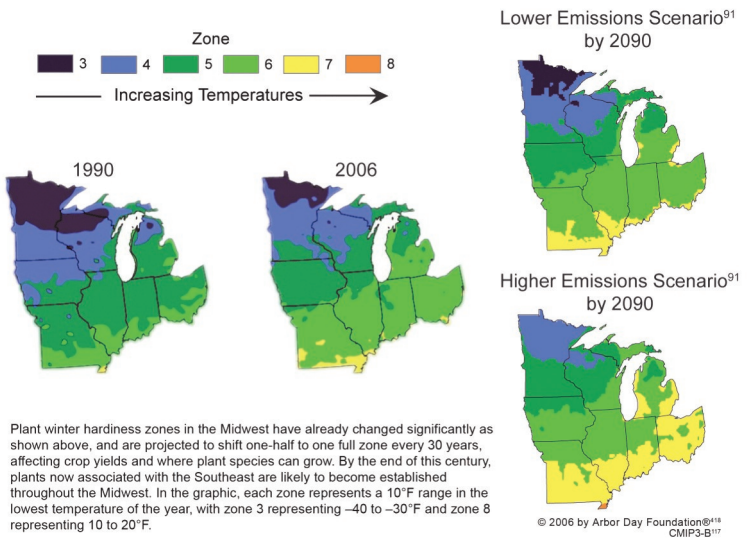
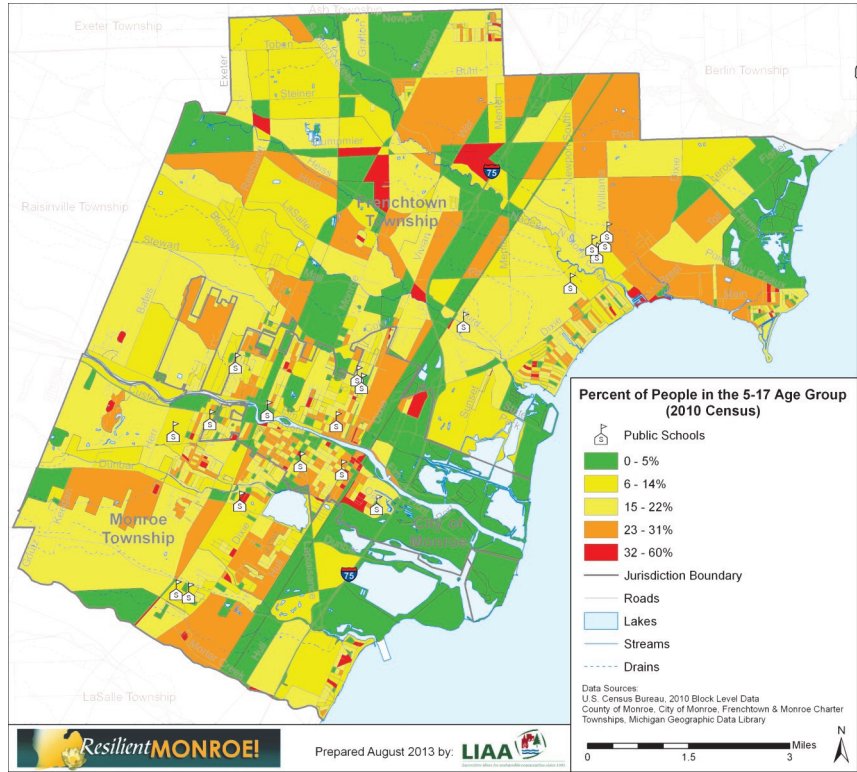




Resource Atlas



October 15, 2013

Prepared by

THANK YOU PARTICIPANTS

Resilient Monroe is an all-new, land-use planning and community design project sponsored by the **City of Monroe, Frenchtown Charter Township** and **Monroe Charter Township**. This project will result in an updated Municipal Master Plan for the City of Monroe and improvements to the existing Municipal Master Plans for Frenchtown and Monroe Charter Townships. Together, these three local governments and their Master Plans will provide guidance for successful, resilient community development in the years to come.

The **Community Planning Committee (CPC)** is composed of planning commissioners and elected officials from Monroe Charter Township, Frenchtown Charter Township, and the City of Monroe. The CPC meets monthly to oversee and provide guidance on the *Resilient Monroe* process.

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STAFF & SUPPORT

LIAA is providing a large share of the staff and support work for the Resilient Monroe Project. Additional staffing and research support services are being provided by the:

Community Foundation of Monroe County

Michigan Townships Association

Michigan Municipal League

Michigan Association of Planning

Taubman College of Architecture & Urban Planning, University of Michigan



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Monroe is an amazing, engaging and hopeful place. On the western shore of Lake Erie at the mouth of the River Raisin, Monroe has provided food, manufactured goods and transportation to human communities for centuries, from the Native Americans and French Voyagers through the workers and leaders who drove Michigan's rise as an industrial powerhouse. Once known as the gateway to our nation's Northwest Territories and a continuing hub of Great Lakes transportation, the Monroe Community offers a diversity of economic, cultural and natural resources at a time of great change and opportunity — for Michigan and the nation.

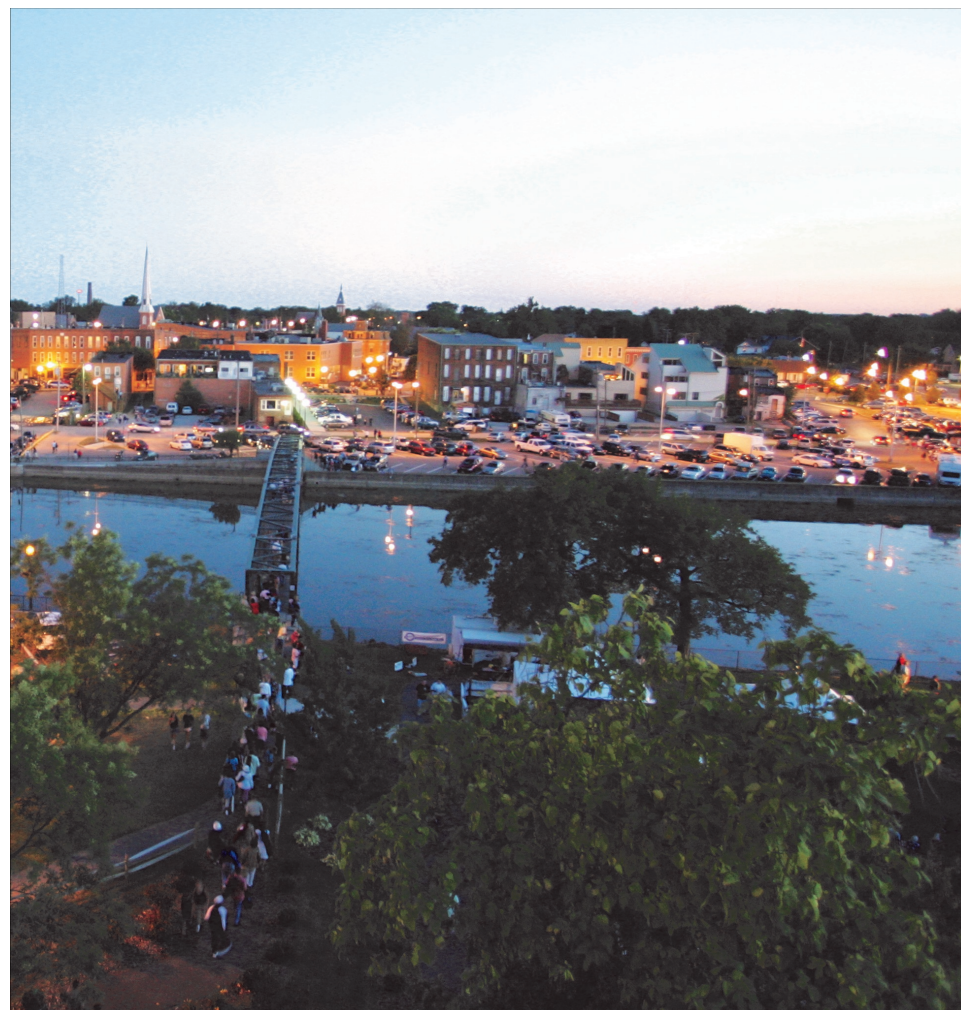


Photo Courtesy of John Patterson

INTRODUCTION

This **Resource Atlas** has been compiled to provide a wide variety of useful information to support the land use planning and community development process known as **Resilient Monroe**. The *Atlas* begins in Chapter 2 with an overview of community resilience from economic challenges to climate change. Chapters 3-6 describe and illustrate the wide array of community resources now available, including human, natural and economic resources. Chapters 7-8 provide information on options for increasing community resilience, including enhancing economic diversity through *placemaking* projects and improving climate resilience by reducing human and community vulnerabilities. Chapter 9 is a review of local and regional documents and plans that relate to each jurisdiction. Chapter 10 provides a detailed report on what the citizens have said about today's challenges and their goals for the development of the Monroe Community over the coming decades. Discovered through interviews, focus groups, public meetings, working groups, a planning charrette, and a community-wide survey, the public's hopes and dreams for Monroe will drive positive change. Chapter 11 in this Resource Atlas presents a compilation of *options for local action* which may be needed to achieve the goals of Monroe's public officials, community leaders and citizens.

THE RESILIENT MONROE PROJECT

Early in 2013, the City of Monroe, Frenchtown Charter Township and Monroe Charter Township agreed to pool their resources and work together in reviewing and revising their respective master plans under the project name **Resilient Monroe**. Each of these local governments conducts land-use planning and community development separately under Michigan's planning and zoning laws. However, when taken together, the three jurisdictions include the geographic area most people think of as the greater Monroe Community.

The **Resilient Monroe** project is designed to serve the whole community by supporting the work of all three planning commissions and the elected officials. Together, these public officials have formed the *Community Planning Committee* to review and consider the planning documents developed by the project. Research, planning and process facilitation services are being provided by the Land Information Access Association (LIAA) with support from the Community Foundation of Monroe County, Michigan Municipal League (MML), Michigan Townships Association (MTA), Michigan Association of Planning (MAP) and the Urban Planning division of the University of Michigan. Funding for this effort has been provided by the City of Monroe, Frenchtown Charter Township, Monroe Charter Township, the Kresge Foundation and the Americana Foundation. Additionally, LIAA is contributing in-kind efforts.

Ultimately, the **Resilient Monroe** project is all about helping the leaders and citizens of the greater Monroe Community refine their land use and development plans. This effort will support the City of Monroe in rewriting its existing Master Plan and assist the participating townships in reviewing their master plans — working toward greater resilience. In all cases, this community planning effort is following the requirements of the *Michigan Planning Enabling Act* (Public Act 33 of 2008) including the five-year plan review.

CHAPTER 2. BUILDING COMMUNITY RESILIENCE

Most communities across Michigan are wrestling with difficult economic, social and environmental challenges. The shifting global economy and statewide recession is forcing big changes in business practices and employment. State and federal funding is declining and new long-term assistance appears unlikely. Fuel and electrical energy costs are high and subject to unpredictable price spikes. Further, paying for basic energy supplies continuously siphons off community resources. Making matters worse, the harmful impacts of extreme weather events on agriculture, infrastructure and human health are being felt almost everywhere across Michigan.

These are turbulent times for many Michigan communities. However, with planning and preparation, communities can weather the storms and recover, becoming even better places to live and thrive. Through community-wide planning, resilient cities and townships actively cultivate their abilities to recover from adverse situations and events, working to strengthen and diversify their local economies and communications networks, increase social capital and civic engagement, enhance ecosystem services, improve human health and social systems, and build local adaptive capacity.



Photo Courtesy of Judy Reinhardt

COMMUNITY RESILIENCE

Resilience can be described as the capability of a person or community to withstand and recover from a shock or serious misfortune without permanent disruption. According to the Rand Corporation, community resilience is *a measure of the sustained ability of a community to utilize available resources to respond to, withstand, and/or recover from adverse situations.*^{1,2} Communities that are resilient are able to learn from adversity and adapt quickly to change. In general, the most important characteristics of community resilience are: (1) strong and meaningful social connections, (2) social and economic diversity, (3) innovation and creative problem solving capacity, and (4) extensive use of ecosystem services.

Resilience includes adaptive capacity. Adaptation is a critically important part of resilience because it allows us to prevent further harm from disasters and disruptions while making the most of the new conditions. By adapting rapidly to changing circumstances, our communities may not only survive challenges, but thrive.

Communities interested in becoming more resilient assess their vulnerabilities and make action plans to reduce their sensitivities and exposures to hazards of all kinds. For example, local governments can improve building standards to reduce heating and cooling challenges posed by severe temperature swings (cold and hot). Improvements in social cohesion and civic engagement also improve community resilience, by increasing the capacity of volunteer organizations and providing more secure neighborhoods, among other things. Planning processes can help increase civic engagement by improving communications and cooperation between cultural and service organizations and assuring more effective community projects.

To improve economic resilience, communities can work to encourage and support local production of goods and supplies, increasing self-reliance and reducing the flow of funds out of the community. Programs to encourage local investing and entrepreneurship have been helpful in building both employment and production capacity. Local investments, consumption of locally produced products, and locally owned businesses all help to diversify the community's economy, giving it greater resilience.

DEFINING RESILIENCE

One way to reduce the impacts of disasters on the nation and its communities is to invest in enhancing resilience. As defined in this report, resilience is the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events. Enhanced resilience allows better anticipation of disasters and better planning to reduce disaster losses — rather than waiting for an event to occur and paying for it afterward.

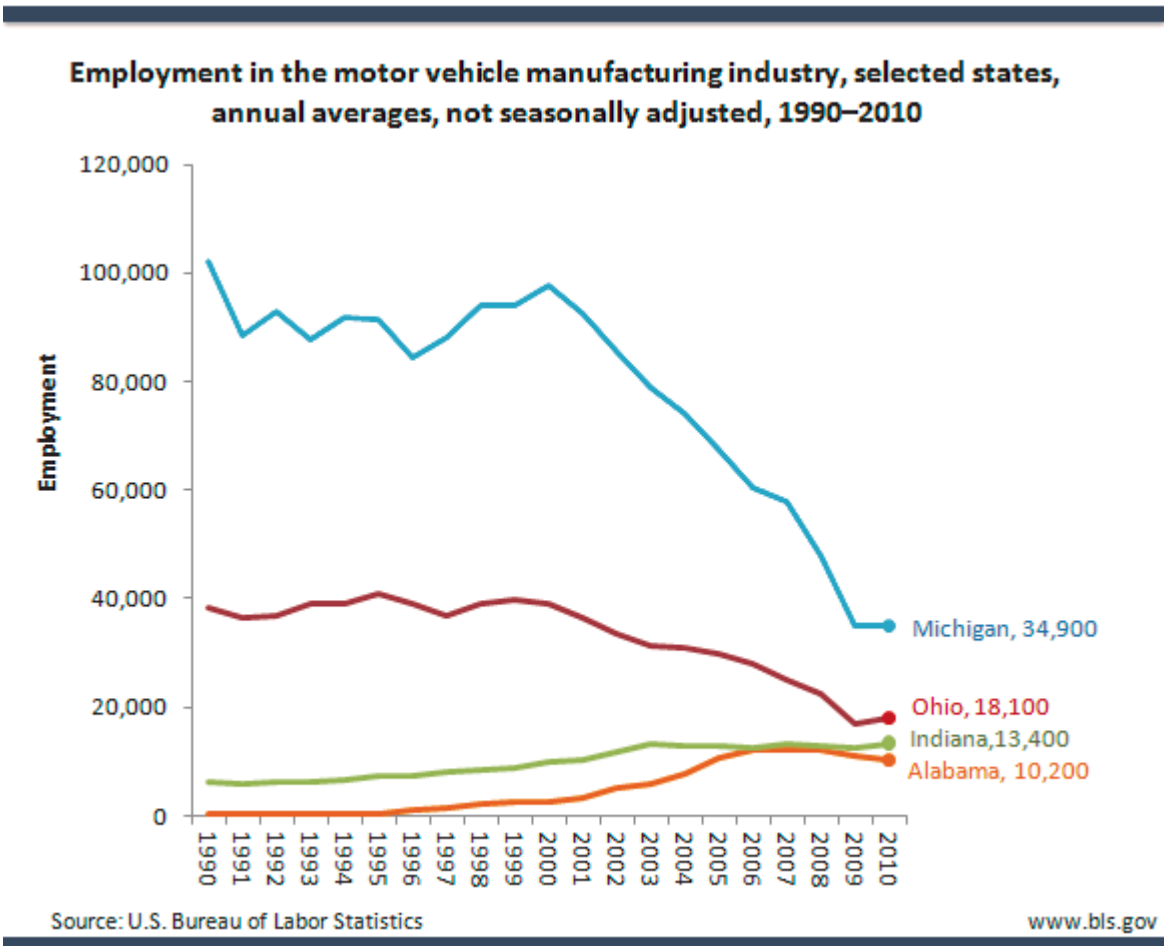
Disaster Resilience – A National Imperative, 2012. National Academy of Science, National Academies Press, Washington, DC

ECONOMIC TRENDS & CHALLENGES

Over the past 20 years, technologies such as broadband digital communications and the rapid transport of agricultural and manufactured goods have changed the global economy. Many manufactured goods can now be produced anywhere in the world and transported anywhere else, increasing global competition. As a result, many manufacturing jobs have been and are being moved to countries with the lowest labor and related costs.

The trend toward moving jobs to other, lower-cost countries together with the continuing automation of processes has resulted in the nation, as a whole, losing manufacturing jobs. The impact of this changing trend has been particularly hard on Michigan’s economy which has relied more heavily on manufacturing than most other states’ economies. In the vehicle manufacturing sector alone, Michigan lost 65,100 jobs from 1990 to 2010 (see Figure 2.1). Overall, between 2000 and 2010, Michigan lost 367,000 manufacturing jobs.³

Figure 2.1 Manufacturing Employment Trends



Over the past decade, most communities across Michigan have faced severe economic challenges due in part to a statewide loss of manufacturing jobs combined with a severe national recession. Along with the harsh economic

downturn has come a loss in population and a significant loss in real estate values as many people moved to other locations. Ranked 17th of all states in 1970, Michigan was ranked 34th in average household income by 2007.

According to many experts, most of the future economic growth in Michigan will come in the high-technology and services sectors, including health care, financial management, highly-skilled manufacturing, human services and the food industry. While the recovering manufacturing sector will remain a major component of our state’s economy, most of the jobs already lost will not return. Rather than compete for a decreasing number of manufacturing jobs, the experts say, communities and regions should embrace this *New Economy*.

The *New Economy* is a buzz-phrase used to describe the transition from a manufacturing-based economy to a service-based or innovation-based economy. In the new economy, communities and regions are encouraged to build from within, expanding existing businesses and supporting new entrepreneurial enterprises. To rebuild or retain economic vitality, the experts say, communities will need to attract and retain educated and talented people. Figure 2.2 is often used by Michigan State University’s Land Policy Institute (MSU LPI) to contrast the old economy with the *New Economy*.⁴

Figure 2.2 Comparing the Old Economy with the New Economy

Old Economy	New Economy
Being a community and region that was an inexpensive place to do business was the key.	Being rich in talent and ideas is the key to the community and region’s economic success.
A high-quality physical environment was a luxury, in the way of attracting cost-conscious businesses.	Physical and cultural amenities are key in attracting knowledge workers.
Economic success was built upon a fixed competitive advantage in some resource or skill.	Economic success comes from organizations and individuals with the ability to learn and adapt.
Economic development was government-led.	Partnerships with business, government and nonprofit sector lead to economic development.
Industrial sector (manufacturing) focus.	Sector diversity is desired, and clustering of related sectors is targeted.
Fossil fuel dependent manufacturing.	Communications dependent.
People followed the jobs.	Talented, well-educated people choose a location to live first, then look for a job.

There are a number of things that communities and regions can do to improve their economic outlook. Economic development actions recommended by many experts reflect on the characteristics of the *New Economy*. For example, the following list presents some of the actions suggested by MSU LPI’s 2010 training course. All of these actions could, if properly focused, increase community resilience.

Actions We Could Take to Restore Prosperity

1. Diversify our economy.
2. Expand our markets.
3. Embrace the Green Economy and its focus on alternative energy.
4. Promote and support entrepreneurialism.
5. Focus on talent retention and attraction.
6. Focus on population retention and attraction.
7. Focus on effective *placemaking* and place-based strategies.
8. Right-size and maintain our infrastructure.

The following chapters in this *Resource Atlas* provide details on the Monroe Community's cultural and natural assets as well as the local and regional economy. These chapters will describe many opportunities to enhance the economic resilience of the Monroe Community through planning, preparation and action.

CLIMATE CHANGE AND VARIABILITY

Climate and *weather* are directly related, but not the same thing. *Weather* refers to the day-to-day conditions we encounter in a particular place: sun or rain, hot or cold. The term *climate* refers to the long-term patterns of weather over regions or large areas. When scientists speak of global climate change, they are referring to generalized, regional patterns of weather over months, years and decades. Ongoing and predicted climate changes refer to the generalized weather characteristics or averages on a regional basis.

As stated by the *Intergovernmental Panel on Climate Change*, significant changes in the earth's climate have been observed and thoroughly documented. *Warming of the climate system is unequivocal* and is now evident in average air and ocean temperatures, rising sea levels and the melting of ice. Further, more change is expected.

Figure 2.3 provides a summary of observed changes in several key climate indicators over the last 100 to 150 years, as compiled by the Intergovernmental Panel on Climate Change. The bar graph in Figure 2.4 presents observed changes in the amount of ice cover on the Great Lakes. The decrease in ice cover is another strong indicator of change.⁵

To help predict what the climate will be in the future, scientists are using rapidly improving three-dimensional computer models of the earth's atmosphere, oceans and land surfaces to understand and predict large-scale changes in climate. These *General Circulation Models* (GCM) have been improved and verified in recent years, resulting in relatively reliable predictions for climate changes over large regions. To help predict climate change at the earth's surface for smaller regions, scientists apply downscaling techniques.

The *Great Lakes Integrated Sciences Assessment* (GLISA) is a consortium of scientists and educators from the University of Michigan and Michigan State University that is helping to provide downscaled models for the Great Lakes Region in support of community planning efforts like *Resilient Monroe*. According to GLISA, the Great Lakes region has already experienced a 2.3° F increase in average temperatures from 1968 to 2002. An additional increase of 1.8 to 5.4° F in average temperatures is projected by 2050. Although these numbers appear relatively small, they are driving very dramatic changes in Michigan's climate.⁶

Figure 2.3 Observed Key Climate Indicator Changes

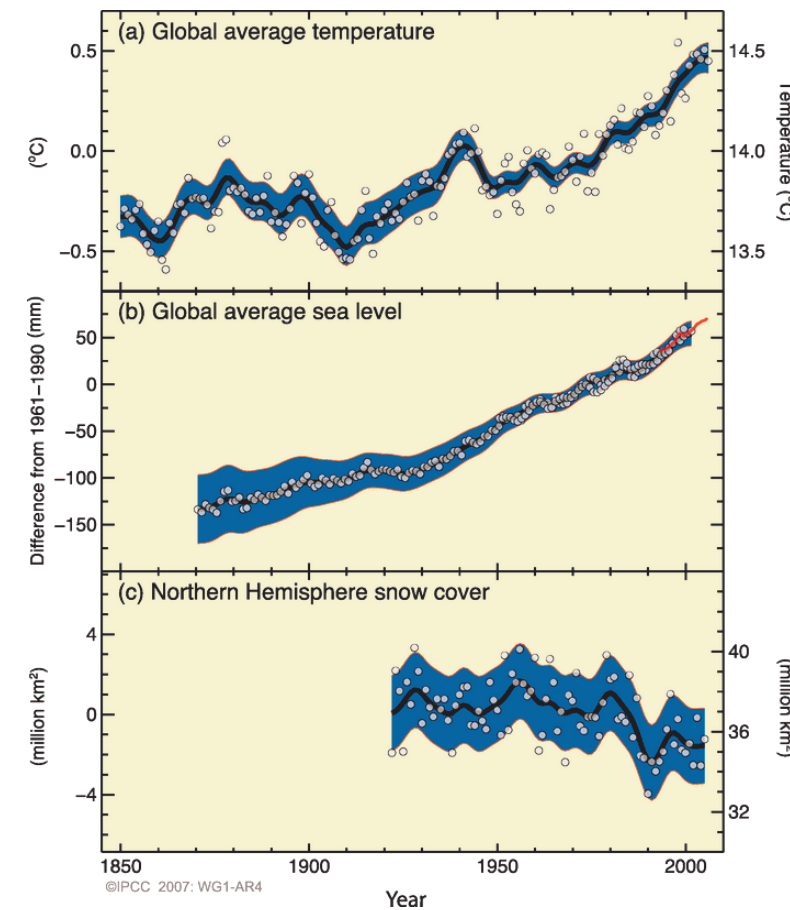
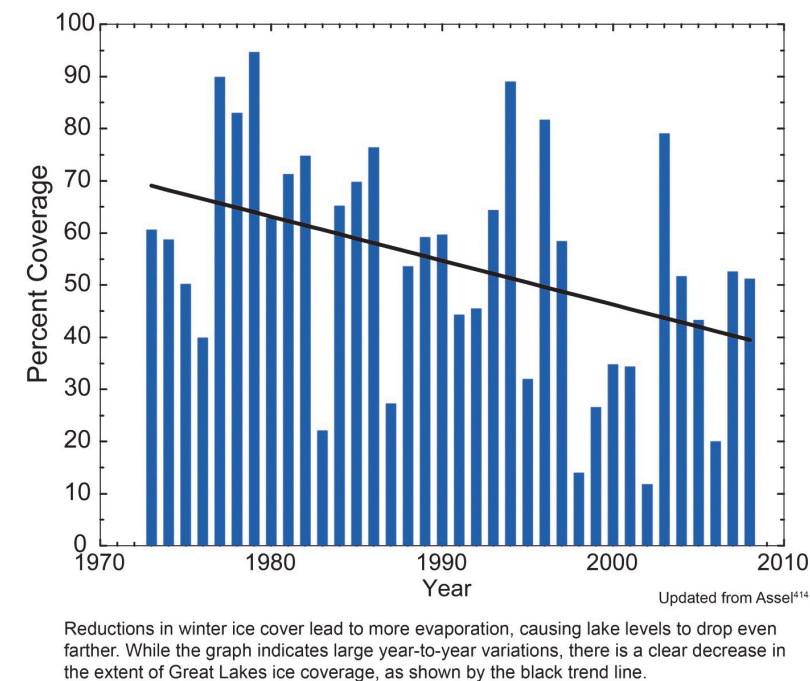


Figure 2.4 Great Lakes Ice Cover Changes



Reductions in winter ice cover lead to more evaporation, causing lake levels to drop even farther. While the graph indicates large year-to-year variations, there is a clear decrease in the extent of Great Lakes ice coverage, as shown by the black trend line.

Based on the most recent models, the climate of Monroe and southeast Michigan will continue to warm, with greater increases in temperature during the winter months and at night. There are a variety of weather impacts expected with this change in average temperatures. For example, storms are expected to become more frequent and more severe. Some of the potential impacts of climate change for Monroe and southeast Michigan include:

- ▮ Increases in winter and spring precipitation
- ▮ Less precipitation as snow and more as rain
- ▮ Less winter ice on lakes
- ▮ Extended growing season (earlier spring/late fall)
- ▮ Greater frequency and intensity of storms
- ▮ More flooding events with risks of erosion
- ▮ Increases in frequency and length of severe heat events
- ▮ Increased risk of drought, particularly in summer

These changes in climate could have a number of both good and bad effects on the greater Monroe area. For example, an extended growing season could help increase crop yields for area farmers. On the other hand, the highly variable weather conditions such as severe storms and flooding mixed with summer droughts present big challenges to farming.

The National Climate Assessment for 2009 (U.S. Global Change Research Program) includes a number of illustrations that help us understand the extent and character of anticipated climate change impacts. The section on the Midwest includes an illustration of projected summer climate for Illinois and Michigan under two different emissions scenarios (see Figure 2.5). The higher emissions model refers to the continuation of existing discharge levels. Models indicate that Michigan's climate will feel more like present-day Arkansas or Oklahoma by the end of the century.⁶

Responding to the impacts of climate change will challenge many different parts of the Monroe Community, from social services to industrial production. The following is a partial list of climate change impacts on community life as described by GLISA and Michigan's State Climatologist:

Rivers, Stream and Lakes

Decline in coldwater fish populations – changing fisheries.
Lower river and lake levels and more frequent lake stratification.
Increases in pollution from stormwater runoff.

Plants and Wildlife

Increases in invasive species that damage local trees and plants.
Changes in tree species able to survive in the new regional climate.

Energy & Industry

Increases in electrical energy demand due to heat waves.
Reduced water availability from streams and groundwater.

Transportation

Increased damage to roads and bridges from flooding and heat waves.
Additional difficulty for shipping on the Great Lakes due to lower water levels.

Public Health Risks

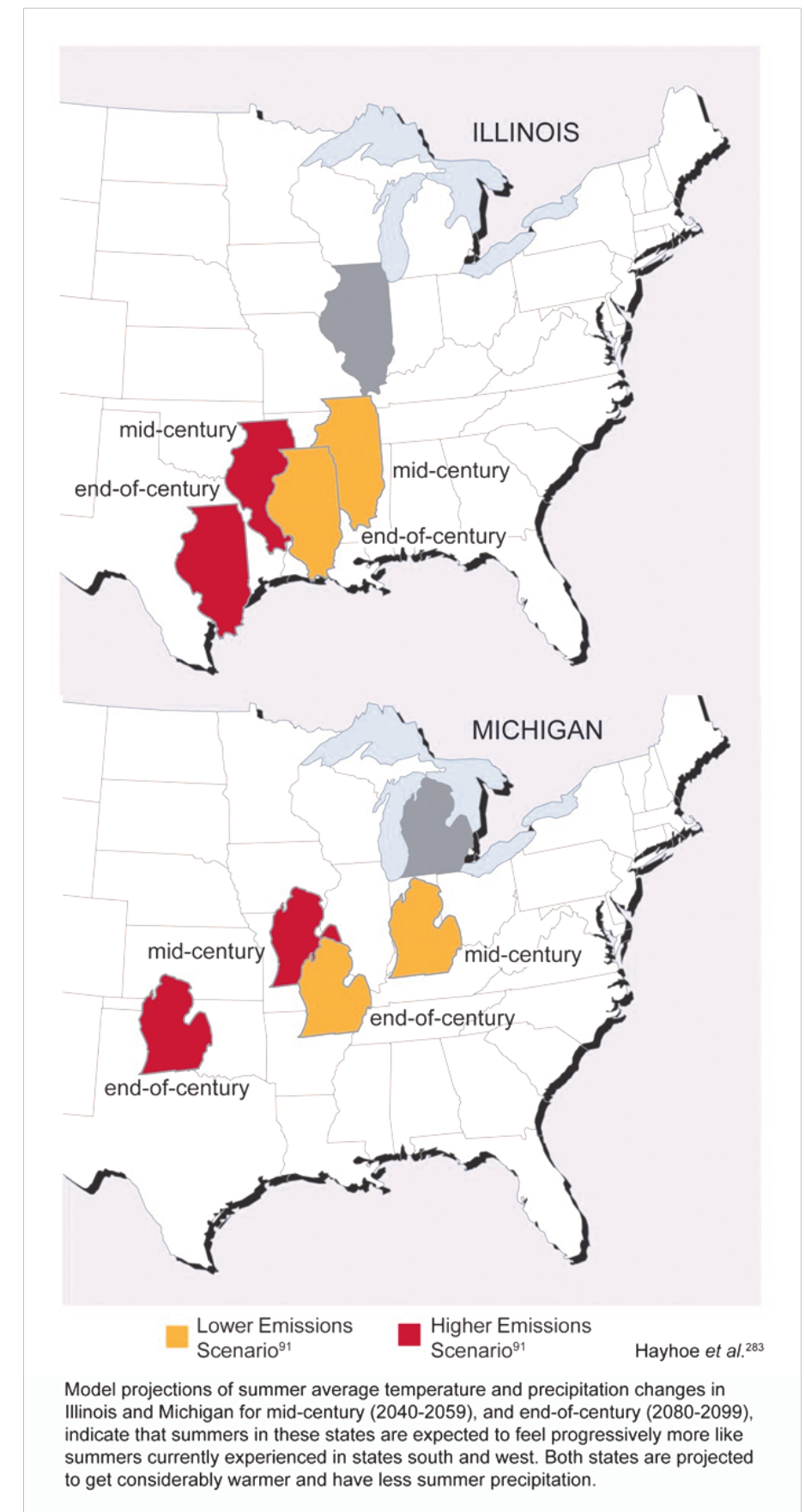
Increased risk of illness and death due to high heat and humidity.
Increased risk of water contamination from flooding events.
Increased risk of disease spread by mosquitoes, ticks and other vectors.

COMMUNITY RESILIENCE AND CLIMATE ADAPTATION

Across the country, communities have begun making plans, preparing and acting to reduce the current and future adverse impacts of climate change, including sudden storms and floods as well as longer term threats such as water pollution. Much of this work begins with understanding, managing and reducing risks from hazards that could harm human health, the environment, cultural assets, and community infrastructure.

The following chapters provide information on the Monroe Community's existing capacity to address social, environmental and economic challenges presented by climate change. For example, we aggregate detailed Census information and mapped data concerning the Monroe Community's population characteristics and vulnerabilities. Later chapters describe and map the natural and cultural resources present in the Monroe Community. Information is also provided on the human health and social services available throughout the community.

Figure 2.5 Illinois & Michigan Projected Summer Climate Changes



CHAPTER 3. THE PEOPLE & SOCIAL SYSTEMS OF MONROE

The Monroe population reflects the rich history of the community, and the impact of early French explorers that settled in the area is still apparent. The community is predominately white, with less racial diversity as compared with the state average. Prior to World War II, Monroe was primarily a farming community, but now farming only accounts for 2.5% of jobs in the workforce. As with much of southeast Michigan, the Monroe Community lost many of its high paying manufacturing jobs over the last decade. As a result, Monroe has a slightly lower median household income as compared to the state average.

Community Profile

The following section describes the population and socioeconomic statistics, housing status, and health characteristics and trends of the Monroe Community. For the purpose of this document, we have used figures provided by the US Census Bureau from 1990, 2000 and 2010. In some instances, we used the 2011 and 2012 population statistics and forecast data developed by the Southeast Michigan Council of Governments (SEMCOG).

THE MONROE JAZZ FESTIVAL
COMBINES A CELEBRATION OF ARTS,
CULTURE, AND HISTORY



Photos Courtesy of Bill Saul



Figure 3.1 Population Trends 1990 – 2010

Community	1990	2000	Percent Change 1990 - 2000	2010	Percent Change 2000 - 2010
City of Monroe	22,902	22,076	-3.6%	20,733	-6.1%
Monroe Ch. Township	11,909	13,491	13.3%	14,568	8.0%
Frenchtown Ch. Township	18,210	20,777	14.1%	20,428	-1.7%
Monroe County	133,600	145,945	9.2%	152,021	4.2%
Southeast Michigan	4,590,468	4,833,368	5.3%	4,704,809	-2.7%
State of Michigan	9,295,297	9,938,444	6.9%	9,883,640	-0.6%

Source: 2012 SEMCOG Community Profiles

POPULATION PROJECTIONS

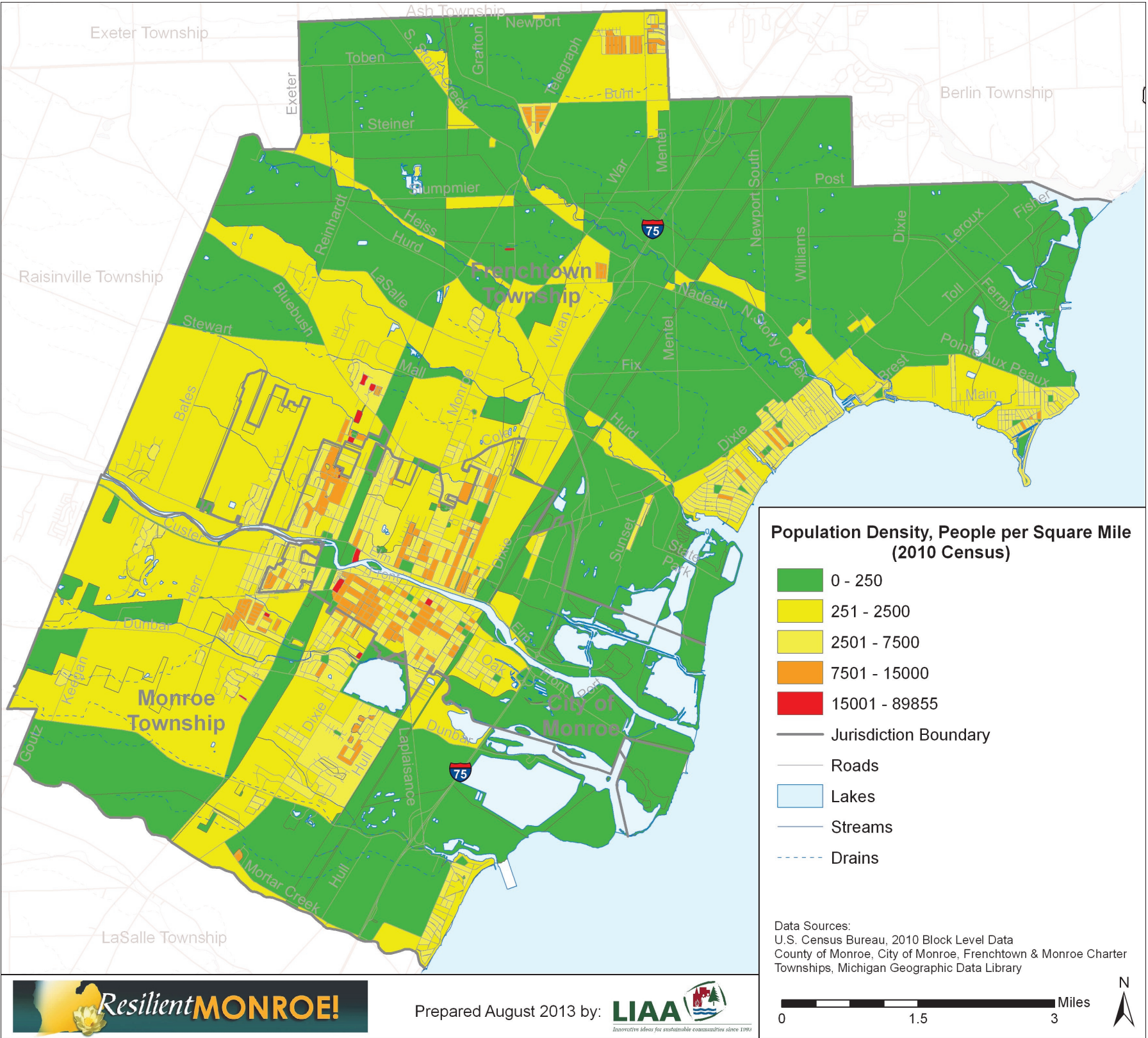
Based on data published by the U.S. Census Bureau, there were 55,729 people living in the Monroe Community in 2010, including 20,733 in the City of Monroe,⁷ 14,568 in Monroe Charter Township⁸ and 20,428 in Frenchtown Charter Township.⁹ For the City, this is about a 6% decrease in the population recorded in 2000.

In Frenchtown Charter Township, the population decreased by 1.7% between 2000 and 2010. This is a dramatic shift from the population growth experienced between 1990 and 2000. Figure 3.1 presents the population trends from 1990 to 2010 for the Monroe Community, Monroe County, Southeast Michigan and the State of Michigan. Between 2000 and 2010, the population in Monroe Charter Township increased by 8%. However, growth over this 10-year period was at a much slower rate than from 1990 to 2000.

As shown in Map 3.1, the Community’s population is most heavily concentrated in the City of Monroe and along the Lake Erie coastline. There are also two mobile home parks in the townships with higher population densities than the surrounding area. Though consistent with regional trends across southeast Michigan, the population loss in the City of Monroe is higher than the regional average.

Population forecasts developed by SEMCOG in 2012 suggest that a decrease in the overall population in the City of Monroe and Monroe Charter Township can be expected in the next decade. Despite the downward trend, forecasts also predict a modest increase in overall population in the two townships by 2030. However, the projected 2040 population for the City of Monroe is predicted to be less than the population recorded in 2010.

Map 3.1 Population Density, People per Square Mile



Although there is no way to predict the total population growth with certainty, it is important to consider these forecasts while developing public policy and land use regulations. Figure 3.2 presents the population projections for the City of Monroe, Monroe Charter Township, Frenchtown Charter Township and Monroe County for the next 30 years. According to SEMCOG, these projections are based on historical data and established, well-tested computer models used in large metropolitan areas across the United States.

Figure 3.2 Population Projections

	2010	2020	2030	2040
City of Monroe	20,733	19,899	19,995	20,164
Monroe Charter Township	14,568	14,513	15,233	15,515
Frenchtown Charter Township	20,428	21,319	22,266	23,633
Monroe County	152,021	156,592	160,841	164,720

Source: 2012 SEMCOG Community Profiles

RACIAL MAKEUP

In 2000 and again in 2010, citizens identified as “white” made up between 85% and 95% of the population within the Monroe Community. The number of citizens defined by a race other than “white” is relatively small. However, between 2000 and 2010, each of these populations (except “Asians”) witnessed a modest increase. The largest of these minority populations in the City of Monroe is the “Black” population whereas the largest minority population in each Township is the “Hispanic/Latino” population. Figure 3.3 presents the racial makeup of the Monroe Community for 2000 and 2010.



Figure 3.3 Racial Makeup

Race	City of Monroe				
	2000		2010		Change 2000 - 2010
	Number	Percent	Number	Percent	
White	19,748	89.5%	17,855	86.1%	-3.3%
Black	1,092	4.9%	1,251	6.0%	1.1%
Asian	186	0.8%	140	0.7%	-0.2%
Hispanic	610	2.8%	860	4.1%	1.4%
Multi-Racial	376	1.7%	524	2.5%	0.8%
Other	64	0.3%	103	0.5%	0.2%

Race	Monroe Charter Twp.				
	2000		2010		Change 2000 - 2010
	Number	Percent	Number	Percent	
White	12,659	93.8%	13,224	90.8%	-3.1%
Black	244	1.8%	356	2.4%	0.6%
Asian	111	0.8%	108	0.7%	-0.1%
Hispanic	266	2.0%	587	4.0%	2.1%
Multi-Racial	172	1.3%	269	1.8%	0.6%
Other	39	0.3%	24	0.2%	-0.1%

Race	Frenchtown Charter Twp.				
	2000		2010		Change 2000 - 2010
	Number	Percent	Number	Percent	
White	19,475	93.7%	18,598	91.0%	-2.7%
Black	326	1.6%	415	2.0%	0.5%
Asian	109	0.5%	129	0.6%	0.1%
Hispanic	510	2.5%	847	4.1%	1.7%
Multi-Racial	267	1.3%	370	1.8%	0.5%
Other	90	0.4%	69	0.1%	-0.1%

Source: 2012 SEMCOG Community Profiles

AGE DISTRIBUTION

The age distribution of the Monroe Community can be an important factor in identifying social and economic trends as well as public service needs. There are several identifiable stages that individuals go through during the span of a lifetime. Using U.S. Census Bureau statistics, we have characterized eight life-stages, including: (1) Preschool; (2) Elementary/Secondary; (3) College; (4) Young Family; (5) Established Family; (6) Mature Family; and (7) Retired.

As detailed in Figure 3.4, the 2010 Census statistics demonstrate the largest population group in each of the three jurisdictions is the *Established Family*, ages 35 to 59 years old (around 33% of the population). This population group was the largest in 2000 as well.



