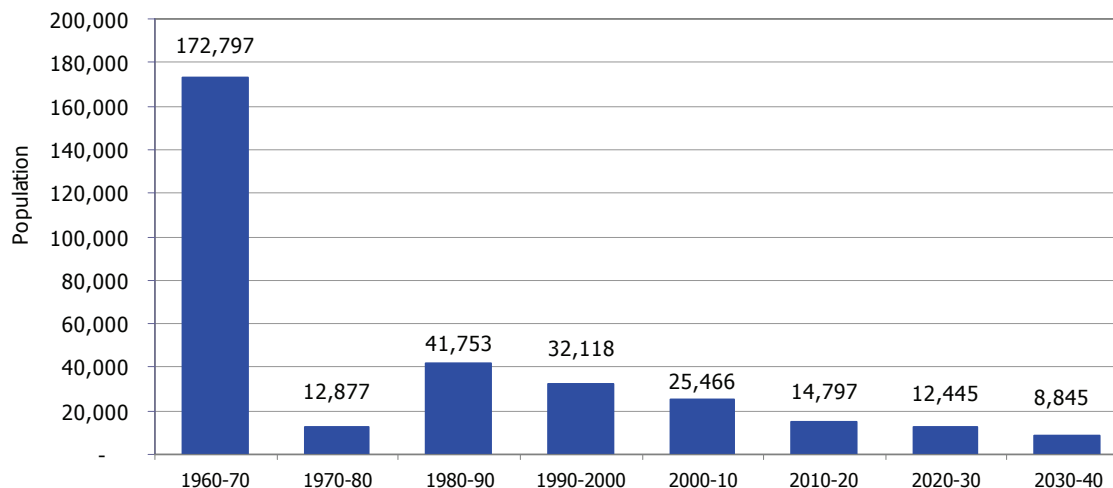
## People

The decennial censuses of population and housing that have been conducted since 1790 provide the most accurate and detailed demographic information available for planning purposes. The results of the 2010 Census were not available during the development of the *LRTP 2035*. Data from Census 2000 combined with estimates of the current population and projections of the future population were utilized.

Population growth in the region has been modest since 1970, after experiencing a nearly 20 percent increase in residents in the ten years before (1960 to 1970). According to Census 2000, the population of the Genesee-Finger Lakes Region was 1,199,588 persons. It is estimated that the region gained ap-

Exhibit 3

Population Change in the Genesee-Finger Lakes Region, 1960-2040



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

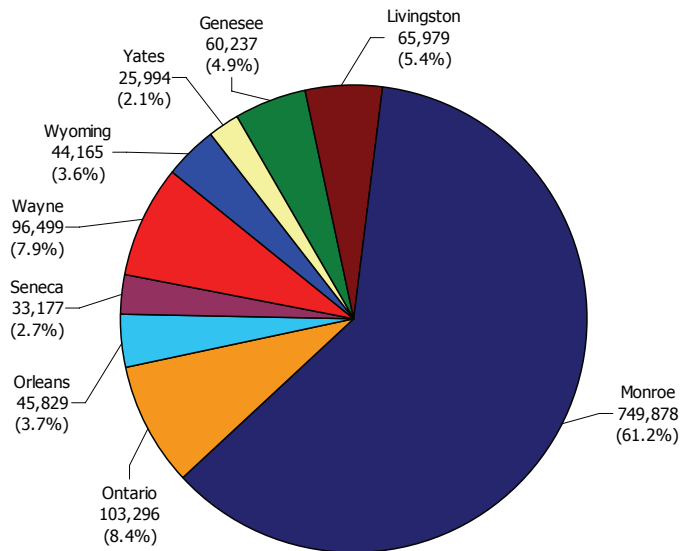


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proximately 25,500 residents through 2010, representing a 2.1 percent increase in the population. It is projected that an additional nearly 32,000 people will call the region home between 2010 and 2035. Exhibit 3 presents the change in population in ten year increments from 1960 through 2040. In short, it is anticipated that the population of the region will continue to grow but at a slower rate with a projected population in 2035 of 1.26 million people.

The distribution of the regional population among the nine counties of the region is expected to remain nearly constant from the present through 2035. This is not surprising given the limited increase in population that the region is expected to experience over the next nearly 25 years. Approximately six out of 10 people will reside in Monroe County with the remainder of the population nearly equally split between the Wayne-Finger Lakes sub-region (Ontario, Seneca, Wayne, and Yates counties) to the east

**Population in the Genesee-Finger Lakes Region by County, 2010**

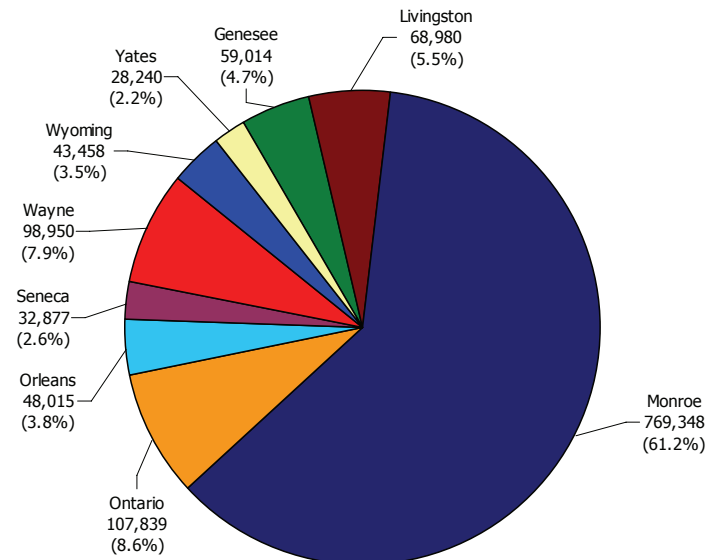


Source: Genesee/Finger Lakes Regional Planning Council

and the GLOW sub-region (Genesee, Livingston, Orleans, and Wyoming counties) to the west and south. The distributions of regional population by county in 2010 and 2035 are presented in Exhibit 4.

While the distribution of the population within the counties is expected to be nearly the same in 2035, the distribution of population among age cohorts is anticipated to be far different than it is today. The first of the Baby Boomers have begun to turn 65. Increases in life expectancy and the size of this generation will have significant impacts on the nation, New York State, and the Genesee-Finger Lakes Region for the entirety of the time period covered by the *L RTP 2035*. As shown in Exhibit 5, it is projected that the senior population (65 years and older) will increase more than 40 percent while the number of persons 14 years and younger and the working age cohort (15 to 64 years) will decrease approximately 10 percent and 15 percent, respectively, between 2010 and 2035. A related issue that has and