Figure 3.4 Age Distribution

City of Monroe										
Stage of Life	Age Group	2010	2015	2020	2025	2030	2035	2040	Change (2010 - 2040)	
									Number	Percent
Preschool	Under 4	1,561	1,291	1,269	1,229	1,173	1,186	1,116	-445	-28.5%
Elementary/Secondary	5 to 17	3,874	3,368	3,009	2,893	3,024	3,280	3,139	-735	-19.0%
College	18 to 24	1,884	1,688	1,542	1,427	1,334	1,349	1,367	-517	-27.4%
Young Family	25 to 34	2,731	2,576	2,915	2,889	2,704	2,519	2,420	-311	-11.4%
Established Family	35 to 59	6,881	6,396	5,848	5,454	5,544	5,744	5,878	-1,003	-14.6%
Mature Family	60 to 64	1,041	1,261	1,354	1,290	1,118	968	902	-139	-13.4%
Retired	65+	2,761	3,238	3,962	4,618	5,098	5,306	5,342	2,581	93.5%
Total		20,733	19,818	19,899	19,800	19,995	20,352	20,164	-569	-2.7%

Frenchtown Ch. Township										
Stage of Life	Age Group	2010	2015	2020	2025	2030	2035	2040	Change	
									Number	Percent
Preschool	Under 4	1,235	1,217	1,218	1,370	1,390	1,352	1,292	57	4.6%
Elementary/Secondary	5 to 17	3,502	3,389	3,136	3,150	3,264	3,452	3,699	197	5.6%
College	18 to 24	1,967	2,002	1,769	1,545	1,454	1,420	1,702	-265	-13.5%
Young Family	25 to 34	2,409	2,630	2,930	3,131	2,781	2,734	2,652	243	10.1%
Established Family	35 to 59	7,424	7,239	6,718	6,467	6,845	7,190	7,616	192	2.6%
Mature Family	60 to 64	1,146	1,324	1,459	1,408	1,206	1,106	1,082	-64	-5.6%
Retired	65+	2,745	3,320	4,089	4,761	5,326	5,549	5,590	2,845	103.6%
Total		20,428	21,121	21,319	21,832	22,266	22,803	23,633	3,205	15.7%

Monroe Ch. Township										
Stage of Life	Age Group	2010	2015	2020	2025	2030	2035	2040	Change	
									Number	Percent
Preschool	Under 4	864	779	844	945	905	869	841	-23	-2.7%
Elementary/Secondary	5 to 17	2,605	2,296	2,223	2,148	2,309	2,342	2,333	-272	-10.4%
College	18 to 24	1,251	1,238	1,084	1,021	940	904	983	-268	-21.4%
Young Family	25 to 34	1,709	1,765	2,063	2,089	2,114	1,932	1,834	125	7.3%
Established Family	35 to 59	5,188	4,762	4,336	4,206	4,275	4,485	4,770	-418	-8.1%
Mature Family	60 to 64	847	990	1,089	1,062	887	754	686	-161	-19.0%
Retired	65+	2,104	2,411	2,874	3,422	3,803	3,994	4,068	1,964	93.3%
Total		14,568	14,241	14,513	14,893	15,233	15,280	15,515	947	6.5%

Monroe County										
Stage of Life	Age Group	2010	2015	2020	2025	2030	2035	2040	Change	
									Number	Percent
Preschool	Under 4	8,719	8,511	8,867	9,223	9,153	8,853	8,625	-94	-1.1%
Elementary/Secondary	5 to 17	27,958	26,159	23,931	23,426	24,312	25,300	25,315	-2,643	-9.5%
College	18 to 24	12,763	13,576	11,943	10,683	9,776	9,666	10,571	-2,192	-17.2%
Young Family	25 to 34	16,517	18,322	21,060	21,379	19,893	18,923	18,144	1,627	9.9%
Established Family	35 to 59	56,663	53,674	49,039	46,771	48,226	50,245	52,398	-4,265	-7.5%
Mature Family	60 to 64	9,009	10,765	11,844	11,435	9,788	8,692	8,149	-860	-9.5%
Retired	65+	20,392	24,683	29,908	35,415	39,693	41,501	41,518	21,126	103.6%
Total		152,021	155,690	156,592	158,332	160,841	163,180	164,720	12,699	8.4%

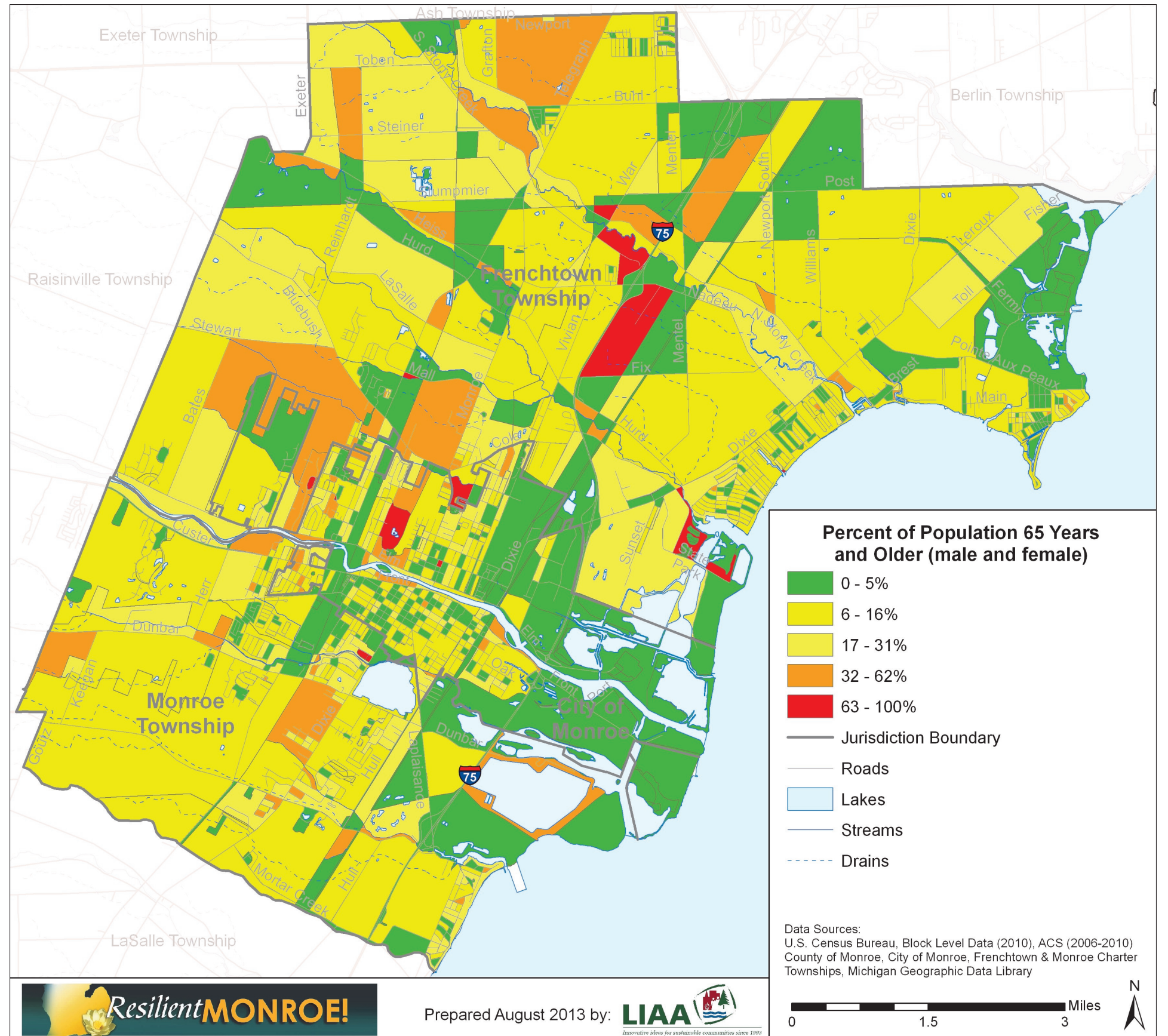
The *Retired* group is the third largest cohort in all three jurisdictions. However, according to SEMCOG projections, the number of people in the *Retired* group will increase substantially in coming years. The population in this age group is projected to increase by over 90% in the City of Monroe and Monroe Charter Township and over 100% in Frenchtown Township by 2040. In the City of Monroe, the *Retired* group is the only age group predicted to increase over the next 30 years. Increases in the older adult population present challenges to the community. By offering a diversity of social services, neighborhoods where individuals can age in place, and accessible transportation options, communities can greatly improve the quality of life offered to the senior population. As illustrated in Map 3.2, there are currently high concentrations of older adults living long distances from commercial districts, centralized services, transit service, and dense population areas.

TODAY'S SENIOR POPULATION DESIRES AMENITIES SIMILAR TO THAT OF THE MILLENNIAL GENERATION, INCLUDING WALKABLE NEIGHBORHOODS, A ROBUST PUBLIC TRANSIT SYSTEM, AND A DIVERSITY OF HOUSING OPTIONS.



Photo Courtesy of Bill Saul

Map 3.2 Percent of Population 65 Years or Older



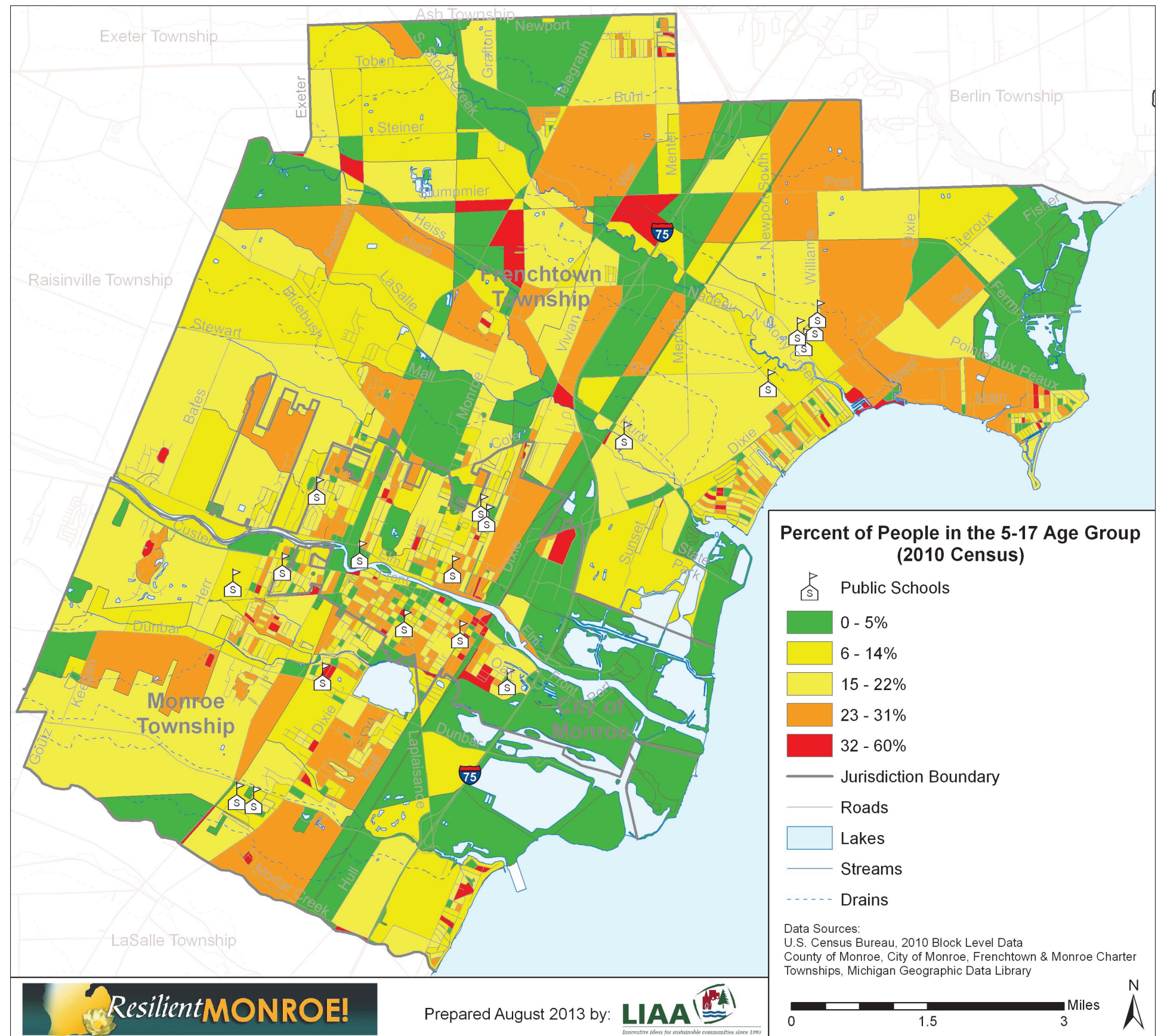
Of particular importance is the projected decline in young residents. The *Preschool, Elementary/Secondary, and College* categories are all projected to decrease in Monroe Charter Township and the City of Monroe through 2040 (see Figure 3.4). This raises concern for both schools and planners.

Map 3.3 indicates where varying concentrations of school-aged young people live (ages 5-17 years). It is worth noting where the highest concentrations of school-aged young people live. In a number of areas, concentrations of young people are 30%-60% of the total population, but the closest public school is two or more miles away.



Photo Courtesy of Jeff Green

Map 3.3 Percent of People in the 5-17 Age Range



INCOME

As with most of Michigan, the median household income declined from 2000 to 2010 in all three jurisdictions (see Figure 3.5 and Map 3.4). The trend of income decline is consistent with Monroe County and southeast Michigan. This loss of income across Michigan is often attributed to the general decline in high-paying manufacturing jobs. As of 2010, the median household income was lower in the city and both townships as compared with Monroe County and southeast Michigan.

Figure 3.5 Median Household Income

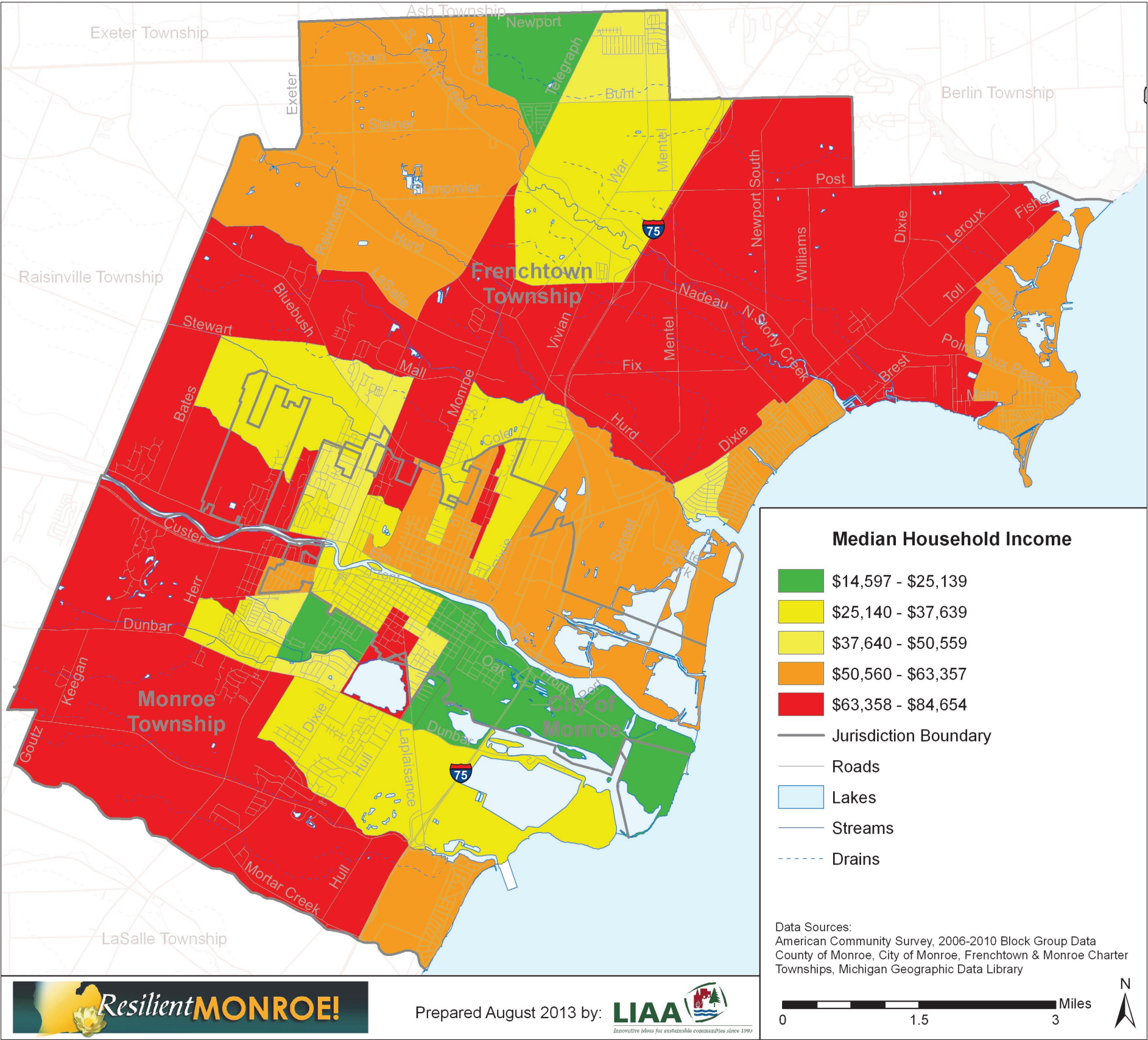
Community	5-Yr. ACS 2010 (Dollars)	Change 2000 - 2010 Dollars	Percent Change 2000 - 2010
City of Monroe	\$42,673	(12,050)	-22.0%
Monroe Ch. Township	\$46,718	(13,089)	-21.9%
Frenchtown Ch. Township	\$52,111	(10,320)	-16.5%
Monroe County	\$55,366	(12,358)	-18.2%
Southeast Michigan	\$53,242	(12,173)	-18.6%

Source: 2012 SEMCOG Community Profiles



Photo Courtesy of Bill Saul

Map 3.4 Median Household Income



POVERTY STATUS

Percent of persons living in poverty and percent of households living in poverty is higher in all three jurisdictions than in the County on average (see Figure 3.6). The City of Monroe has the highest averages, with 15% of people living below the poverty line and 15.1% of households living below the poverty line.

Figure 3.6 Poverty Status, 2010

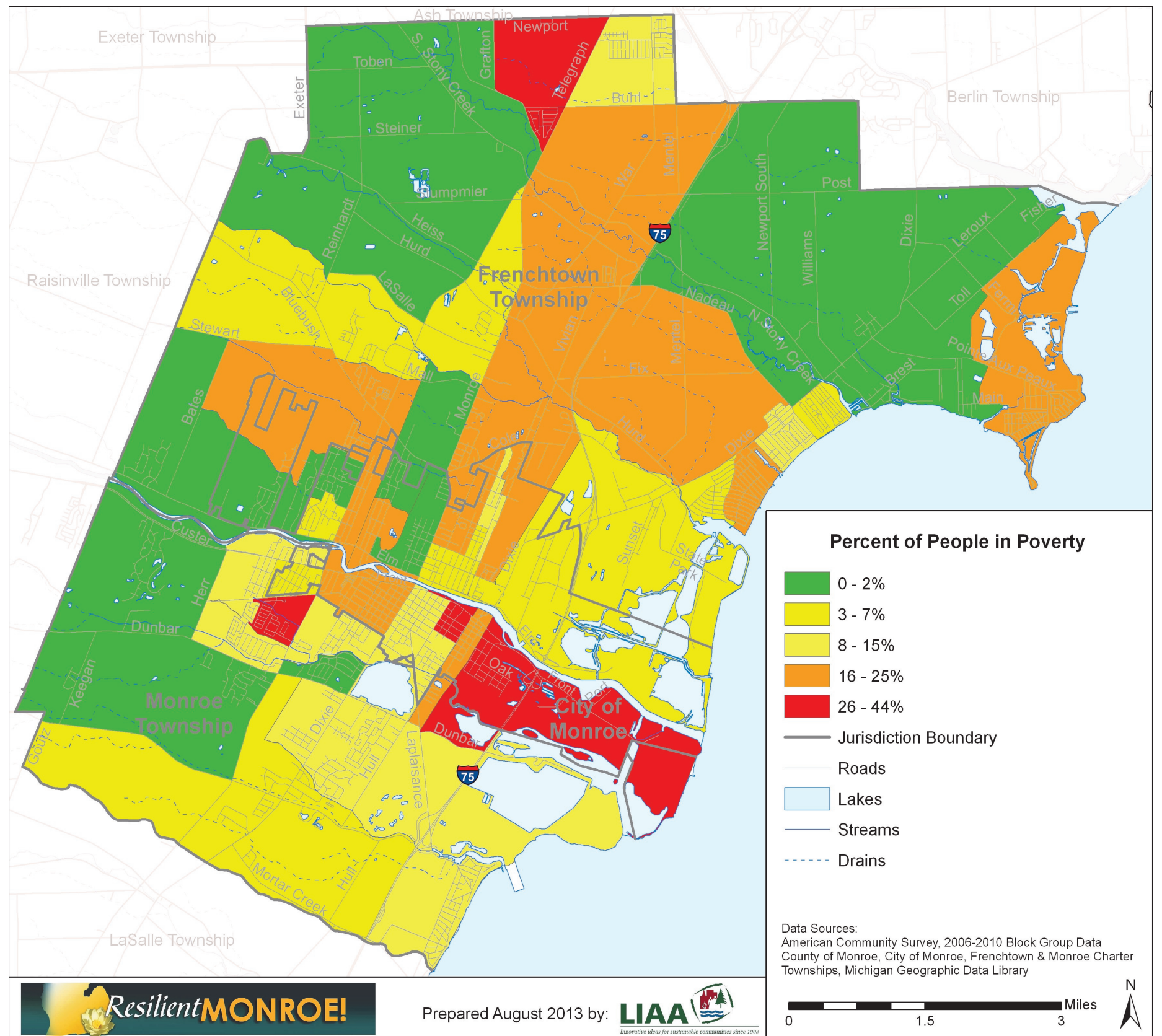
5-Yr. ACS Survey 2010	City of Monroe	Monroe Charter Twp.	Frenchtown Charter Twp.	Monroe County
Persons in Poverty	15.0%	10.4%	11.9%	9.0%
Households in Poverty	15.1%	12.3%	11.6%	9.2%

Source: 2012 SEMCOG Community Profiles

In areas highlighted in red on Map 3.5, approximately 25% to over 43% of residents were living below the federally designated poverty level of just over \$23,000 per year for a family of four in 2010. In addition to the city, significant concentrations of poverty also exist in the two townships. The red triangle in the north portion of the community in Frenchtown and the red section in the southwest portion of Monroe Charter Township are mobile home parks. The red section in the City of Monroe is the *Orchard East Neighborhood*, which is cut off from much of the community by heavily traveled rail lines.



Map 3.5 Percent of People in Poverty



EDUCATIONAL ATTAINMENT

Overall, it appears that educational attainment is slowly rising in the Community. Although both townships and the city have a higher percentage of residents who did not graduate from high school than the county average, that percentage has decreased over the past 10 years. Of the three jurisdictions, the City of Monroe has both the lowest percentage of residents without a high school diploma and the highest percentage of residents with a Bachelor’s degree or higher.

Figure 3.7 Educational Attainment

Community	Did Not Graduate High School		High School Graduate		Associate Degree or Some College		Bachelor's Degree or Higher	
	5-Yr. ACS 2010	Percent Change 2000 - 2010	5-Yr. ACS 2010	Percent Change 2000 - 2010	5-Yr. ACS 2010	Percent Change 2000 - 2010	5-Yr. ACS 2010	Percent Change 2000 - 2010
City of Monroe	12.4%	-8.3%	34.1%	0.2%	33.0%	4.3%	20.5%	3.7%
Monroe Ch. Township	18.3%	-3.5%	33.4%	-2.4%	31.4%	2.8%	16.9%	3.0%
Frenchtown Ch. Township	15.9%	-6.8%	42.8%	2.8%	29.0%	0.9%	12.3%	3.1%
Monroe County	12.3%	-4.6%	37.8%	0.5%	32.9%	1.4%	17.0%	2.7%
Southeast Michigan	12.2%	-4.9%	28.5%	0.2%	30.9%	1.0%	28.5%	3.7%

Source: 2012 SEMCOG Community Profiles

HOUSEHOLD SIZE

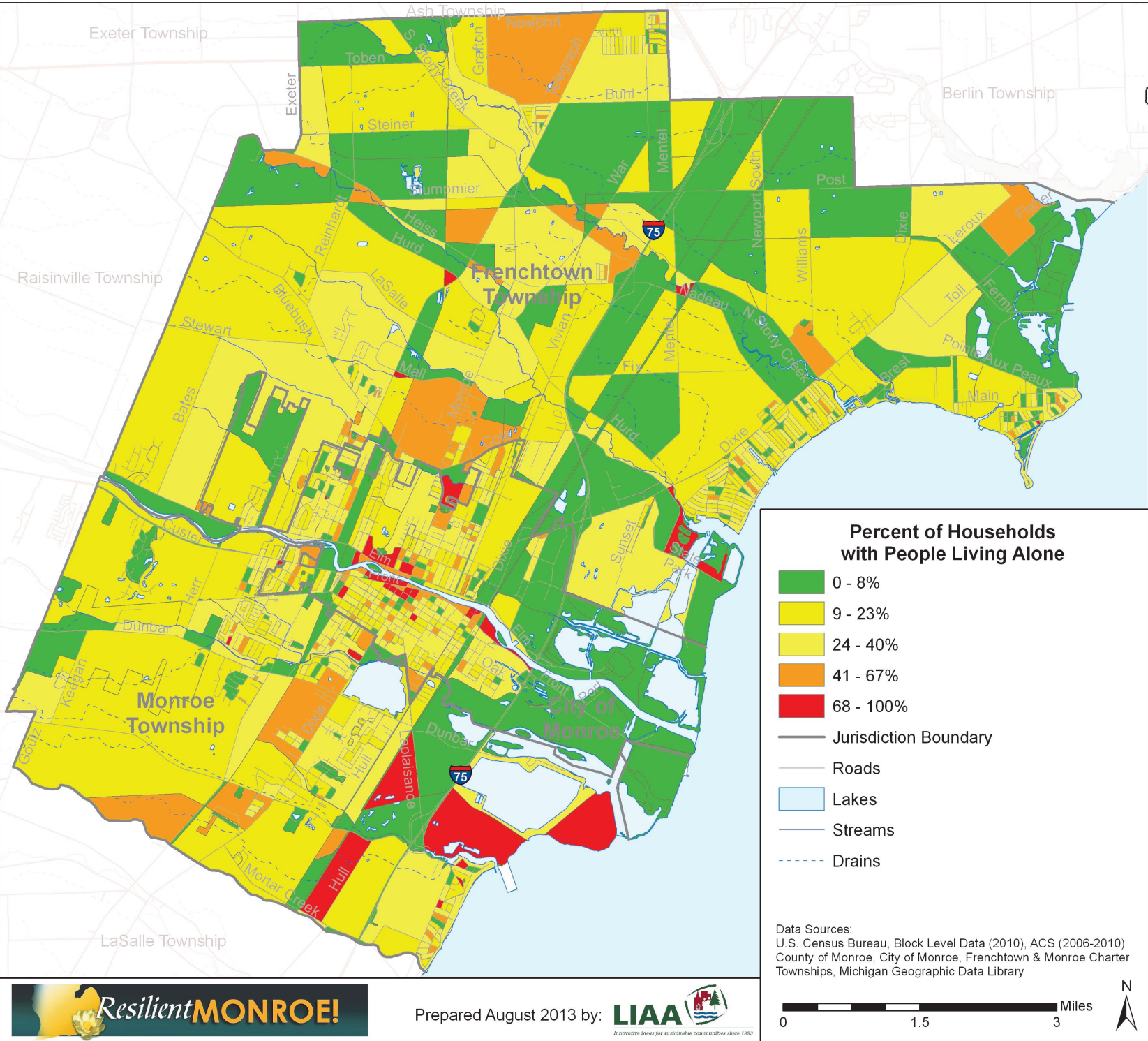
Consistent with trends observed nationwide, the average household size is decreasing in the Monroe Community (see Figure 3.8). Although Frenchtown Charter Township has the largest average household size in the Monroe Community, from 2000 to 2010 the average household size decreased the most in Frenchtown Charter Township. Household size is projected to continue to decline to 2.27 in the City of Monroe by 2040. As illustrated in Map 3.6, there is a high concentration of people living alone in the downtown district.

Figure 3.8 Average Household Size

Community	Average Household Size 2010	Percent Change 2000 - 2010	Estimate July 2012	Projection 2040
City of Monroe	2.44	-0.03%	2.44	2.27
Monroe Ch. Township	2.49	-0.02%	2.48	2.28
Frenchtown Ch. Township	2.53	-0.12%	2.50	2.39
Monroe County	2.59	-0.10%	2.56	2.40
Southeast Michigan	2.51	-0.06%	2.50	2.39

Source: 2012 SEMCOG Community Profiles

Map 3.6 Percent of Households with People Living Alone



COMMUTE MODE

According to data gathered by the Census and the five-year American Community Survey (ACS), the vast majority of commuters drive to work alone in the Monroe Community. Despite a fairly robust public transit system, less than 1% of commuters in the Monroe Community report taking transit to work. The average travel time to work is 20 to 25 minutes, with the City of Monroe having the shortest average time. The average commute time county-wide has declined slightly from 2000.

Figure 3.9 Commute Mode

	City of Monroe		Monroe Charter Twp.		Frenchtown Ch. Twp.		Monroe County	
	People	Percent	People	Percent	People	Percent	People	Percent
Drove Alone	8,105	84.6%	5,159	91.1%	7,842	87.6%	59,420	87.4%
Carpooled	800	8.3%	230	4.1%	703	7.8%	5,185	7.6%
Public Transit	119	1.2%	0	0.0%	17	0.2%	220	0.3%
Walked	290	3.0%	52	0.9%	199	2.2%	980	1.4%
Other Means	80	0.8%	73	1.3%	57	0.6%	555	0.8%
Worked at Home	188	2.0%	147	2.6%	139	1.6%	1,647	2.4%
Mean Travel Time to Work (minutes)	21.4		23.6		24.0		24.7	

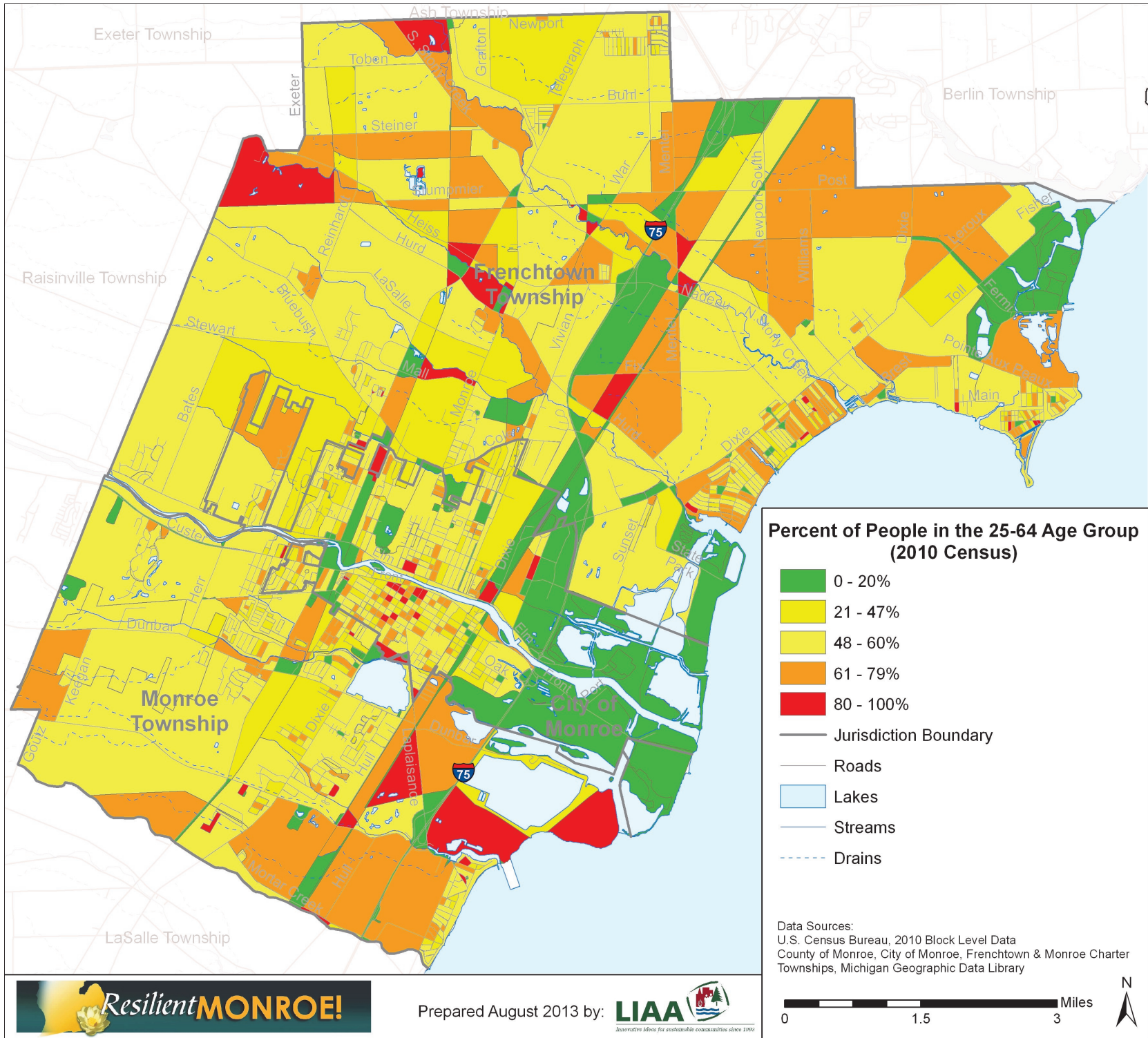
Source: 2012 SEMCOG Community Profiles

As is illustrated in Map 3.7, the typical “commuter” demographic (persons 25-64 years of age) is distributed fairly evenly across the Community. Many places in the Community where commuters likely live are not ideal for commuting by bicycle, walking, or transit.



Photo Courtesy of Bill Saul

Map 3.7 Percent of People in the 25-64 Age Group



HEALTH

There are a variety of factors that impact the general health of the community. For example, people who live in communities with safe and accessible parks and recreation spaces are more likely to exercise, which reduces heart disease risk. The Robert Wood Johnson Foundation and the University of Wisconsin collaborated to produce *County Health Rankings & Roadmaps*, a community health ranking system of counties across the country.¹⁰ This resource ranks counties in terms of health outcomes and health factors. Health *outcomes* represent how healthy a county is, while health *factors* represent what influences the health of the county. For example, mortality and morbidity rates are measures of health *outcomes*. *Health factors* include diet and exercise, access to healthcare, education and income, and the built environment. All of these *factors* are measurable. The underlying assumption is that by identifying and improving *health factors*, a community can change *health outcomes* through targeted community planning and health policies.

Figure 3.10 presents data gathered on health outcomes in Monroe County. The county ranks 37th out of 82 counties in the State of Michigan that have data on health outcomes. Overall, the incidence of premature death is lower than the incidence of disease.

Figure 3.10 Health Outcomes

	Monroe County	Error Margin	Michigan	National Benchmark*	Rank (of 82)
Heath Outcomes					37
Mortality					28
Premature death	6,696	6,229-7,164	7,254	5,317	
Years of potential life lost before age 75 per 100,000 population					
Morbidity					47
Poor or fair health	14%	12-18%	14%	10%	
Percent of adults reporting fair or poor health, 2005-2011 (age-adjusted)					
Poor physical health days	3.5	2.8-4.1	3.5	2.6	
Average number of physically unhealthy days reported in past 30 days, 2005-2011 (age-adjusted)					
Poor mental health days	3.8	3.0-4.6	3.7	2.3	
Average number of mentally unhealthy days reported in past 30 days, 2011-2013 (age-adjusted)					
Low birthweight	7.20%	6.7-7.7%	8%	6%	
Percent of live births with low birthweight (< 2500 grams)					

* 90th percentile, i.e., only 10% are better. Source: Source: RWJ Foundation, County Health Rankings and Road Maps 2013

Monroe County ranks in the better half of Michigan counties in terms of health *outcomes*. However, adult obesity, physical inactivity, and excessive drinking tend to be higher in Monroe County than the state as a whole (see Figure 3.11).

Figure 3.11 Health Factors: Health Behavior

	Monroe County	Error Margin	Michigan	National Benchmark*	Rank (of 82)
Health Factors					43
Health Behaviors					58
Adult smoking	21%	17-25%	20%	13%	
Percent of adults that report smoking >= 100 cigarettes and currently smoking, 2005-2011					
Adult obesity	35%	31-40%	32%	25%	
Adult obesity, 2009 (percent of adults that report a BMI >= 30)					
Physical inactivity	28%	24-32%	25%	21%	
Physical inactivity, 2009 (percent of adults that report no leisure time physical activity)					
Excessive drinking	23%	18-28%	19%	7%	
Excessive drinking, 2005-2011 (percent of adults who report heavy or bringe drinking)					
Motor vehicle crash death rate	12	--	11	10	
Motor vehicle crash deaths per 100,000 population, 2004-2010					
Sexually transmitted infections	206	--	500	92	
Chlamydia rate per 100,000 population, 2010					
Teen birth rate	28	26-29	32	21	
Teen birth rate per 1,000 females ages 15-19, 2004-2010					

* 90th percentile, i.e., only 10% are better. Source: Source: RWJ Foundation, County Health Rankings and Road Maps 2013



Photo Courtesy of Bill Saul

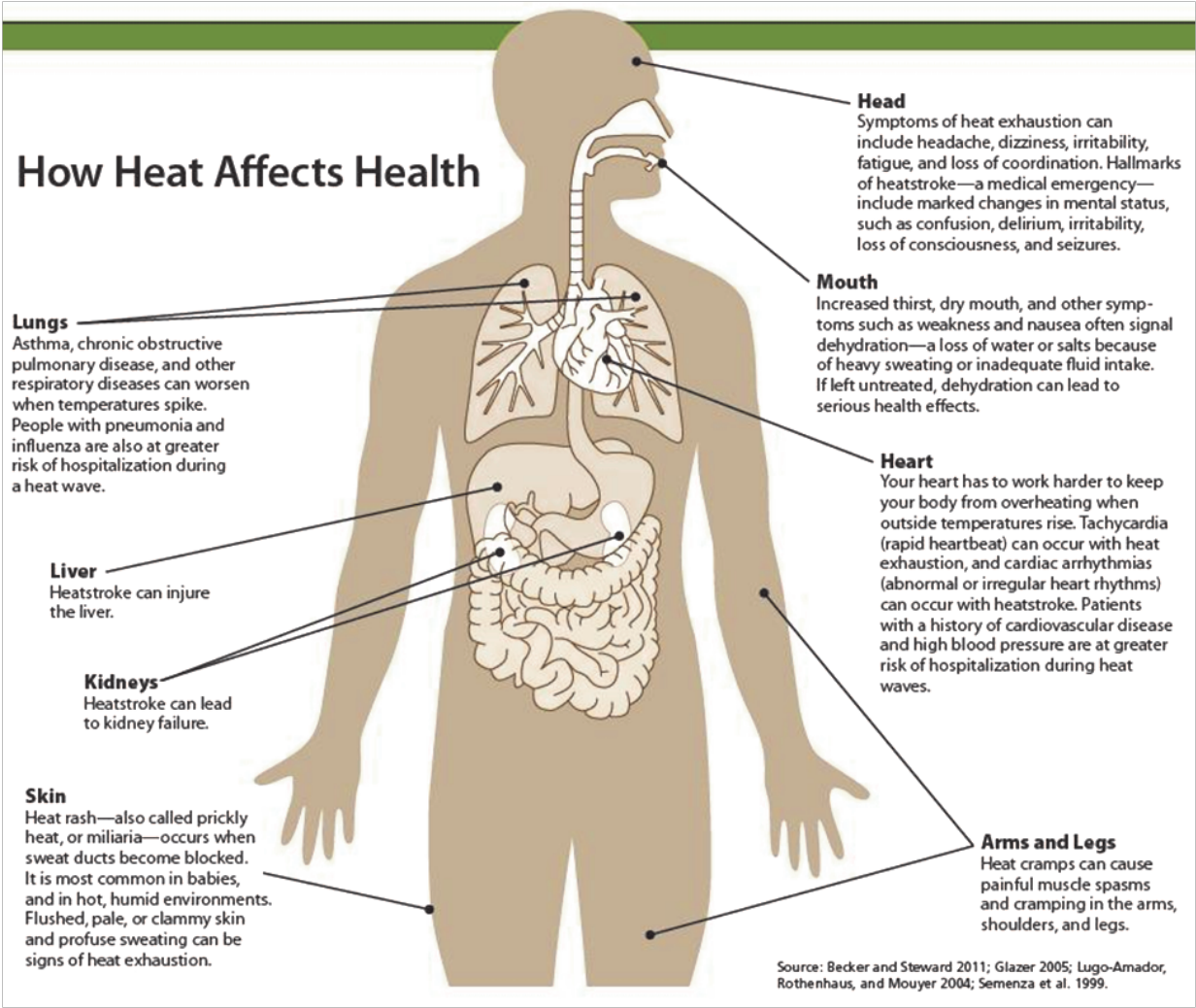
CLIMATE CHANGE, HEAT & HUMAN HEALTH

Unlike a specific disease or a dangerous chemical, increases in climate variability can present a variety of harmful health effects. In some cases, such as extreme heat waves or severe storms, the health threats are direct. In other cases the threat is indirect, such as the increases of allergens and ozone that accompany some heat waves. However, in most cases, these risks to human health can be managed or limited by planning, preparation and action at the community and local government levels.

Heat is considered the leading cause of weather-related deaths in the United States. According to the *U.S. Global Change Research Program*, over 3,400 deaths related to excessive heat exposures were reported between 1999 and 2003.⁶ Climate change is expected to increase the frequency, severity and duration of heat waves over the coming decades. Studies completed in Chicago suggest that the number of deaths due to heat waves could more than double by 2050.

There are a number of factors that make human populations particularly vulnerable to heat-related illness and death. For example, a body’s heat regulating systems are not as effective in older people (e.g., 65 years and older) and the very young (4 years or younger). Homeless people and people in poverty are also at greater risk due to limited access to adequately cooled living conditions. Human health studies also indicate that pre-existing conditions such as asthma, heart conditions and diabetes put people at greater risk.¹¹

Adding to the risks caused by exposures to excessive heat, climate change is predicted to increase air quality concerns. For example, ground-level ozone (a component in smog) is related to temperature and is projected to be much worse as average temperatures increase. Very warm stagnant air is projected to increase the levels of allergens in the air as well. Again, some people are more sensitive to these conditions than others, making them more vulnerable if exposed.



HEAT-RELATED DEATHS – MILWAUKEE, WISCONSIN

In July 2013, a severe heat wave moved in across much of the upper Midwest. In Milwaukee, the high temperatures were between 93 and 95 degrees F each day from July 16th through July 19th (four days in a row). Making this heat much worse, the temperatures didn’t drop below 79 degrees for three nights in a row. By the end of the week, five people had died. Three people aged 64, 71 and 79 were found dead in their homes. Two others, aged 44 and 69, died in the hospital after being discovered unresponsive.

Out of the 82 counties in Michigan with health information available, Monroe County ranks 73rd in clinical care. As is shown in Figure 3.12, preventable hospitalizations are significantly higher, and health screenings are significantly lower, in Monroe County than in the state overall. There are also about half as many doctors and dentists per person in Monroe as compared with the rest of the state (see Figure 3.12).

Figure 3.12 County Health Factors: Clinical Care

	Monroe County	Error Margin	Michigan	National Benchmark*	Rank (of 82)
Health Factors					43
Clinical Care					73
Uninsured	11%	10-12%	14%	11%	
Percent of population < age 65 without health insurance, 2010					
Primary care physicians	2,666:1		1,271:1	1,067:1	
Ratio of population to primary care physicians, 2011-2012					
Dentists	3,069:1		1,626:1	1,516:1	
Ratio of population to dentists, 2011-2012					
Preventable hospital stays	88	83-93	70	47	
Preventable hospital stays rate per 1,000 Medicare enrollees, 2010					
Diabetic screening	77%	74-81%	86%	90%	
Percent of diabetics that receive HbA1c screening, 2010					
Mammography screening	62%	57-66%	67%	73%	
Percent of females that receive screening, 2010					

* 90th percentile, i.e., only 10% are better. Source: Source: RWJ Foundation, County Health Rankings and Road Maps 2013



There is significantly more fine particulate matter in the air in Monroe County than is typical for the state as a whole. It is also interesting to note that access to parks in Monroe County is significantly lower than the state average (see Figure 3.13)

Figure 3.13 Health Indicators: Physical Environment

	Monroe County	Error Margin	Michigan	National Benchmark*	Rank (of 82)
Health Factors					43
Physical Environment					68
Daily fine particulate matter	12.3	12.1-12.4	9.9	8.8	
Average daily measure in micrograms per cubic meter, 2008					
Access to recreational facilities	9		9	16	
Rate per 100,000 population, 2010					
Limited access to healthy foods	5%		6%	1%	
Percent of population who lives in poverty and more than 10 miles from a grocery store					
Fast food restaurants	51%		49%	27%	
Percent of all restaurants that are fast food, 2010					
Physical Environment					
Commuting alone	87%		83%		
American Community Survey, 5-year estimates, 2007-2011					
Access to parks	23%		37%		

*90th percentile, i.e., only 10% are better. Source: Source: RWJ Foundation, County Health Rankings and Road Maps 2013



Figures 3.14 and 3.15 are from data compiled by the Michigan Department of Community Health. The rates are based on key health indicators of chronic disease and unhealthy behaviors, and on risk factors derived from Michigan Behavioral Risk Factor surveys, hospitalization data, and indicators of access to health care.¹²

As illustrated in Figure 3.14, the rates of disability and obesity are slightly higher in Monroe County than in the state of Michigan overall and the rates of arthritis are significantly higher in Monroe County than the state overall.