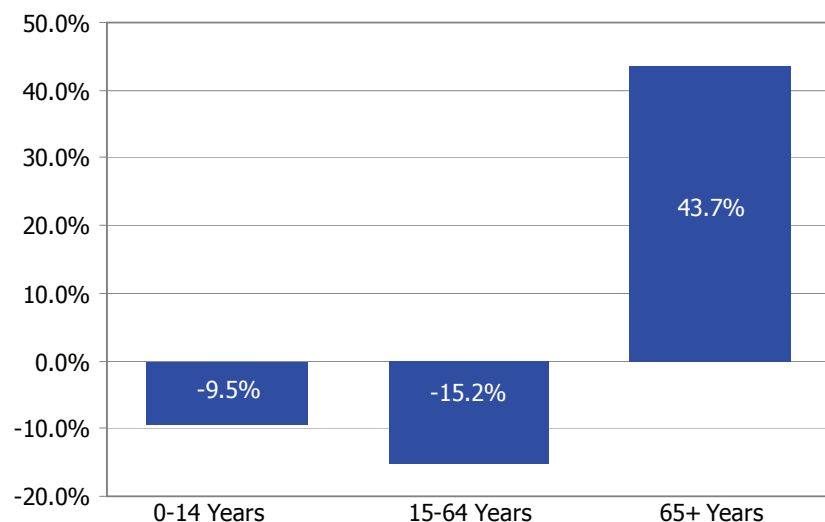
**Population in the Genesee-Finger Lakes Region by County, 2035**



Source: Genesee/Finger Lakes Regional Planning Council



**Exhibit 5** Percent Change in Population of the Genesee-Finger Lakes Region by Age Cohort, 2010-2035



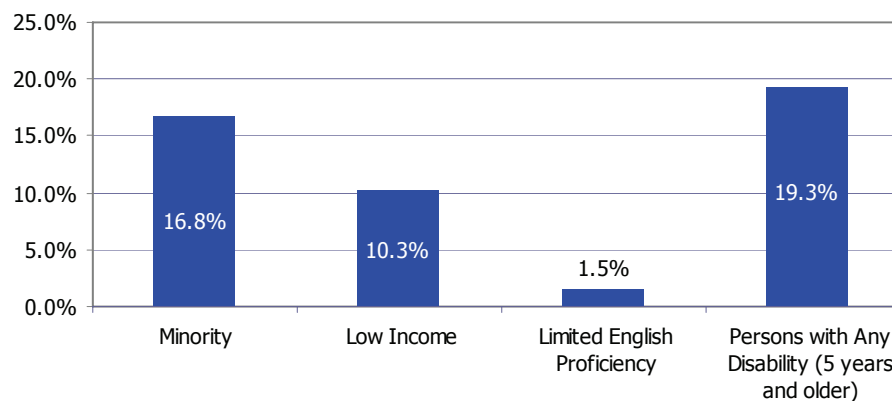
Source: Cornell University Program on Applied Demographics

continues to capture the attention of the public and media is the so-called “brain drain”. Research by the Federal Reserve Bank of New York and others locally has demonstrated that the real issue is not the out-migration of younger residents but rather a lack of in-migration of this cohort. Regardless, the emphasis should be as much on “brain gain” (i.e., attracting younger residents) as retaining those that are leaving as the rate of younger workers leaving is consistent with that seen among other regions at the state and national level.

While the senior population requires special attention with respect to transportation, so do those groups of persons traditionally underrepresented in the transportation planning process. Specifically, minorities (i.e., non-whites and those of Hispanic origin), individuals with low-incomes, lim-

ited English proficiency, disabilities face transportation challenges that include, but are not limited to, access to employment and needed services, inability to obtain or understand pertinent information about opportunities to participate in the planning process, and a lack of required accommodations. The presence of these groups relative to the overall regional population is presented in Exhibit 6. The *GTC Environmental Justice, Title VI, and Americans with Disabilities Act Involvement Plan* was adopted in December 2010. This plan identifies these groups by location within the region and discusses the actions that GTC is undertaking to ensure their increased involvement in the metropolitan transportation planning process.

**Exhibit 6** Groups Traditionally Under-Represented in the Transportation Planning Process by Percent of Total Population in the Genesee-Finger Lakes Region, 2000



Source: U.S. Census Bureau



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## Businesses

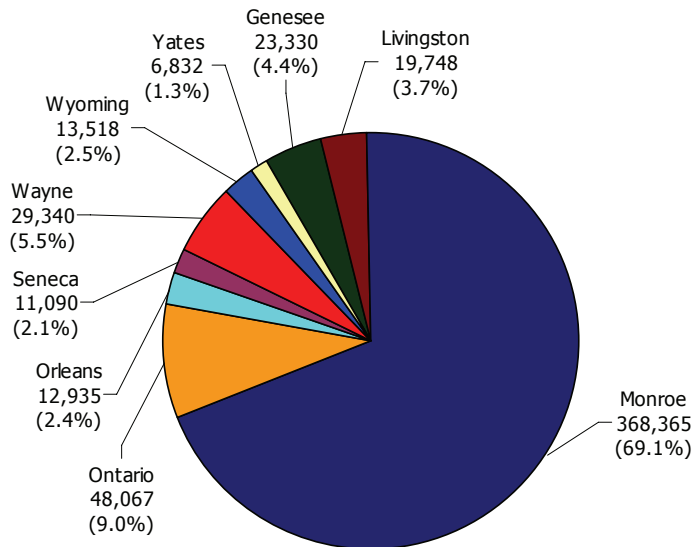
Nearly 30,000 establishments employing more than 530,000 workers – 85 percent of whom are employed by the private sector – are located in the Genesee-Finger Lakes Region. In 2009, seventy percent of jobs in the region were located in Monroe County. As with population, the distribution of employment within the nine counties of the region is expected to remain nearly constant through 2035. Employment in the region over the next nearly 25 years is expected to increase at a rate consistent with the projected rise in the population and the greater numbers of seniors – both of which determine the number of potential candidates to fill new positions. The distributions of regional employment by county in 2009 and 2035 are shown in Exhibit 7.

In terms of value, the Gross Domestic Product of the Rochester Metropolitan Area (Livingston, Monroe, Ontario, Orleans, and Wayne counties) was the 54<sup>th</sup> largest of the nearly 370 metropolitan areas in the United States in 2009 at more than \$45 billion, demonstrating that the regional economy is an important contributor to the national economy.

Overall, employment in the region declined five percent (slightly less than 30,000 jobs) between 2000 and 2009. During this period, more than 40,000 jobs were lost in the manufacturing sector with an additional loss of nearly 11,000 jobs in the retail trade, information, professional and technical services, and administrative and waste services sectors. Nearly two-thirds of the new jobs created in the region have been in the health care, social assistance and educational services sectors, accounting

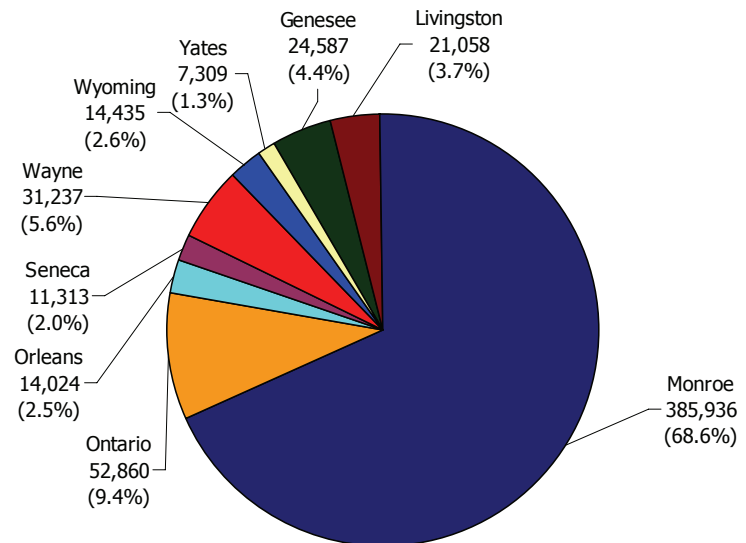
Exhibit 7

Employment in the Genesee-Finger Lakes Region by County, 2009



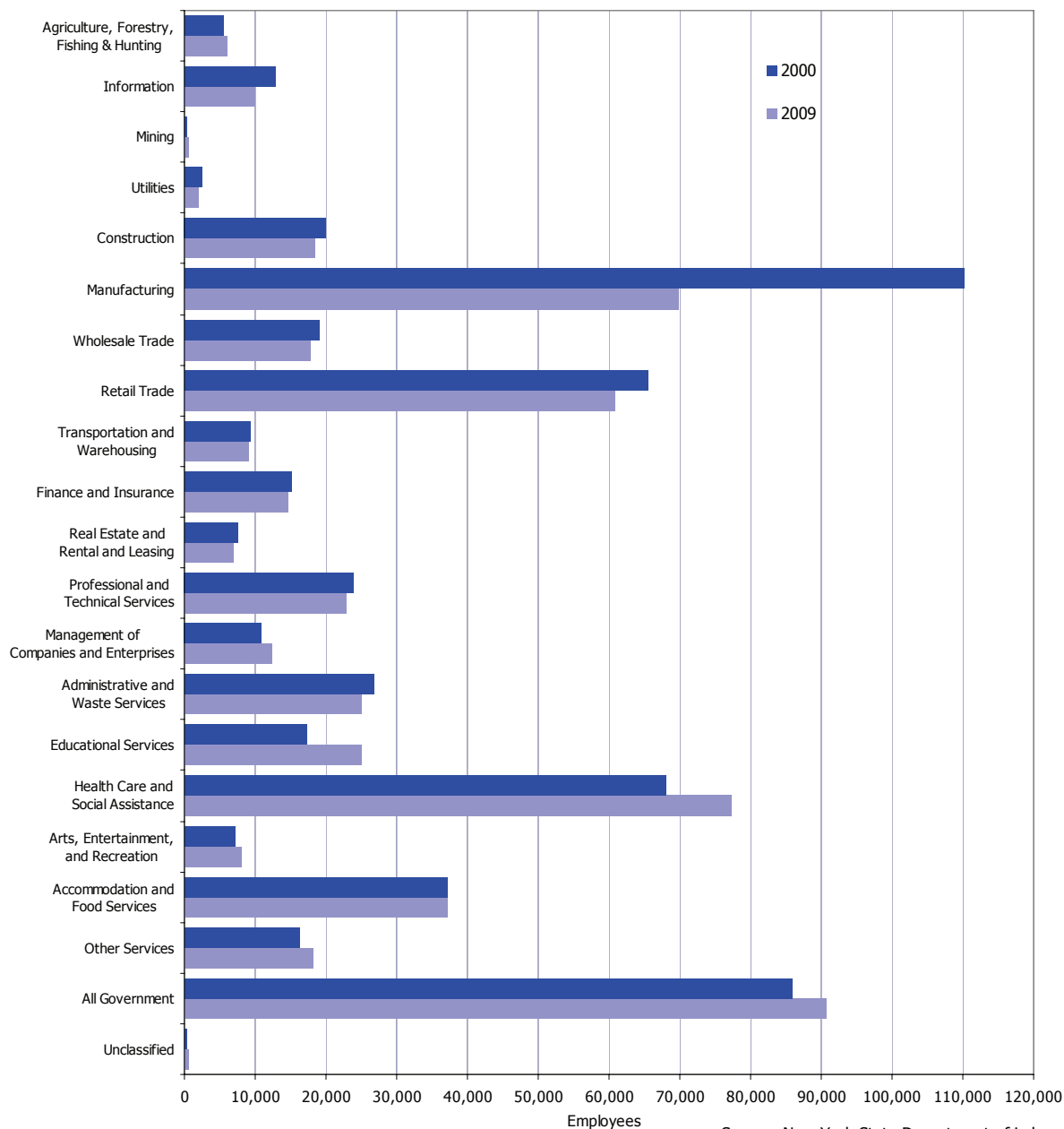
Source: New York State Department of Labor

Employment in the Genesee-Finger Lakes Region by County, 2035



Source: Genesee Transportation Council

Exhibit 8 Employment by Sector in the Genesee-Finger Lakes Region, 2000 & 2009



Source: New York State Department of Labor

for more than 17,000 of the approximately 26,000 new positions added from 2000 to 2009. Exhibit 8 presents regional employment by sector in 2000 and 2009.

Even as manufacturers continue to shed jobs and transition to higher value-added activities to compete in the global marketplace, they remain a major component of the regional economy. As shown in Exhibit 9, the percentage of jobs in manufacturing in the Genesee-Finger Lakes Region exceeds that of the other four largest metropolitan areas in Upstate New York, as well as New York State as a whole. Due to increases in productivity, the volume of goods produced (both finished products and intermediate inputs) in the region is expected to continue to grow.

Not all manufacturing firms will continue to reduce the number of workers they employ. Emerging and established high-value components of the region's manufacturing sector that have the greatest potential for job creation include optics and imaging, alternative energy and fuels, biotechnology, printing and publication, food and beverage manufacturing, telecommunications, and precision instruments. Growth in biotechnology and food and beverage manufacturing thrive upon the region's



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skilled workforce and plentiful natural resources, such as agriculture and access to fresh water.

Agriculture and related agri-business are also important components of the regional economy that require transport of products to market and processing facilities. In 2007, half of the land in the region was dedicated farmland, the highest percentage of any region in New York State. The market value (adjusted for inflation) of agricultural products sold by farms in the region increased 50 percent between 1997 and 2007. In 2007, five of the nine counties in the region ranked within the top 10 in New York State in market value of agricultural products sold. Four counties in the region ranked in the top 100 nationwide in market value of milk and other dairy products from cows and three counties ranked in the top 100 in the country for market value of fruit and vegetable crop products sold in 2007.

With over 80,000 full- and part-time students, the more than 20 two- and four-year colleges and universities in the region are essential to training the future workforce, upgrading the skills of employees and those seeking work, and acting as an economic catalyst by employing over 6,000 persons. Furthermore, these institutions play a vital role alongside local industry in creating an environment of innovation that is one of the highest in the nation as measured by the number of patents issued per worker. The prominence of colleges and universities continues to grow and is vital to the current and future economic success of the region.