Figure 3.14 Self-Reported Conditions

	Rate (Percentage)	
	Monroe County	Michigan
Disability	26.4	23.7
Asthma (Still)	10.1	10.1
Asthma (Ever)	15.8	15.6
Diabetes	8.8	9.5
Heart Attack	4.5	4.6
Angina or Coronary Heart Disease	4.0	4.8
Stroke	3.1	2.8
Any Cardiovascular Disease	9.8	8.9
Obesity	37.3	30.9
Arthritis	46.4	31.5

Source: Monroe County Health Department

Figure 3.15 is a compilation of data from regional hospitals in the Monroe area. Hospitalization rates for asthma are significantly higher for females and adults in Monroe County than in the state overall.

Figure 3.15 Asthma Hospitalizations per Year in Monroe County

Group	Average Number of Asthma Hospitalizations per Year in Monroe	Asthma Hospitalization Rate per 10,000 People in Monroe County	Asthma Hospitalization Rate per 10,000 People in Michigan
Total	294	18.9	16.2
Sex			
Male	96	13.5	12.4
Female	198	24.2	19.5
Race			
White	253	17.1	11
Black	13	35.2	45.1
Age			
0-17	60	17.5	17.1
≥18	234	19.4	15.8

Source: Monroe County Health Department

COMMUNITY AND CULTURE

The Monroe Community has a wide variety of cultural events and opportunities. The following overview is reprinted from the *Monroe County Comprehensive Economic Development Strategy*.¹³

The Monroe City/County Fine Arts Council offers programs and scholarships, the River Raisin Centre for the Arts in downtown Monroe and the Meyer Theater at Monroe County Community College host numerous cultural events of all kinds...Monroe has often been called the walleye capital of the world, and fishing is a year-round activity. William C. Sterling State Park, with its beach, campgrounds, and boat launching facilities, is one of the top 5 Michigan state parks in terms of attendance with an average of about 1-million visitors annually. Many commercial marinas are very popular during the warmer months. River Raisin Jazz Festival during the second weekend in August attracts over 50,000 visitors each summer. Other local annual events include an annual fife and drum corps parade in downtown Monroe, the River Raisin Independence Festival and Fireworks Show on Lake Erie in July, the River Raisin Labor Day BBQ Festival, the Observance of Custer Week in October, and the Pipers' Holiday Christmas Show in December. The Monroe County Fair is considered to be one of Michigan's finest county fairs.

History

As the third oldest city in Michigan, the City of Monroe has a rich history that is cultivated and celebrated throughout the Community. The River Raisin National Battlefield Park, which is located on a battlefield from the War of 1812, was officially opened to the public in October 2010. Built in 1910, the George Armstrong Custer Equestrian Monument is located in the heart of downtown, at the corner of Elm Avenue and North Monroe Street. The Monroe County Labor History Museum in downtown Monroe has a number of permanent exhibits that feature the 1937 labor negotiation at the Newton 21 Steel Company. The Monroe County Historical Museum features a large, permanent George Custer collection as well as items from the French Town settlement, the early Victorian settlement in Monroe, and a diverse array of Native American artifacts.

The Monroe Community also has no shortage of historical groups. The City of Monroe has a Historic District Commission that oversees a number of Historic Districts within the City limits. The City of Monroe has three historic districts, one historic site, and five individual resources listed in the National Register of Historic Places. Monroe County has a Historical Commission, which is a department of



Monroe County and is focused on historic properties in the County as well as on the County Historical Museum. There is also a Historical Society for the Monroe County area, which is a non-profit with one part-time staff person. The goal of the Historical Society is building strong local preservation through education, training and advocacy for historic landmarks and districts.

Schools

The Monroe County Intermediate School District (ISD) is a regional educational agency providing specialized services, including special education programs, general education programs, and business services to stakeholders throughout the community. The Monroe County ISD provides services to both the public and non-public schools of Monroe County. Jefferson Public Schools and Monroe Public Schools are the two school districts that fall within the Monroe Community. Founded in 1964, Monroe County Community College (MCCC) is a public, two-year institution. Currently, over 4,000 students attend the college, which is a fully accredited institution offering pre-professional programs for students of all ages.

Social Services

The Monroe Community has a robust array of social and support services for its diverse population. The following is an overview of important social service assets in the Community:

- † The **Monroe County Employment and Training Department** (MCETD) is a program to equip residents in Monroe County with the tools and knowledge they need to find a job and succeed in the workplace, with a special emphasis on moving forward successfully in Michigan's transitioning economy.
- † The **Monroe County Healthy Communities Coalition** is a group convened by the County Health Department to address the fact that Monroe County is the fourth most physically inactive county in the state of Michigan. The group's mission is to empower Monroe County residents to live healthy lifestyles.
- † The **Community Foundation of Monroe County** invests in programs that improve the quality of life of residents in Monroe County. The Foundation convenes civic and social leaders to identify local needs.
- † The **Human Services Collaborative Network** is an informal network of representatives from most social services organizations in Monroe County that meet monthly to share information and exchange ideas.
- † The **Monroe County Commission on Aging** coordinates the use of county senior millage dollars that are specifically designated to provide services for seniors in their daily lives. Services include transportation assistance, counseling, health and nutrition support, partial funding for the seven county senior citizen centers, and access to other important resources.
- † The **Monroe County Opportunity Program (MCOP)** runs a variety of programs that benefit residents in Monroe. MCOP has set up local food pantries and emergency food programs and provides access to low-income housing and services for the homeless. The program also runs educational programs ranging from home weatherization to tax preparation.

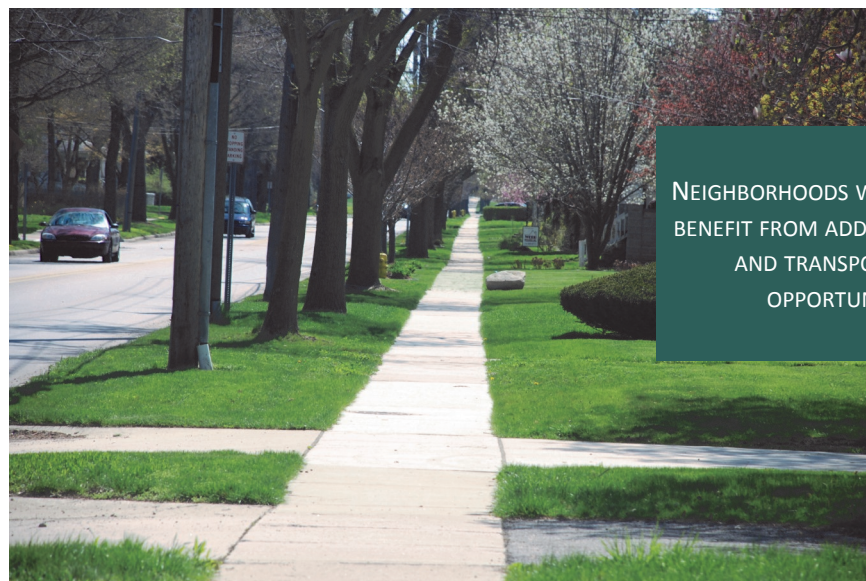


CHAPTER 4. COMMUNITY ASSETS: BUILT SYSTEMS

The foundation of Monroe's *built environment* can be traced back to the late 1700s, when French explorers established a permanent settlement called French Town with a trading post along the River Raisin. Prior to European settlement, migratory routes were established by the Ottawa and Pottawatomie tribes. These routes are still visible today in the form of highways that were built along their routes. "The original French and French-Canadian settlers divided land using a traditional system of parceling property into long, narrow pieces, each of which had frontage on the river, which was the main source of water, transportation, commerce and communication."¹⁴

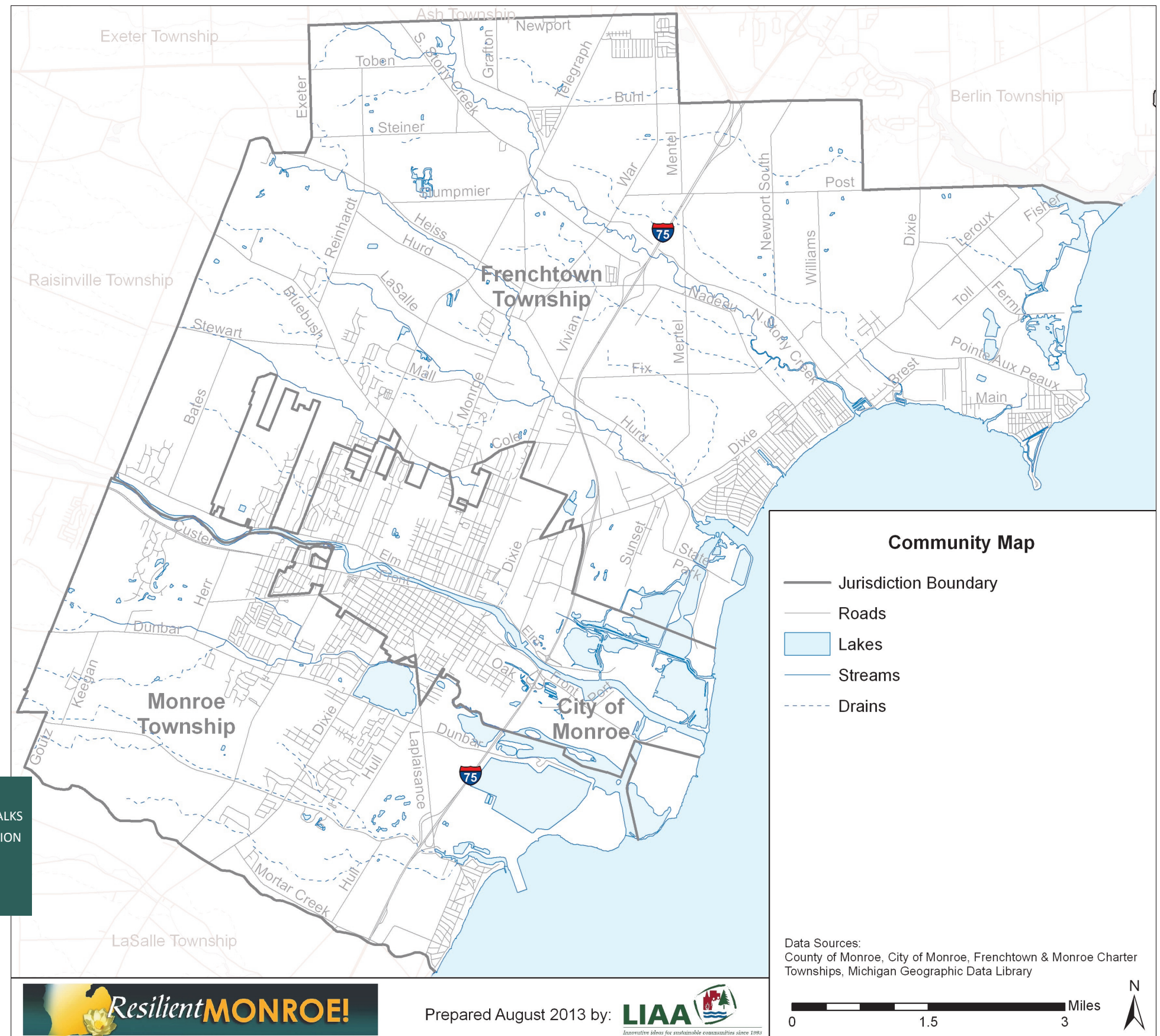
PHYSICAL CHARACTERISTICS

The Monroe Community is geographically located about 40 miles south of Detroit and 23 miles north of Toledo, Ohio, on the western shore of Lake Erie. The Monroe Community, including the city and two townships, is 71.3 square miles in area. Frenchtown Charter Township accounts for over half the land area of the Community with 43.4 square miles within its jurisdiction. Frenchtown and Monroe Charter Townships are more rural in character, with approximately 67% of their total land area classified as open or agriculture and another 20% classified as trees or woody vegetation. Though significantly smaller in area than the two townships, the City of Monroe is the most densely populated jurisdiction. Almost 15% of the city and 9% of Frenchtown Charter Township is



NEIGHBORHOODS WITH SIDEWALKS
BENEFIT FROM ADDED RECREATION
AND TRANSPORTATION
OPPORTUNITIES.

Map 4.1 Community Map



classified as government or institutional, compared with only 1.7% in Monroe Township. This difference is due in part to Sterling State Park, which is located in both Frenchtown and the city.

TRANSPORTATION

In the Monroe Community, there are many ways people and products move from place to place. The major highways in Monroe include South Custer (M-50), Telegraph Road (M-24) and Monroe Street (M-125). These are key transport routes for freight and passenger traffic in and out of the community. Two interstate routes (I-75 and I-275) link Monroe to large population and commerce centers to the north and south. Walking and biking paths such as the River Raisin Heritage Trail are important parts of the transportation system. Sidewalks and bike lanes provide key connections to businesses, public buildings and neighborhoods.

Figure 4.1 Average Annual Vehicle Collisions

	Intersection	Annual Average Collisions 2007-2011	Rank in Jurisdiction	Rank in County	Rank in Region
City of Monroe	Telegraph Rd. S @ Front St. W	27.2	1	2	137
	Cole Rd. @ Monroe St. N	21.0	2	5	293
	Elm Ave. E @ Monroe St. N	13.8	3	9	726
	Telegraph Rd. S @ Lorain St. W	13.4	4	10	762
	Telegraph Rd. N @ Fredericks Dr.	12.6	5	11	837
	Monroe St. S @ 3rd St W	10.0	6	13	1205
Monroe Ch. Township	Front St. W @ Roessler St. S	10.0	7	13	1205
	Telegraph Rd. S @ Front St. W	27.2	1	2	137
	Telegraph Rd. S @ Dunbar Rd. W	20.4	2	6	312
Frenchtown Ch. Township	Dixie Hwy S. @ Dunbar Rd. E	16	3	8	547
	Telegraph Rd. N @ Stewart Rd.	38.8	1	1	39
	Telegraph Rd. N @ Mall Rd.	22.8	2	3	230
	Cole Rd. @ Monroe St. N	21	3	5	293

Source: SEMCOG Regional Traffic Counts Database

Telegraph Road, Monroe Street, and North Dixie Highway are the predominant north-south corridors. The average daily traffic on Telegraph is between 15,000 and 30,000 vehicles depending on the intersection. The average volume of traffic on Monroe Street is between 8,000 and 23,000 vehicles per day, and the average daily traffic volume on North Dixie Highway is between 7,000 and 13,000 vehicles.¹⁵ The segment of Telegraph between Custer Drive and Monroe Street has by far the most accidents per year in the region. On average, between 2007 and 2011, that segment of highway had 196 accidents per year. The short 1½-mile segment of Telegraph between Custer Drive and Stewart Road has on average 108 accidents per year alone.

CLIMATE CHANGE & INFRASTRUCTURE

Civil engineers design roads and bridges as well as city parking lots and sewer systems to handle the water from almost every rain event ever experienced in a particular place, based on past experience. Climatologists provide these engineers with *precipitation tables*, the calculated chances or probabilities of maximum amounts of rain over specific periods of time.

Unfortunately, our climate is undergoing rapid change, raising many doubts about the usefulness of precipitation tables calculated on past experience. In fact, the precipitation tables for the City of Monroe were recently revised upward to reflect newer data. These tables will be revised upward again as more data accumulates concerning increases in extreme precipitation events. However, town and city infrastructure built 10, 20 or 50 years ago was designed to handle smaller storms. As a result, Monroe’s infrastructure is at much greater risk of failure than in the past due to the effects of intense heat, rain storms and flooding.

On March 23, 2011, the City of Monroe received 4.5 inches of rain in one 24-hour period, the largest amount ever recorded (records exist to 1917). Later that fall, the Monroe Community experienced an extended period of wet weather, receiving 7 inches of rain over 11 days.¹⁶ By December 1st, the *Monroe Evening News* announced that flood waters had closed the Monroe YMCA, parts of Elm Street and other city roads, and Veterans Park. The city received numerous calls concerning flood damage to homes in most parts of the city. Unfortunately, such extreme rain events are becoming more common. In NOAA’s recently released *Point Precipitation Frequency Estimates* (Atlas 14, Volume 8), 7 inches of rain over a 10-day period is within the confidence intervals of a 25% chance event.¹⁷ Additionally, a 24-hour rain event of 4.5 inches also falls within confidence intervals for a 25% chance event. In other words, similar rainy periods are not unlikely in the future.

Climate change is also posing significant challenges to transportation infrastructure across much of Michigan. Extreme heat can cause pavement to soften and expand and put additional stress on bridge joints. While air temperatures may be in the 80s, the pavement surface may be over 120 degrees F. There are many examples of concrete becoming overheated during the day with little cooling at night leading to buckling in highway surfaces. For example, in the heat event of June 2011, a section of I-69 near Battle Creek buckled so severely

that traffic was stopped and directed around the site. Similarly, heat can soften road surfaces and result in broken pavement and potholes.



“ . . . ALTHOUGH KNOWING THE MAGNITUDE OF FUTURE EXTREMES WOULD BE USEFUL, IT IS NOT NECESSARY, FOR EXAMPLE, TO KNOW EXACTLY HOW EXTREME PRECIPITATION WILL BE IN THE FUTURE TO KNOW THAT LARGER CULVERTS NEED TO BE USED THAN WERE USED IN PAST ROAD DESIGN.”
[PG. 43, INFRASTRUCTURE ADAPTATION; 2013. GAO-13-242]

Street Network

The Monroe Community is dissected from north to south by three major roadways, including M-24 or Telegraph Road to the west, M-125 (South Dixie Highway and Monroe Street) near the center, and US Interstate 75 to the east. Three freight railroad lines also dissect the community from north to south. State highway M-50 is the only major roadway entering the community from the west, becoming South Custer Avenue. M-50 officially ends and becomes Front Street at Telegraph Road, continuing east into the City of Monroe.

There are several other significant roads that traverse east and west across the Monroe Community, including West Albain and Dunbar Roads to the south in Monroe Charter Township. In addition to South Custer Avenue and Front Street on the south side of the River Raisin, North Custer and Elm Street form an important east-west corridor to the north of the River Raisin. Two important east-west roadways to the north are formed by Stewart and Cole Roads and, farther north, Heiss and Nadeau Roads in Frenchtown Charter Township.

During several of the public discussions for the Resilient Monroe project, participants raised concerns over problems with east-west connectivity across the community. People noted that the rail crossings present hazards to people and traffic, and the long freight trains that use the railways can cause lengthy travel delays. Additionally, local or neighborhood roads are not always fully interconnected. For example, local roads north of River Raisin in the City of Monroe have limited east-west connectivity. Similarly, Frenchtown Charter Township has suggested a new section of road to connect Hurd and Lasalle Roads to increase east-west connectivity.

There are several street network types within the Monroe Community. In the core of downtown south of the River Raisin, there is a rectangular grid pattern with alleys and short blocks, typical of pre-automobile development. The grid pattern evolves into longer blocks north of the River Raisin in neighborhoods between North Dixie and Lake Erie, in South Monroe, West Monroe, and south along Lake Erie. Newer streets in more rural areas use a curvilinear system with a wider right of way.

Road Classification

Roads in the community are categorized under two different classification systems, the National Functional Classification (NFC) System (see Map 4.2) and Michigan Public Act 51 of 1951 (Act 51) (See Map 4.3). The NFC is a planning tool developed by the Federal Highway Administration (FHWA) to classify all streets, roads and highways according to their function.¹⁸ The NFC System is divided into the following categories:

Principal Arterials – These roads generally carry long distance, through-travel movements. Examples include interstate and other freeways and other state routes.

Minor Arterials – Similar to Principal Arterials, but they carry trips of shorter distances and provide access to lesser traffic generators.

Collectors – These roads tend to provide more access to property than do arterials. Collectors also funnel traffic from residential or rural areas to arterials.

Local – Residential streets and lightly traveled county roads that provide direct access to properties.

Map 4.2 National Functional Classifications, Monroe Community

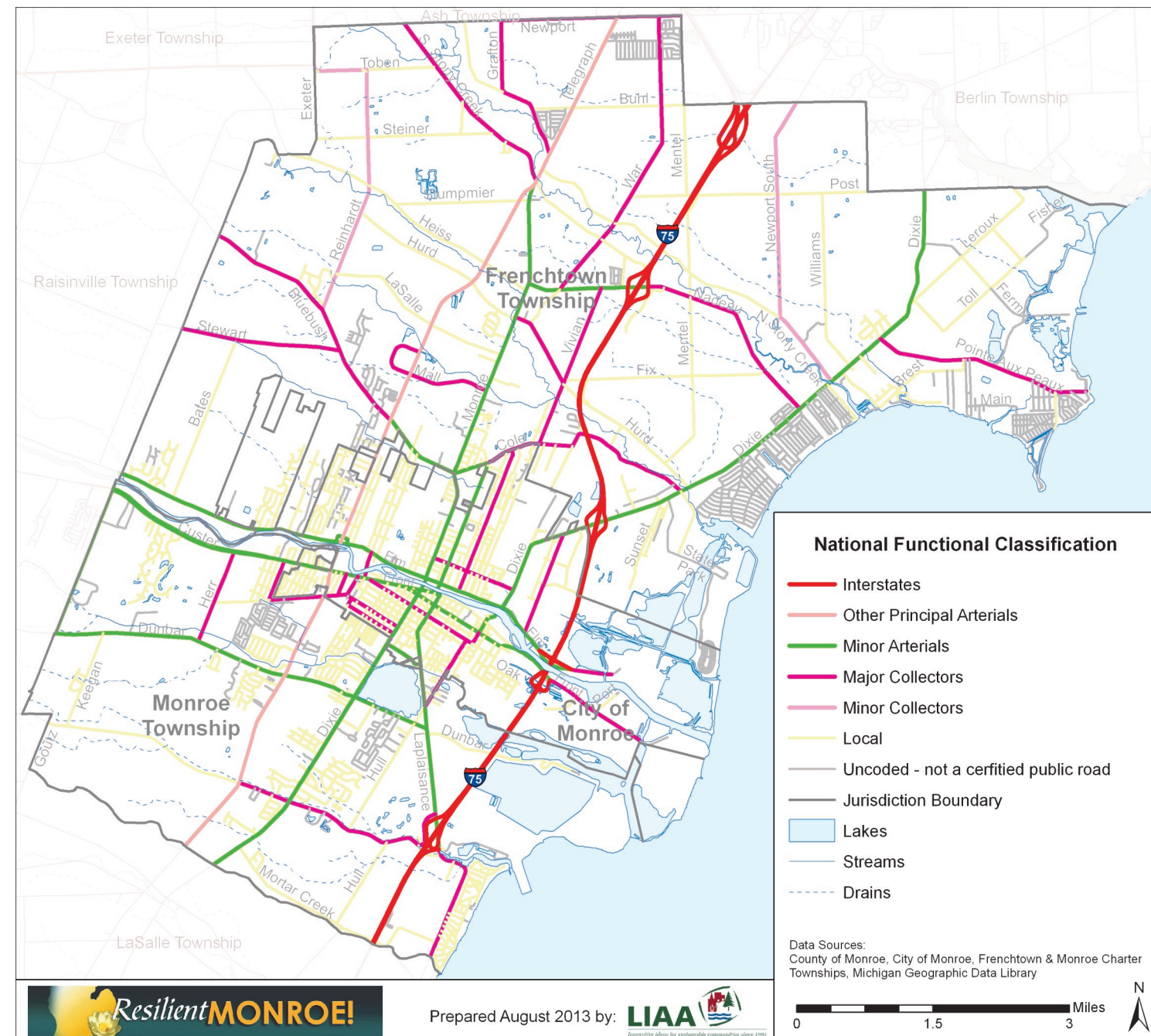


Photo Courtesy of Bill Saul

State funding provided through Act 51 classifies roads in the following categories:¹⁹

State Trunklines – Roads, streets, and highways assigned to the Michigan Department of Transportation (MDOT) for maintenance and upkeep, designed to facilitate through-traffic movement.

County Primary – The routes serve longer trip distances between major destination points within the County.

County Local – Roads that provide access to homes and businesses and are designed for short to medium length trips.

City Major – Major routes within the city’s jurisdiction that provide for longer trip distances and higher capacity traffic.

City Local – Roads that provide access to homes and businesses and are designed for short to medium length trips.

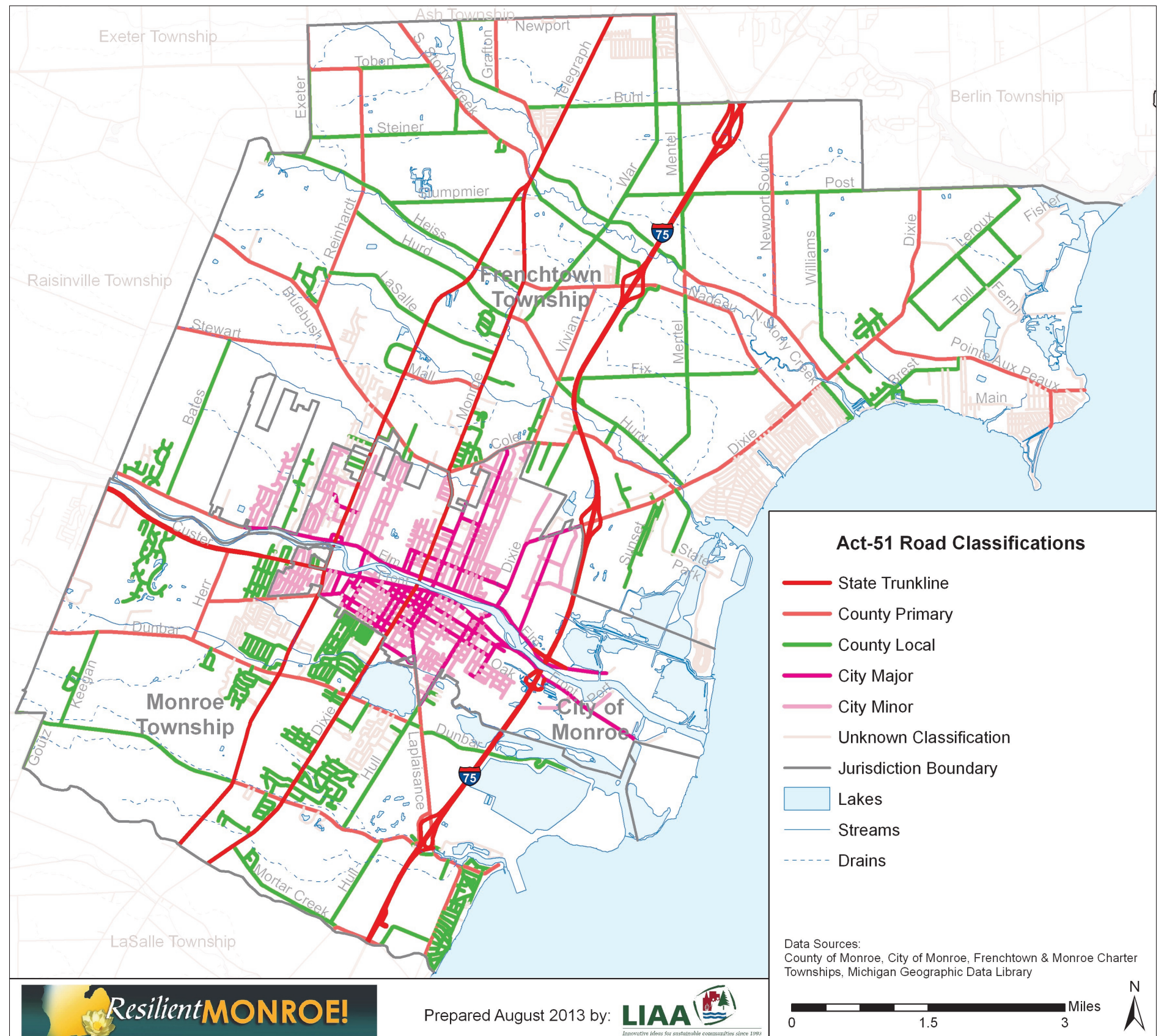
Monroe County Road Commission

The Monroe County Road Commission is tasked with “formulating policies to maintain and improve roads within the County system so that roads are convenient and safe for public travel.”²⁰ The Road Commission has jurisdiction over all roads within the county, with the exception of state and interstate highways and roads lying inside city limits.

More than 130 employees work for the Monroe County Road Commission. “Expenditures are in excess of \$4.5 million to repair, grade, drain, maintain, and improve more than 424 miles of primary roads and 855 miles of local roads.”²⁰ In addition, the Board contracts with the State of Michigan for the maintenance of 124 miles in Federal and State Trunkline highways throughout Monroe County.

Funding for maintenance of county roads comes from gas and weight taxes and driver’s license fees and often falls short of financing all the pavement preservation projects needed in the county. In 2012, 40% of public roads in Monroe County were classified as poor. In 2010, 26% of bridges in Monroe were labeled as deficient.²¹

Map 4.3 Act 51 Road Classifications



Lake Erie Transit

Lake Erie Transit (LET) is the regional transit service provider for the Monroe Community, providing eight fixed routes and Dial-A-Ride services in locations not served by the fixed-route service area (See Map 4.4). On average, LET provides 400,000 rides per year. Much of the population served by LET does not have access to a personal automobile, so the service LET provides is critical to the social fabric of the community.

Through its *Essential Transportation Services* program, LET contracts with Community Mental Health to provide door-to-door service from home to a person's place of employment. LET also serves older adults by providing a free bus pass to anyone over 60 years of age and guarantees a ride home to anyone picked up. Older adults can learn to navigate the fixed-route bus system under the guidance of a volunteer in LET's *Bus Buddy* program. All buses are equipped with bike racks on the front. The transit agency is also in the process of transitioning its fleet to hybrid, saving on average 40% in fuel for every mile driven. Currently, there are eight hybrid buses operated by the agency.

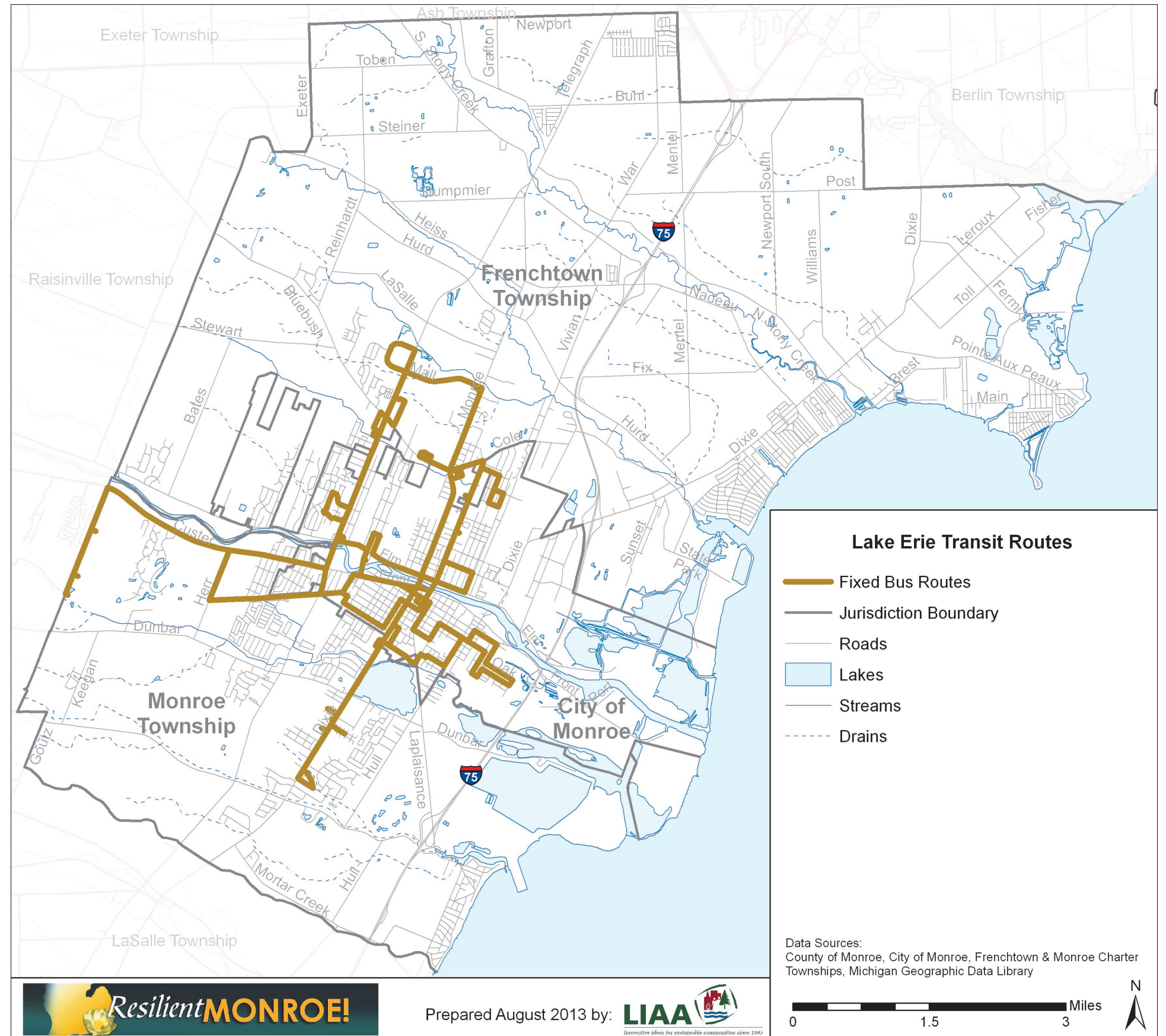
Rail

There are three freight rail lines that run through the Monroe Community. The railroads create a significant physical barrier for the community, impacting everything from travel times to critical services to property values. The City of Monroe and Monroe Charter Township share fire service and are forced to operate three separate fire stations to avoid a train delay. The East Orchard neighborhood is located east of the train tracks which act as a barrier to easy movement.

The CSX Railroad runs generally parallel along Telegraph Road. The CSX line crosses four minor arterials (Dunbar Road, W. Elm Avenue, W. Front Street and Stewart Road) and one major collector (W. Albain Road). The Canadian National (CN) and Norfolk Southern (NS) operate on the east end of the community and cause significantly more traffic delays as noted in the City of Monroe Master Plan. The CN and NS lines intersect with six minor arterials (Dunbar Road, LaPlaisance Road, E. Front Street, E. First Street, E. Elm Street and N. Dixie Highway) and four major collectors (E. Albain Road, Sandy Creek Road, E. Hurd Road and Nadeau Road).



Map 4.4 Lake Erie Transit Fixed-Route Service Area



Non-Motorized Transportation Options

The Monroe Community's non-motorized trails and sidewalks make it fun and easy to enjoy portions of the community by bike and by foot. For example, the Sterling-Marsh Trail, which is paved and ADA accessible, runs for six miles through Sterling State Park. Trail users weave past a series of lagoons and wetlands teeming with birds, waterfowl, and wild rabbits. The Sterling-Marsh Trail connects with the River Raisin Heritage Trail which is composed of a trail and a series of connected sidewalks that lead through the National Battlefield Park, into downtown Monroe, then out North Custer Road past Munson Park.

There is only one designated bike lane in the Monroe Community. That bike lane runs along Detroit Avenue from N. Dixie Highway to E. Elm Street. Both the City of Monroe Greenways Plan and the River Raisin National Battlefield Park development plans specify the need for additional non-motorized community linkages as illustrated on Map 4.5. Most residential and commercial areas within the City of Monroe have sidewalks. However, sidewalks are rare in Frenchtown and Monroe Charter Townships.

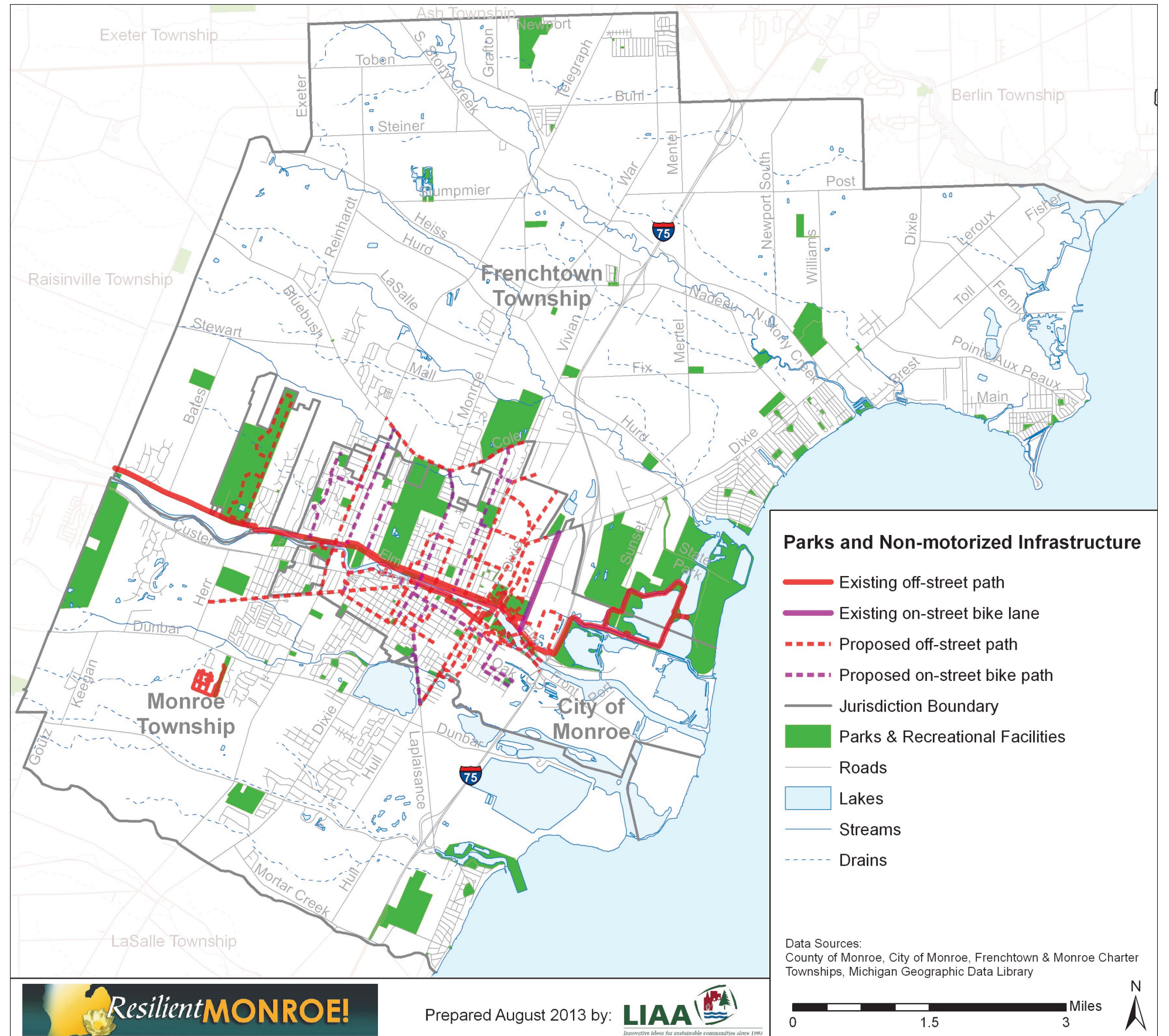
The Southeast Michigan Council of Governments (SEMCOG) is currently working on a regional non-motorized transportation plan, which may lead to the development of non-motorized transportation linkages between the Monroe Community and the rest of southeast Michigan.²² The goals of the non-motorized plan are as follows:

1. Create an inventory of existing facilities in the region.
2. Develop guidelines for new facilities.
3. Address the most critical gaps within the non-motorized corridors.
4. Create a planning resource for communities within the seven-county SEMCOG region to coordinate facilities across boundaries.



Photo Courtesy of Bill Saul

Map 4.5 Non-motorized Infrastructure



Port of Monroe

The Port of Monroe is the only port in Michigan on Lake Erie. It is a non-profit public authority created by a public vote in 1932. The port is classified as a deep- commercial harbor. It is the 143rd leading port in the United States with just over one million tons of material shipped or received in 2007. The port has an entrance channel in Lake Erie that is almost 16,000 feet long.²³ Lake Erie water levels are a key concern for the port. Recent low water levels have limited and disrupted barge traffic to the Port of Monroe. Low water levels present a long-term threat to the regional economy.

Airport

The Monroe Custer Airport is located at the western edge of the Monroe Community. The airport services local businesses, residents, and students at the Monroe Aviation School of Flight. In 2000, a busy month serviced on average 3,000 airplanes per day (an arrival is one service and a departure is another service). Since then, the airport service has decreased, with only approximately 600 takeoffs and landings per day in 2013.

PUBLIC UTILITIES

Stormwater Infrastructure

Stormwater management is an important government service provided to protect roads, bridges, and other structures from damage. The capacity and distribution of stormwater conveyances can be a critical factor in community development. The City of Monroe owns and maintains almost 23 miles of storm sewers within its city limits. However, both townships rely on the county drain system to manage stormwater and runoff. As described in Chapter 5 on *Natural Systems*, Monroe County has 1,100 publically managed drains to remove stormwater runoff. Approximately 200 of the drains are closed, and the remaining 900 are open.

Under the EPA National Pollution Discharge Elimination System (NPDES) permit program, communities over 50,000 people are required to complete a Municipal Separate Storm Sewer System (MS4) Permit. In the MS4 permit, the City of Monroe outlines a public education plan, establishes a city *Commission on the Environment*, sets the framework for stormwater control, and outlines a number of other water quality actions to be taken by the community.



CLIMATE CHANGE AND STORMWATER MANAGEMENT

In April 2013, a portion of northern Illinois received almost 8 inches of rain in 24 hours.²⁴ A month later, San Antonio received over 12 inches.²⁵ In July 2013, Philadelphia recorded a new local record of 8 inches in 24 hours. Long-term climate projections for southeast Michigan and nationwide predict these “freak” events of rain will continue to occur more often and with higher severity. Most researchers expect the total amount of precipitation in the Midwest to increase, especially in the winter, with a projected 30% increase in annual averages.²⁶ In the summer, streamflows are expected to increase in flashiness and variability.²⁷

Managing stormwater serves a number of important purposes. It can reduce the cost burden on the public water system and improve the quality of rain water entering the watershed. In the case of resilience to climate change, stormwater management increases the capacity of the system, reducing the potential for flooding and reducing the likelihood of waterborne diseases and water supply contamination.

Decrease Impervious Surfaces

Communities can use a variety of tactics to reduce the likelihood of severe flooding. Communities like Homer, Alaska, require new developments to limit total impervious surface to provide better stormwater drainage as a part of their Capital Improvement Plan. Because many communities are already built out, retrofitting impervious surfaces is a common strategy. In its Natural Systems Plan, Ann Arbor, Michigan listed “replacing gravel parking lots with pervious parking to facilitate drainage and control dust” as a best management practice.

Rain Gardens and Water Storage

Urban forests and green space can reduce the concentration of flow and erosion.²⁸ Through a partnership between the City of Saugatuck, Michigan, the Saugatuck Center for the Arts, and the Michigan Department of Environmental Quality, Saugatuck diverted rainwater from parking lots and roofs to a rain garden at a public park. In addition to stormwater control, an added benefit is that the water is filtered before it runs into Kalamazoo Lake. Communities like East Lansing, Michigan have used rain gardens in place of and in addition to traditional drains with success.

Some communities collect and store water on-site to slow runoff and control flooding. Ann Arbor has invested in large, subsurface holding tanks to manage stormwater from large rain events. The city has also provided incentives to property owners to install smaller holding systems on private property. Rain barrels are a great way for residential property owners and small commercial businesses to capture rainwater and reuse it in the future, simultaneously reducing stormwater discharge while reducing the demand for treated water. A 40-75 gallon rain barrel ranges in price from \$100-\$250 and can last for up to 20 years.²⁹

Design and Construction

There are numerous opportunities during the site plan development phase to integrate best practices in stormwater management. Cluster housing developments are a common strategy used by developers to avoid construction on wetlands and floodplains. In Louisville, Kentucky, developers are required to monitor and satisfy a number of post-construction erosion control measures. Many communities also require large buffers between development and natural waterways. Site designs that protect homes and other critical structures top the priority list for many communities given that life is at stake. Elimination of reverse slope driveways is one requirement Toronto, Ontario has integrated into its zoning code. Many communities also require existing utilities, sewer and water facilities prior to development.

In 2006, the City of Monroe received a grant from the Michigan Department of Environmental Quality (MDEQ) Coastal Zone Management Program to write a *Pilot Watershed Improvement Plan*. Part of the study included an assessment of urban stream corridors and drains that carry stormwater through the city, eventually releasing it into Lake Erie. There were a number of notable findings related to water flow. For example, a number of drain sections have trash and unsightly debris built up that is causing partial flow blockages and should be removed. There is also evidence of construction debris causing soil erosion, which also can impair channel flow capacity. The study also found that floodplains along several drain segments had encroachment from filling, land development, and man-made structures. Encroachment was assessed from the perspective of how it alters the flood plain's ability to pass extreme flood events. Seventeen suburban stream corridors were categorized as optimal, while 20 corridors had very poor flood encroachment. Researchers found several challenges, including aggradation, bank failure, channelization, downcutting, sediment deposition, and widening.³⁰ The plan made a series of recommendations, including debris removal, addition of rain gardens, planting tree buffers to capture rainfall, and dam removal.



Water and Sewer Services

The City of Monroe owns and operates a water treatment plant as well as pumping stations and distribution lines that accompany it. Water from Lake Erie is treated and supplied to city residents and Monroe Charter Township residents at a metered rate. The system has a capacity of 14 million gallons per day. Frenchtown Charter Township owns and operates a separate water treatment plant for Frenchtown residents with an 8 million gallon per day capacity. The City of Monroe and Frenchtown Charter Township have a joint service agreement for water and will assist one another with service if necessary. Most residents in less densely populated areas of Monroe Charter Township and Frenchtown Charter Township rely on private groundwater wells for drinking water.

The City of Monroe has a sanitary sewer district that provides service to all city residents as well as most businesses and dense residential neighborhoods in Frenchtown and Monroe Charter Townships. In the case of both townships, the pipes are owned by the townships and the service is provided by the city. There is a seven-member board made up of two representatives from the city and each township and one representative from the County Drain Commission that oversees the sanitary sewer. Residents in less densely populated areas of Monroe Charter Township and Frenchtown Charter Township have septic tanks.

Gas and Electric

Electric service is provided by Consumers Energy in the southern end of the Community and DTE Energy in the northern portion of the Community. The Monroe Community is served by Michigan Gas Utilities for natural gas. Some portions of the community have a separate service provider, but Michigan Gas Utilities owns the distribution infrastructure.

Cable and Internet

In 2012, a new fiber-optic data network was installed in Michigan by Merit Network, Inc., bringing faster Internet speeds to Monroe County. Part of the new system crosses Monroe County from west to east, with a connection to Monroe County Community College. The Monroe County Library System and Monroe County Intermediate School District have access to faster data and broader interconnectivity. The project was financed primarily by federal stimulus grants.





Housing

According to the 2010 Census, the Monroe Community has a total of 24,090 housing units (see Figure 4.2). Of those units, two-thirds are owner-occupied, one quarter are renter-occupied, and 8% are vacant. The number of vacant homes in the City of Monroe increased by 81% from 2000 to 2010 and increased by 67% and 61% in Monroe Charter Township and Frenchtown Charter Township respectively.

Figure 4.2 Housing by Tenure and Owner Occupancy, 2010

	Total Housing Units	Owner-Occupied Units	Renter-Occupied Units	Vacant Housing Units
City of Monroe	9158	5116	3122	920
% of Total	100%	55.9%	34.1%	10.0%
Monroe Ch. Twp.	6152	4407	1312	433
% of Total	100%	71.6%	21.3%	7.0%
Frenchtown Ch. Twp.	8780	5876	2082	822
% of Total	100%	66.9%	23.7%	9.4%
Monroe County	62971	46496	11734	4741
% of Total	100%	73.8%	18.6%	7.5%

Source: SEMCOG 2012 Community Profiles

As shown in Figure 4.3, compared with the two townships, the City of Monroe has a much lower disparity between the lowest-value homes and the highest-value homes. Both townships have higher numbers of mobile homes as well as higher-value, larger-lot homes compared to the city.

Figure 4.3. Distribution Value of Owner-Occupied Homes

Value	City of Monroe	Frenchtown Charter Township	Monroe Charter Township
\$1,000,000 or more	7	12	59
\$500,000 to \$999,999	0	47	79
\$300,000 to \$499,999	99	567	457
\$250,000 to \$299,999	118	377	288
\$200,000 to \$249,999	557	581	393
\$175,000 to \$199,999	426	421	326
\$150,000 to \$174,999	1068	967	399
\$125,000 to \$149,999	1077	438	464
\$100,000 to \$124,999	716	723	326
\$80,000 to \$99,999	697	369	177
\$60,000 to \$79,999	347	307	124
\$40,000 to \$59,999	251	203	229
\$30,000 to \$39,999	40	63	277
\$20,000 to \$29,999	18	261	200
\$10,000 to \$19,000	35	414	221
Less than \$10,000	24	442	468
Median Housing Value	\$139,200	\$ 142,900	\$ 136,900

Source: SEMCOG 2012 Community Profiles

As detailed in Figure 4.4, the majority of the housing stock is single family detached. However, as noted earlier, mobile home and manufactured housing represent a significant percentage of housing stock in the townships, approximately 19% of total homes.

Figure 4.4 Housing Type, 2010

	City of Monroe	Monroe Charter Township	Frenchtown Charter Township
Single Family Detached	6,221	3,458	5,841
Duplex	807	132	185
Townhouse/Attached Condo	259	322	215
Multi-Unit Apartment	2,126	674	1,591
Mobile Home/Mfr. Housing	40	1,404	1,453
Other	0	0	0
Total	9,453	5,990	9,285

Source: SEMCOG 2012 Community Profiles



Industrial Areas

The Monroe community has a number of industrial areas. According to the Monroe County Business Development Corporation, there are four designated industrial sites within the community. They include:

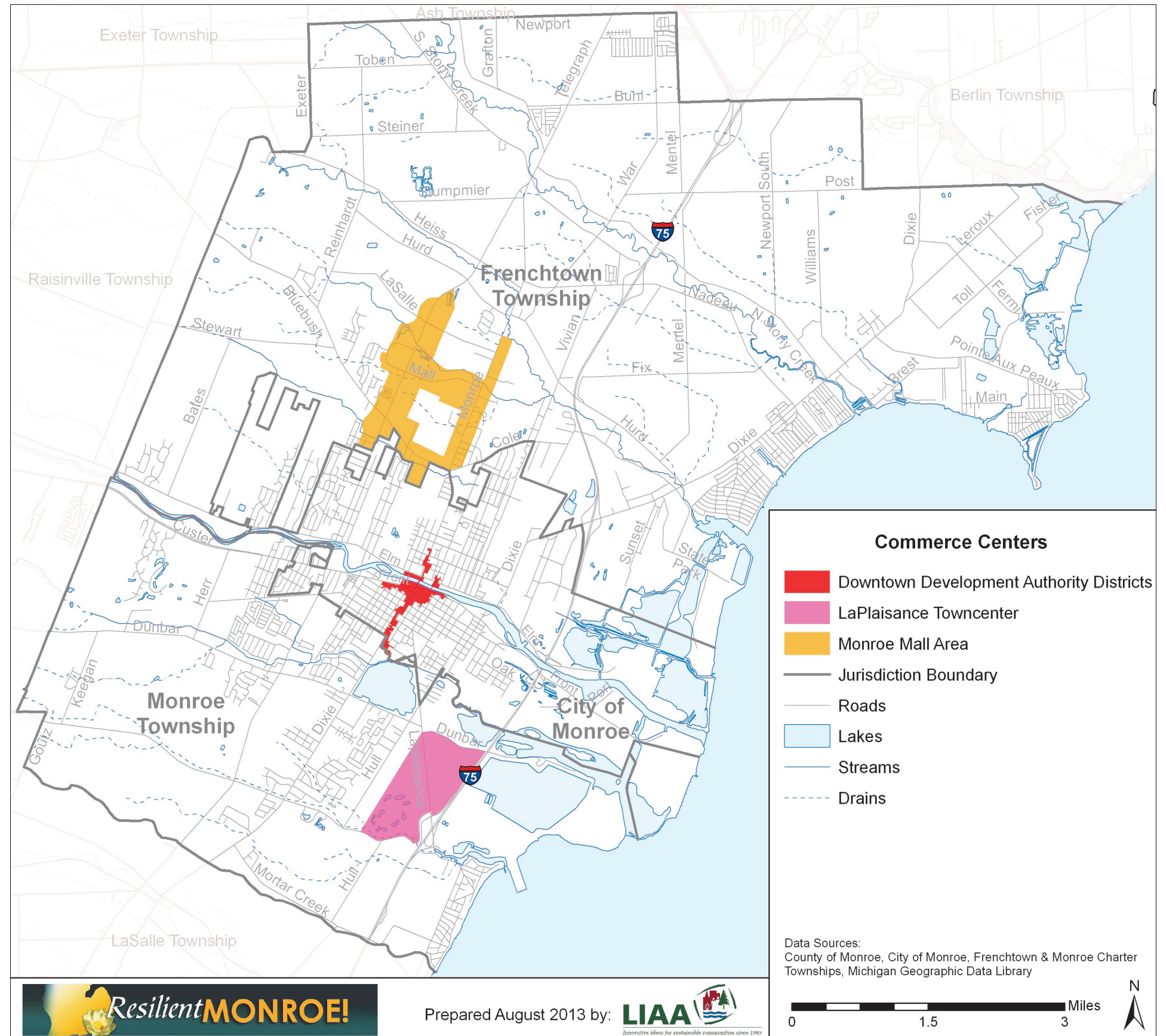
1. Ternes/North Monroe Industrial Park
2. The Frenchtown Business Park
3. Port of Monroe—East
4. Port of Monroe—West

The Frenchtown industrial park is a Class A certified park. Currently, 4,771 acres are zoned industrial in the Monroe Community. The City of Monroe accounts for over half of the industrial zoned area, with a total of 2,462 acres. Frenchtown Charter Township has the smallest amount of land zoned industrial, with 742 acres.

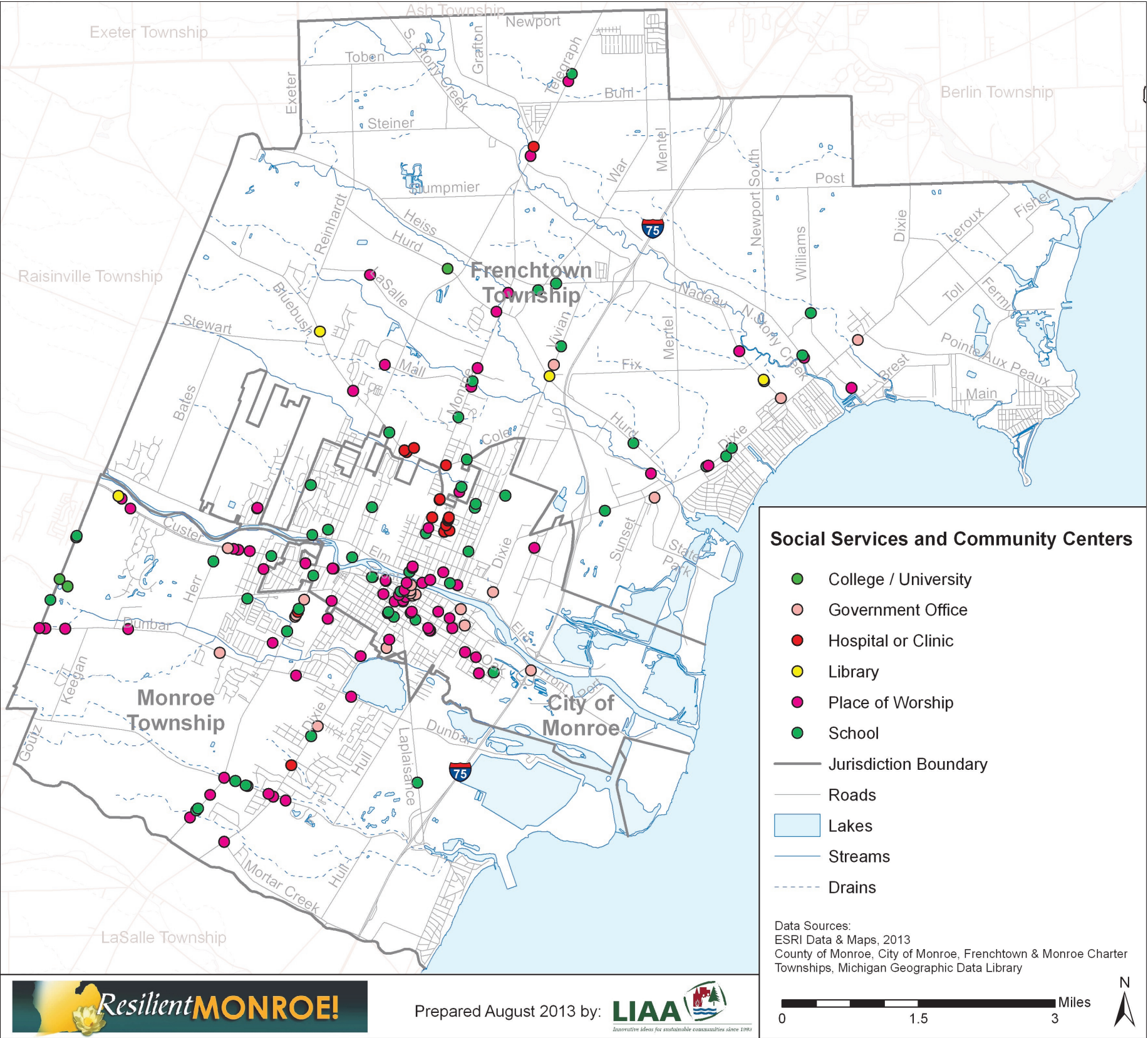
Shopping Districts

Although the diversity of choices is somewhat limited, there are three primary shopping districts in the Monroe Community (See Map 4.6). The central business district is located in downtown Monroe, on 1st Street and Front Street, bound by Adams Street and Wadsworth Street to the west and east, and also includes five blocks out Monroe Street in both directions. There are other commercial nodes in the townships that exist in the form of designated Town Centers. Frenchtown Charter Township designates the south central portion of the Township between Telegraph and North Monroe as a Town Center. The Monroe Mall, Walmart, and Meijer are located there. Similarly, Monroe Charter Township designates the LaPlaisance area as a commercial center, which is held to higher design and landscape standards. The Horizon Outlet Center is located there. Unfortunately, the Horizon Outlet Center has experienced significant vacancy rates in the past 10 years.

Map 4.6 Commercial Centers



Map 4.7 Social Services and Community Centers



Key Services

Service centers and institutions are important in communities for day-to-day support to residents. In the event of an emergency, such as an extreme heat event or flash flooding episode, service centers and institutions are especially important because this is where residents will go if they cannot return home. Map 4.7 highlights key locations of places where residents may seek temporary refuge in the event of an emergency. These locations include schools, places of worship, governmental buildings, hospitals and clinics, libraries, and other non-profit social service organizations. Social services are concentrated in the downtown core and along major commercial corridors.

Communities with high population densities, frequent extreme weather events, or both are likely to have designated services centers. In the event of extreme heat waves, designated community *Cooling Centers* such as libraries or a senior centers may provide refuge for sensitive populations and those without access to air conditioning. In the event of loss of power due to flooding or extreme storms, locations with a backup power source, such as a generator, are in high demand.

A resilient community has designated community service centers that are accessible, evenly distributed across the population, open 24 hours, and well-known to residents.



CHAPTER 5. COMMUNITY ASSETS: NATURAL SYSTEMS

Natural features in the Monroe Community play an instrumental role in Monroe's identity. The rich clay soil has supported generations of farmers. Access to fresh water, food, and furs along the River Raisin attracted Native Americans as well as *French Voyagers* to the area, who called the river *La Rivière aux Raisins (River Raisin)* after the wild grape vines that lined the river in the late 1700s.

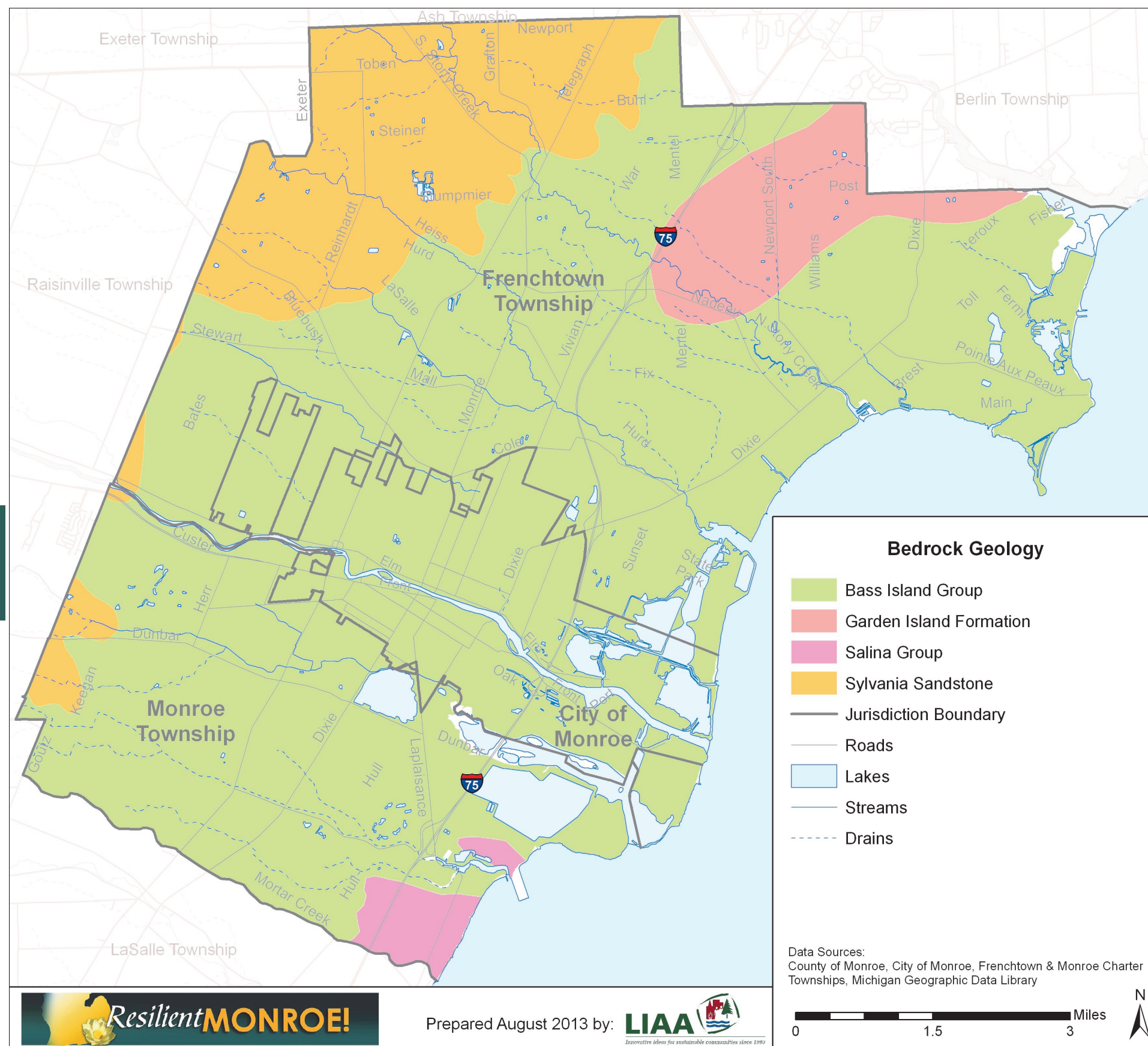
GEOLOGY

As noted by Mozola (1970), the bedrock in Monroe is "predominately limestone and dolomite, with some sandstone and shale. The bedrock is directly overlain by a layer of clay till, deposited by receding glaciers."³¹ The majority of water wells in Monroe County are in bedrock. In general, the bedrock is porous, fractured and shallow, so groundwater is easily obtained, but there is also increased risk for drinking water contamination (See Map 5.1).

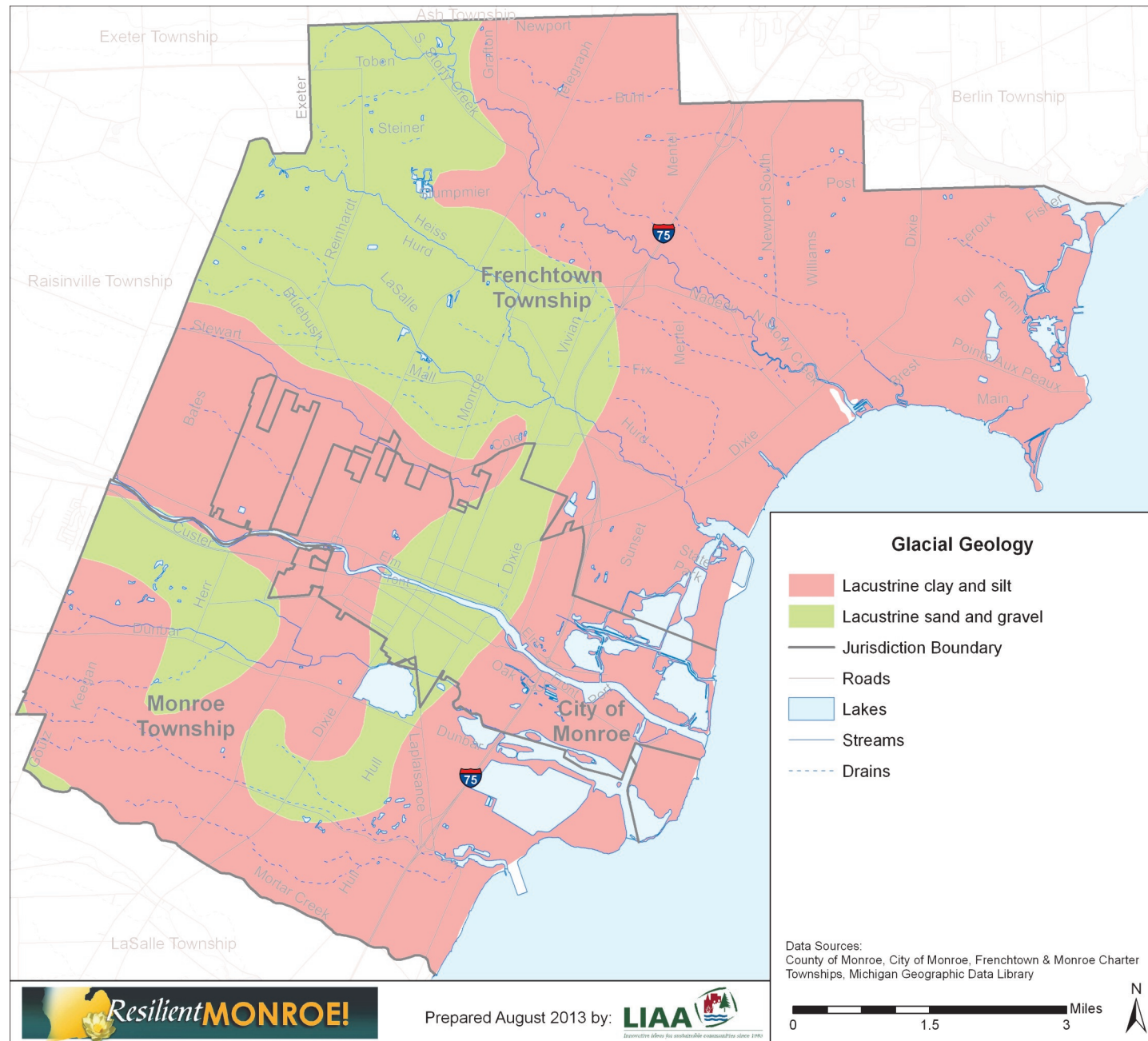
FARMLAND IS PLENTIFUL IN THE MONROE COMMUNITY. WHEN DRAINED, THE FARMLAND IS HIGHLY PRODUCTIVE.



Map 5.1 Bedrock Geology



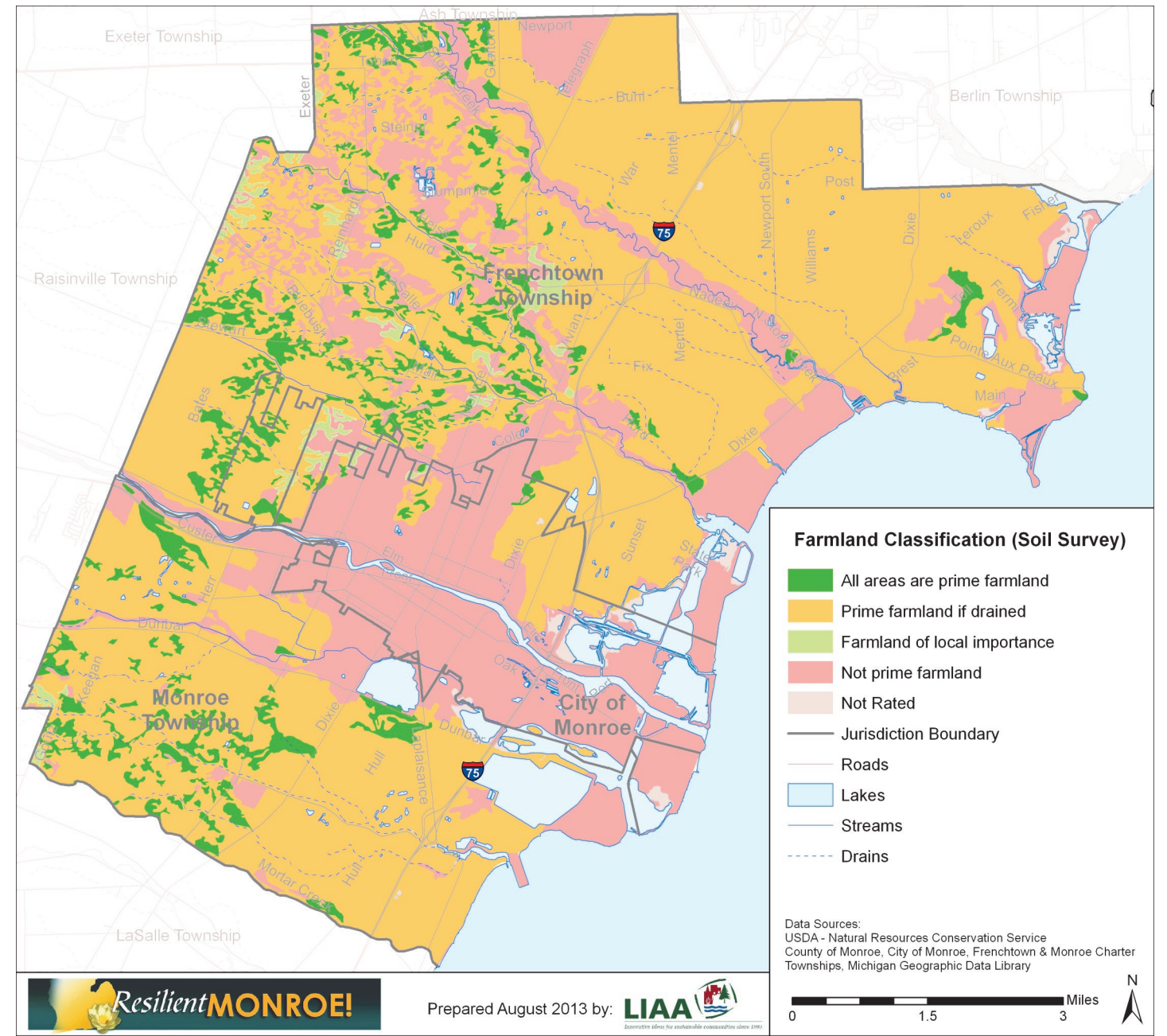
Map 5.2 Glacial Geology



Soils

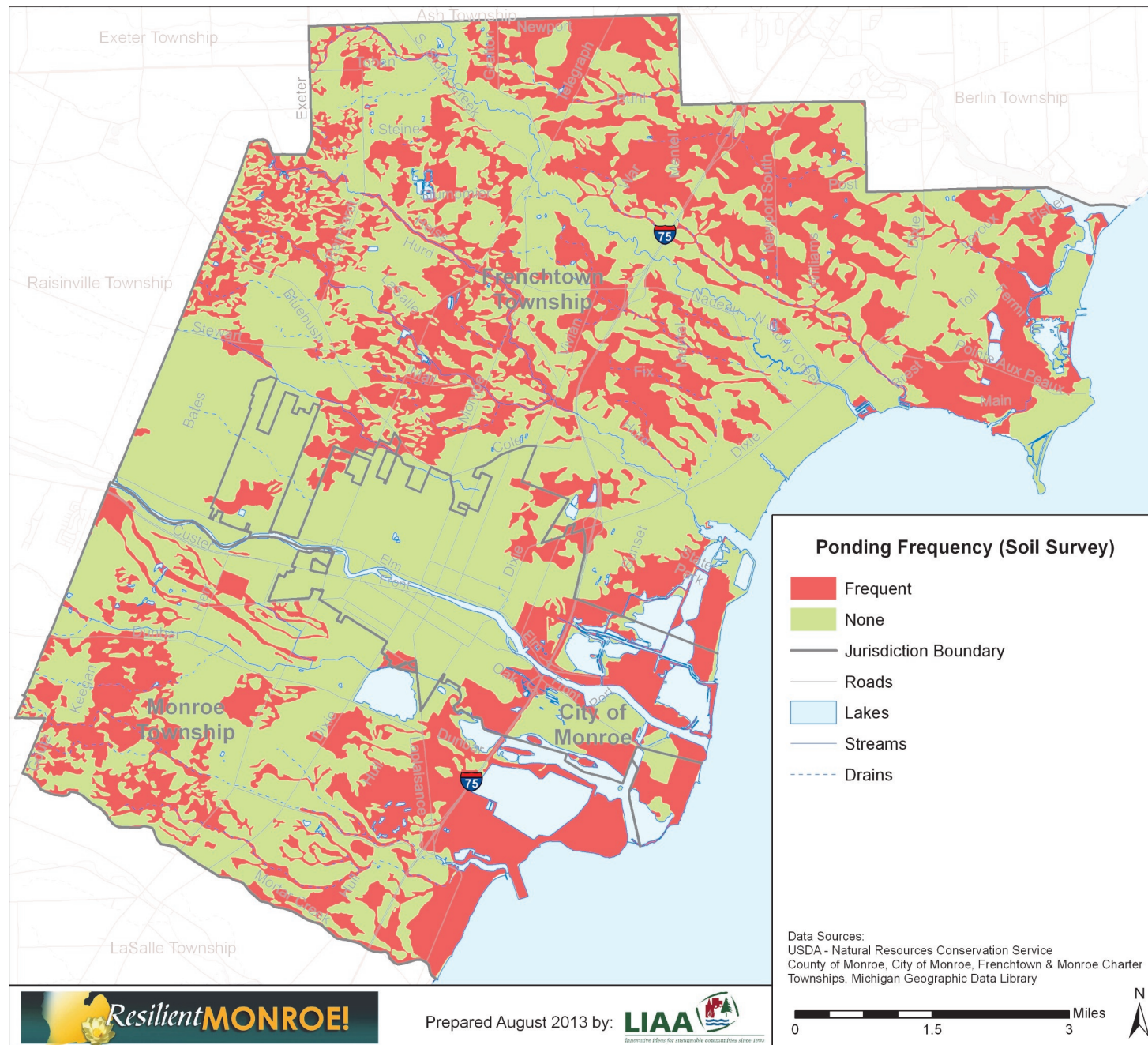
The Monroe Community lies within a clay plain that gradually slopes toward Lake Erie on the east.³² The clay plain covers the bedrock, and the clay is dissected by large glacial drainage areas of sandy soil (See Map 5.2). According to Mozola (1970), “Monroe County owes its general lack of topographic relief to ancient lake beds.”³¹

Map 5.3 Farmland Classification (Soil Survey)

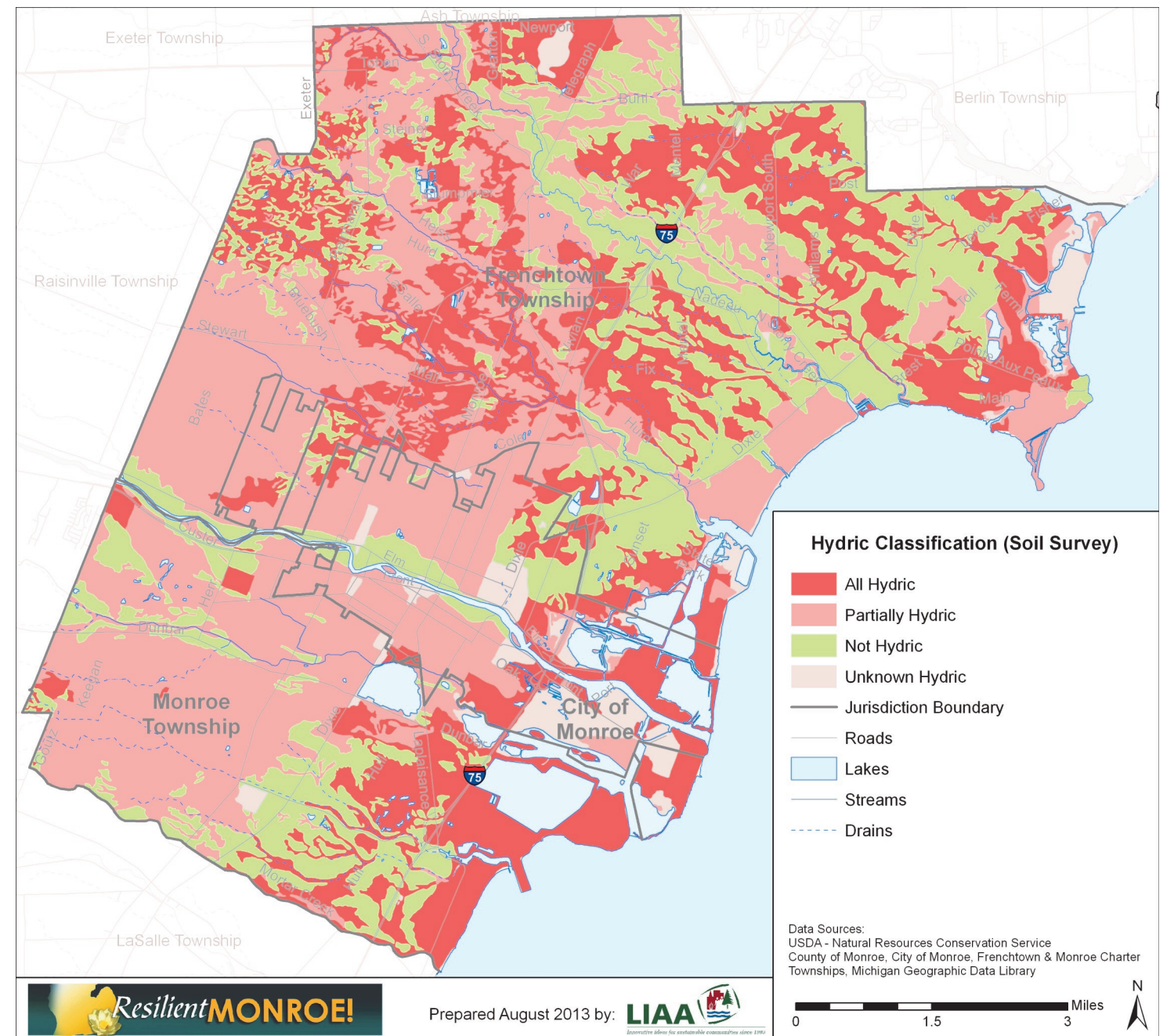


According to the soil survey of Monroe County, Michigan, the Monroe Community includes four general soil associations. All of these soil associations are classified as either *somewhat poorly* or *very poorly* drained.³³ Most non-urban areas in the Community have been cleared and were de-watered by drains because of their suitability for cultivated crops (see Map 5.3).

Map 5.4 Ponding Frequency (Soil Survey)



Map 5.5 Hydric Classification (Soil Survey)



Because Monroe has low slopes, poorly drained soils, and an extensive network of rivers and tributaries, the area is prone to flooding. The presence of silty clay loam causes many areas in the Monroe Community to be susceptible to ponding, especially in low-lying pockets³³ (see Map 5.4 and 5.5).

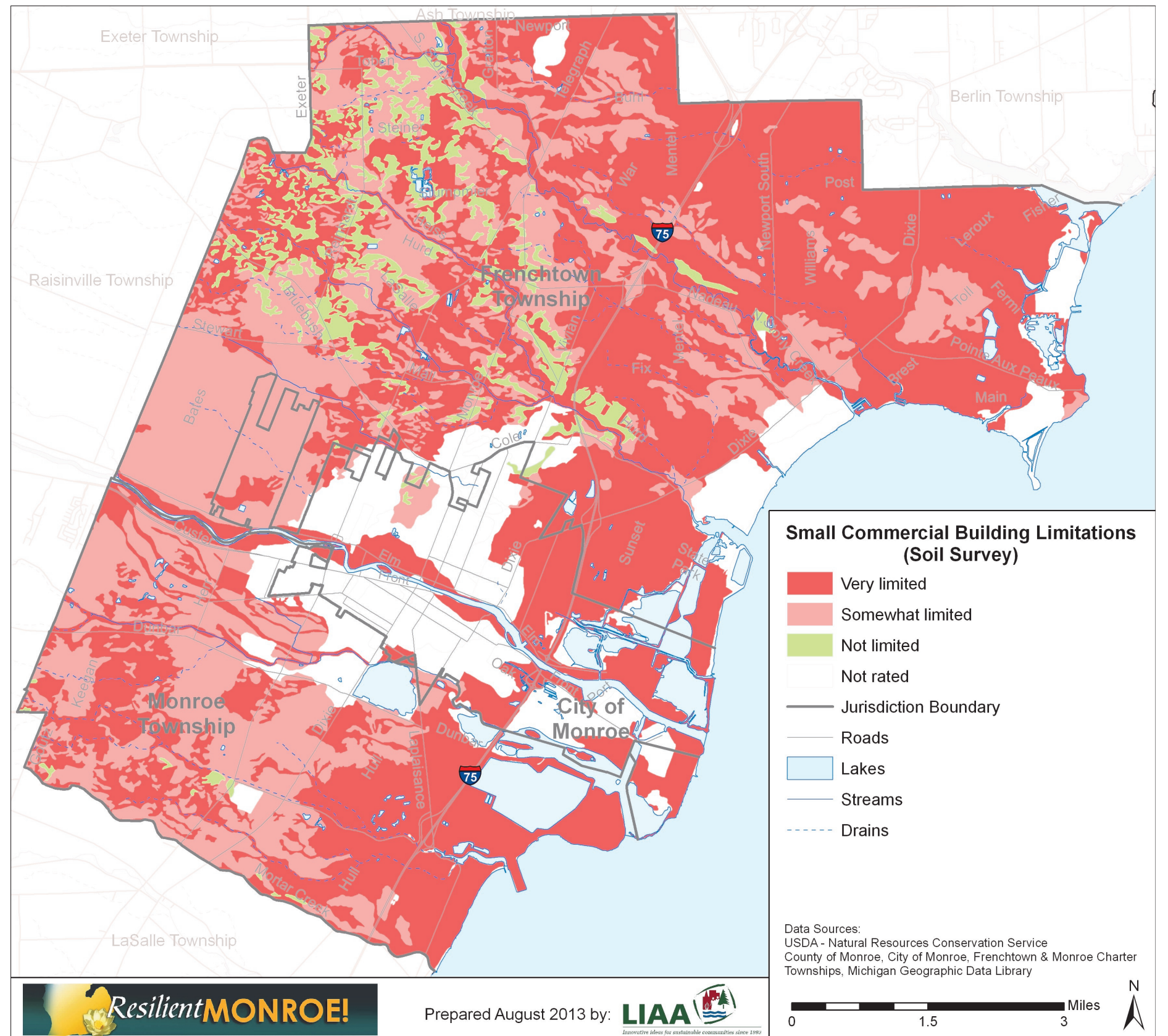
The soil survey for Monroe County also designates areas as *very limited*, *somewhat limited*, and *not limited* for small commercial buildings (see Map 5.6 for county designations). Although the designation of “*very limited*” does not prohibit construction, the designation is a good indicator that the soil has “one or more features that are unfavorable for (construction). The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.”³⁴

According to County Drain Commissioner David Thompson, Monroe County has approximately 1,100 drains (and 1,100 drainage districts). Around 200 of the drains are closed while the remaining 900 are open. The drains are designed to accommodate a 10-year storm event. The most severe flooding in recent history occurred in 2011 when there were two 25-year rain events back to back in a two-day period.



Photo Courtesy of Bill Saul

Map 5.6 Small Commercial Building Limitations (Soil Survey)



Although the River Raisin AOC has not been delisted, significant remediation progress has been made. Of the nine beneficial use impairments identified in 1987, one has been delisted, and substantial progress has been made on the remaining eight BUIs.³⁷

Listed below are the eight remaining BUIs with an overview of additional action that still needs to be taken:

1. Restrictions on Fish and Wildlife Consumption: Additional sampling has to occur.
2. Degradation of Fish and Wildlife Populations: Will be assessed following completion of all necessary habitat projects.
3. Bird or Animal Deformities or Reproduction Problems: Statewide assessment completed last year; a technical committee needs to be formed to discuss and assess this BUI.
4. Degradation of Benthos: Need to dredge the last spot of contamination on the River Raisin just downstream of the Port of Monroe.
5. Restrictions on Dredging Activities: Still impaired; will be removed along with the Benthos BUI.
6. Eutrophication or Undesirable Algae: A removal recommendation has been written.
7. Loss of Fish and Wildlife Habitat: This BUI can be removed when all the work at Sterling State Park is complete and when Phases 1 and 2 on the dam removal projects are complete.
8. Beach Closings: A removal recommendation has been written.

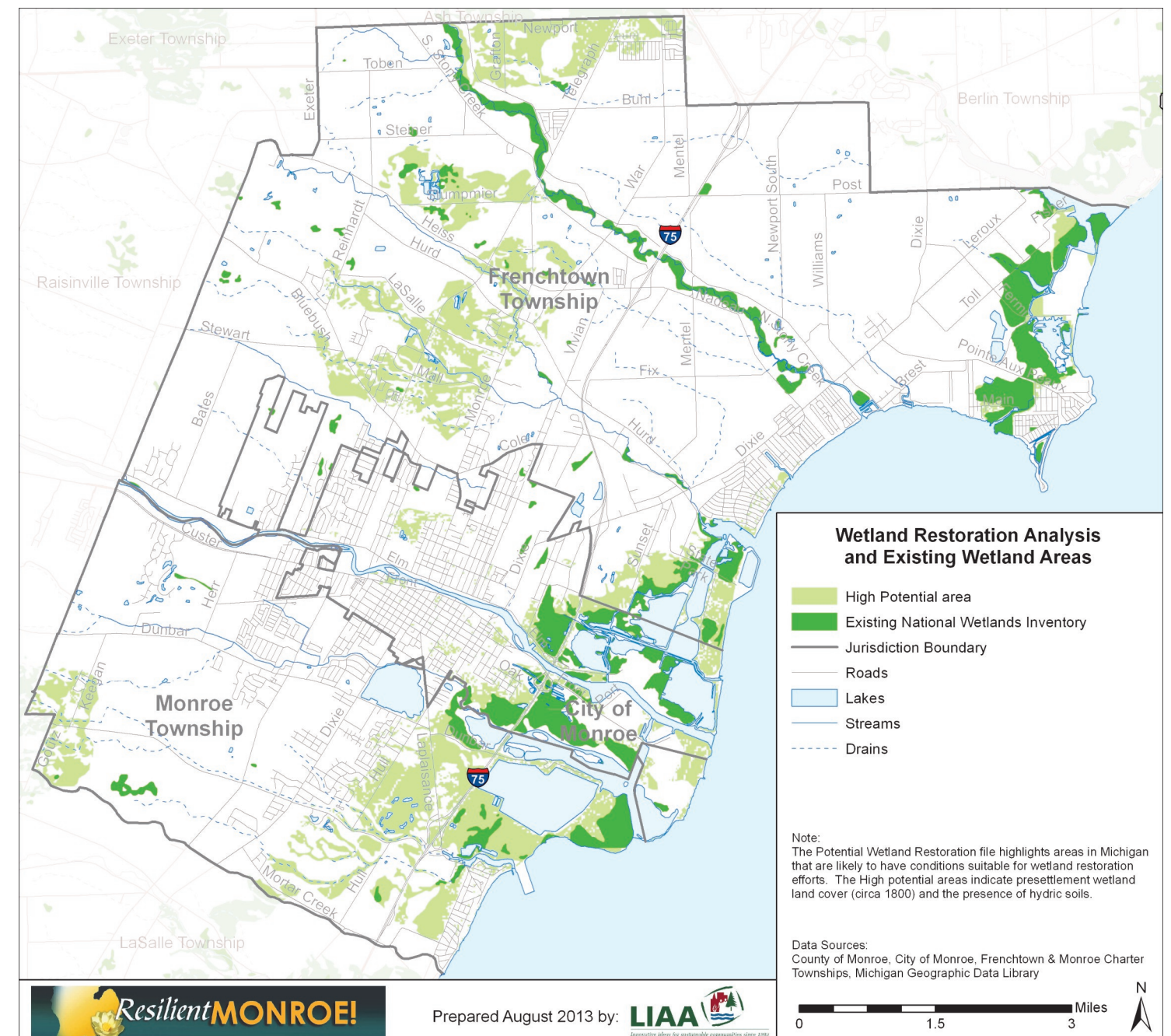
In 2012, the Environmental Protection Agency (EPA) and the Michigan Department of Environmental Quality (MDEQ) dredged approximately 3,000 cubic yards of the most highly contaminated PCB sediments from the River Raisin Area of Concern. To address the BUIs regarding degradation of fish and wildlife populations and loss of fish and wildlife habitat, the Great Lakes Restoration Initiative is funding the River Raisin Dam Remediation Project. The project is well underway, and the final result will be a fish and small boat passage from Lake Erie up the River Raisin by modifying existing dams.