The region's higher education institutions continue to increase their important role in workforce development through the development of degree programs – at both the undergraduate and graduate levels – in established and emerging industries. Over half of all degrees in optics and imaging are conferred by the University of Rochester. In addition, the region's colleges and

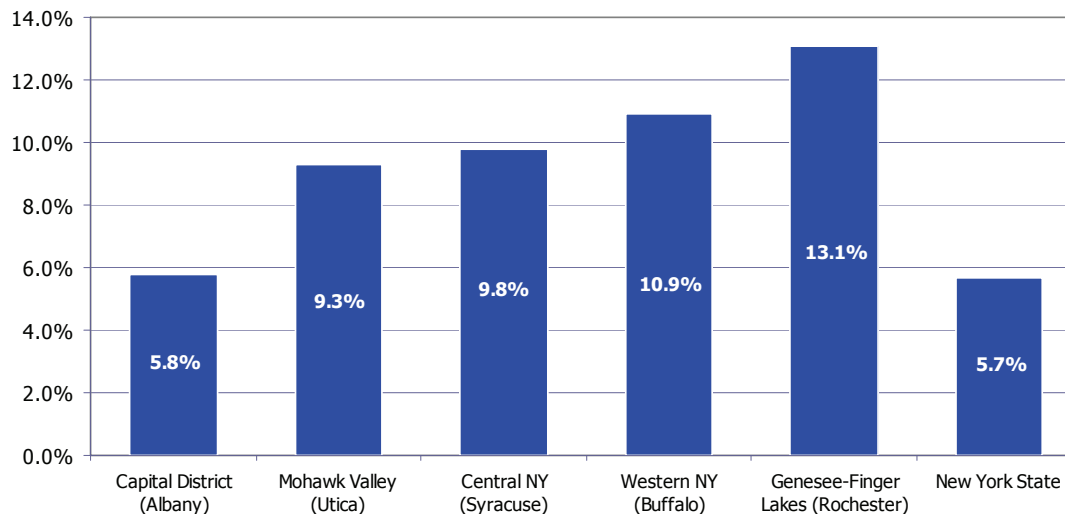
universities continue to expand their role in overall economic development, contributing approximately \$4 billion to the regional economy. Additions and renovations to campuses and at other affiliated locations that are currently underway or expected to begin over the next three years at the region's universities, colleges, and community colleges total more than \$350 million in development.

## Recreational and Cultural Resources

The Genesee-Finger Lakes Region is defined not only by its residents and businesses but by its history, scenic beauty, and recreational venues – providing opportunities to not only live and work but also play. The normal daily mean temperature in

Exhibit 9

**Percent of Total Employment in Manufacturing in the Largest Upstate New York Regions and New York State, 2009**



Source: New York State Department of Labor

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Rochester varies from 24 degrees Fahrenheit in January to 71 degrees Fahrenheit in July, providing recreational opportunities that range from downhill skiing during the winter to water sports and fishing in the summer. The region's parks and historical sites offer year-round opportunities to enjoy a range of outdoor activities and enriching experiences.

The Erie Canal, so influential to the development of the region, continues to serve as a major attraction for residents and tourists. The western Finger Lakes are also located in the region and offer multiple recreational opportunities, as does the Cayuga-Seneca Canal. Water-based recreational activities offer opportunities for increased visitor spending and have the potential to be expanded through increased access and promotion.

The top 15 arts and cultural attractions in the Genesee-Finger Lakes Region attracted 3.8 million attendees in 2007, a 27 percent increase from 2001. These venues are also a significant component of the region economy. Visitor spending in 2008 accounted for approximately \$1.3 billion, with \$936 million spent in Monroe County alone. The majority of tourists came from other areas in New York State, Pennsylvania, New Jersey, Canada, and Ohio. Canadian tourists comprise the majority of international travelers to the region.

The region's cultural center is the City of Rochester, which plays host to museums of science and art, theatrical productions, the National Museum of Play at the Strong, Rochester Philharmonic Orchestra, the George Eastman House and its International Museum of Photography and Film, and numerous festivals.

The region is home to 20 New York State Parks, the most notable being Letchworth State Park nestled in southern Wyoming and Livingston Counties where the Genesee River winds through the park's 14,350 acres, flows over three major waterfalls, and is continuing to carve out the famed 17-mile gorge. The City of Rochester is home to an "emerald necklace" of parks designed

by Fredrick Law Olmsted, the father of American landscape architecture. These parks are located along the Genesee River banks, Erie Canal, and Lake Ontario, and provide a multitude of recreational opportunities. The Monroe County parks system is extensive and home to many of the region's renowned festivals. Highland Park, designed by Olmsted, with over 1,200 lilac bushes hosts the acclaimed Lilac Festival. Held every year during the month of May the festival draws about 500,000 attendees from all over the world.

The region's agricultural bounty can be seen in the variety of local farmers markets throughout the region. The Rochester Public Market was voted the number one farmer's market in the 2010 America's Favorite Farmers Market contest sponsored by the American Farmland Trust. Many other communities in the region have similar markets that are key to ensuring access to healthy foods and supporting local agriculture.

The Finger Lakes Wine Region is the largest wine producing area in New York State and is renowned for its Rieslings. The lakes offer the ideal climate for growing grapes along their banks, moderating the temperature throughout the year. The wineries attract a large number of tourists year round, supporting the local economy, particularly in the balmy summer months and in the fall to admire the foliage. The New York Wine and Culinary Center opened its doors in 2006 on the shores of Canandaigua Lake. The \$7.5 million center offers wine tasting, culinary and wine classes, and a restaurant featuring regional produce and food products. The Center has hosted over 151,000 visitors since 2008.

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



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celebration in Waterloo, and the Ganondagan State Historical Site.

A study prepared by the Genesee/Finger Lakes Regional Planning Council for GTC identified over 50 landscapes that define the region's history but are not currently listed on either the New York State or national registers of historic places. These include historic landscapes that were designed, have been defined by their occupants or the activities they were used for, are associated with a historic event or person, or contain a variety of natural or cultural resources. These culturally-significant landscapes are presented on Map 2.

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

## Places

Due to the importance of place to the transportation needs of persons, businesses, and institutions, areas within the region have been classified based on land use patterns and uses as well as physical, social, and economic characteristics now and as projected through 2035. Considerations in delineating these areas include their population density and the time period in which the majority of their growth occurred for the residential places and the amount of space they provide and for what economic activity they are meant to serve for the employment places.

Essentially, their function and form were considered. It is this combination of purpose and design that defines the built envi-

ronment and determines the use of physical space and the associated transportation needs now and in the future. The generalized transportation needs for each type of place through 2035 along with the corresponding degree of priority are discussed later. Map 3 shows the Genesee-Finger Lakes Region by place and Map 4 provides greater detail of the same for the Rochester TMA. The various types of places in the region are discussed below.