Rock Quarry

There is one large inland body of water in the Monroe Community, a former inland stone quarry. As noted by the Monroe Evening News, the quarry “now is water filled with its shoreline partially lined by homes. It is known for its sheer rock drops and considerable depths.”³⁸ Aerial photographs indicate that as recently as 1993, the quarry did not contain water. The current landowner of the quarry is Quarry Ridge, Inc. There are 28 private property owners that line the circumference of the quarry, including a number of residences.

The Monroe Township Future Land Use Map envisions commercial recreation, residential, and some office commercial development along the shore of the quarry. The Monroe Charter Township Master Plan states, “Alternatives for the redevelopment of the old stone quarry should be considered and actively pursued.”

Map 5.8 Wetland Restoration and Existing Wetland Areas



LAND USE

Human settlement has changed land cover in the Monroe Community dramatically. Before European settlement, the area was forested with lowland and upland forests, as well as grasslands, savannahs, and extensive marshlands. Wetlands that once covered much of the region have been drained and replaced by farmland and suburban development. In the past 50 years, much of the agricultural land has been slowly converted to urban and suburban residential developments. Much of the agricultural land along major highway corridors has been converted to commercial development.

As illustrated in Map 5.8, there are a number of areas where restoring wetlands have a high potential for success. By comparing this map with an existing land-use map, we see that much of the high potential wetland areas are not currently developed. Reestablishing wetlands could be a powerful tool for enhancing community resilience. Wetlands have significant water storage capacity and can improve water quality as well.

Land Use/Land Cover Analysis

A Land Use/Land Cover analysis is used to determine development trends in a community over time. In 2000, SEMCOG performed a Land Use/Land Cover analysis for the Monroe Community. The Resilient Monroe project team used orthophotography from 2010, provided by Monroe County Planning Department, to assess the change in land cover from 2000 to 2010. The team conducted the land cover change analysis at Level I of an Anderson Classification system. Listed below are the seven different land-use categories at Level I:

- Urban & Built
- Agricultural
- Grass & Shrub
- Forest
- Water
- Wetland
- Barren

Table 5.1 Land Use/Land Cover Change, Monroe Community, 2000-2010

Land Cover	Acres of Land (2000)	Acres of Land (2010)	% Change
Urban & Built Up	17,815.8	18,847.2	5.8%
Agricultural Land	5,466.0	4,241.1	-22.4%
Grass and Shrub Land	2,019.1	2,230.4	10.5%
Forest Land	1,814.9	1,819.1	0.2%
Water	1,918.6	1,915.6	-0.2%
Wetlands	2,534.5	2,515.5	-0.7%
Barren	2.6	2.6	0.0%

It is interesting to note that there was a 22% decrease in total land being farmed over the 10-year period (see Table 5.1). Grass and shrub land increased by the highest percentage in that time, probably because farmland was left unused and because much of the new grass and shrub land was agricultural in 2000. As would be expected, urban and built-up land cover increased in the 10-year period.

Countywide, farmland in Monroe consists of mostly cultivated farmland, but also includes orchards, livestock, pastures, greenhouses and nurseries. At almost 60% of the total land cover in Monroe County, agricultural fields and pastures are at the forefront of the non-built landscape. There are over 1,100 farms in the county, which is almost four times more than the state average.³⁹ Despite the high proportion of land area dedicated to farming, only 2.8% of the total employed population are farmers.

CLIMATE CHANGE IMPACTS ON TREES

Across the United States, changing climate conditions and increases in non-native pests are stressing native tree species, and the Monroe Community is no exception. Climate scientists expect to see a dramatic decrease in many of the tree species native to southern Michigan. At the top of this list is the American beech, the paper birch, the tamarack, the black spruce, the eastern white pine, and the sugar maple.

As noted by Walker and Salt (2006), all species in the natural world exist and thrive in a range of stable states.⁴⁰ Trees have evolved to be adaptable to variations in precipitation, temperature, nutrients and sunlight. However, at a certain point, species are no longer able to adapt. Once that threshold is crossed, it is almost impossible to return again to the original stable state. Some trees like the American beech and the paper birch will struggle to thrive in a warmer climate. The eastern white pine will have difficulty out-competing new hardwoods that prefer a warmer climate.⁴¹

In general, increased carbon dioxide will increase forest productivity, until other factors have a negative impact on growth. Examples of negative factors include drought, floods, forest fires, and non-native invasive species. However, not all tree species are expected to suffer as a result of changing weather patterns. Climate models predict there will be a significant increase in abundance of the box elder. Although box elder are native, they thrive in disturbed areas. It may be necessary to control the spread of box elder to ensure biodiversity of tree species.⁴¹

Communities can be proactive with their urban forestry policies to help maximize canopy cover in the coming years. For example, hickory has been shown to do well in flood-prone areas. Oaks like the bur oak, black oak and white oak located near the wildland-urban interface will benefit from prescribed burns. Controlled fire can reduce the number of invasive pests and help restore natural savanna systems. While the sugar maple has already experienced decline in many parts of Michigan, the red maple is a good alternative for landscaping.

Despite the large number of farms, there is limited capacity for food processing and manufacturing in the Monroe area; much of the food that is grown must be shipped out of the area for processing. Currently, there are no fruit or vegetable canning, preserving, pickling, or drying manufacturing companies in Monroe County. Local food processing presents an economic development opportunity for the Monroe Community and could take advantage of the growing demand for locally sourced and locally produced food.

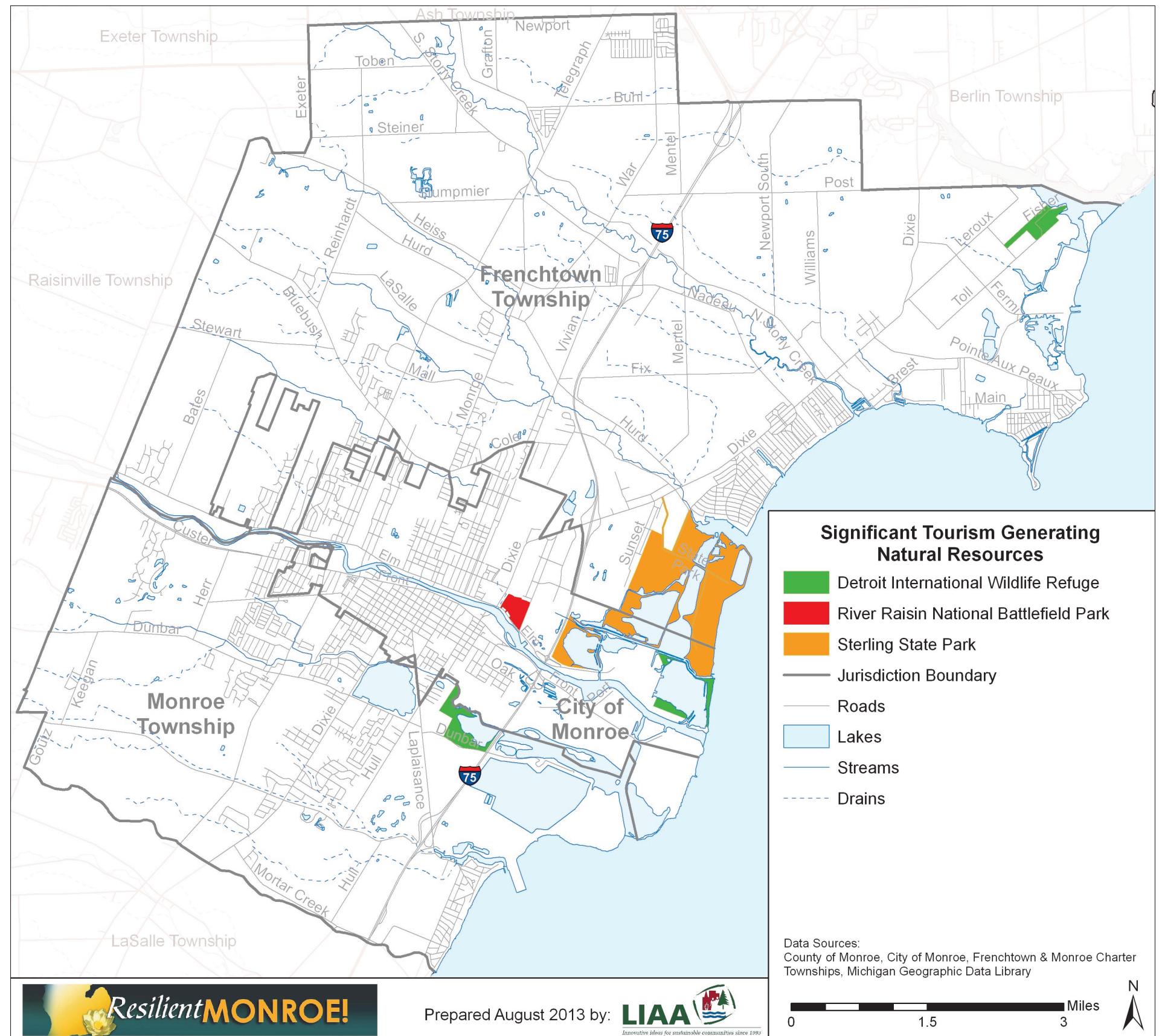
There is opportunity for smaller, specialty farms and agri-tourism as well. According to 2013 ESRI Business Analyst data, there are four farmer's Markets in the county, five community supported agriculture (CSA) farms, eight farms that offer agri-tourism or recreational activities, and numerous community gardens.

Biota

Monroe has a good diversity of native plants and animals. As noted in the Monroe County Master Plan, "The wildlife of the area includes deer, rabbit, fox, muskrat, coyote, squirrel, raccoon, opossum, and a variety of other small mammals. The region also provides important habitat for resident and migratory songbirds, birds of prey, shorebirds, and other types of birds."¹⁴



Map 5.9 Significant Tourism Generating Natural Resources



In the Monroe Community, high concentrations of trees are located at Sterling State Park and other protected natural areas. Tree cover is sparse between farms and rural homes. The city and both townships state that they make a concerted effort to plant street trees along the median in new developments and redevelopments. Areas that are moderately well drained support American beech, sugar maple, and basswood. The poorly drained areas are dominated by American elm, red ash, oak, and silver maple.³²

Similar to other communities across the country, invasive species have significantly disturbed the natural balance in Monroe. The zebra mussel has clogged water intakes and disrupted the food chain in lakes and rivers. Zebra mussels also filter water in Lake Erie which makes the lake more susceptible to algal blooms (see Inset). Invasive plants such as phragmites and purple loosestrife have negatively impacted wetlands, and the emerald ash borer has killed many ash trees, both in urban areas and in forests.

Parks and Recreation

The City of Monroe, Monroe Charter Township, and Frenchtown Charter Township collectively have 48 parks and over 2,300 acres of parks and open space. Residents living in the Monroe Community are fortunate to have access to Sterling State Park, a National Battlefield Park, and an International Wildlife Refuge, all within close proximity to one another (see Map 5.9).

Sterling State Park, a 1,300 acre park on the shore of Lake Erie, is the largest park in the Monroe area. The State Park offers a diversity of activities including camping, fishing, hiking, swimming, and birding. The

Lake Erie Algal Blooms

Excess phosphorus from stormwater running off the land and from many discharge points along the rivers leading to Lake Erie produced harmful algal blooms regularly in the 1960s and 1970s. In response, the United States and Canada adopted new strategies under the Great Lakes Water Quality Agreement and successfully reduced phosphorus discharges from wastewater treatment plants and other point sources. The result was a rapid reduction in algal blooms in Lake Erie. Unfortunately, these dangerous algal blooms have now returned to Lake Erie.

According to the National Oceanic and Atmospheric Administration (NOAA), algal blooms have returned to plague western Lake Erie for many of the last 10 years. Several types of algae take advantage of high loads of nutrients, particularly phosphorus, and high levels of light in the water to reproduce and grow. The resulting very dense blooms of algae pull oxygen out of the water and release dangerous toxins.⁴²

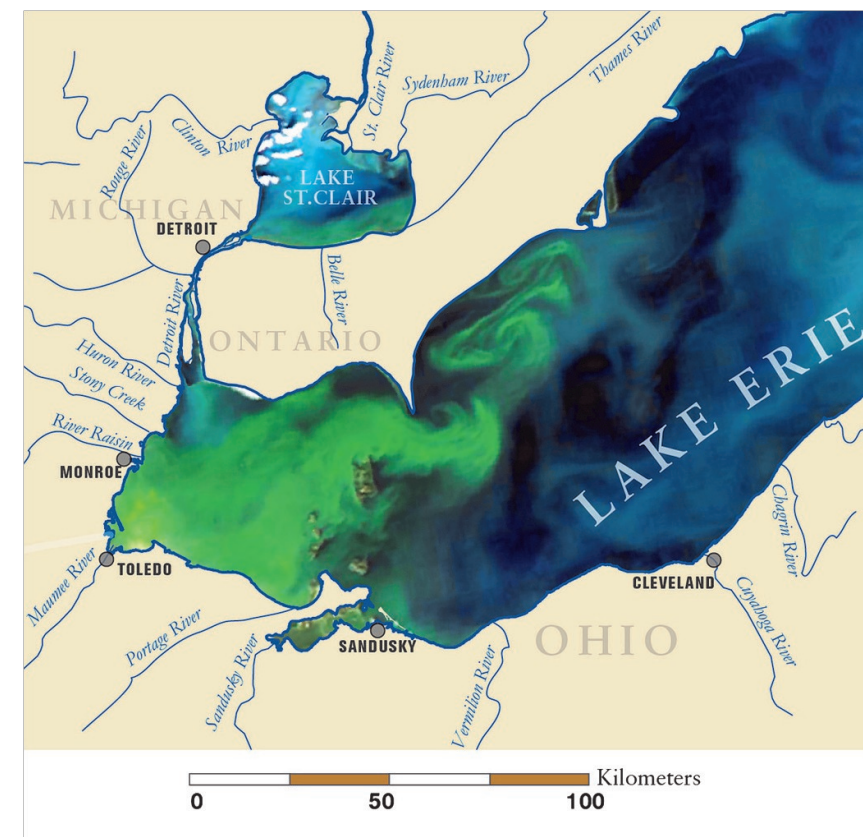
In 2011, Lake Erie suffered the largest harmful algal bloom in its recorded history. During its peak intensity in early October, the algal bloom covered an area of 1,930 square miles, three times greater than any previously observed bloom.

A technical research report published by the National Academy of Sciences in April 2013 provided a detailed account of the 2011 record-breaking algal bloom. In the report, Anna M. Michalak and a long list of scientists described the algal bloom as consistent with increasing phosphorus loading in western Lake Erie and the impacts of climate change.⁴³

These scientists drew a clear connection between climate change, current agricultural practices and the increasing frequency and severity of algal blooms in Lake Erie. Climate change is bringing about more frequent and more severe rain events that flush sediments and nutrients from farm fields into streams and drains and into Lake Erie. However, climate change is also resulting in weak lake circulation, keeping the nutrients high in the water column for longer periods of time, resulting in larger algal blooms.

As the occurrence of severe rainstorms increases in the years ahead, stormwater runoff is likely to create even greater water quality challenges. To protect local rivers as well as Lake Erie, planners will need to increase and expand runoff controls to limit the amount of sediment and agricultural nutrients impacting water quality everywhere.

Quagga and Zebra Mussels: These invasive species in Lake Erie filter organic particles out of water. The clearer water allows more light to reach deeper into the water, stimulating algae growth.



Lake Erie Harmful Algal Bloom: A satellite image of Lake Erie on Sept. 3, 2011, overlaid on a map by Michigan Sea Grant.⁴⁴

park also features a six-mile paved trail that connects to the River Raisin Heritage Trail and provides a safe, scenic pathway for cyclists and joggers.

Just southwest of Sterling State Park is the River Raisin National Battlefield Park. In October 2010, the River Raisin Battlefield became part of the National Park System. As detailed in the Placemaking section (see Chapter 7), the River Raisin National Battlefield has the potential to fundamentally transform the Monroe Community. The River Raisin Heritage Corridor-East Master Plan for the battlefield includes a battle reenactment area, a 10,000 person outdoor amphitheater, a series of peace gardens, a newly renovated visitor center, a re-creation of the original Frenchtown settlement, and a network of non-motorized trails connecting key battlefield assets.

The Detroit River International Wildlife Refuge was established in 2001, becoming the first International Wildlife Refuge. The refuge is located along the lower Detroit River and western shoreline of Lake Erie, extending 48 miles along the coastline. Currently, the refuge has obtained 20 units that together compose 5,700 acres. The units include islands, coastal wetlands, marshes, shoals, and waterfront lands. The Refuge is home to 29 species of waterfowl, 65 species of fish, and 300 species of migratory birds.

Although much of the Wildlife Refuge is not currently open to the public, a primary mission of the Refuge is to “Provide for quality public recreation opportunities that are compatible with the vision of the Detroit River IWR including hunting, fishing, wildlife observation and photography, environmental education and interpretation.”⁴⁵

There are three units located in the Monroe Community. The most northern unit is called the Lagoon Beach Unit. According to the U.S. Fish and Wildlife Service, the Lagoon Beach Unit is managed cooperatively by the Refuge in partnership with DTE Energy and is located near the Fermi Power Plant. The Ford Marsh Unit is a contiguous 180 acres of wetland near the River Raisin and Sterling State Park. The third unit is the Plumb Creek Bay Unit, located around the mouth of Plumb Creek where water enters the Plumb Creek Bay.

CHAPTER 6. MONROE COMMUNITY ECONOMY

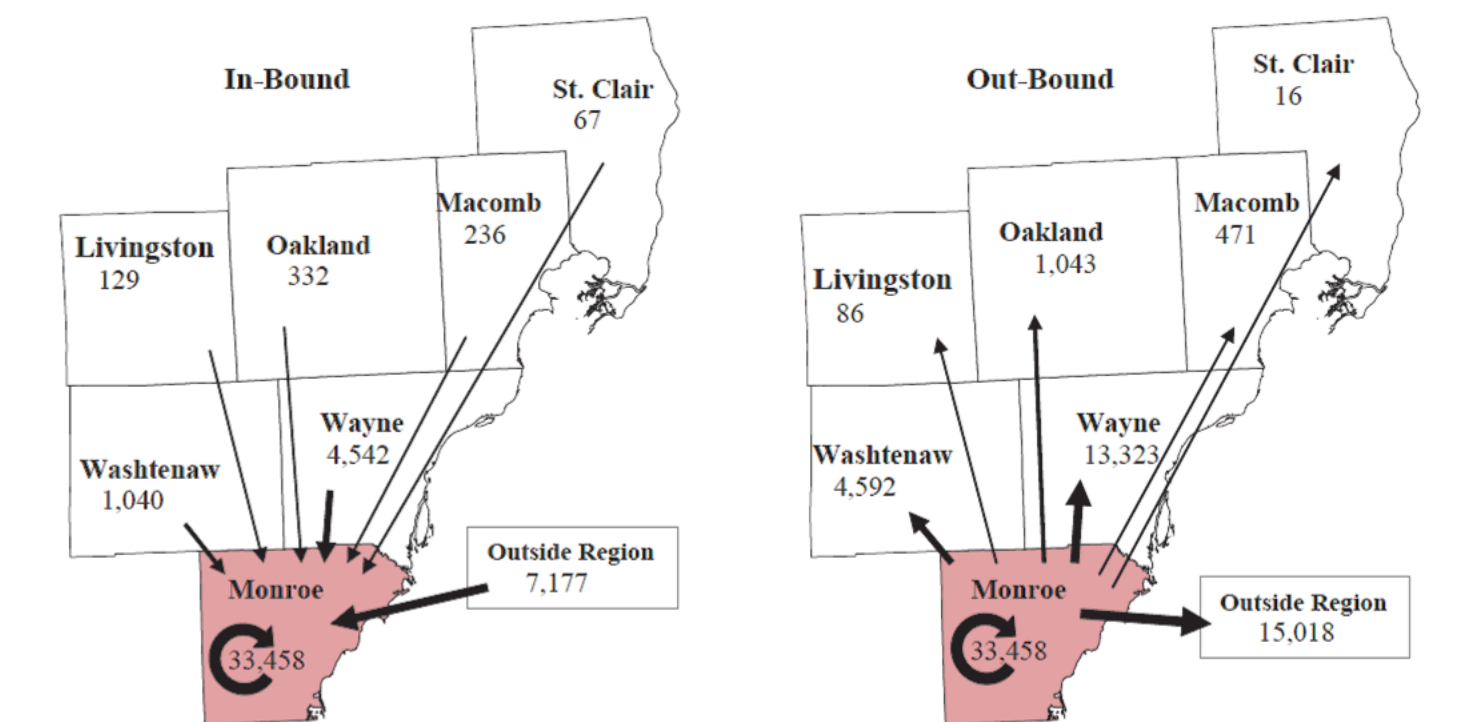
Even before the nation’s Great Recession began in 2008, Michigan was already deep into a recession of its own, and southeast Michigan has been one of the hardest-hit regions in one of the hardest-hit states for more than a decade. Many of the basic tenants of resilient communities — such as economic diversity, innovation, and creative problem-solving capacity — speak very clearly to Michigan communities that have suffered through some of the worst economic upheavals in our nation’s history.

The Monroe Community has not been immune to this suffering, particularly as Michigan struggles to cope with a severe (and almost certainly permanent) decline in manufacturing jobs that have been the dominant cornerstone of the state’s modern economy. However, the Monroe Community possesses some unique assets, not the least of which is a demonstrated willingness to recognize the inevitability of large external shocks — and cooperatively plan to face and adapt to them.

THE LOCAL CONTEXT

The Monroe Community is famously the world headquarters of the La-Z-Boy furniture company and is also a large regional supplier of electricity, home to both the Fermi 2 Nuclear Generating Station and the coal-fired Monroe Power Plant.

Figure 6.1 In-Bound and Out-Bound Commuting in Monroe County (SEMCOG 2010)



Currently, there are nearly 47,000 people working in Monroe County. Each day, approximately 13,500 people commute from outside the area into Monroe County to work (see Figure 6.1).⁴⁶ This presents an opportunity for local businesses to retain the spending power of these individuals during the day for lunch, groceries, and other errands. In contrast, there are over 34,500 Monroe County citizens who commute out of the County for jobs elsewhere. This signifies an employment *leakage*. In the southeast Michigan region, only the relatively small and distant counties of St. Clair and Livingston send a small surplus of in-bound commuters into Monroe; all others draw significantly more commuters away from Monroe. If Monroe can generate additional job opportunities, fewer people may seek employment elsewhere. More jobs in Monroe translate to a more rooted and stable local economy.

The Golden Age of Manufacturing is Coming to an End

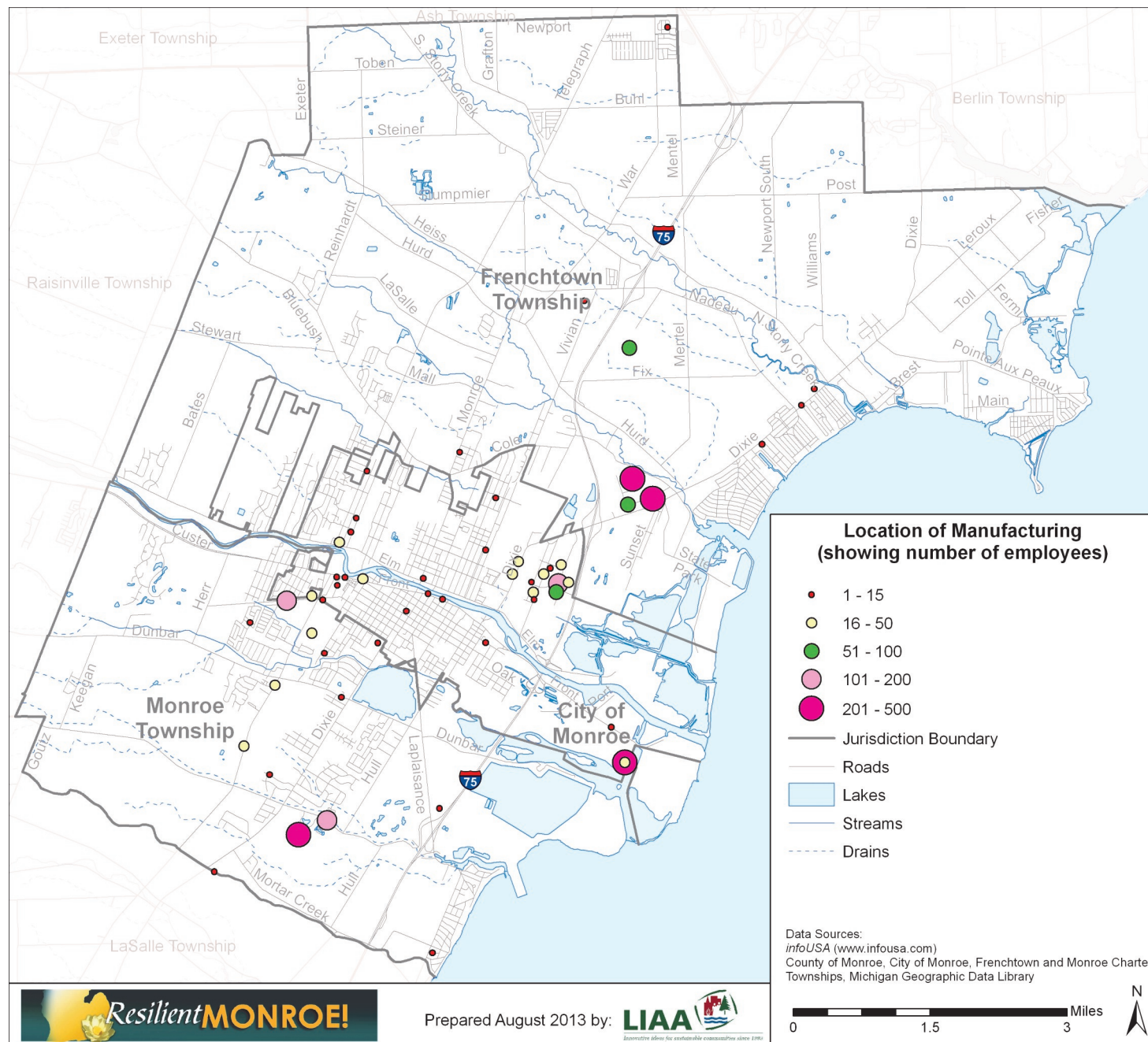
Like so many other communities in Michigan, the Monroe Community has experienced severe economic challenges due in part to a statewide loss of manufacturing jobs combined with a severe national recession. In 2008, the Monroe Community lost 1,200 jobs at just one facility when Ford Motor Company closed its Automotive Components Holdings (ACH) plant. Long-term projections through 2040 predict a continued trend of loss in manufacturing jobs (see Figure 6.2).²¹

Figure 6.2 Jobs by Industry Forecast, 2040 (SEMCOG 2010)

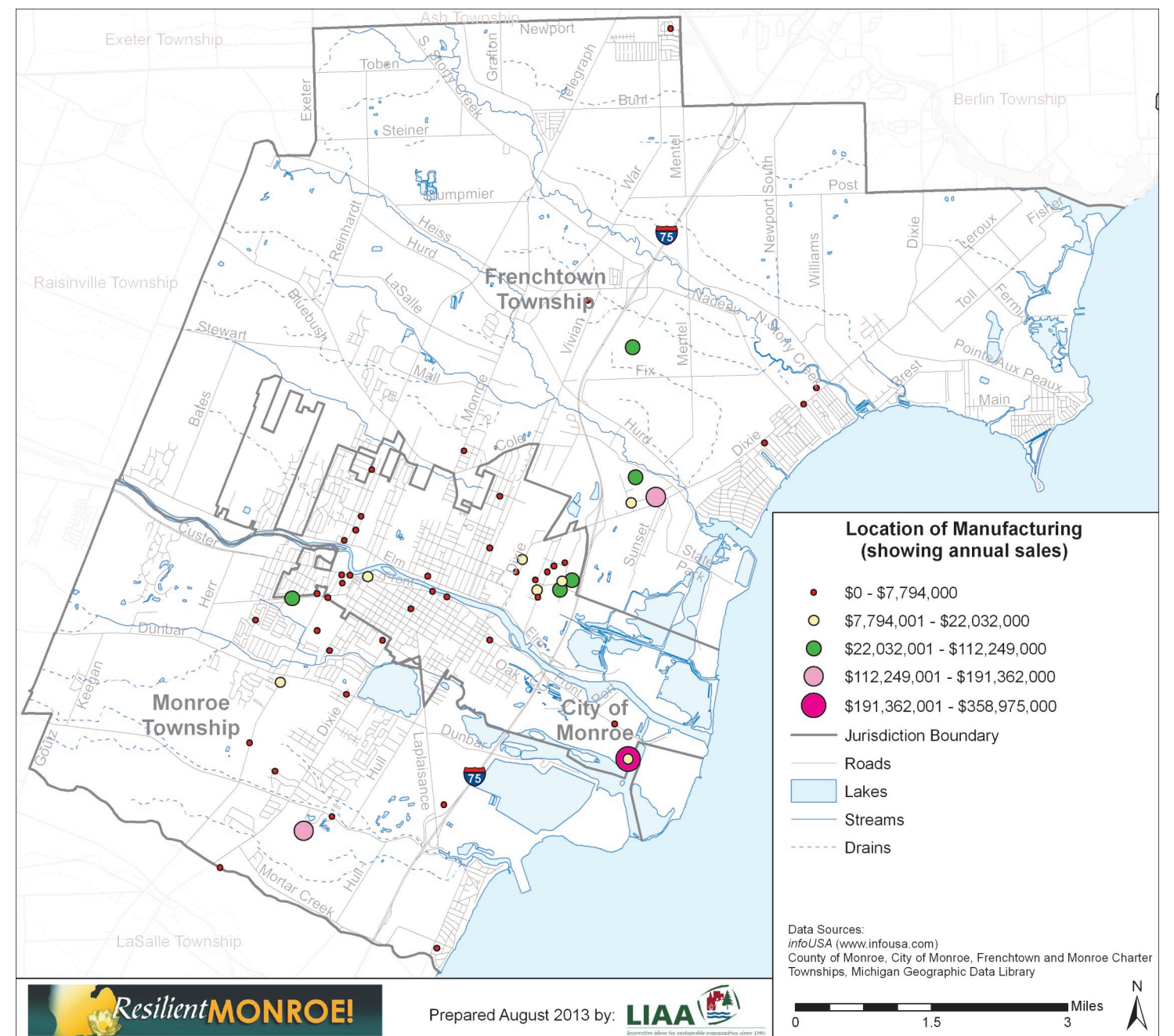
Jobs by Industry	2010			Forecast 2040			% Change		
	City of Monroe	Monroe Charter Twp.	Frenchtown Charter Twp.	City of Monroe	Monroe Charter Twp.	Frenchtown Charter Twp.	City of Monroe	Monroe Charter Twp.	Frenchtown Charter Twp.
Natural Resources, Mining, & Construction	495	191	1,759	513	204	1,978	3.6%	6.8%	12.5%
Manufacturing	1,363	292	398	980	185	270	-28.1%	-36.6%	-32.2%
Wholesale Trade, Transportation, Warehousing, & Utilities	718	217	2,308	928	193	2,091	29.2%	-11.1%	-9.4%
Retail Trade	662	761	2,834	583	717	2,753	-11.9%	-5.8%	-2.9%
Knowledge-based Services	3,038	2,422	1,665	3,410	3,672	2,181	12.2%	51.6%	31.0%
Services to Households & Firms	2,869	254	581	3,420	293	741	19.2%	15.4%	27.5%
Private Education & Healthcare	3,118	479	1,416	4,443	790	2,323	42.5%	64.9%	64.1%
Leisure & Hospitality	1,539	701	1,277	1,681	849	1,443	9.2%	21.1%	13.0%
Government	1,390	1,700	378	1,423	1,792	396	2.4%	5.4%	4.8%
Total	15,192	7,017	12,616	17,381	8,695	14,176	14.4%	23.9%	12.4%

Source: SEMCOG Community Profile 2010

Map 6.1 Monroe Community Manufacturing Employees



Map 6.2 Monroe Community Manufacturing Annual Sales



Although manufacturing is on the decline in general, a large percentage of the local industry sector is still dominated by manufacturing. Many top employers and top revenue generators in the community are manufacturing-based. According to data provided by *InfoUSA*,⁴⁷ some of the largest employers in terms of total employees in the Monroe Community are as follows:

Mercy Memorial Hospital (1,400 employees)
Fermi Nuclear Power Plant (1,000 employees)

LA-Z-Boy Inc. (500 employees)
Gerdau Michigan (450 employees)
Tenneco Inc (450 employees)
Monroe County Community College (400 employees)
Superior Health Plans Inc (400 employees)
TWB Company LLC (400 employees)

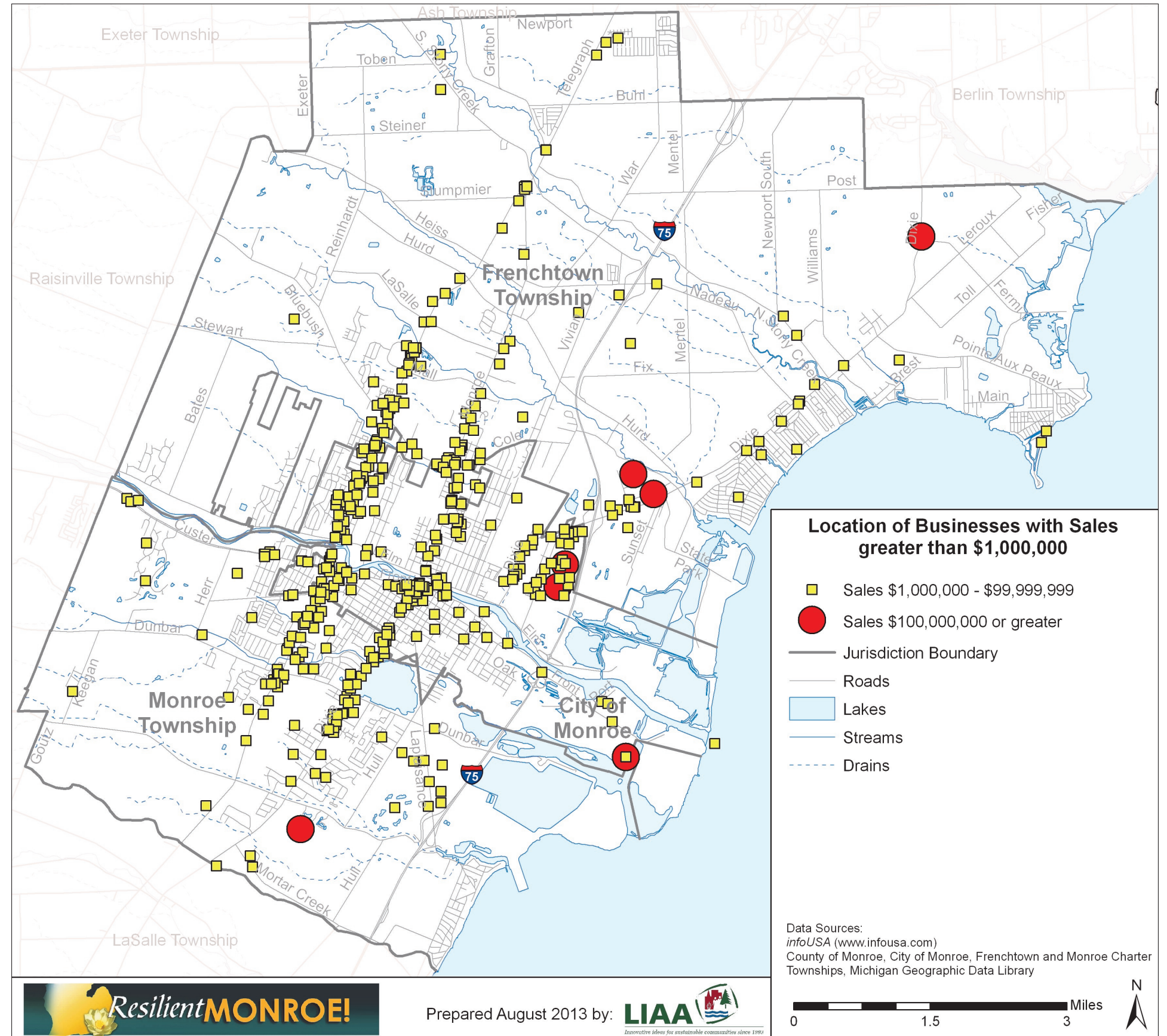
According to data provided by *InfoUSA*, there are seven companies in the Monroe Community that each generated over \$100 million in location sales last year. All seven of these locations are industrial or manufacturing-type businesses. There are 593 other companies that brought in over \$1 million each in sales. These 593 businesses are economically diverse. In context, the “Big 7” collectively accounted for about \$1.3 billion in sales, while their smaller cousins topped \$3.2 billion in sales. As in many aspects of community resilience, there can be strength in diversity and numbers.

The New Economy

As the number of manufacturing jobs continues to decline, the Monroe Community has an opportunity to invest in and attract other industries. The service industries, particularly knowledge-based services, are projected to continue to increase in the city and both townships over the next 27 years (Figure 6.2). This projection fits with a national trend toward the *New Economy*. The *New Economy* is a buzz phrase used to describe the transition from a manufacturing-based economy to a service-based or innovation-based economy. In the New Economy, communities and regions are encouraged to build from within, expanding existing businesses and supporting new entrepreneurial enterprises. To rebuild or retain economic vitality, the experts say, communities will need to attract and retain educated and talented people.

The Monroe Community is already creating the foundation for a more diversified local economy. For example, in an effort to attract locally-owned start-up businesses, the City of Monroe Downtown Development Authority (DDA) has developed information to assist entrepreneurial individuals in writing a business plan, securing a loan, basic accounting, strategic planning, and marketing. The DDA also developed a Downtown Monroe Handbook that outlines parking standards, zoning requirements, street services, special events, and financial opportunities.⁴⁸ The handbook serves as a reference for local business owners as well as tourists and patrons. By making downtown Monroe attractive, friendly, and accessible, local leaders have taken an important first step in attracting new entrepreneurial enterprises to the entire Community.

Map 6.3: Monroe Community Businesses with Annual Sales Greater than \$1 Million



Efforts such as these are real examples of *economic gardening*, an economic development model that works to attract and nurture entrepreneurship. Communities that can “cultivate” entrepreneurs build economic resilience into their greatest assets: their citizens.

ECONOMIC GARDENING

Economic gardening is an economic development model that embraces the fundamental idea that entrepreneurs drive economies. The model works to connect entrepreneurs to resources, encouraging the development of essential infrastructure and providing entrepreneurs with needed information. The three basic elements of economic gardening are:

- 1. Providing critical information needed by businesses to survive and thrive.*
- 2. Developing and cultivating an infrastructure that goes beyond basic physical infrastructure and includes quality of life, a culture that embraces growth and change, and access to intellectual resources, including qualified and talented employees.*
- 3. Developing connections between businesses and the people and organizations that can help take them to the next level — business associations, universities, roundtable groups, service providers and more.*

*Kauffman Foundation
and the
Edward Lowe Foundation*

Commerce in the Monroe Community

Household incomes in the Monroe Community (including the City of Monroe and Monroe and Frenchtown Charter Townships) are projected to rise in the next five years, though the same projections show that the Community will continue to lag behind incomes in the rest of the U.S. (Figure 6.3).⁴⁹

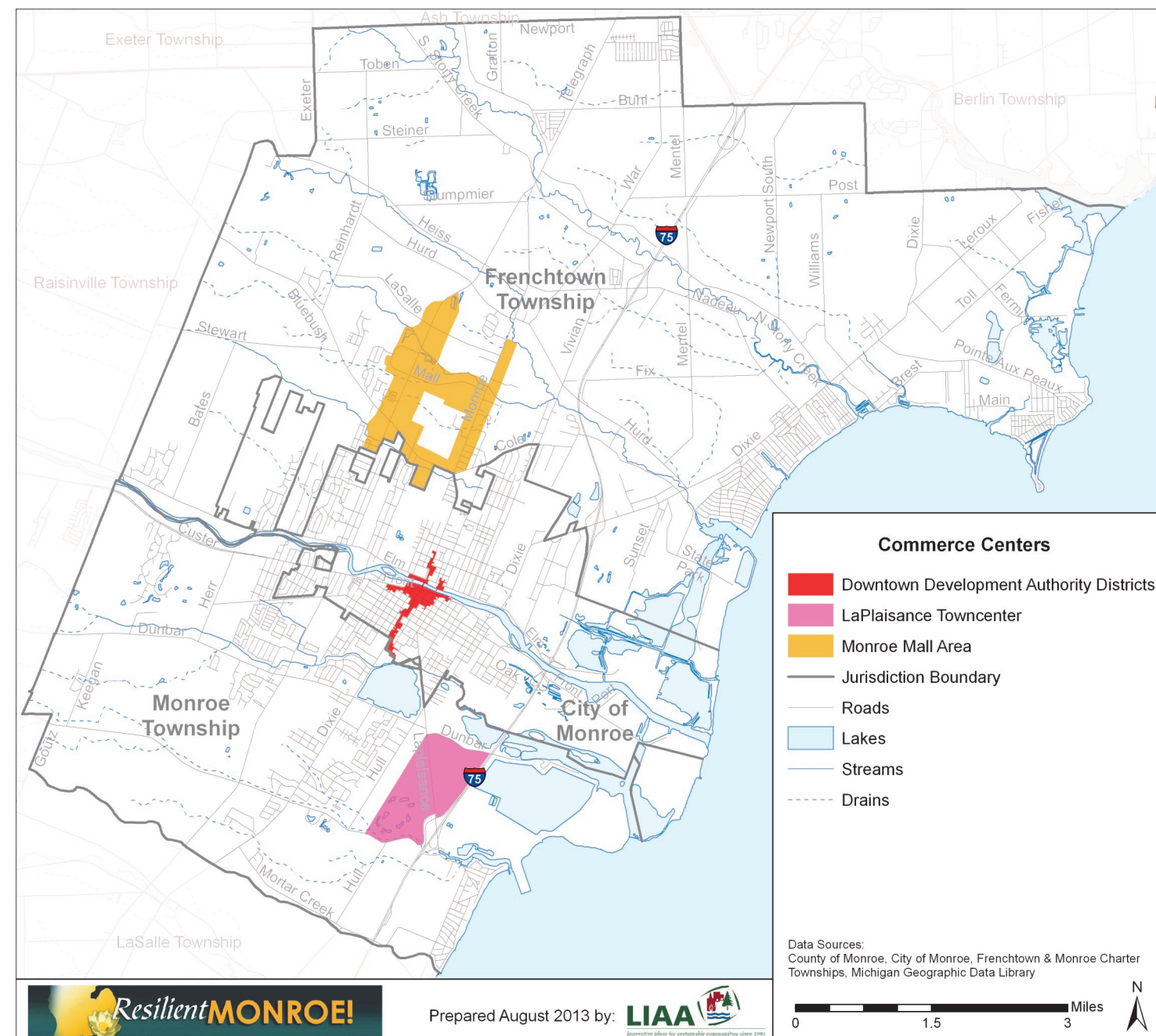
Figure 6.3: Household Incomes and 5-Year Projections

Households by Income	2012			5-Year Forecast (2017)		
	All U.S. Households	Monroe Community	Compared to U.S.	All U.S. Households	Monroe Community	Compared to U.S.
Median Household Income	\$ 50,157	\$ 44,324	-11.6%	\$ 56,895	\$ 52,183	-8.3%
Average Household Income	\$ 68,162	\$ 56,986	-16.4%	\$ 77,137	\$ 62,990	-18.3%
Per Capita Income	\$ 26,409	\$ 22,914	-13.2%	\$ 29,882	\$ 25,630	-14.2%

Source: Esri Business Analyst, July 2013

So where are consumers in the Monroe Community spending their hard-earned money? For most retail industry groups in the Community, sales exceed the demand that would be expected from residents of the three jurisdictions themselves, indicating that a *surplus* of customers is being drawn from outside the Community to consume goods and services (Figure 6.4).⁴⁹ Exceptions to this market surplus can be found across several industry

Map 6.4 Monroe Community Commerce Centers



groups. These exceptions, known as *leakages*, indicate retail potential in the Community to capture and retain more local spending (Figure 6.5).⁴⁹ The benefit to the Community is even more powerful if locally-owned businesses can be developed to plug these retail leaks.