## Regional Urban Core

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

## Sub-Regional Urban Cores

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

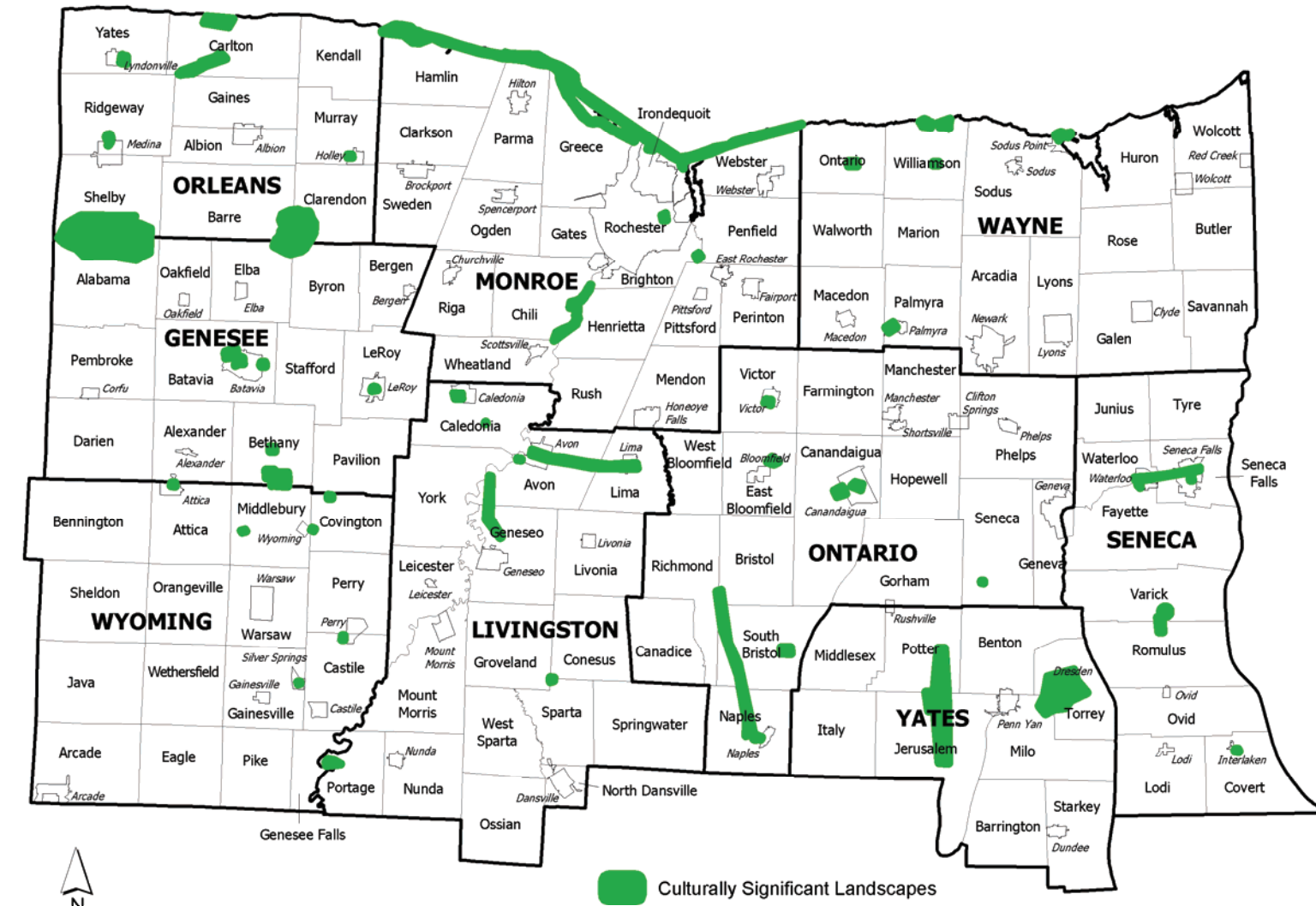
## Mature Suburbs

Mature Suburbs include areas in the Census Bureau-defined Rochester Urbanized Area that saw the earliest expansion of development (initially, residential) outside of the urban cores (the City of Rochester and Sub-Regional Urban Cores). Population density is less than in the urban cores but multi-family housing



## Culturally Significant Landscapes in the Genesee-Finger Lakes Region

Map 2

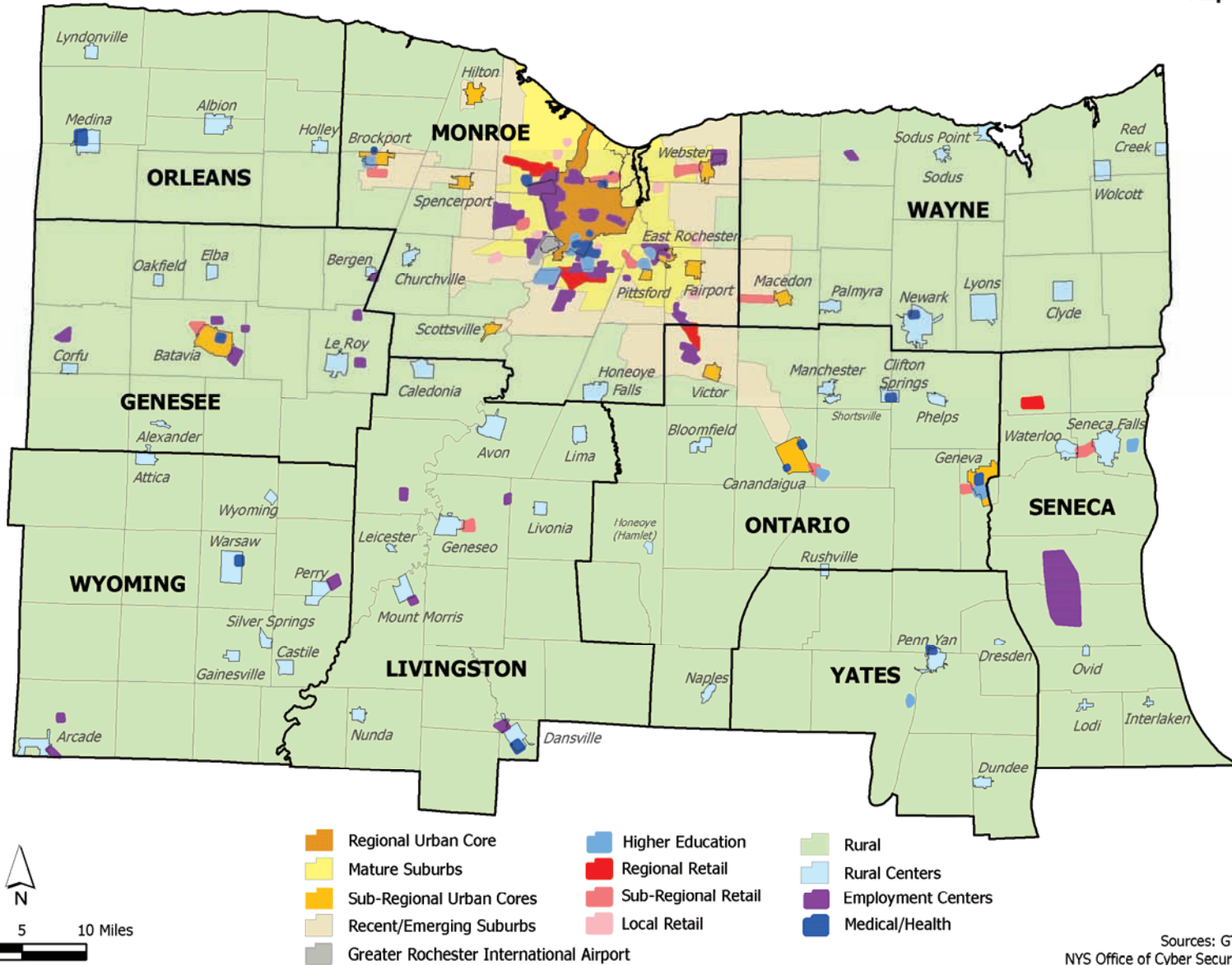


Sources:  
Genesee/Finger Lakes Regional Planning Council, 2010  
NYS Office of Cyber Security, 2010

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## Genesee-Finger Lakes Region by Place

Map 3



is more prevalent than in other places (including Recent/Emerging Suburbs). Non-residential development that serves commercial uses is less dense than the urban cores and more automobile-oriented. Infill and redevelopment opportunities exist as recent residential and commercial development have increased in the Recent/Emerging Suburbs, but to a lesser extent than in the urban cores.