Figure 6.4 Monroe Community Retail Gap Analysis Data Table

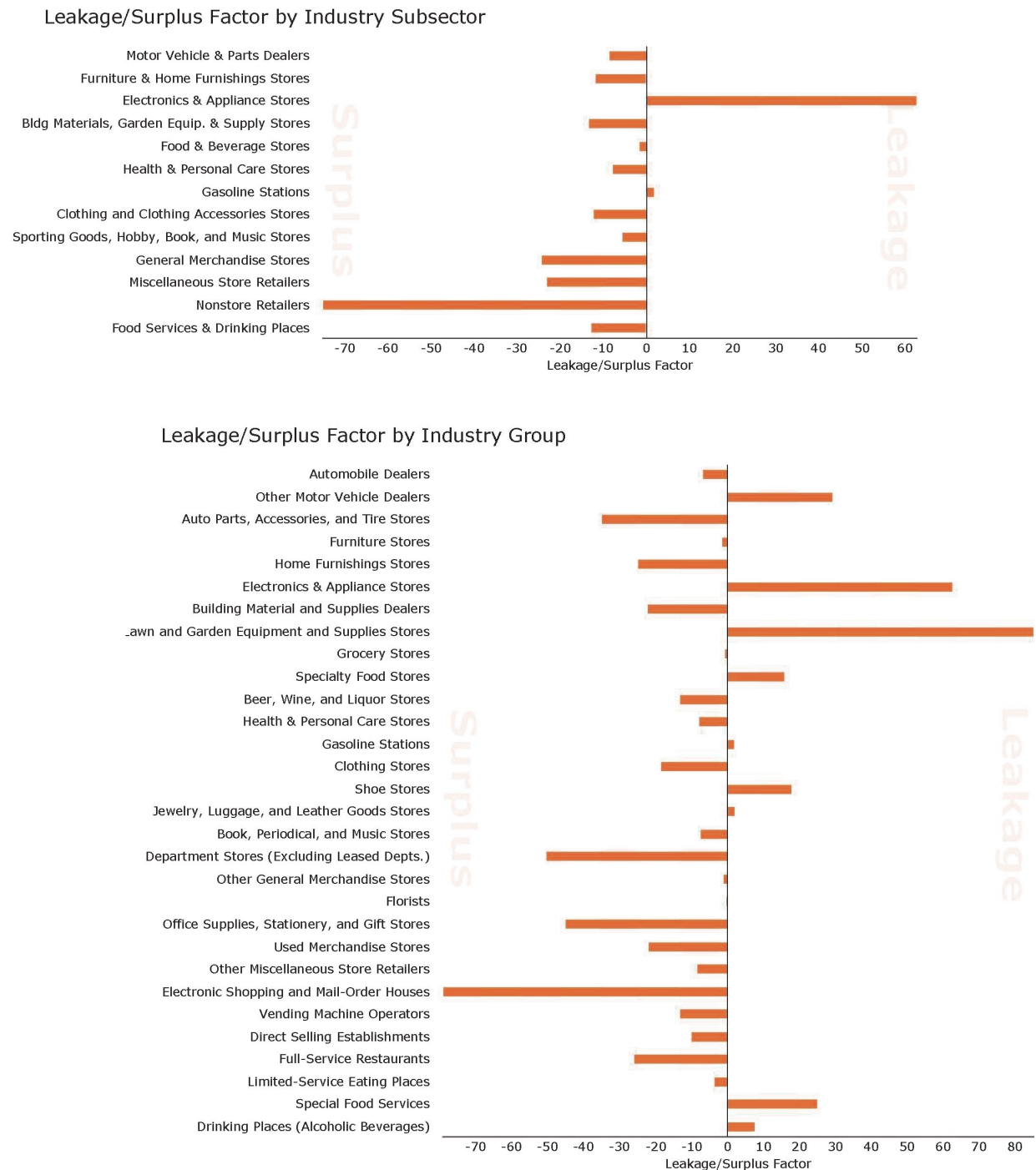
Summary Demographics						
2012 Population						55,333
2012 Households						21,622
2012 Median Disposable Income						\$37,560
2012 Per Capita Income						\$22,914
Industry Summary	NAICS	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/Surplus Factor	Number of Businesses
Total Retail Trade and Food & Drink	44-45,722	\$513,062,600	\$827,084,430	-\$314,021,830	-23.4	447
Total Retail Trade	44-45	\$464,243,427	\$764,044,310	-\$299,800,883	-24.4	352
Total Food & Drink	722	\$48,819,173	\$63,040,120	-\$14,220,947	-12.7	95
Industry Group	NAICS	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/Surplus Factor	Number of Businesses
Motor Vehicle & Parts Dealers	441	\$85,225,936	\$101,081,229	-\$15,855,293	-8.5	32
Automobile Dealers	4411	\$72,588,088	\$82,972,647	-\$10,384,559	-6.7	12
Other Motor Vehicle Dealers	4412	\$5,260,429	\$2,877,936	\$2,382,493	29.3	9
Auto Parts, Accessories & Tire Stores	4413	\$7,377,419	\$15,230,646	-\$7,853,227	-34.7	11
Furniture & Home Furnishings Stores	442	\$8,888,904	\$11,217,656	-\$2,328,752	-11.6	23
Furniture Stores	4421	\$5,606,367	\$5,780,571	-\$174,204	-1.5	9
Home Furnishings Stores	4422	\$3,282,537	\$5,437,085	-\$2,154,548	-24.7	14
Electronics & Appliance Stores	4431	\$13,005,263	\$2,974,587	\$10,030,676	62.8	10
Bldg Materials, Garden Equip. & Supply Stores	444	\$15,123,843	\$19,744,633	-\$4,620,790	-13.3	17
Bldg Material & Supplies Dealers	4441	\$12,497,489	\$19,536,494	-\$7,039,005	-22.0	16
Lawn & Garden Equip & Supply Stores	4442	\$2,626,354	\$208,139	\$2,418,215	85.3	1
Food & Beverage Stores	445	\$64,511,538	\$66,641,536	-\$2,129,998	-1.6	36
Grocery Stores	4451	\$53,980,245	\$54,661,888	-\$681,643	-0.6	16
Specialty Food Stores	4452	\$3,029,513	\$2,191,520	\$837,993	16.1	10
Beer, Wine & Liquor Stores	4453	\$7,501,780	\$9,788,128	-\$2,286,348	-13.2	10
Health & Personal Care Stores	446,4461	\$39,485,003	\$46,092,818	-\$6,607,815	-7.7	31
Gasoline Stations	447,4471	\$46,963,858	\$45,234,840	\$1,729,018	1.9	17
Clothing & Clothing Accessories Stores	448	\$26,272,850	\$33,521,804	-\$7,248,954	-12.1	44
Clothing Stores	4481	\$18,892,331	\$27,398,087	-\$8,505,756	-18.4	23
Shoe Stores	4482	\$3,565,967	\$2,476,863	\$1,089,104	18.0	6
Jewelry, Luggage & Leather Goods Stores	4483	\$3,814,552	\$3,646,854	\$167,698	2.2	15
Sporting Goods, Hobby, Book & Music Stores	451	\$12,389,280	\$13,838,840	-\$1,449,560	-5.5	33
Sporting Goods/Hobby/Musical Instr Stores	4511	\$9,566,174	\$10,563,704	-\$997,530	-5.0	27
Book, Periodical & Music Stores	4512	\$2,823,106	\$3,275,136	-\$452,030	-7.4	6
General Merchandise Stores	452	\$107,925,487	\$177,165,795	-\$69,240,308	-24.3	13
Department Stores Excluding Leased Depts.	4521	\$33,475,918	\$101,428,884	-\$67,952,966	-50.4	9
Other General Merchandise Stores	4529	\$74,449,569	\$75,736,911	-\$1,287,342	-0.9	4
Miscellaneous Store Retailers	453	\$12,066,910	\$19,256,259	-\$7,189,349	-23.0	69
Florists	4531	\$816,178	\$817,987	-\$1,809	-0.1	4
Office Supplies, Stationery & Gift Stores	4532	\$3,280,388	\$8,656,338	-\$5,375,950	-45.0	15
Used Merchandise Stores	4533	\$1,028,182	\$1,602,882	-\$574,700	-21.8	9
Other Miscellaneous Store Retailers	4539	\$6,942,162	\$8,179,052	-\$1,236,890	-8.2	41
Nonstore Retailers	454	\$32,384,555	\$227,274,313	-\$194,889,758	-75.1	27
Electronic Shopping & Mail-Order Houses	4541	\$25,316,889	\$218,461,429	-\$193,144,540	-79.2	3
Vending Machine Operators	4542	\$2,171,421	\$2,830,196	-\$658,775	-13.2	9
Direct Selling Establishments	4543	\$4,896,245	\$5,982,688	-\$1,086,443	-10.0	15
Food Services & Drinking Places	722	\$48,819,173	\$63,040,120	-\$14,220,947	-12.7	95
Full-Service Restaurants	7221	\$19,793,421	\$33,627,637	-\$13,834,216	-25.9	33
Limited-Service Eating Places	7222	\$23,513,096	\$25,290,602	-\$1,777,506	-3.6	39
Special Food Services	7223	\$2,304,090	\$1,380,189	\$923,901	25.1	4
Drinking Places - Alcoholic Beverages	7224	\$3,208,566	\$2,741,692	\$466,874	7.8	19

Data Note: Supply (retail sales) estimates sales to consumers by establishments. Sales to businesses are excluded. Demand (retail potential) estimates the expected amount spent by consumers at retail establishments. Supply and demand estimates are in current dollars. The Leakage/Surplus Factor presents a snapshot of retail opportunity. This is a measure of the relationship between supply and demand that ranges from +100 (total leakage) to -100 (total surplus). A positive value represents 'leakage' of retail opportunity outside the trade area. A negative value represents a surplus of retail sales, a market where customers are drawn in from outside the trade area. The Retail Gap represents the difference between Retail Potential and Retail Sales. Esri uses the North American Industry Classification System (NAICS) to classify businesses by their primary type of economic activity. Retail establishments are classified into 27 industry groups in the Retail Trade sector, as well as four industry groups within the Food Services & Drinking Establishments subsector. For more information on the Retail MarketPlace data, please view the methodology statement at <http://www.esri.com/library/whitepapers/pdfs/esri-data-retail-marketplace.pdf>.

Source: Esri and Dun & Bradstreet. Copyright 2012 Dun & Bradstreet, Inc. All rights reserved.

July 18, 2013

Figure 6.5 Monroe Community Retail Gap Analysis, Surplus vs. Leakage



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July 18, 2013

According to our retail gap analysis of the Monroe Community, notable retail leakages are present in *Lawn and Garden Equipment and Supplies*, *Electronics and Appliances*, *Specialty Food Stores*, *Special Food Services* (e.g., caterers, food trucks), *Shoe Stores*, *Drinking Places* (bars/taverns), and *Other Motor Vehicle Dealers* (e.g., motor homes, recreational trailers, campers, motorcycles, recreational watercraft, snowmobiles, off-road all-terrain vehicles, utility trailers). Across a total of nine retail industry groups demonstrating leakages, the retail opportunity to the Monroe Community is estimated at more than \$20 million annually (Figure 6.6).⁴⁹

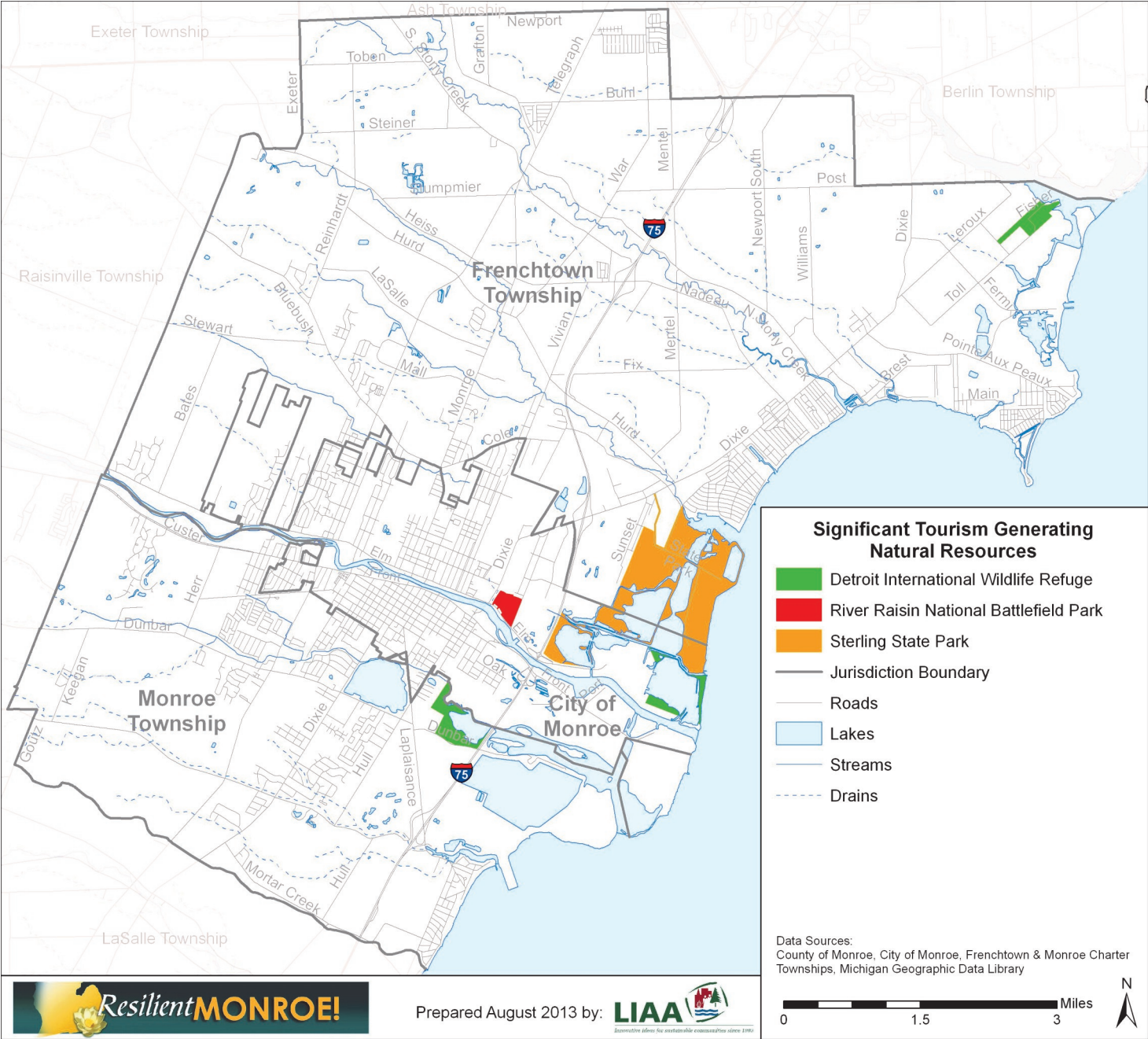
Figure 6.6: Identified Retail Leakages in the Monroe Community by Industry Group

Industry Group	NAICS	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage Factor	# of Businesses
Lawn & Garden Equip & Supply Stores	4442	\$ 2,626,354	\$ 208,139	\$ 2,418,215	85.3	1
Electronics & Appliance Stores	4431	\$ 13,005,263	\$ 2,974,587	\$ 10,030,676	62.8	10
Other Motor Vehicle Dealers	4412	\$ 5,260,429	\$ 2,877,936	\$ 2,382,493	29.3	9
Special Food Services	7223	\$ 2,304,090	\$ 1,380,189	\$ 923,901	25.1	4
Shoe Stores	4482	\$ 3,565,967	\$ 2,476,863	\$ 1,089,104	18.0	6
Specialty Food Stores	4452	\$ 3,029,513	\$ 2,191,520	\$ 837,993	16.1	10
Drinking Places - Alcoholic Beverages	7224	\$ 3,208,566	\$ 2,741,692	\$ 466,874	7.8	19
Jewelry, Luggage & Leather Goods Stores	4483	\$ 3,814,552	\$ 3,646,854	\$ 167,698	2.2	15
Gasoline Stations	447, 4471	\$ 46,963,858	\$ 45,234,840	\$ 1,729,018	1.9	17
Total		\$ 83,778,592	\$ 63,732,620	\$ 20,045,972		

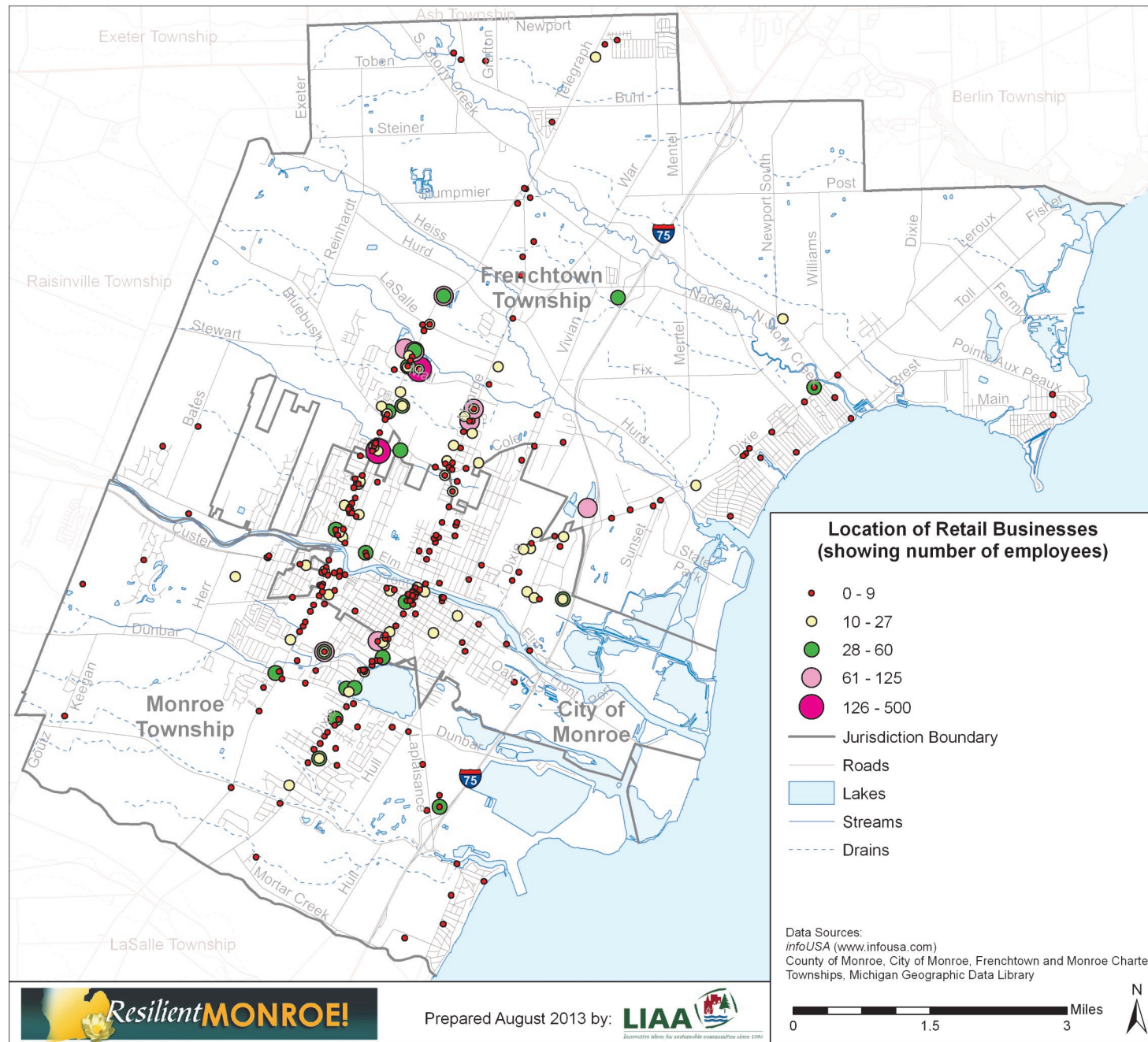
Source: Esri Business Analyst, July 2013

Tourism is one of Michigan’s largest industries. New attractions in the Monroe Community, most notably the River Raisin National Battlefield Park, have the potential to increase retail demand from visitors. As with Sterling State Park and the International Wildlife Refuge, the amount of economic benefit derived by the Community from increased tourism will directly relate to the Community’s ability to meet the increased demand for goods and services.

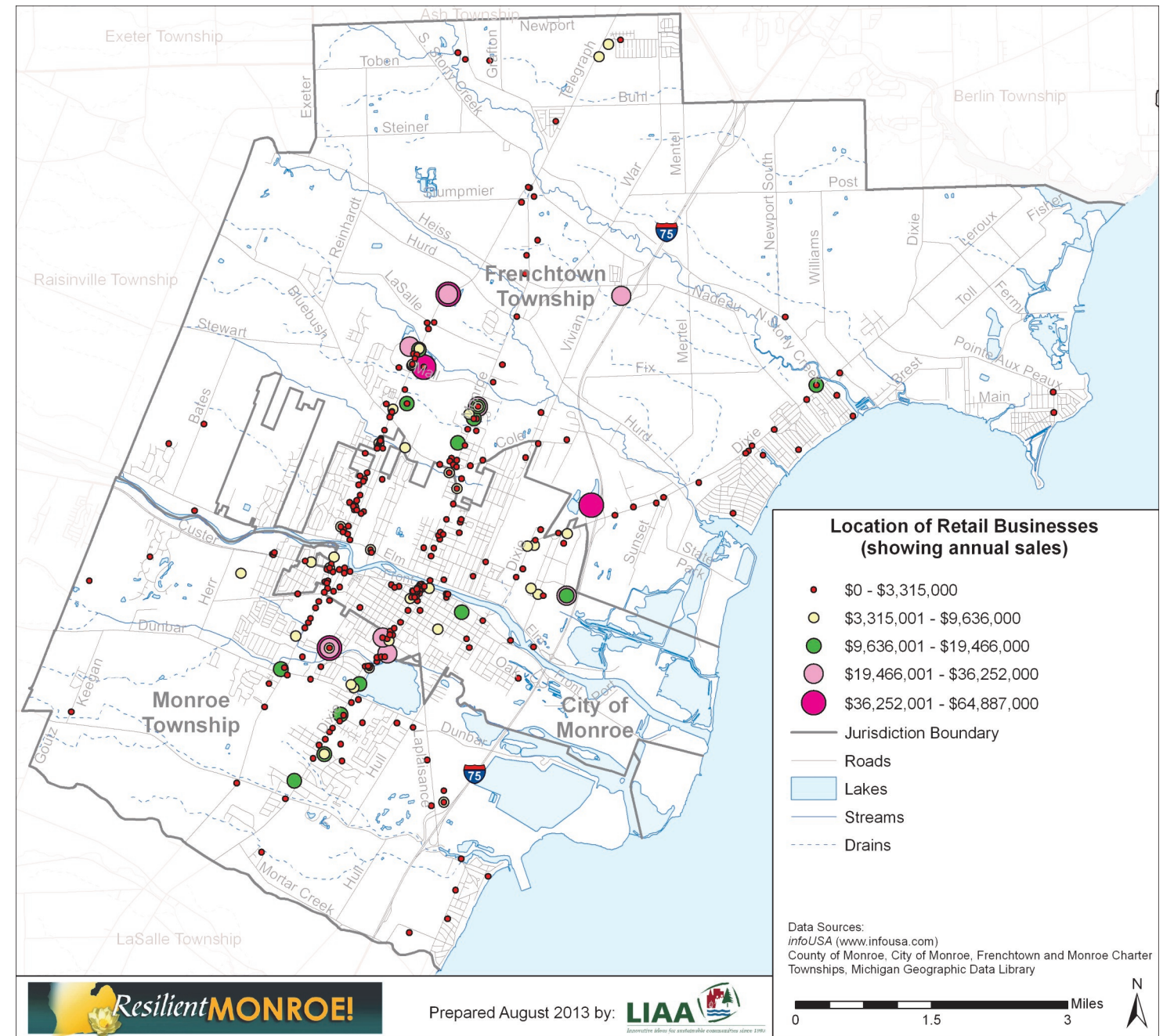
Map 6.5 Monroe Community Tourism Centers



Map 6.6 Monroe Community Retail Business Employees



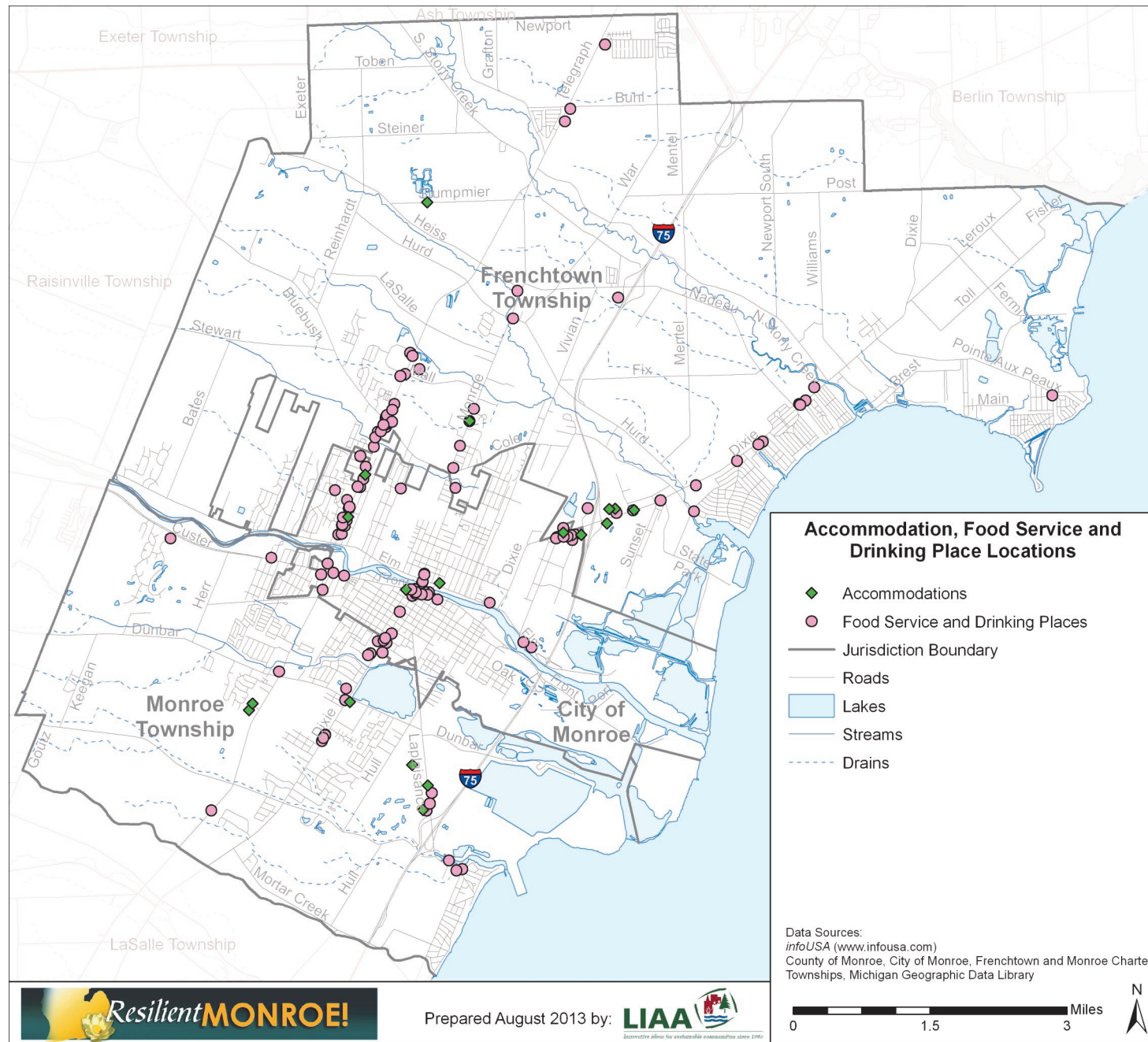
Map 6.7 Monroe Community Retail Business Annual Sales



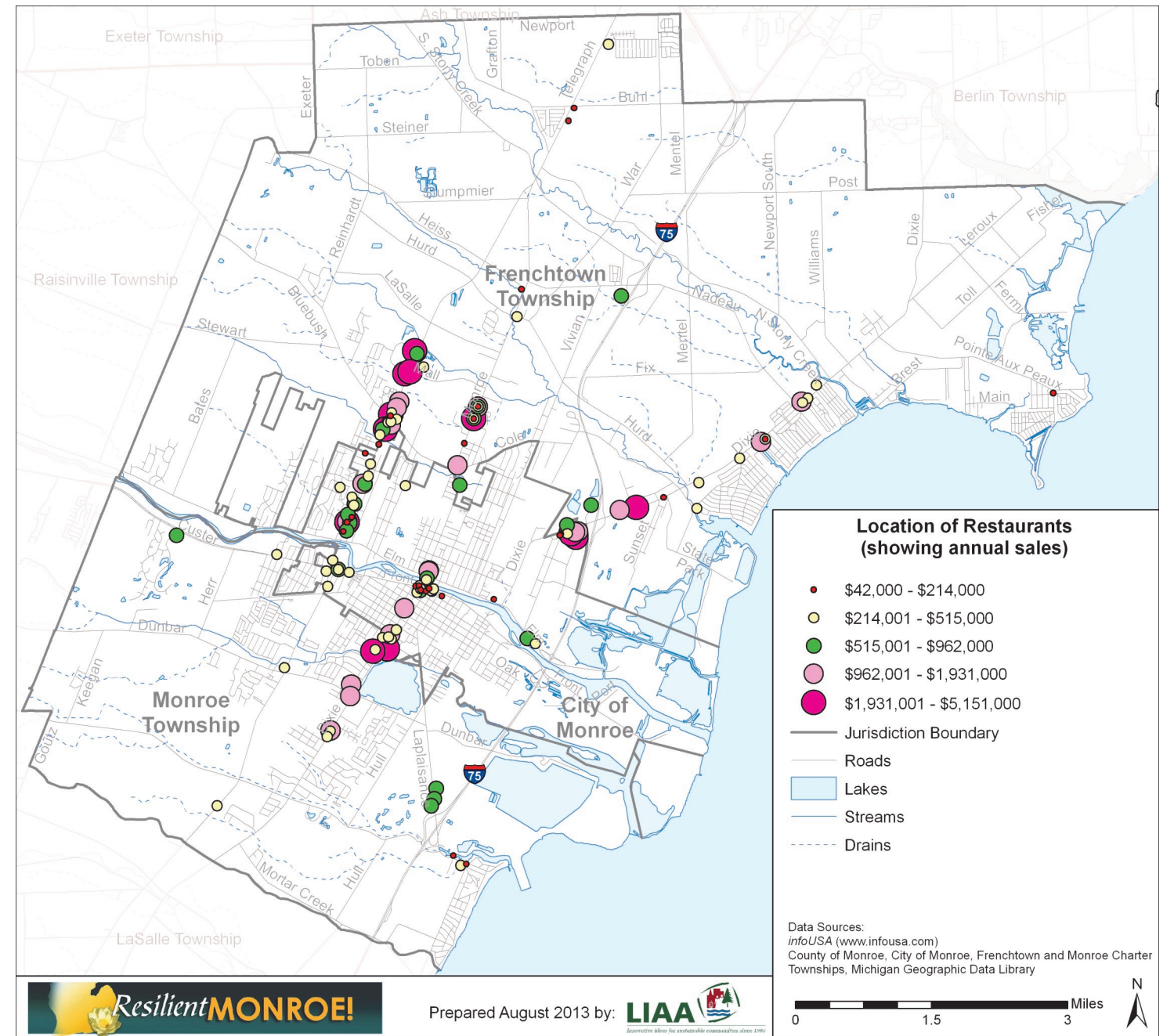
As in many other communities, retail employment and commerce in the Monroe Community is concentrated along major transportation corridors (Maps 6.6 and 6.7).⁴⁹ This analysis confirms a relative lack of retail services along the LaPlaisance Corridor, which has been identified as a concern by stakeholders during the *Resilient*

Monroe planning process. There also appears to be a general lack of retail services near the Community's three most significant tourism destinations (Map 6.5),⁴⁹ which could be a concern in serving additional visitors.

Map 6.8 Monroe Community Accommodations, Food Services and Drinking Places



Map 6.9 Monroe Community Restaurant Annual Sales



Similar distributions can be noted for current *Accommodation, Food Service and Drinking Place Locations* (Map 6.8) and *Restaurants* (Map 6.9).⁴⁹ *Special Food Services and Drinking Places* are also two of the industry groups

that our analyses identified as retail gaps/leakages in the Monroe Community, perhaps signaling an opportunity to better serve both residents and visitors by increasing local capacity for each in strategic locations.

Local Food Production

Just as cultivating local entrepreneurship makes a community stronger, the capacity of a community to produce and process its own food greatly increases resilience. Because of its ability to impact health, wealth, and quality of life, the “local food movement” is gaining traction nationwide. During the *Resilient Monroe* planning process, the Community Action Team focused on Food and Agriculture identified a need to expand and diversify local agriculture and food-based businesses. This is supported by the retail leakages noted in both the Special Food Services and Specialty Food Stores industry groups. Ideally, Monroe will leverage its existing assets, such as the Farmer’s Market, community gardens, and an established agricultural base, to lay the foundation for additional food-related jobs in the community.

A *food hub* is one strategy that Monroe could use to bring together farmers, processors and consumers, and ensure local, diversified agricultural products. A food hub is a central location that serves as an intermediary and aggregation source for local food. Food hubs can also serve as business incubators, and are one way to attract younger people with less capital into the agriculture profession (the average age of a farmer in Michigan is 56 years old and climbing).⁵⁰

In Springfield, Oregon, a food hub called Sprout provides a common workspace with an industrial kitchen, processing machinery, a place to sell food products, and office space for other food-related services.⁵¹ In Fremont, Michigan, the local Farmer’s Market was part of a larger downtown revitalization effort. Financial support for the space was donated by the local Community Foundation and technical support was provided by MSU Extension. Farmers were part of the conversation from the beginning, helping to determine characteristics such as the market’s location and hours of operation. Farmers are also members of the steering committee that oversees the Market. The facility in Fremont is city-owned and rented.⁵²

WHAT IS CSA?

Community Supported Agriculture (CSA) is a growing social and agricultural movement that encourages small farm preservation and profitability by directly linking local growers with local community members.

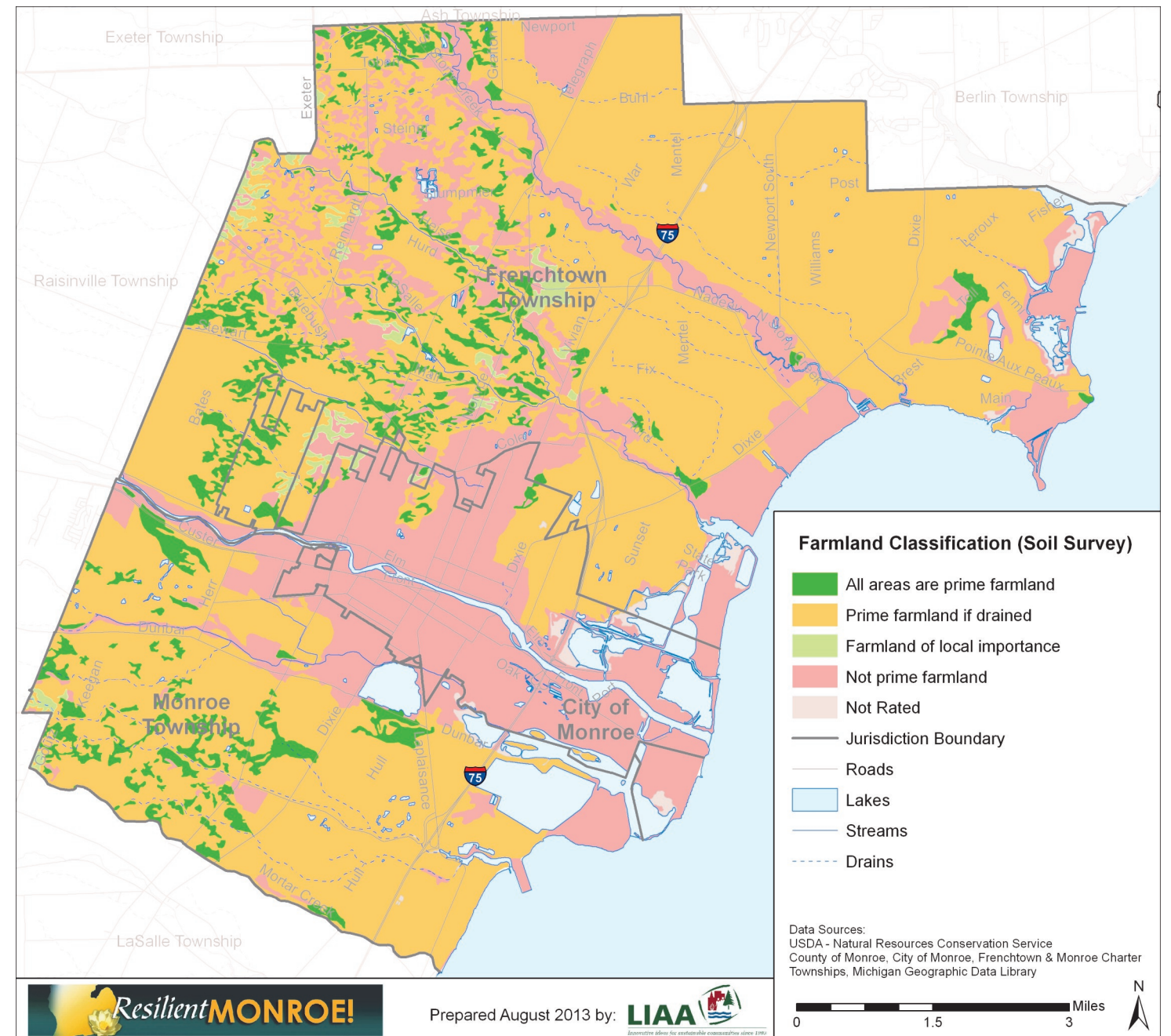
- CSA Farms Northwest Michigan

Community Supported Agriculture (CSA) is another strategy to grow a community’s entrepreneurial base. CSA supports small farm viability and profitability by creating a direct connection between local growers and local customers. Before the growing season, CSA participants purchase a “share” in the products produced by a grower, then receive these fresh products throughout the growing season, typically weekly. This helps the grower more accurately plan for the growing season, and helps provide an economic buffer against unexpected circumstances such as storm damage

or the loss of an individual crop. CSA customers receive steady access to the freshest local food and ensure that their dollars are invested in the local economy.

The Monroe County Health Department’s *Local Food Accessibility* guide (2010) lists dozens of local food resources in the Monroe Community, including CSA, community gardens, farmers’ markets, local-food grocers and restaurants, and roadside stands.⁵³ Encouraging further development of the local food system is a critical component of community resilience and takes advantage of the Monroe Community’s already strong agricultural foundation.

Map 6.10 Monroe Community Farmland Classification



An Energy Leader

The Monroe Community is a major regional supplier of electricity thanks to two large production facilities owned by DTE Energy. The massive Monroe Power Plant occupies shoreline on both the River Raisin and Lake Erie. Built in the early 1970s, it is the 11th-largest power plant and the fourth-largest coal-fired plant in the country, with a peak generation capacity of 3,300 megawatts. Just north along Lake Erie is the 1,000-employee, 1,100-megawatt Fermi 2 facility, one of only three nuclear power plants in Michigan.⁵⁴

DTE has also made the Monroe Community home to two of the largest solar power installations currently in Michigan, one on the Monroe County Community College campus and the other on the grounds of the Sisters, Servants of the Immaculate Heart of Mary (IHM).⁵⁵ Negotiations are underway for a potential third solar installation by DTE at the Port of Monroe. And Ventower Industries, a fabricator of utility-scale wind turbine towers, makes its home in Monroe.

The economic impact of renewable energy in the Monroe Community is dwarfed by the two more traditional generation facilities. However, perhaps owing to its long-time role as an “energy town,” this Community is demonstrably more aware of costs, benefits and new opportunities in energy generation and smart use.

For example, two new lighting projects by the city are paying significant dividends. Efficient new lighting at the city’s Multi-Sports Complex is saving \$12,000-\$15,000 a year, with a payback period of less than six years.⁵⁶ The replacement of nearly 300 mercury vapor streetlights with new LED fixtures will save the city \$20,000 annually.⁵⁷ In both cases, the initial investment was softened by rebates from DTE, and the streetlight project received significant additional support from a federal Community Development Block Grant, leaving it with a payback period of only one year.

Efficient use of energy is a crucial component of a resilient community. Reduced energy usage also reduces costs, pollution, and vulnerability to disruptions in supply. As demonstrated above, municipalities are often the catalysts for more efficient energy usage in a community, providing tangible examples of the many kinds of “win-win” bargains that energy efficiency measures can attain.

MUNICIPAL ENERGY EFFICIENCY PROJECTS IN MONROE—RECENT EXAMPLES

Monroe County conducts Building Facilities Energy Conservation Study and creates Sustainable Energy Plan (2011)

Replacement of single-pane windows with double-pane energy efficient windows at City Hall (2011)

Replacement of incandescent fixtures with fluorescent fixtures and installation of electronic ballasts in existing fluorescent fixtures at City Hall (2011-13)

Lighting audit of City Hall for possible replacement of fluorescent fixtures with induction and/or LED lighting (2012)

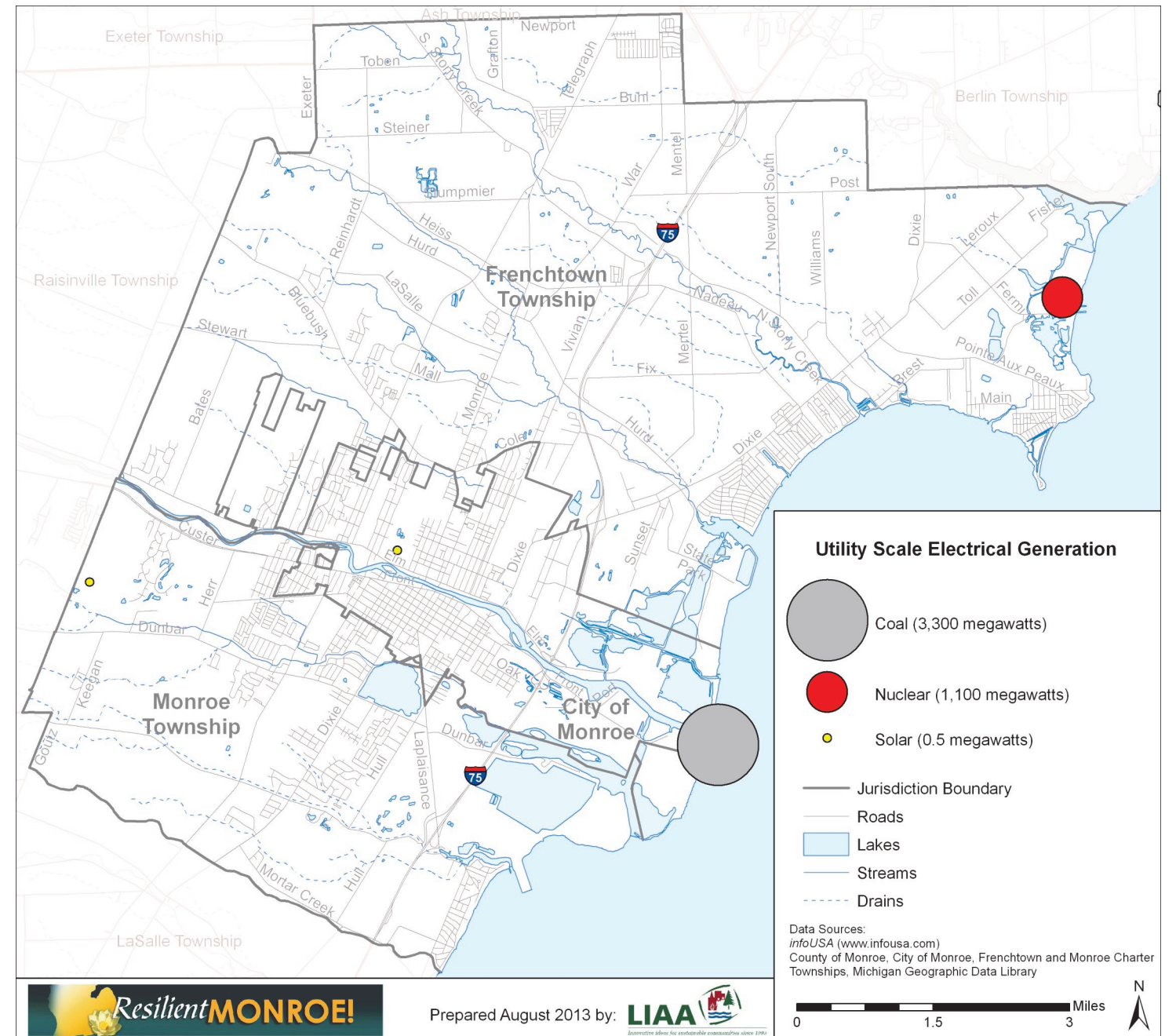
Replacement of high-pressure sodium (HPS) lights in Monroe Multi-Sports Complex with magnetic induction lighting (2013)

Energy audit at city water and sewer facilities by Johnson Controls (2013)

City contract with DTE to replace HPS overhead streetlights with LED (2013)

Port of Monroe selected as one of seven sites from over 80 submittals to proceed to Phase II of DTE’s Solar Program, in partnership with McNaughton-McKay Electric Company (2013)

Map 6.11 Monroe Community Utility Scale Electrical Generation



ENERGY, CLIMATE CHANGE AND COMMUNITY RESILIENCE

Energy production is one of the unique characteristics of the Monroe Community. It also presents some of the greatest challenges — and perhaps some of the greatest opportunities — for the long-term resilience of the Community.