## Recent/Emerging Suburbs

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

## Rural

Rural places include towns with the lowest residential and employment densities and significant portions of their land devoted to critical agriculture and related agri-business uses, which are integral to the regional economy and food system, as well as forested lands and open space. Pressure for residential and associated retail and commercial development is limited compared to Mature Suburbs and Recent/Emerging Suburbs as are infill and redevelopment opportunities.

## Rural Centers

Rural Centers include villages and hamlets located in Rural places that include mixed use development and provide localized but limited commercial and civic uses with most residents required to travel to other places for necessary employment, retail, and civic needs. Infill and redevelopment opportunities exist

but are limited given population and associated market opportunities.

## Employment Centers

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

## Regional Retail

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

## Sub-Regional Retail

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

## Local Retail

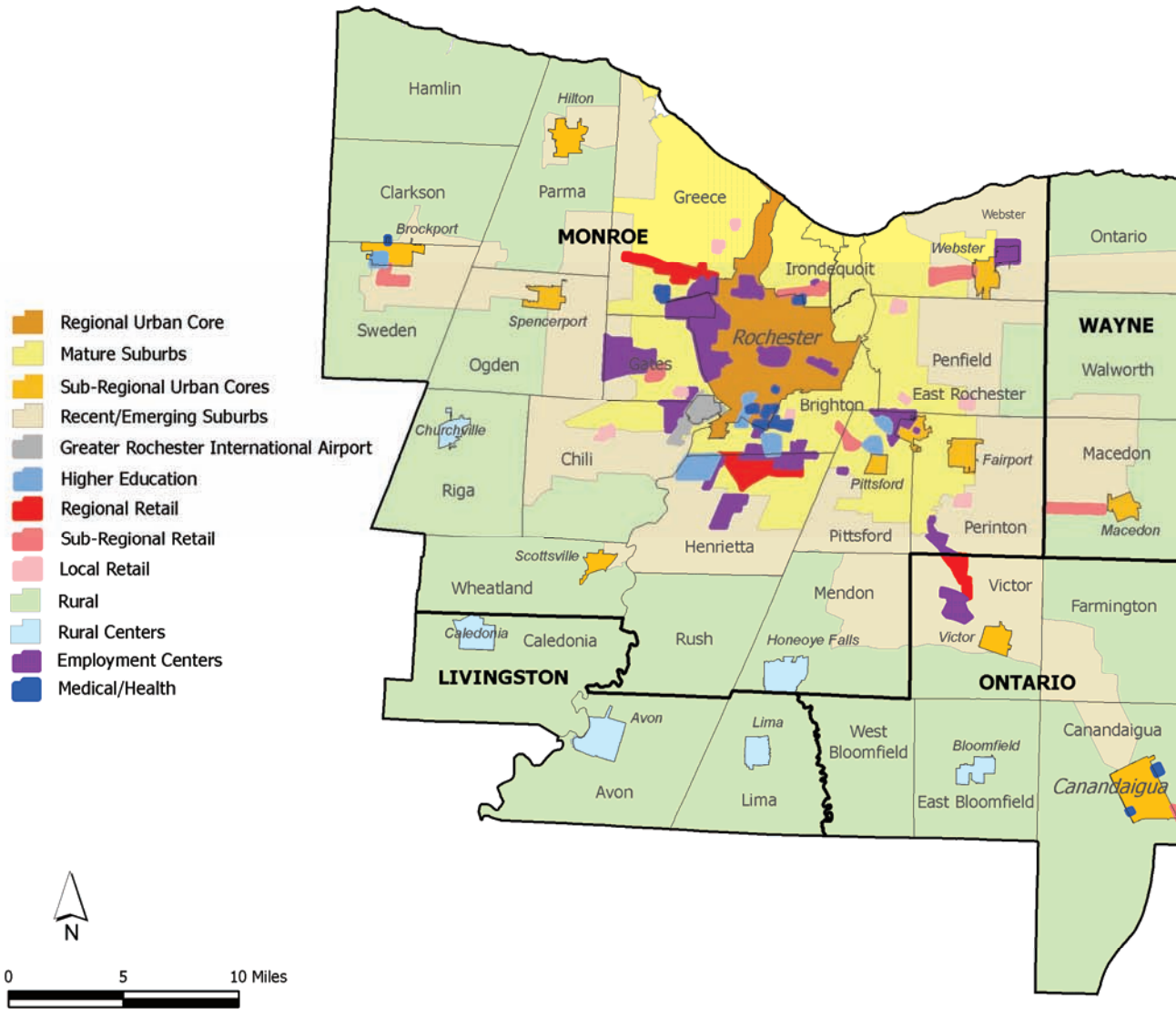
Local Retail includes retail and commercial development with a supermarket as the typical anchor that serves a portion or combination of suburban, urban, and/or rural places and is typically primarily automobile-oriented but can be accessed by bicycling or walking due to residential development in closer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



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## Rochester Transportation Management Area by Place

Map 4



Sources: GTC, 2008  
NYS Office of Cyber Security, 2010

## Medical/Health

Medical/Health includes either a hospital and/or an agglomeration of health-related facilities that provide wellness services to the region's residents and will gain importance due to the increasing senior population through 2035 and the overall growth of jobs in the health care sector.

## Higher Education

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

## Airport

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

## Emerging Opportunities and Issues

The following considerations are those that will impact the region over the next 25 years and beyond. How they are addressed both now and in the future will be vital to the success of the region both in terms of quality of life and economic development. There is overlap among the emerging issues discussed below and many are interrelated in terms of how transportation will impact and be impacted by them. The emerging opportunities and issues are addressed throughout the recommendations

to the extent possible given the limited financial resources available to address the region's transportation needs through 2035.

## The Growing Importance of Seniors: An Economic Engine

The aging of Baby Boomers will be one of the most powerful demographic events in our nation's history. As noted earlier, the number of seniors in the Genesee-Finger Lakes Region will increase by almost 80,000. The stereotype that seniors, like children, are a dependent population is a misconception and one that could severely limit regional economic opportunities. In 2000, households in the region that were headed by persons 65 years and older realized nearly \$4 billion in income. In each of the nine counties of the region (and, therefore, the region as a whole), seniors had disproportionately more income than their population size – 15.8 percent of the region's total household income compared to comprising 13.0 percent of the region's population.



While working seniors in the region earned nearly \$800 million in 2000, the majority of seniors' income came from transfer payments (e.g., Social Security, pension payments, etc.) which are



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not directly dependent on the regional economy and serve as a buffer against cyclical national economic downturns. As the senior population grows, these somewhat insulated sources of income will become an even more important component of regional purchasing power. This is particularly important because the region's seniors through 2035 will be Baby Boomers who, with their keen sense of lifestyle and personal fulfillment, currently outspend every population cohort and can be expected to do so as they age. Jobs follow purchasing power and people follow jobs. Accordingly, the ability to retain wealthy retirees (including current and potential "snowbirds") presents the opportunity to increase economic development in the region.

## The Regional Food System: Stability and Enhancement

As discussed previously, agriculture is a critical component of the regional economy. This previous discussion focused on agriculture in the traditional sense as characterized by larger scale operations that are major economic drivers in rural areas. Smaller-scale and more localized agricultural production, including in the Regional Urban Core and Sub-Regional Urban Cores, have the potential to significantly contribute to improving access to nutritious foods for residents in all places and reshaping the physical development of the region. This reshaping will influence and need to be supported by the regional transportation system – specifically, through targeted farm-to-fork initiatives. The regional food system – and the contribution of agriculture to the economy and equitable access to fresh fruits and vegetables – can be stabilized and enhanced by ensuring that the transportation system connects production with consumption.

Given the modest projected increase in the regional population through 2035 and the corresponding availability of land for contained, small-scale production of fruits and vegetables, the opportunities for increased urban and suburban agriculture has the potential to create landscapes that have not been seen in this region since the 1800s and increase equitable access to whole-

some foods that improve public health. Current examples include elements of the City of Rochester's Project Green which includes the conversion of over three dozen blocks to "green infrastructure" that can be converted to, among other uses, urban farms, and Freshwise Farms, a farm in Penfield, that is operated by Foodlink and provides over 2,000 prepared meals each day for schools and runs a for-profit catering service.



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

Decreasing the number of motor vehicle crashes that result in fatalities, injuries, and property damage should be and is the primary risk to the personal well-being of the region's residents addressed in the *LRTP 2035*. In addition but not in place of reducing crashes, there is a greater role that transportation can play in supporting improved health in the larger sense. Healthy communities are those that not only enable the production of nutritious foods and provide greater connectivity to them but also increase opportunities for residents with the requisite physical ability to take trips by modes other than private vehicles (regardless of the fuel source), reduce air and water pollution, and increase access to health care. These health considerations



should be more prominently considered in transportation planning activities via Health Impact Assessments or some other form of analysis of proposed improvements and services.

Most importantly from a transportation perspective, enabling bicycling and walking promotes active transportation that has the potential to reverse the epidemic of obesity that is one of, if not the most, prescient public health issue in the nation. The most acute illustration of this is the widely publicized fact that the current generation of children is the first in history to have a life expectancy less than its parents as a result of a sedentary lifestyle void of the level of physical activity of previous generations. With an increasing senior population, it is imperative that access to health care (including preventative services that reduce overall costs) be a primary consideration in the design of future transportation services. Reductions in transportation-related emissions that are detrimental to air and water quality have and will continue to be the result of increased efficiency in the engines and pollution control devices of motor vehicles.



## The Larger Mega-Region: Positioning the Region for Success

As metropolitan areas have expanded over the past 50 years, the connections between them have increased both physically and functionally into agglomeration economies as defined by a ready availability of customers, requisite labor force, and connected industries (or clusters). These mega-regions have been the topic of a growing discussion and associated research agenda. As presented in Exhibit 10, the Genesee-Finger Lakes Region has been included in two identified mega-regions: the Royal Institute of Technology-Centre of Excellence for Science and Innovation Studies' Tor-Buff-Chester (i.e., Toronto-Buffalo-Rochester) Mega-Region and the Regional Plan Association's Great Lakes Mega-Region. Both of these mega-regions include the Greater Toronto Area. The economy of the Greater Toronto Area includes one out of every eight Canadian jobs and is expected to grow by approximately five percent this year. This prosperous economy represents significant opportunities for the Genesee-Finger Lakes Region.

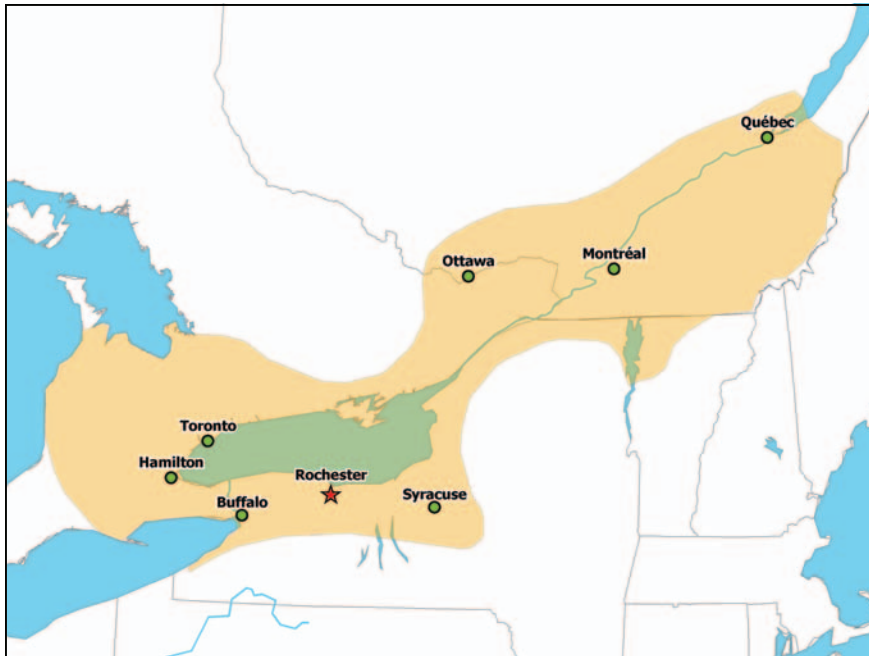
In terms of an agglomeration economy, the combined population of the Greater Toronto Area, Buffalo-Niagara, and Genesee-Finger Lakes regions is approximately 10 million residents (availability of customers), over 5.5 million workers (requisite labor force), and a similar economic base with a comparable proportion of workers employed in various economic sectors (connected industries). To take full advantage of this region's geographic location in this emerging context, the transportation system will need to ensure reliable, convenient, and cost-effective connections for people and freight both within the larger mega-region and to other domestic and international markets.



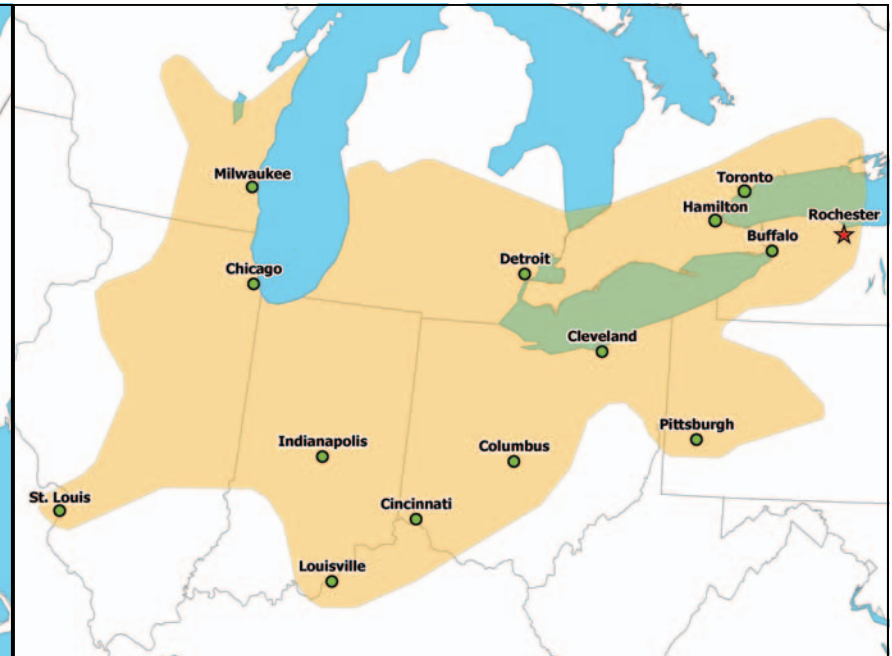
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Exhibit 10

**Tor-Buf-Chester  
(Royal Institute of Technology)**



**Great Lakes  
(Regional Plan Association)**



## The Impacts of Climate Change: Mitigation and Adaptation

Significant scientific debate continues over the impacts of human (i.e., anthropogenic) activities on global temperatures. Regardless, transportation policies, services, and programs can reduce the emission of greenhouse gases (GHG) and simultaneously attain other significant benefits. The most fundamental of these is reducing dependence on foreign oil which constitutes both an environmental and national security concern. Replacing oil from the Middle East and North Africa with domestically-produced, cleaner energy sources for transportation would assist in reducing GHG and potentially mitigating the impacts of climate change while also creating jobs in the United States and improving the nation's position in the global political economy.