For example, the city counts the Monroe Power Plant as its largest single taxpayer, accountable for approximately 39 percent of the city's tax base.⁵⁸ Loss of the plant would not only cost the Community jobs, it could devastate city services as currently constituted. The fellow Monroe County community of Luna Pier is experiencing this already; that city is losing its coal-fired power plant and is feverishly working to replace more than half of its tax base as a result.⁵⁹

DTE has recently invested hundreds of millions of dollars into the Monroe Power Plant, signaling its intent to continue to operate the facility for the foreseeable future. But reliance on this plant to the current degree is highly tenuous in a context of community resilience. As Michigan knows better than any state in the nation, overreliance on any one industry leaves communities highly vulnerable to economic forces that are far beyond local control.

What is within local control is the ability to identify threats to the local community and work to build resilience to these threats before they hit. Anyone who has experienced a power outage for even a few hours clearly understands just how critical reliable electric service is to modern life, from basic communications to human health and wellbeing. Increasingly volatile and erratic weather events — driven by unprecedented levels of heat-trapping gases in the atmosphere, the same gases we emit through the burning of fossil fuels — are likely to unpleasantly remind us all of this reliance on a much more frequent basis.

Climate change in particular is inextricably linked to any consideration of a community's energy production and usage. According to the nonpartisan Center for Climate and Energy Solutions,⁶⁰ coal remains the third largest energy source in the U.S., accounting for 20.8% of all energy consumed in 2010. Electricity generation accounts for 92% of U.S. coal consumption. With the highest carbon content of all the fossil fuels, carbon dioxide emissions from coal combustion represented 28.3% of total U.S. greenhouse gas emissions in 2010 and 43.1% of global CO₂ emissions. As reported to the US EPA, greenhouse gas emissions from the Monroe Power Plant totaled 15,936,102 metric tons in 2011, the ninth-highest total of any power plant in the nation.

While still a major source of energy for U.S. electricity generation, coal is declining in favor of natural gas and other energy sources due to low natural gas prices, state renewable energy standards and environmental regulations. Coal, it is safe to say, is not the future.

The current alternative energy activity in the Monroe Community speaks to some recognition of this trend, and the distributed nature of the existing solar facilities hints at a strategy that is becoming a hallmark of resilient communities. Smaller, more localized energy production offers much more resilient capacity than do massive individual power plants supplying large areas. This “distributed” approach makes communities less vulnerable to wide-scale disruptions and helps to limit the impact of disruptions.

Under the current paradigm, one unfortunately placed storm can have regional consequences, such as the tornado that damaged structures and triggered a shutdown at the Fermi 2 plant in 2010. Extreme heat events and higher surface water temperatures are also a concern, as both Fermi 2 and the Monroe Power Plant rely on surface water for cooling.

The Monroe Community is a steward of a facility that is a nationally significant producer of greenhouse gases. The Community is also a forward-thinking incubator of utility-scale clean energy production. This apparent dichotomy is instead indicative of great opportunity, particularly given the existing partnerships between the Community and DTE to establish the solar facilities. Additional efforts to build on this public-private relationship and continue to innovate in the Community could focus on efficient energy usage, distributed generation, and clean sources for a Resilient Monroe.

RETAILER SOLD ON SOLAR

*Durocher's TV, Appliances & Furniture has been a fixture in the Monroe Community for more than 60 years, selling and servicing TVs, appliances and furnishings. For the last three years, it has also been generating electricity. More than 80 solar panels are installed on the roof of the iconic downtown business. About a third of the installation cost was covered by federal tax credits, and another third was subsidized by a DTE energy-optimization program. DTE transmits the electricity from the 20-kilowatt system to the consumer grid, and Durocher's gets a credit every month on its DTE bill for the energy produced. With the credits and a simultaneous push toward more energy-efficient lighting inside the store, Durocher says it has cut its utility bills in half (“Durocher's Gamble on Solar Energy Paying Off,” *Monroe Evening News*, June 18, 2013).⁶¹ Durocher's expected a payback period of five years, but due to rising energy costs, it may be closer to four. Durocher's is still the only business in all of Monroe County enrolled in DTE's SolarCurrents program.*



PHOTO COURTESY OF MONROE EVENING NEWS

CHAPTER 7. PLACEMAKING FOR A RESILIENT MONROE

Every community is unique in one way or another. For some communities, it is their proximity to a lake or river. For others, it is their active downtown, interesting public square and vibrant neighborhoods. Unique community assets or *places* help to define the character of the community. *Placemaking* works to leverage community assets to create communities in which people want to live, work and play.

What is Placemaking?

Placemaking is a dynamic, public process involving elements of physical design and citizen participation to improve the aesthetic character and overall livability of a community. Placemaking design guidelines can help establish a standard for development in the entire community. Placemaking can also play an important role in community resilience, engendering a strong sense of place and building enthusiasm for maintaining and improving the community.

PLACEMAKING

*Placemaking is the process of creating quality places where people really want to live, work and play.*⁶²

Placemaking in Michigan

Placemaking is not a new term or community development tool in Michigan. In fact, local jurisdictions have been doing placemaking for many years. Whether it is preserving historic buildings or building new trails, local jurisdictions have a long history of creating interesting and unique places that contribute to the character and livability of their community.



During his first term, Michigan Governor Rick Snyder has made placemaking a key platform in his plans to revitalize the state. Speaking on community development and local government reforms to the Michigan State Legislature in 2011, the governor said:

*“Neighborhoods, cities and regions are awakening to the importance of ‘place’ in economic development. They are planning for a future that recognizes the critical importance of quality of life to attracting talent, entrepreneurship and encouraging local businesses. Competing for success in a global marketplace means creating places where workers, entrepreneurs, and businesses want to locate, invest and expand. This work has been described as a “sense of place” or “place-based economic development” or simply “placemaking.” Economic development and community development are two sides of the same coin. A community without place amenities will have a difficult time attracting and retaining talented workers and entrepreneurs, or being attractive to business. Each community contributes to the overall success of its region. People, companies and talent do not move to specific communities—they move to regions. Being globally competitive as a region requires understanding, mapping and pooling regional resources and assets. Local governments, the private sector, schools, higher education and nongovernmental and civic organizations must collaborate to make Michigan’s economic regions, and ultimately the state, competitive.”*⁶¹

The Governor is asking each community to make a more concerted effort and take a more deliberate approach to placemaking. Planning professionals believe that the design and development of high-quality, amenity rich places will help communities attract and retain the creative, entrepreneurial workers that spur job creation and economic growth. The statewide *MIplace Initiative* was created by Governor Snyder to help communities leverage their physical, cultural and natural assets to make them more economically successful.



STRATEGIC PLACEMAKING

*Strategic Placemaking is targeted at achieving a particular goal in addition to creating quality places. It aims to create places that are uniquely attractive to talented workers so that they want to be there and live there, and in so doing, create the circumstances for substantial job creation and income growth.*⁶²

- *MIplace Initiative*

Why is Placemaking Important?

Between 2000 and 2009 Michigan lost 860,400 jobs. Michigan's unemployment rate was the highest in the nation at 14.2% in August 2009, compared to 9.6% for the nation. With little work available and few prospects, people left the state in great numbers. Between 2000 and 2010, Michigan's population declined by 54,804, roughly 0.6%. As people left the state, Michigan lost some of its most talented and productive workers.³

To help recover from this loss of talent, Michigan communities are being encouraged to use placemaking to attract young, talented, creative professionals. Research suggests that young, talented workers want different things than the typical worker of 15 years ago. Today's workers are more concerned about living in a quality place with lots of amenities than about which company they work for. Workers desire an active and dynamic living environment with social interactions, cultural amenities, and diverse ethnic experiences.⁴ They choose to settle down in communities with outdoor parks and amenities, multimodal transportation choices, and diverse housing choices. By focusing on the community attributes that creative professionals are looking for, the Monroe Community can continue to attract a diversity of talent that will enhance its economy.

WHAT ARE TALENTED PEOPLE LOOKING FOR?

Active & Dynamic Living Environment

Entertainment, recreation, cultural amenities, social interaction and diverse cultural and ethnic experiences

Amenities Driven

Parks, outdoors, thriving farms, sports, hunting, fishing, waterways, greenery

Diverse Lifestyle Choices

Multi-modal transportation (especially transit), range of housing types and prices, density range

Business and Entrepreneurial Opportunities

Creativity, risk taking, good market for innovation, high-wage jobs



HOW DO WE CREATE BETTER PLACES?

There are many elements that contribute to quality-of-place. The Michigan Municipal League has developed *Eight Assets of 21st Century Communities* to highlight specific ways in which communities can better position themselves for success in today's economy.⁶⁴

Physical Design and Walkability

Communities have been designed to shuffle people between work and home. However, market analysis continues to show that today's young professionals, Baby Boomers and empty nesters want to live in neighborhoods with walkable downtowns, access to cultural, social, and entertainment opportunities, and a variety of transportation options.

Green Initiatives

Green Initiatives are critical for any community intending to be viable in today's economy. The way we use energy and natural resources impacts our quality of life and our financial bottom line. Potential to grow green industries, implement sustainable practices, and get on the cutting edge of current trends exists right here in Michigan.

Cultural Economic Development

Arts and culture are essential components of a thriving, knowledge-based economy. A healthy creative sector attracts and retains residents and businesses, and produces economic benefits including jobs, a stronger tax base, downtown and neighborhood revitalization, and tourism.

Entrepreneurship

Growing knowledge-based jobs in ones and twos creates sustainable economies in the 21st century. Strategies that solely focus on seeking out large manufacturers and big-box retailers overlook the positive impact that entrepreneurs and small businesses have on local communities.

Multiculturalism

Creating and sustaining a genuine commitment to diversity and multiculturalism in Michigan's communities is vital to attracting key demographics and global businesses. Today's fluid, mobile, and most importantly, global workforce is seeking out "the right kind of place" that embraces people of all religions, ethnicities, national origins and races.

Messaging and Technology

Next-generation Internet and communication technologies, known as Web 2.0, are connecting people and allowing them to share information in the virtual world in unprecedented ways. Social networking applications like Twitter, Facebook and YouTube, as well as communication platforms like blogs and Wikis, are not just for kids anymore.

Transit

Developing effective public transit options in Michigan is a necessary tool for attracting and retaining residents, workers and businesses. Research shows that people across the nation are choosing communities that offer various modes of transportation, easy access to the places they live, work and play, and allow them to travel without having to rely on a car. In particular, systems like streetcars and light rail have been credited with sparking new commercial and residential development.

Education

Education institutions, from pre-kindergarten through college, play a central role in growing a knowledge-based economy and encouraging a more engaged citizenry. As anchor institutions, colleges and universities bring opportunities for entertainment, arts and culture, healthcare and recreation, and serve as engines of economic development.

MONROE COMMUNITY PLACEMAKING ASSETS

The Monroe Community is endowed with a number of place-based assets that can be leveraged in placemaking efforts. The River Raisin and Lake Erie meet and merge in Monroe. The community is within minutes of two large metropolitan communities, Detroit and Toledo. These are assets of location. The following are examples of ways that physical and cultural assets can be enhanced through strategic placemaking actions.

River Raisin

The River Raisin meanders through the Monroe Community to Lake Erie. Historically, development and commerce focused on the river. Today, the river is home to recreational activities and a thriving boating industry. In addition, the Port of Monroe uses the river for loading and unloading a large quantity of finished and unfinished goods. From a placemaking perspective, the Monroe Community could leverage additional benefits from the river by extending the Riverwalk connecting the downtown with the National Battlefield and the Lake Erie shore.



Sterling State Park

Sterling State Park contains 1,300 acres of beautiful natural areas right on Lake Erie. The park offers a number of recreation opportunities including boating, fishing, camping, wildlife viewing, swimming and hiking. The park includes over a mile of Lake Erie beachfront. In fact, Sterling State Park is one of the most visited state parks in Michigan. Placemaking efforts might leverage these resources by simply adding wayfinding and directional signage. Tastefully designed signage might help encourage park visitors to seek out nearby destinations like the National Battlefield Park, the International Wildlife Refuge, and the Monroe Labor Museum.

Historic Homes and Neighborhoods

Monroe has three historic districts, one historic site and five individual places listed in the National Register of Historic Places. Local officials have identified five other areas with a high concentration of buildings that retain their historic appearance and appear to meet the criteria for listing in the National Register of Historic Places. These historic assets contribute to the unique sense-of-place of the Monroe Community. Placemaking efforts to leverage these important cultural assets might include a marked walking trail with shade trees, signage, resting benches, arranged open houses, and special guided tours at some frequency. A map detailing a guided walking tour of historic homes as well as historic commercial buildings could bring more patrons downtown.



Farmers Market

Not only is the Monroe Farmers Market a great place to buy fruits, vegetables, flowers and craft items, it's a great place to meet friends, have conversations and enjoy the vibrant atmosphere. To increase the placemaking value of this asset, the Monroe Community could make improvements to the building making it more comfortable in cold weather, add artistic murals or a unique color scheme, increase the number of vendors and specialty food products available, and provide easy pick-up and drop-off areas for visitors with disabilities. Such redesign ideas are often gathered from citizens through public processes like *charrettes* (see page 7-6).



Loranger Square

Located at the intersection of Washington Street and East First Street, Loranger Square provides a quiet, peaceful and shady spot to eat lunch or rest in the heart of downtown Monroe. Flanked by the Monroe County



Courthouse, Dorsch Memorial Library and First Presbyterian Church, Loranger Square features the Lotus Fountain, a pavilion and picnic tables. The square hosts concerts, family gatherings, and is a popular spot to get married. Allowing food carts to set up in the square could bring additional people downtown and also serve as a catalyst for new restaurants downtown.

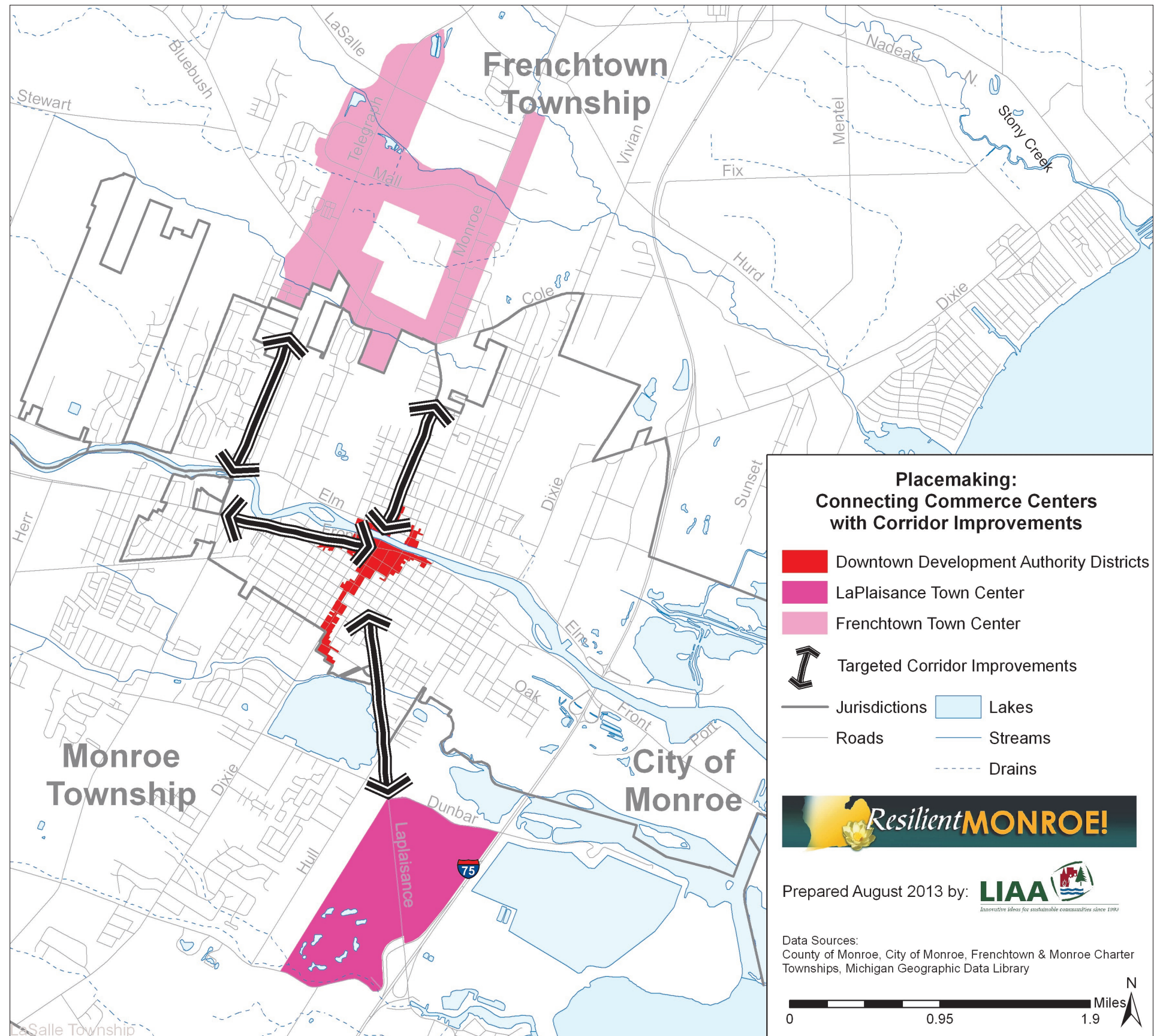
Downtown

Downtown Monroe is the central commercial and civic hub of the greater Monroe Community. Historic buildings, civic structures, tall mature trees, on-street parking, and public spaces all contribute to the character and charm of downtown. In addition, wide sidewalks, the presence of first-floor retail businesses and active restaurants, and interesting gathering places support pedestrian activity and social interaction.

By focusing on corridors that link downtown with township commercial centers, the Monroe Community can enhance economic activity in all three jurisdictions. As illustrated in Map 7.1, the primary transportation corridors that link downtown to the Frenchtown Town Center are Telegraph Road via South Custer Road and North Monroe Street. The primary corridor linking downtown and the LaPlaisance Town Center in Monroe Charter Township is LaPlaisance Road. These key connecting corridors can be enhanced through placemaking design and planning principles. For example, the pedestrian experience would be greatly enhanced if there were fewer driveway access points along the corridor. Through access management, the number of driveways businesses create are limited or reduced to improve automobile, bicycle and pedestrian safety. Design guidelines could also improve visual elements of the corridors. For example, new developments and redevelopments could include site parking behind the business or office. Design standards could help improve the appearance of building façades and signage, making corridors more inviting to visitors and customers.



Map 7.1 Placemaking: Connecting Commerce Centers with Corridor Improvements



Monroe Street: Existing Conditions



Although downtown Monroe has numerous attributes of *great places*, there is still room for improvement, as is illustrated by the photo above. The first photograph was taken in downtown Monroe in August 2013. The second photograph has been graphically altered to illustrate the possibilities that could take shape with some public and private financial investment, and some creativity.

The existing streetscape on the left-hand side is fair. There are some trees and vegetation, and the buildings abut the sidewalk to support a pedestrian-friendly experience. The wide sidewalks make walking feel safe and comfortable. However, the overall appearance leaves a lot to be desired. There are very few vehicles on the street. Some buildings are vacant and windows are boarded up. Paint is chipping away. The pedestrian experience in this setting is not ideal. Mid-block crossings are difficult because there are very few crosswalks.

In the photo on the right, there are multiple modes of transportation possible using the public right-of-way. The addition of a crosswalk and brick sidewalk improve the street appeal for people driving by and pedestrians. The whole scene improves as people use the sidewalks to socialize, stroll and window shop.

Monroe Street: Potential Placemaking Improvements



These transformative changes do not have to originate in local government or from wealthy investors. Communities have been reinvigorated from the ground up for generations when hard-working neighborhood visionaries collaborate to improve their community. Examples of low-cost placemaking actions include:

1. Convert a parking space into a park or public space. A couple of on-street parking spaces provide plenty of space for a park bench, or a spontaneous barbeque.
2. Paint attractive and engaging murals on exposed building walls or at intersections.
3. Get to know your neighbors and local business people by spending more time walking the neighborhoods and visiting the commercial district on foot.
4. Start a community garden at a local park. Invite neighbors to share in the planting, watering, and harvesting of fresh vegetables.

PLACEMAKING OPPORTUNITY: TELEGRAPH ROAD

Telegraph Road is one of the primary north/south corridors in the Monroe Community. Approximately 30,000 vehicles travel along the street each day. A five-lane highway, Telegraph is a well-traveled route for the transport of commerce and people, but it is neither particularly safe nor attractive. The entire public *right-of-way*, from building fronts on one side of the road to the building fronts on the other side, does not offer a bicycle- or pedestrian-friendly environment. Large building setbacks, expansive surface parking lots, busy intersections and numerous curb-cuts (i.e., driveways) all combine to deter people from leaving their cars and discourages any form of pedestrian activity.

As part of the *Resilient Monroe* planning project, local officials, areas businesses, stakeholders, and interested citizens worked together to develop a new vision for Telegraph using a community *charrette* (see Chapter 10). A charrette is a multi-day collaborative planning event that engages local officials, state and regional agencies, business owners, local stakeholder groups (including youth), and interested citizens to create and support a feasible and transformative plan for a specific issue or area of the community.⁶⁵ Traditional transportation corridors such as Telegraph Road are popular targets for community charrettes, as these roads are often in great need of the focused attention and creative thinking a charrette is meant to spark.

Big urban-edge corridors in many communities actually detract from the goals of placemaking. Rather than providing an attractive, amenity rich, multi-use corridor, these old roads were developed with little attention to the number of driveways or building placement, and include excessive amounts of paved parking. The overall effect has been to force unpleasant, impersonal experiences with heavy automobile traffic and unattractive surroundings. Perhaps most telling of all from a placemaking perspective, there is nothing unique about this experience! The same collection of fast food restaurants and chain stores appear in community after community. These corridors are difficult to navigate with cars, almost impossible to walk, and lack an attractive sense of place. Successful placemaking can lead to something that is far more user friendly, attractive and memorable.

Even as specific areas of a community benefit from placemaking efforts, the larger context needs to be kept in mind. For the Telegraph Corridor that means making connections to a larger sense of place, including features such as the River Raisin, Lake Erie Waterfront, and the community’s historic character (see Chapter 10). More specifically, it means leveraging another major placemaking effort: the development of the River Raisin Historic Corridor.

The Charrette Process

Charrette - Day One.

On the first day of the charrette, project team members conduct a walk-through and visual audit of specific areas and elements along the study area. The purpose of this walk-through and audit is to solidify the context and constraints of the specific study area and to test potential design concepts. A preliminary walk-through and audit of these same areas is usually conducted earlier in the project.



Charrette team members then facilitate a series of meetings with different community stakeholder groups. The purpose of these meetings is to more clearly understand and articulate the key issues, constraints and vision of the study areas. Based on the feedback that is received, the charrette team begins to formulate different concepts, evaluate recommendations, and illustrate design solutions.

Later in the first evening, the charrette team hosts a public workshop. The workshop provides an opportunity for citizens to learn about the charrette process and the basic principles that are driving the process. Following a brief presentation, participants are then asked to help articulate a vision for the study area.

Charrette - Day Two.

On the second day of the charrette, team members facilitate additional meetings with community stakeholder groups. The purpose of these meetings is to review and solicit comments and suggestions on the concepts and design solutions developed by the charrette team the previous day. Based on these additional comments and suggestions, the charrette team continues to refine concepts, explore additional solutions, develop new illustrations, and formalize recommendations.

Later in the second evening, the preliminary concepts, recommendations, and illustrations are presented at a public open house. The open house provides an opportunity for stakeholders and interested citizens to provide additional comments and suggestions.



Charrette - Day Three.

Based on the suggestions and comments received at the open house and on additional feedback throughout the day, the charrette team continues to refine and develop the final set of concepts, illustrations and recommendations. The final concepts, illustrations and recommendations are then presented to the community at a public meeting.



PLACEMAKING, CLIMATE CHANGE AND RESILIENCE

Placemaking is an important component of Michigan’s statewide economic development strategy. Incorporating resilience into placemaking further strengthens the overall economic impact. When designing placemaking projects, communities should consider using building materials and standards that add climate resilience to all structures. For example, the Federal Emergency Management Agency (FEMA) recommends that homes in flood-prone areas use flood-damage-resistant building materials, such as concrete, metal, ceramic, vinyl, and glass, for all parts of a building below the base flood elevation (BFE).⁶⁶ FEMA also recommends that residences install sewer backflow valves. Most structural recommendations from FEMA can easily be adapted to fit with historic neighborhood character and form-based building codes.

The River Raisin Heritage Corridor Master Plan proposes a major placemaking effort with regional impacts. As the project is currently described, there are number of ways to incorporate community resilience through this placemaking effort. For example, public spaces like the amphitheater and peace gardens could be designed to function as floodwater storage areas when needed, potentially reducing future damage to nearby structures. Public spaces along the proposed pathways and future commercial shopping areas could integrate attractive rain gardens and bioswales that serve as stormwater storage and retention areas.

Where placemaking efforts target neighborhood and housing improvements, the designs and standards should include climate resilience as well. For example, permanent storm shutters on windows and doors can be aesthetically pleasing while adding valuable new storm resistance. On older commercial buildings, built-up and single-ply roofs are common. During remodels and renovations, the roofing contractor should ensure that the flashing and coping are made of a corrosion-resistant metal, such as aluminum, and are securely attached to the building with screws, concrete spikes, or a continuous cleat.⁶⁶

PLACEMAKING OPPORTUNITY: RIVER RAISIN NATIONAL BATTLEFIELD

One of the oldest communities in Michigan, Monroe has a rich history that continues to shape and define its people, landscape and sense-of-place. Most residents of the Monroe Community are familiar with the area’s history, beginning with the first European settlement known as Frenchtown. Residents also know that this area was the site of one of the most important battles fought with the British during the War of 1812, the Battle for the River Raisin. The battle and violent aftermath claimed the lives of as many as 357 American soldiers. In the decades and centuries that followed, the Monroe Community remembered the battle by erecting many commemorative monuments and markers, sponsoring archeological excavations, and establishing a River Raisin Battlefield Visitor Center in 1990. Ultimately, federal legislation establishing the River Raisin National Battlefield Park was enacted in March 2009, providing for the continued growth and development of this new National Park.

The National Battlefield Park and nearby grounds are an important resource for historians and visitors from throughout the country. Each January on the anniversary of the battle, a memorial service is held on the battlefield. During the service, uniformed living historians representing the soldiers place a wreath on the grounds of the battlefield. In January 2013, about 500 spectators watched as several hundred participants re-enacted the battle for its 200-year anniversary.⁶⁷

In the spring of 2013, the National Park Service joined with the Monroe County Historical Society and the City of Monroe in proposing extensive new development of the National Park and associated facilities. The *River Raisin Heritage Corridor-East Master Plan* proposes seven activity zones, including: a visitor center, peace gardens and

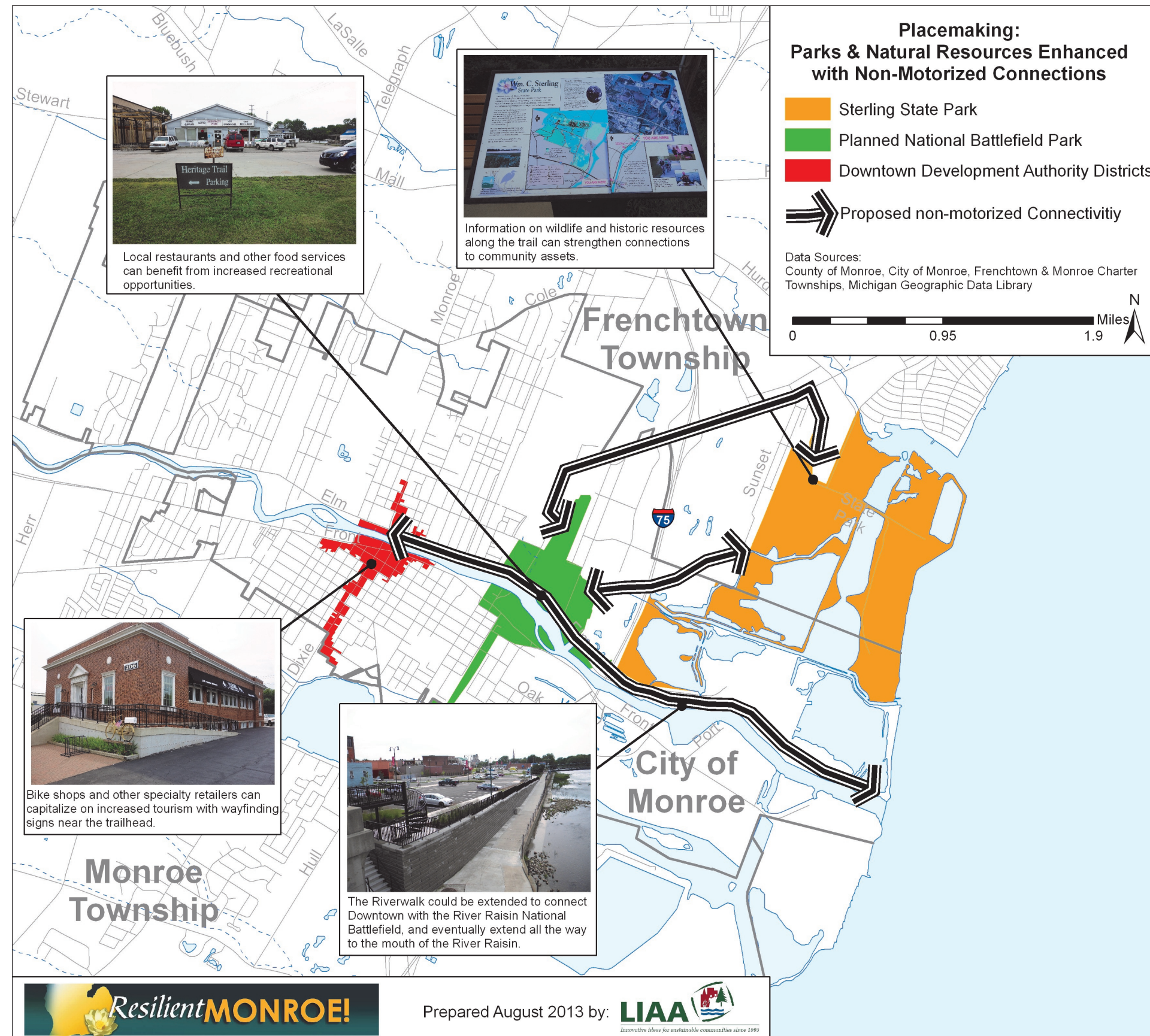
PLANNING FOR PLACEMAKING

The River Raisin Heritage Corridor-East Master Plan outlines a "placemaking" concept for the greater Monroe Community. It is a vision of the River Raisin as a "History Corridor" that would link the River Raisin National Battlefield with Sterling State Park; U.S. Fish and Wildlife Eagle Island Marsh; the Michigan Department of Natural Resources wetlands and wildlife habitat east of I-75 and north of the River Raisin; properties south of the River Raisin including Hellenburg Field; Soldiers and Sailors Park; and the historic and cultural resources of downtown Monroe.

Among other things, the Plan calls for a new visitors center, a new amphitheater (see inset image), waterfront dining, an extension of the Heritage Trail, and a new entrance into downtown. According to the Plan, the recent designation of the River Raisin National Battlefield Park has given the community a unique opportunity to reinvent itself as a destination for historic, cultural, recreational and ecological tourism. It will be important for local officials in the Monroe Community to explore how additional placemaking efforts could attract visitors from the Battlefield to downtown and other parts of the greater Monroe Community.⁶⁸



Map 7.2 Parks and Natural Resources Enhanced with Non-motorized Connections



chapel, Frenchtown Settlement, re-enactment grounds, waterfront development, an entertainment area, and an extensive greenway south through the City.⁶⁸ In many ways, the Heritage Corridor Master Plan is a blueprint for a strategic placemaking process in the Monroe Community.

Because the National Battlefield is located adjacent to large population centers, almost 19 million people live within a three-hour drive of the site. Data compiled from national historic sites across the country suggests that non-local day visitors to national parks spend 30% more than local day visitors.⁶⁹ Zip-code data collected by River Raisin National Battlefield staff indicates that 70% of park visitors are from outside the Monroe Community, and these visitors are likely looking for other goods and services beyond the park gift store, providing an opportunity to capitalize on the spending power of potential visitors. Examples of segments of the economy that benefit from non-local recreational visitors include hotels and bed-and-breakfast inns, restaurants and bars, entertainment, and other various recreation activities. Local economic data suggests there is currently a leakage of retail opportunity for specialty food services and drinking establishments (see Chapter 6). The National Park will likely magnify these opportunities, while also establishing opportunities for additional tourist-related activities.

The National Battlefield is in an ideal location to support movement of bicyclists and pedestrians between downtown Monroe, Sterling State Park, and within the Battlefield itself. As is illustrated in Map 7.2, key pathway connections could allow safe, easy access to the park for bicyclists and pedestrians. If the downtown Riverwalk was extended, pedestrians could move freely between downtown and the Battlefield via the River Raisin. By extending the River Raisin Heritage Trail, the community could provide two options for bicyclists and pedestrians to enter Sterling State Park. These improvements would also increase connectivity between the State Park and the Battlefield. Local businesses located along the non-motorized pathways would likely enjoy increased business due to increased foot traffic.



CHAPTER 8. CLIMATE CHANGE & VULNERABILITIES IN THE MONROE COMMUNITY

As briefly described in previous sections, the climate in southeast Michigan is changing as overall global temperatures increase. Climate models now indicate that extreme heat and rain events will become more frequent and more intense over the coming years. Additionally, more frequent extreme storms with high winds and tornadoes are expected. While severe weather events have occurred in the past, the increasing frequency and intensity of heat and rain events will create even greater risks for the people of Monroe.

Historic Climate Data

In general, Monroe and all of southeast Michigan are described as having a humid continental climate with large variations in seasonal temperatures with warm summers and cold winters. Historically, the temperatures have been mostly moderate with few prolonged periods of extremely hot or extremely cold weather. From 1931- 2001, summer temperatures normally ranged from the mid-60s°F to the upper 80s°F. In a limited way, Lake Erie also helped to moderate high and low temperature extremes.

Season	Months	Average Temperature
Annual	January – December	49.0°F
Winter	December – February	26.5°F
Spring	March – May	46.7°F
Summer	June – August	70.8°F
Fall	September – November	51.6°F

(Source: Station 205558 records 1931-2001; National Climatic Data Center)

Hottest Day on Record	June 1988	106°F
Hottest Month on Record	June 1934	77.5°F
Coldest Day on Record	January 1994	-18°F
Coldest Month on Record	January 1977	12.5°F

(Source: Station 205558 records 1931-2001; National Climatic Data Center)

Precipitation in the Monroe Community has also been moderate and relatively evenly distributed over the months. Records indicate that an average 33.4 inches of precipitation fell on Monroe annually from 1971-2000. Over that time period, the driest month has been February with an average of 1.74 inches of precipitation and the wettest month has been June with an average of 3.61 inches of precipitation.⁷⁰ Figures 8.1 and 8.2 provide a summary of monthly precipitation and monthly temperature ranges for 1981—2010 compiled from the weather station at the City of Monroe (Station 5558).⁷¹

Figure 8.1 Monthly Precipitation Ranges for Monroe

Reporting Period 1981 – 2010 (in Inches)
(data from 2008 & 2009 missing)

Month	Average	Highest	Year	Lowest	Year
Jan.	2.134	5.16	2005	0.56	2003
Feb.	1.871	4.54	1990	0.03	1987
Mar.	2.362	5.43	1985	0.66	1981
Apr.	3.204	5.22	1999	1.04	2004
May	3.556	6.31	2010	0.75	2005
Jun.	3.214	5.21	2004	0.70	1988
Jul.	3.475	7.10	2010	0.83	1991
Aug.	3.795	9.03	2007	0.49	1996
Sep.	2.895	7.69	1986	0.88	2004
Oct.	2.660	6.66	2001	0.43	1982
Nov.	3.058	8.50	1982	0.97	1981
Dec.	2.600	6.14	1990	0.65	1998
Annual	34.824	45.22	2006	28.53	1988

Figure 8.2 Monthly Temperature Ranges for Monroe

Reporting Period 1981 – 2010 (in °F)
(data from 2008 & 2009 missing)

Month	Average	Highest	Year	Lowest	Year
Jan.	25.6	63	2010	-18	1994
Feb.	28.0	71	2000	-10	2007
Mar.	36.7	81	1998	-2	2003
Apr.	48.3	90	1990	11	1982
May	59.8	95	1988	30	2005
Jun.	70.1	106	1988	40	1993
Jul.	74.4	104	1990	45	2004
Aug.	72.5	102	1998	42	1986
Sep.	64.5	97	1983	31	1995
Oct.	52.4	90	2007	21	1981
Nov.	41.1	78	2003	10	2005
Dec.	30.1	69	1998	-12	1989
Annual	50.3	106	1988	-18	1994

Monroe weather and climate information has been collected and published by Michigan’s State Climatologist. For more information visit: <http://climate.geo.msu.edu/>

Records published by the National Climate Data Center show that for the years 1931-2001, the greatest single-day total of precipitation in Monroe was recorded in 1987, totaling 4.22 inches. The greatest single month total of precipitation was 8.5 inches recorded in 1982. However, precipitation records for many months were broken since 2001. New monthly records for levels of precipitation⁷¹ were set in:

- † June 2004 at 5.21 inches,
- † January 2005 at 5.16 inches,
- † August 2007 at 9.03 inches,
- † May 2010 at 6.31 inches, and
- † July 2010 at 7.1 inches.

Apparently, 2011 was another extremely wet year. In On March 23, 2011, the City of Monroe received 4.5 inches of rain in one 24-hour period, the largest amount ever recorded. Later that fall, the Monroe Community experienced an extended period of wet weather, receiving 7 inches of rain over 11 days.¹⁶

Climate Trends & Concerns

The average temperature across the Great Lakes Region increased by 2.3°F from 1968 to 2002 and, by recent measures, the rate of warming has accelerated substantially in the past few decades. This warming has been most significant at night and during winter months. Climate scientists tell us that additional warming is already certain, but the amount of that warming will depend on changes in the concentration of heat-trapping gases.⁶ In general, the Midwest can expect overall average air temperatures to increase from 3.8°F to 4.9°F by the middle of the century (2046-2065). Projections for the end of the century indicate increases in average temperature ranging from 4.6°F to 8.5°F.⁷²

These temperature increases will drive additional changes in our climate, including more precipitation, more severe storms, fewer winter snow falls, and a greater likelihood of flooding. As a result, the temperature increases anticipated for our region will tend to increase the risks climate variations already pose to people, infrastructure and ecosystems. Human communities will need to deal with increased heat stress, flooding, drought, air pollution, late spring freezes, changes in insect pests and disease vectors, and widespread ecosystem disturbances. Additionally, crop failures and reduced yields due to extreme weather events are likely.

From a human health standpoint, the increasing number and severity of extreme heat events present one of the most serious risks. On average, heat waves are more deadly than all other forms of major weather events. Unfortunately, the frequency, intensity and duration of heat waves are predicted to increase. A recent analysis indicated that the Detroit area currently has two or more heat waves each year on average (three or more days of dangerously hot air). But by the end of the century, Detroit could face five to 23 days of temperatures over 100°F each summer (depending on concentrations of heat-trapping gasses in the atmosphere).¹¹

As described above, extreme rain events and downpours have also increased in recent decades. According to the U.S. Global Change Research Program, “Over the last century, there was a 50 percent increase in the frequency of days with precipitation over 4 inches in the upper Midwest.”⁶ The Monroe Community has also seen substantial

increases in precipitation and downpours in recent years, resulting in a revision upward in the *Point Precipitation Frequency Estimates* issued by NOAA.¹⁷

Heavy rains can lead to flooding events that cause direct damage to buildings, roadways and other infrastructure. Downpours can also overwhelm stormwater systems and drainage systems and trigger sewage overflows. The ponding of storm waters can also contribute to the transmission of pollutants, including contamination from livestock and septic system wastes.

Vulnerability Assessments

A vulnerability assessment can be used to obtain a general estimate of the susceptibility of people in the Monroe Community to harm caused by certain extreme weather events. By assessing the potential for *exposure* to a hazard as well as the *sensitivities* of specific populations, we can generate location maps for residential areas with relatively greater vulnerability. This assessment should help provide a focus for community planners and public health workers in reducing risks to human health in the future.

To create the following sensitivity and exposure maps as well as the resulting vulnerability maps, LIAA relied on methodologies developed at the University of Michigan’s Taubman College of Architecture and Urban Planning as presented in the report, *Foundation for Community Climate Action: Defining Climate Change Vulnerability in Detroit* (December 2012).⁷³ Like the University of Michigan, we decided to limit our vulnerability assessments to *extreme heat waves* and *flooding*. However, climate change is predicted to result in increases of other exposures that should also be considered in community planning and development (e.g., high winds and tornados).

Our assessments were based in part on data obtained from the American Community Survey, a continuing survey program operated by the U.S. Census Bureau. This data includes information on housing, income, and education characteristics of the populations in geographic areas called *block groups*, containing between 600 and 3,000 individuals. We also used data from the 2010 Census including population age and racial composition collected by Census blocks, the smallest available geographic areas for demographic data. Data sets concerning parcel characteristics and residential buildings were obtained from the Southeast Michigan Council of Governments (SEMCOG), Monroe County, the City of Monroe, and Frenchtown Charter Township.

DEFINING VULNERABILITY

In general, vulnerability is defined as susceptibility to physical or emotional injury. To be vulnerable to injury a person or group of people must be exposed to harm and be sensitive to injury. For example, a person may be sensitive to sunburn, but that person’s exposure can be limited by sunscreen.

Potential Vulnerability = Exposure + Sensitivity

HEAT SENSITIVITY ASSESSMENT

As described previously, all of southeast Michigan is expected to experience more frequent and more intense extreme heat waves that last longer. Additionally, there will be less nighttime cooling to provide relief. These conditions can present health challenges to people who cannot escape the heat.

The Excessive Heat Events Guidebook (EPA 430-B-06-005, June 2006) explains that the risk of losing control of one's internal body temperature increases when the weather gets hotter.⁷⁴ The guidebook notes that internal body temperature is impacted by a number of conditions, such as air temperature, humidity, sun exposure, and wind. Extreme heat events subject people to a kind of shock that can overwhelm normal temperature regulating functions. Extended exposures to extreme heat with no cooling can cause heat-related illnesses.