Independent of mitigating climate change, adapting transportation facilities and programs to be more resistant and resilient is equally if not more important. Adaptation activities as they relate to transportation are clearly a public responsibility given that the vast majority of associated infrastructure and services are provided by government entities. Accordingly, evaluation of the vulnerability of critical infrastructure to impacts resulting from more severe and intense weather events, including storms and corresponding flooding, needs to be conducted so that the reconstruction and replacement of these facilities includes de-



Exhibit 11

## Estimated Number of Daily Truckloads to Stimulate a Horizontally-Drilled Well for High-Volume Hydraulic Fracturing of Natural Gas from Marcellus Shale

Well Development Activity	Truckloads
Drill Pad and Road Construction Equipment	10-45
Drilling Rig	30
Drilling Fluid and Materials	25-50
Drilling Equipment (casing, drill pipe, etc.)	25-50
Completion Rig	15
Completion Fluid and Materials	10-20
Completion Equipment	5
Hydraulic Fracture Equipment (pump trucks, tanks)	150-200
Hydraulic Fracture Water	400-600
Hydraulic Fracture Sand Trucks	20-25
Flow Back Water Removal	200-300
<b>Total Per Well</b>	<b>890-1,340</b>

Source: NYSERDA, September 2009

sign features and operations and management capabilities that account for these impacts.

### The Future Energy Requirements of the Nation: Undecided Sources

Probably the greatest amount of uncertainty exists in the future sources of energy for transportation. As of late-December 2010, it was being reported that many experts believe that gasoline demand in the United States will decrease over the period covered by the *L RTP 2035*. This reduction in demand domestically will result in tempered global demand and occur due to federal requirements and demographic changes. What is certain is that the freedom of mobility provided by private automobiles, the

fact that public transportation in the majority of areas in this country utilize buses, the need for trucks to transport the majority of freight to its final destination, and the significant investment in facilities that serve these modes of travel (e.g. highways and bridges) demand that alternative fuel sources for vehicles be identified and that related vehicles and fueling infrastructure be developed.

It is highly likely that there will be multiple non-petroleum-based energy sources developed and used for transportation over the next nearly 25 years covered by the *L RTP 2035*. Electric and hydrogen fuel cells represent non-fuel sources for automobiles, but require further refinement to increase the distances that can be travelled between recharges (and mitigate drivers' "range anxiety") and improve the affordability of these sources by reducing production costs. Bio-fuels will continue to evolve beyond those based on foodstuffs to reduce the fuel versus food debate, as well as become "drop in" (i.e., do not require any vehicle modifications) and more energy efficient. These non-petroleum-based energy sources offer the opportunity to reduce the nation's dependence on foreign oil, which serves both environmental (including climate change) and national security goals.

One immediate energy-related issue in the Genesee-Finger Lakes Region is the discussion over hydraulic fracturing (commonly referred to as hydrofracking). Hydrofracking involves injecting water and chemicals into horizontally drilled wells to fracture rock formations and release natural gas. Hydrofracking is being considered in the Marcellus Shale formation that is located in the southern portion of the region. The Utica Shale, which lies to the north of the Marcellus Shale, has also been identified as large source of natural gas worthy of detailed consideration for exploitation. Regardless of the debated environmental impacts of hydrofracking, if approved, its impacts on the transportation system will be significant. As presented in Exhibit



# THE REGION

11, it has been estimated that between 890 and 1,340 truckloads would be required to establish (or stimulate) each horizontally-drilled well. This number does not include the number of trucks that would transport the natural gas that is exported from the well, and there is the potential for multiple wells on a single fracking site. While hydrofracking is not currently allowed in New York State and no permits have been approved (at the time of the development of the *L RTP 2035*), the resulting deterioration to roads owned, operated, and maintained by the state, counties, and municipalities if they were demand that means for obtaining appropriate compensation be considered. One option used elsewhere in the country is road use agreements that require compensation for damage sustained beyond the existing level of deterioration as a result of the increased truck traffic necessary to stimulate wells and transport extracted natural gas.

## The Region in 2035

Based on the projected population and employment and the emerging opportunities and issues in the Genesee-Finger Lakes Region through 2035, two future scenarios were developed. Scenario planning is typically conducted by regions that expect to experience significant growth in residents and jobs. Even though population and employment growth in the region is not anticipated to be comparable to that of high-growth regions, it was decided that the *L RTP 2035* would benefit from consideration of alternate reasonable scenarios of how the moderate growth the region is expected to experience may occur.

Both of these scenarios adhere to the population and employment projections discussed previously, which are based on the official population forecasts for the region (as adopted by the Genesee/Finger Lakes Regional Planning Council that developed them with funding through the UPWP) and the employment projections developed by GTC for the *L RTP 2035*. The scenarios differ in the distribution of growth in population and employment within the Rochester TMA. Effectively, the scenarios repre-

sent a “Familiar Tomorrow” and a “Changing Landscape”. The former assumes that growth will continue to occur as it has in the past based on historical trends and the latter incorporates a re-densification within the Rochester TMA driven by increased energy costs and/or other factors that precipitate changes that alter the demand for housing and location of firms in a way that results in more compact development.

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

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

While the growth in the Mature Suburban, Recent/Emerging Suburban, and Rural places would be reduced, these areas would still receive a significant amount (approximately 60 percent) of the growth in households in the Rochester TMA; just not as much as they would based on historical trends under the “familiar tomorrow” scenario.

Given the nearly 25-year horizon of the *L RTP 2035*, both the “Familiar Tomorrow” and “Changing Landscape” scenarios are plausible. The development pattern that materializes in the region will depend on decisions made at the local level regarding land use and the associated types of development that are allowed by comprehensive plans and zoning codes that determine what is approved for construction. The vast majority of this development will be driven by the private sector as it responds to market demand within locally-determined land use regulations.



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

Recognizing that transportation is one of many considerations in the land use planning and development processes, it is imperative that cities, towns, and villages work with county, regional, and state transportation agencies to gain a full understanding of how their decisions impact the existing transportation system and what improvements are generally achievable given physical and fiscal constraints. GTC has and continues to develop resources that allow for better integration of transportation and land use planning, as well as provide direct financial assistance to local governments to conduct coordinated transportation and land use plans.