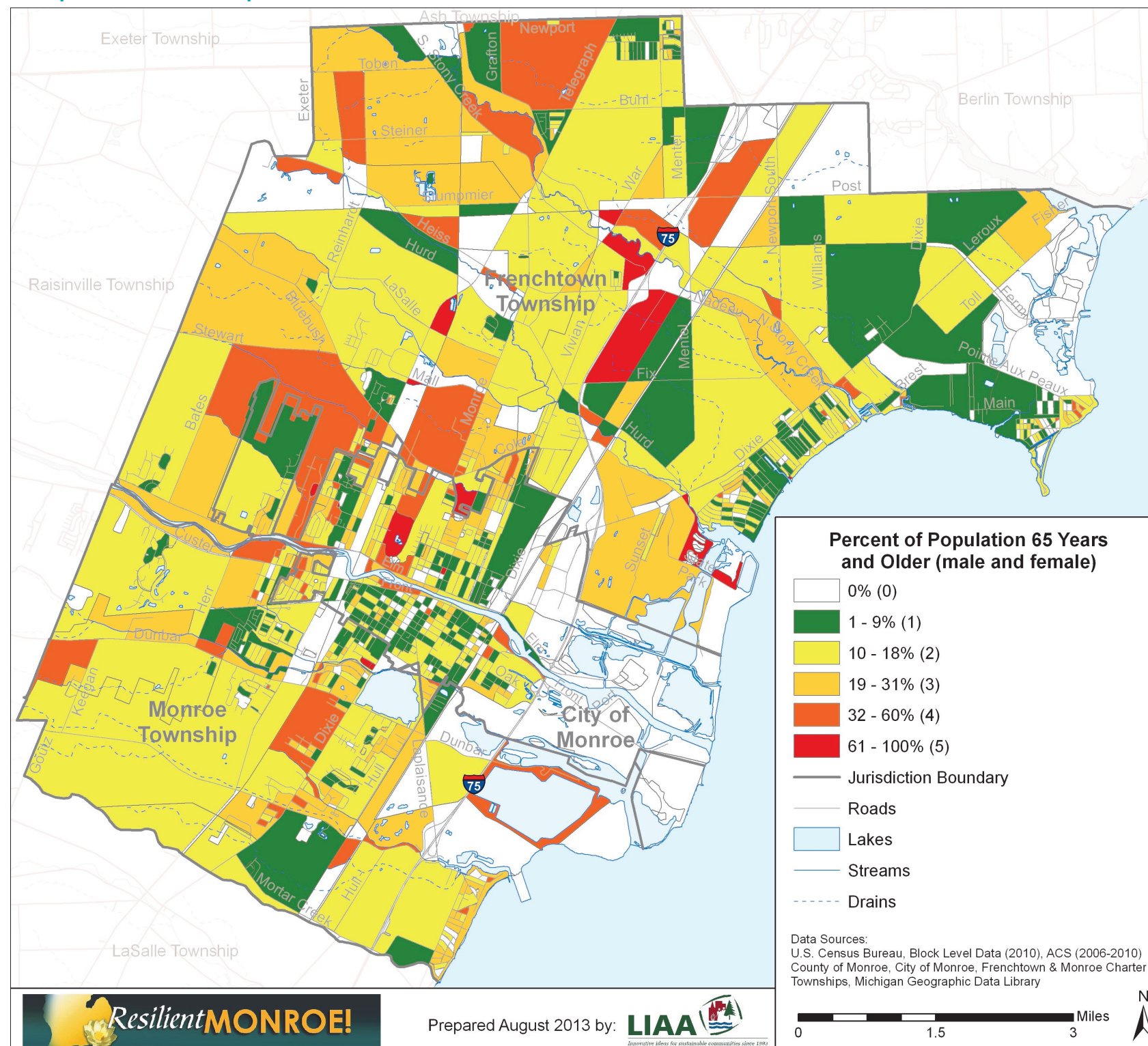
People have different sensitivities to the effects of heat waves and different capacities to respond. That means some people are at greater risk of heat-related illness than others. One risk category relates to the physical capacity of our bodies to get rid of heat through increased circulation and perspiration. People with less capacity to regulate internal temperatures in this way are at greater risk from heat waves, including:

- ▮ Infants and older people (age 65 and older),
- ▮ People with medical conditions such as obesity, heart disease and diabetes,
- ▮ Bedridden people, and
- ▮ People taking certain medications (e.g., high blood pressure).

Other human risk factors from heat events relate to living conditions and social relationships. For example, people who are isolated or live alone are at greater risk because they are less likely to recognize the symptoms of excessive heat exposures and more likely to delay treatment. Additionally, low-income people are at greater risk from extreme heat events because they have less access to air conditioning and less capacity to regulate home temperatures. It has also been shown that minorities are at greater risk from heat waves for a combination of reasons (e.g., less access to health care support).

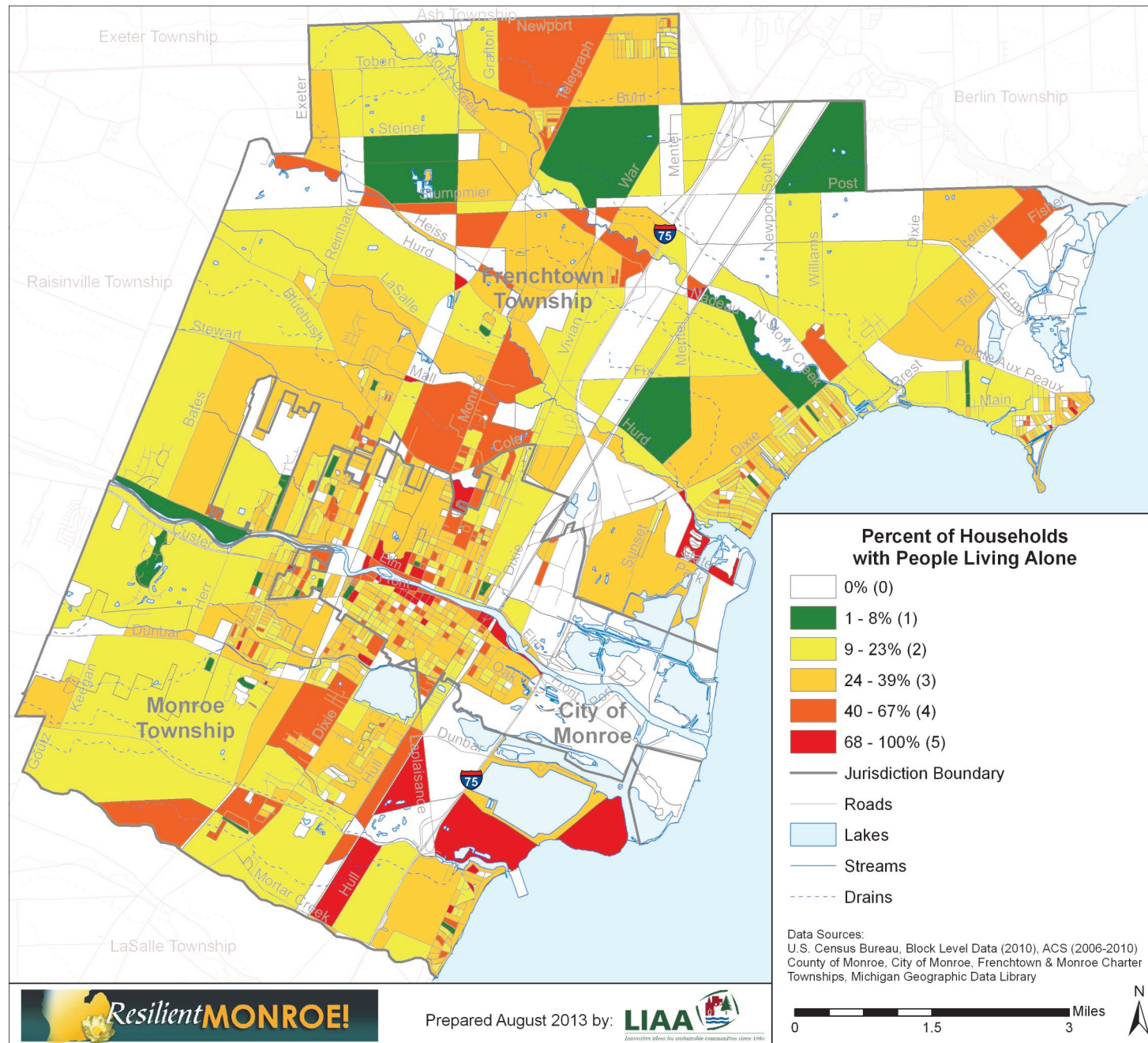
To conduct this heat sensitivity assessment of the Monroe Community, we used a geographic information system (GIS) for spatial data analyses to show the relative distribution of people most at risk. We considered five factors as primary contributors to the sensitivities and risks of people exposed to a heat wave. Using the U.S. Census data, we identified the percentages of people living in each area (Block Group or Block) for each sensitivity factor.

Map 8.1 Percent of Population 65 Years and Older

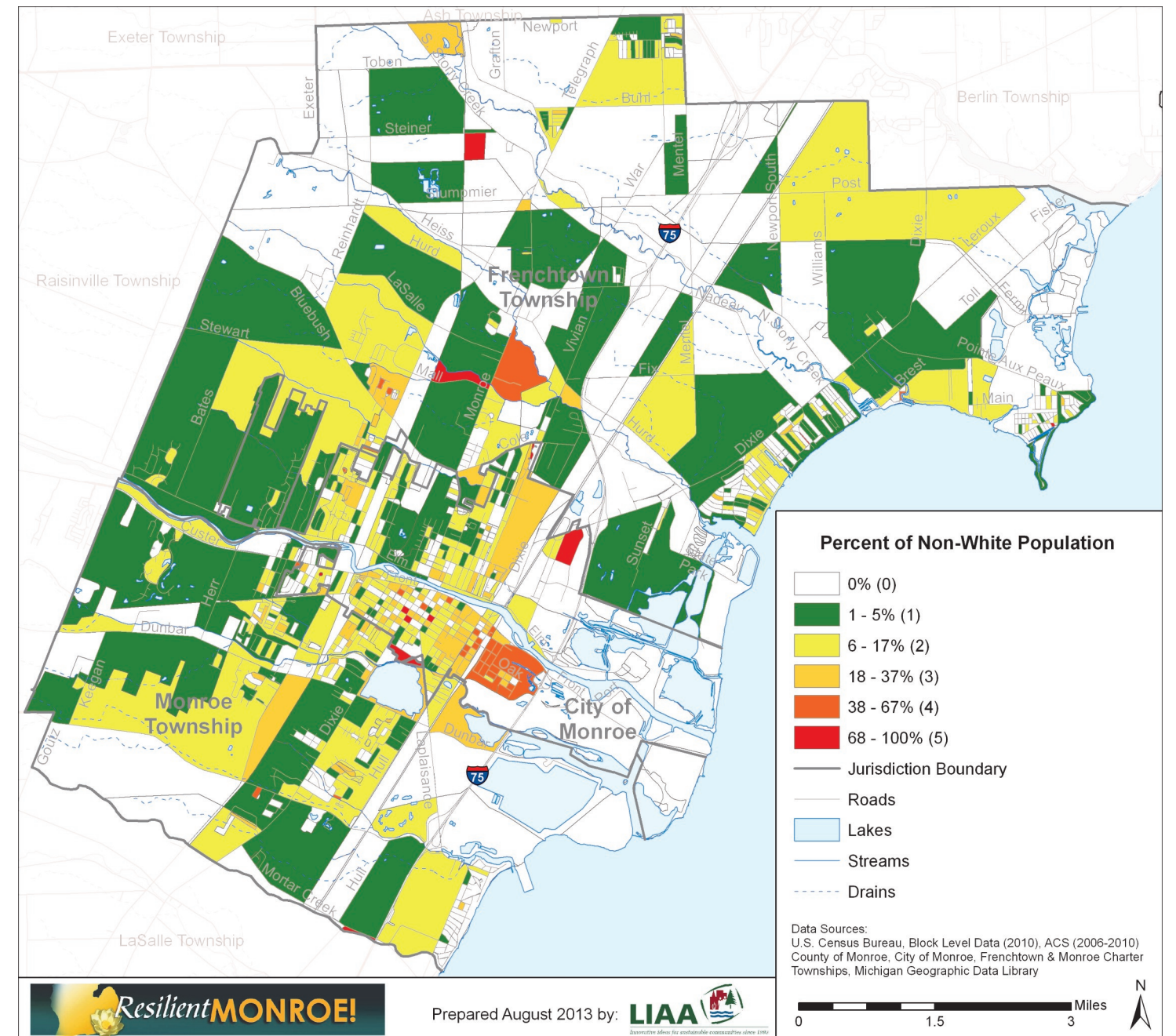


As described previously, people who are older have greater sensitivity to extreme heat events. The technical literature also indicates that older age is associated with higher hospital admission rates in heat waves. The *Percent of Population 65 and Older* map 8.1 depicts the relative concentration of older people in the community by Census Block.

Map 8.2 People Living Alone



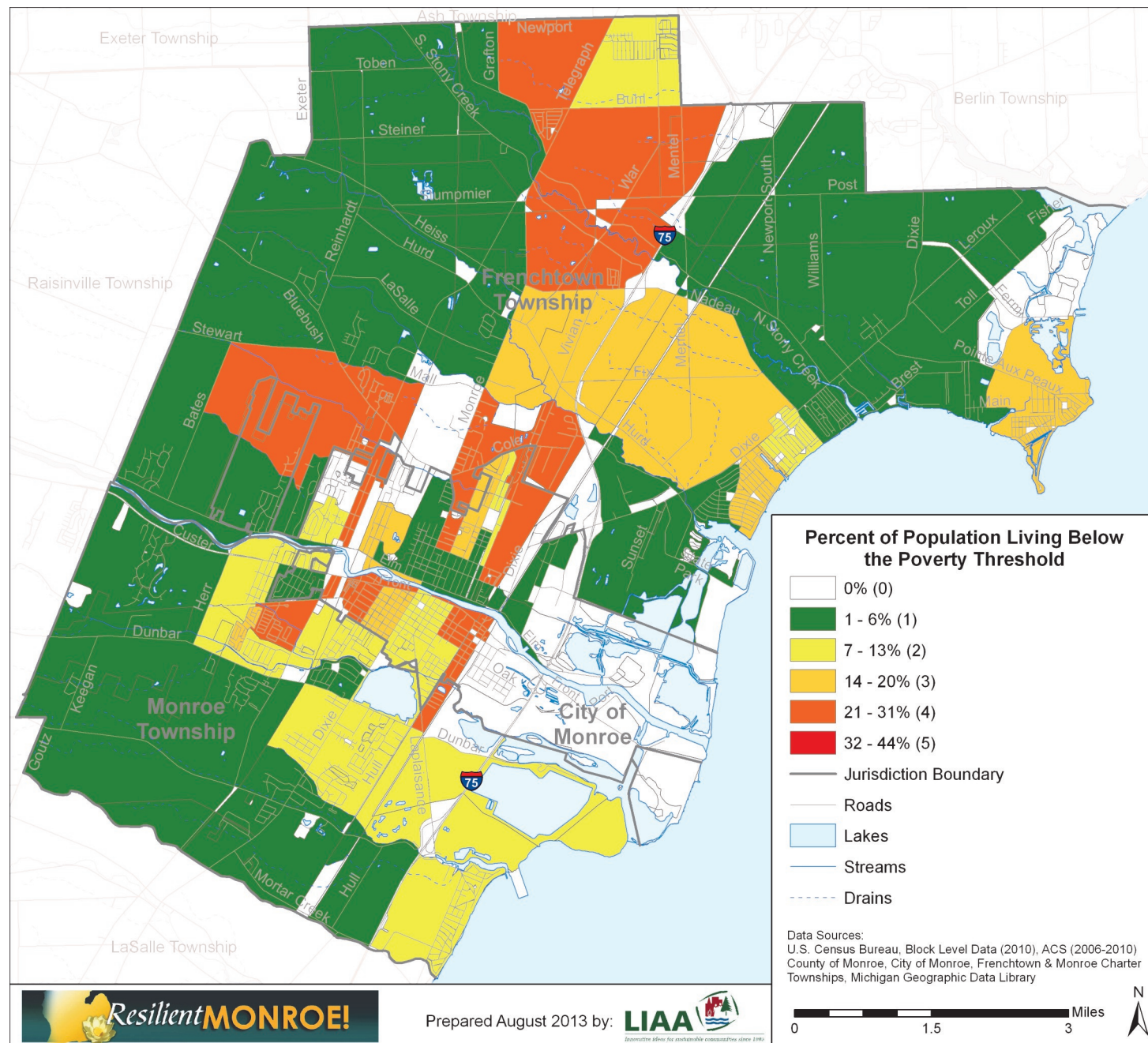
Map 8.3 Non-White Population



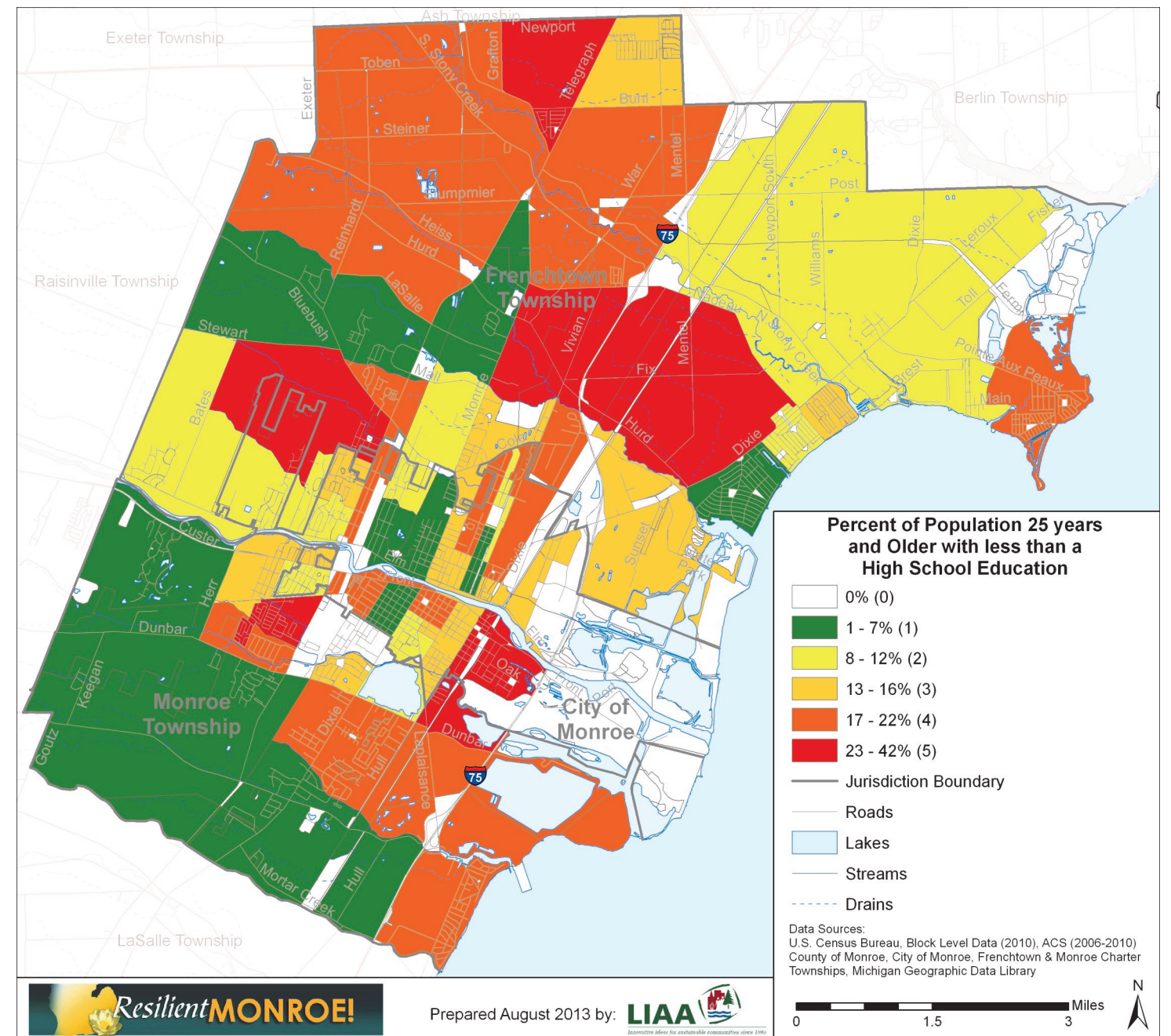
The second sensitivity factor considered was *living alone* as a measure of social isolation in the Monroe Community. Although living alone is not necessarily a risky thing, people who are socially isolated are at greater risk during an extreme heat event. As noted earlier, isolated people may not be able to recognize symptoms of heat-related illness and take proper action. In this case, we used American Community Survey data for Census Block Groups, broken out into individual Census blocks for geographic representation (blocks with no population were not included).

The third sensitivity or risk factor considered was *minority status*. The technical literature indicates that minorities are at greater risk during extreme heat events for various reasons, including less reliable access to health care, transportation and other social supports needed to reduce heat exposures. We used Census Blocks to map the relative percentages of non-white populations in the Monroe Community.

Map 8.4 People Living in Poverty



Map 8.5 People with Less than a High School Diploma



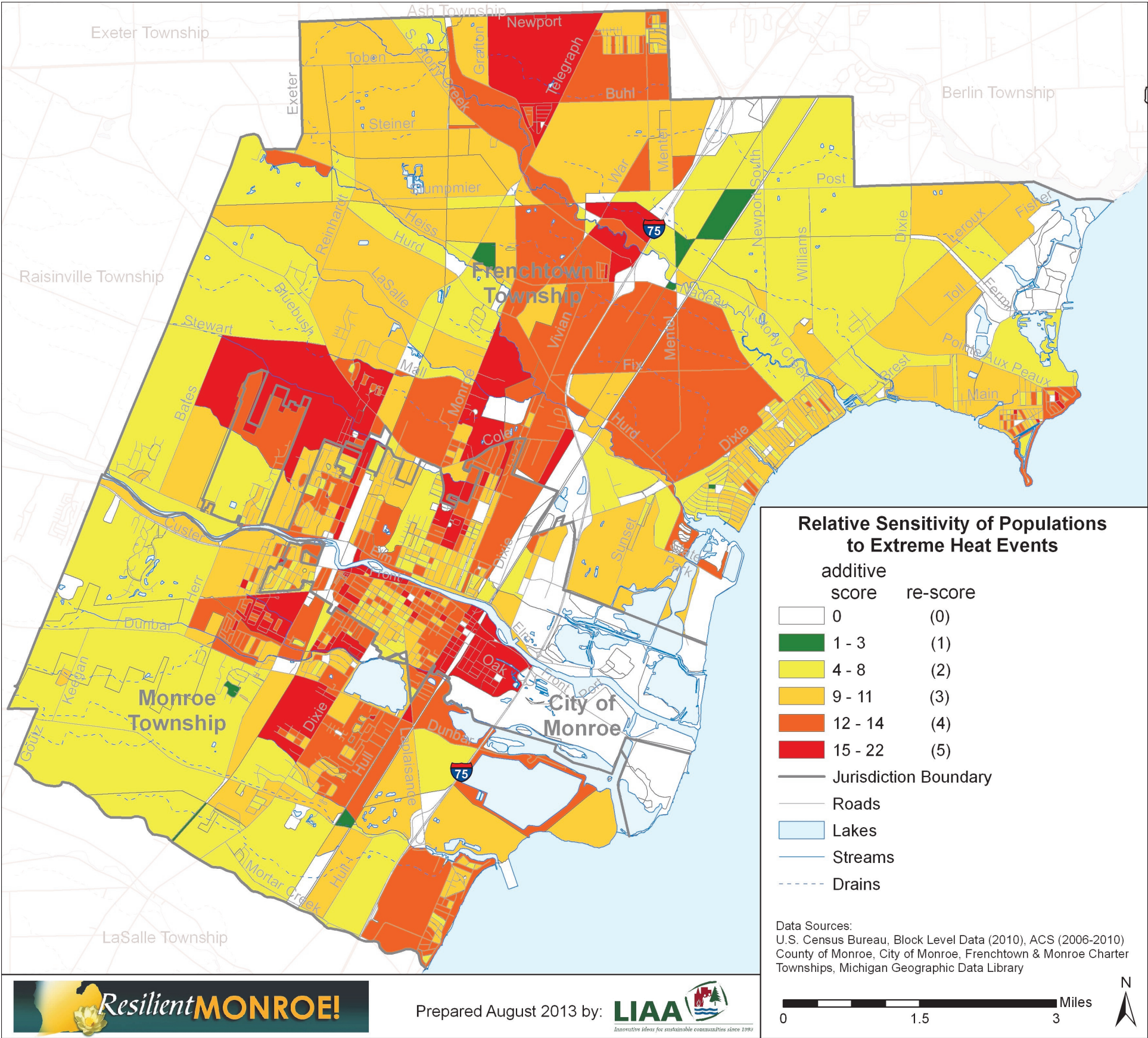
We also mapped two socioeconomic factors that are associated with increased heat-related morbidity and mortality: percentage of the *people living in poverty* and percentage of *people without a high school diploma*. In general, persons living at or below the poverty line have less access to air conditioning or cooling options for their residences. This could limit a person's access to relief from a extreme heat event.

The published literature indicates that people who have less than a high school diploma have greater levels of mortality rates associated with heat-related illness. Apparently, lower levels of educational attainment are correlated with more difficult occupational and living conditions.

To complete the heat sensitivity assessment, we simply added the five sensitivity factors together for a cumulative score in each Census Block. More specifically, we grouped the percentages for each sensitivity factor into five categories ranging from a very low percentage of people to a relatively high percentage with the identified sensitivity. The five categorical groupings were generated by the GIS software using natural breaks in the data (groupings). We assigned a ranking of 1 to 5 to each of the categories, ranging from 1 for the lowest percentage to 5 for the highest. Finally, we combined the scores of each sensitivity factor within each Census Block.

The *Monroe Community Sensitivity to Excessive Heat Map* (Map 8.6) provides a reasonably detailed map of locations where the highest percentages of at-risk residents live. This does not mean that these community residents are in immediate danger. Rather, the map provides planning officials a new way of identifying areas where heat waves could present serious problems for a significant number of citizens

Map 8.6 Monroe Community Sensitivity to Excessive Heat



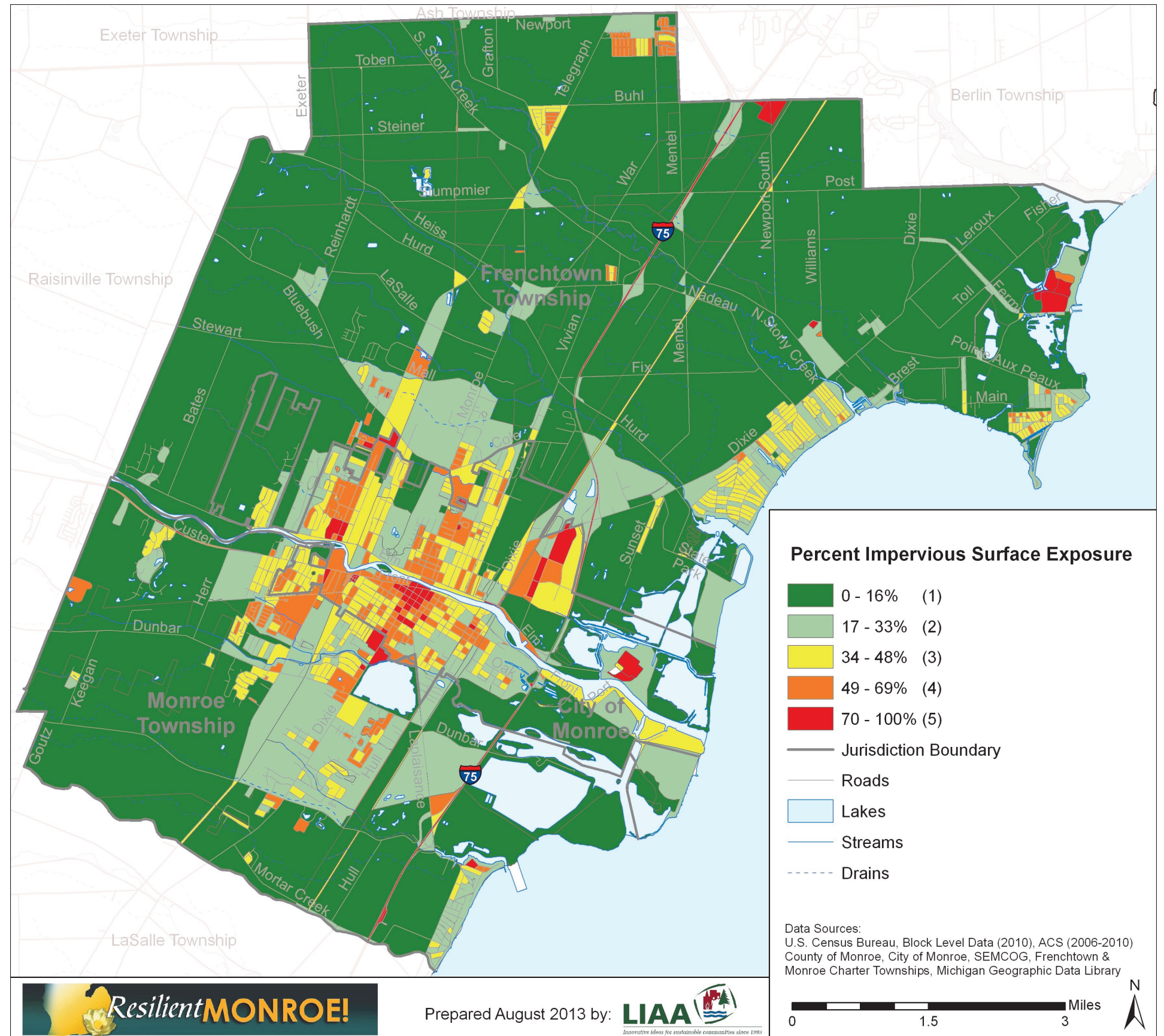
Heat Exposure Assessment

When larger communities experience heat waves, air temperatures can vary significantly from place to place both during the day and at night. Some of these differences can be attributed to the varying types of land cover found throughout the community. For example, temperatures can be significantly lower at night in locations with a heavy tree canopy and very little pavement, versus locations with little greenery and lots of pavement.

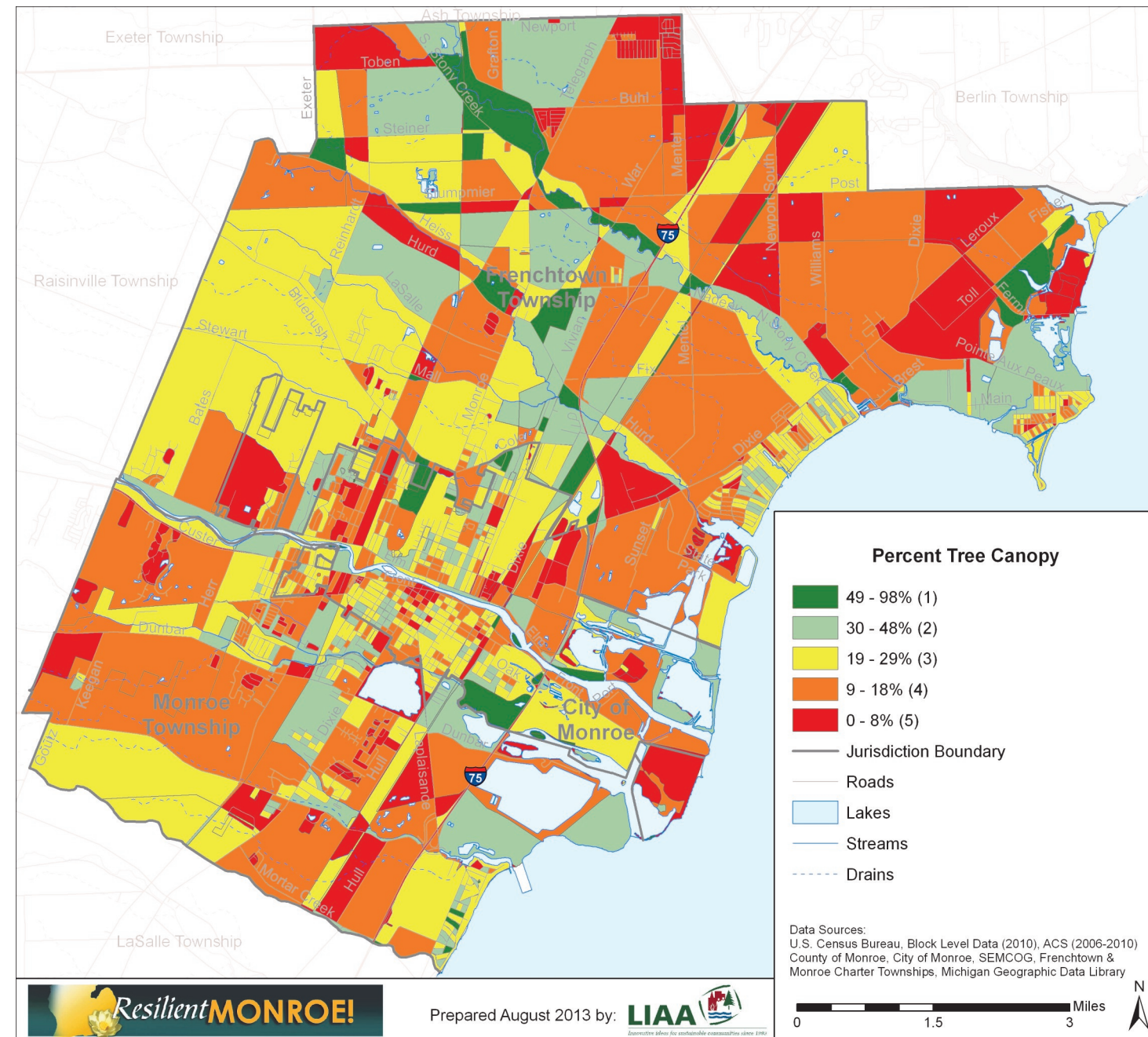
Impervious surfaces such as paved parking lots, roadways, and buildings absorb large amounts of heat from the air and from sunshine that is radiated back into the surroundings when temperatures begin to fall. At the same time, tree canopy and other vegetation tend to help cool an area through evaporation and transpiration of water and by providing shade. Where there is lots of impervious surface and little tree canopy, the immediate surroundings in cities and suburban areas can be much warmer. This condition has been termed the Urban Heat Island Effect.⁷⁵ People living in such settings suffer greater exposures to heat over longer periods of time (e.g., warmer nights), making them more vulnerable.

To complete a heat exposure assessment, we focused on the *urban heat island effect*. With data obtained from Monroe County and the Southeast Michigan Council of Governments, we were able to create two separate exposure maps. The first exposure map depicts the percentage of impervious surfaces within each Census Block, as used in the sensitivity assessment (Map 8.7). These percentages are divided into five categories using the GIS software's natural breaks calculation. We gave scores for each category, with 1 for the lowest percentage and 5 for the highest percentage of impervious surfaces.

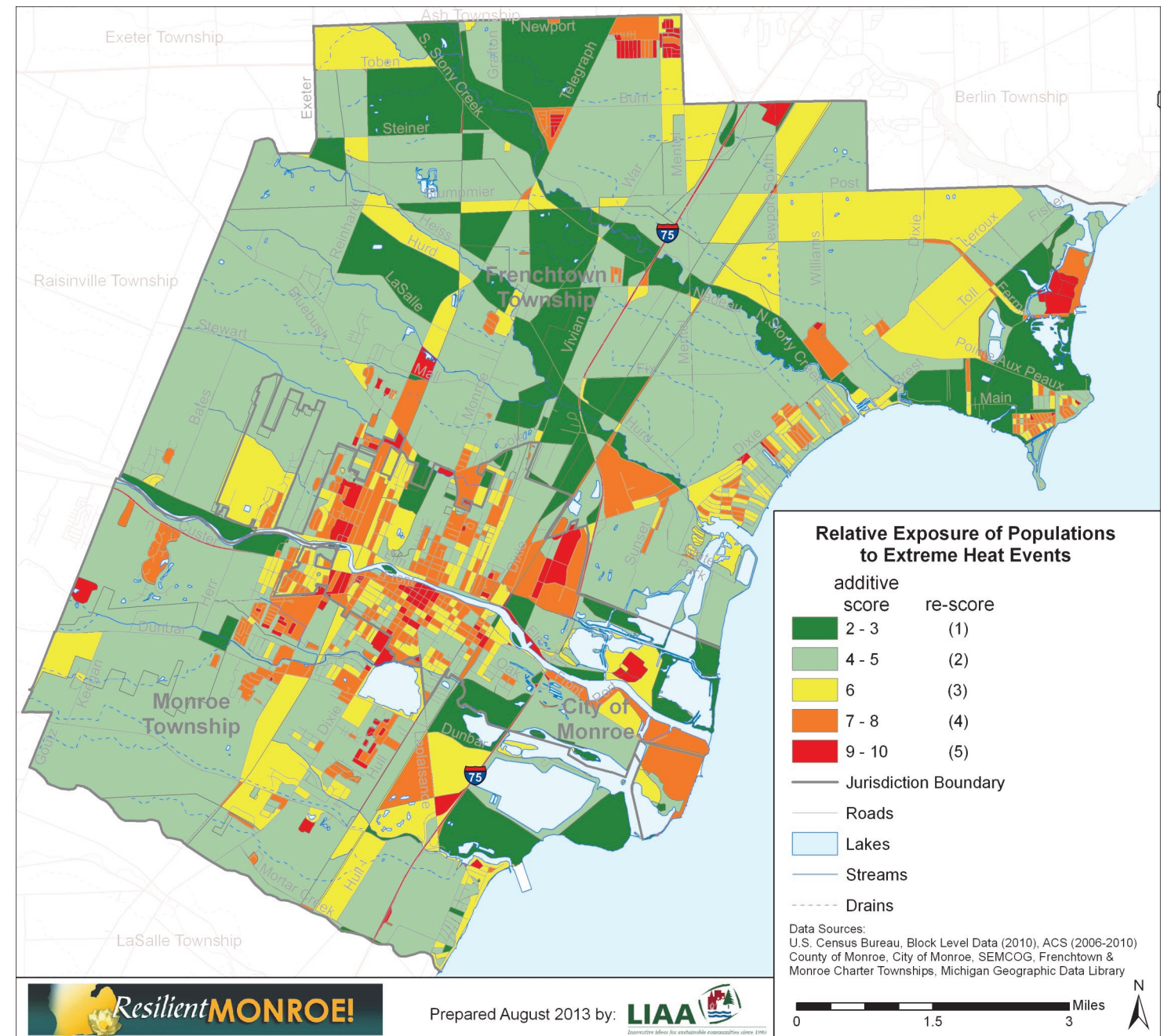
Map 8.7 Monroe Community Impervious Surface Exposure



Map 8.8 Percent Tree Canopy



Map 8.9 Monroe Community Extreme Heat Exposures



The second exposure map depicts the percentage of tree canopy mapped within each Census Block (Map 8.8). We used a similar process, creating five categories of percentages and scoring them. In this case, the highest percentage of tree canopy received 1 and the lowest percentage received a 5. It is noteworthy that most of the Monroe Community has a relatively low amount of tree canopy in many locations.

Again, we simply added the scores of the two exposure maps to provide a single *Monroe Community Excessive Heat Exposures Map* (Map 8.9). This cumulative map provides a reliable depiction of where the *urban heat island effect* would be most and least intense during a heat wave. Community planners can use this map to better assess where new vegetation and tree canopy would be helpful to mitigate the effects of impervious surfaces.

Heat Vulnerability

The *Monroe Community Heat Vulnerability Map* (Map 8.10) is a simple additive combination of the overall sensitivity map and the overall exposures map. The resulting vulnerability index depicts where concentrations of exposures and sensitive populations create a higher risk for community residents. In general, those areas with a composite score of 8 to 10 (red) have residential populations that may be particularly vulnerable to extreme heat events.

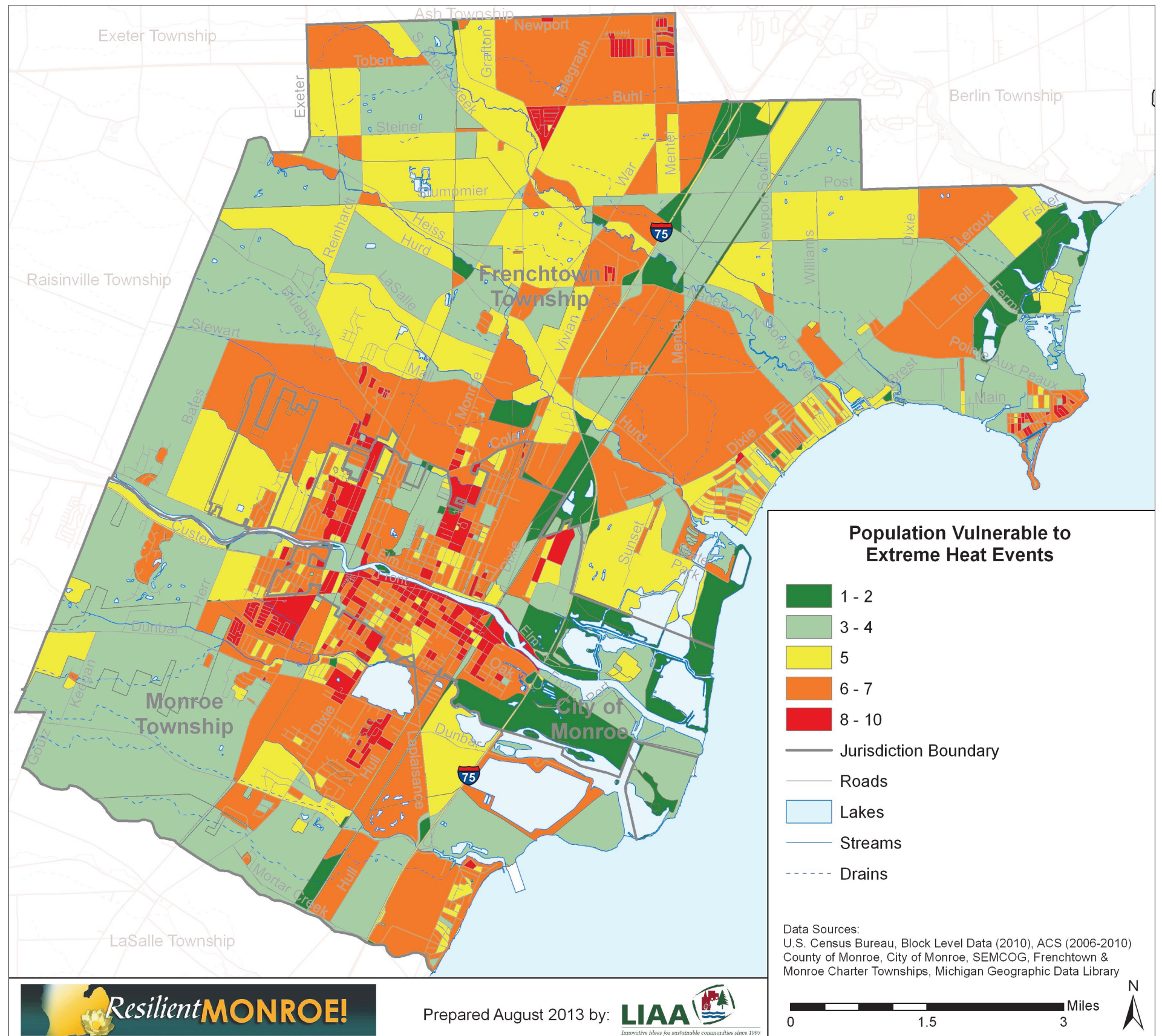
REDUCING EXTREME HEAT VULNERABILITY

There are a number of ways that vulnerability to extreme events can be reduced, as suggested throughout this analysis. Some of these approaches would provide relief directly to sensitive populations. For example, public *cooling centers* such as libraries are identified and promoted for use by people who have limited access to air conditioning. Of course, people may need transportation assistance to reach these cooling centers.

In many communities, planning and land use development efforts have focused on reducing the *urban heat island effect*. For example, by increasing the amount of tree cover and other vegetation in urban and suburban areas, a community can increase the cooling effects from shading and evapotranspiration of water from the plants. Planners in the City of Grand Rapids, Michigan recently set a goal of increasing its total tree canopy from 34.6% to 40% in an effort to reduce heat exposures.

Urban infrastructure also plays an important role in creating the urban heat island effect. Some communities are working to reduce the amount of heat absorbed by pavement and buildings by increasing the use of reflective materials for structures, using green roofs (i.e., roofs with a vegetative cover), and reducing impervious surfaces (e.g., paved parking areas). New approaches include the use of cool pavements, designed to reflect more of the sun's radiation.⁷⁵

Map 8.10 Monroe Community Heat Vulnerability Map

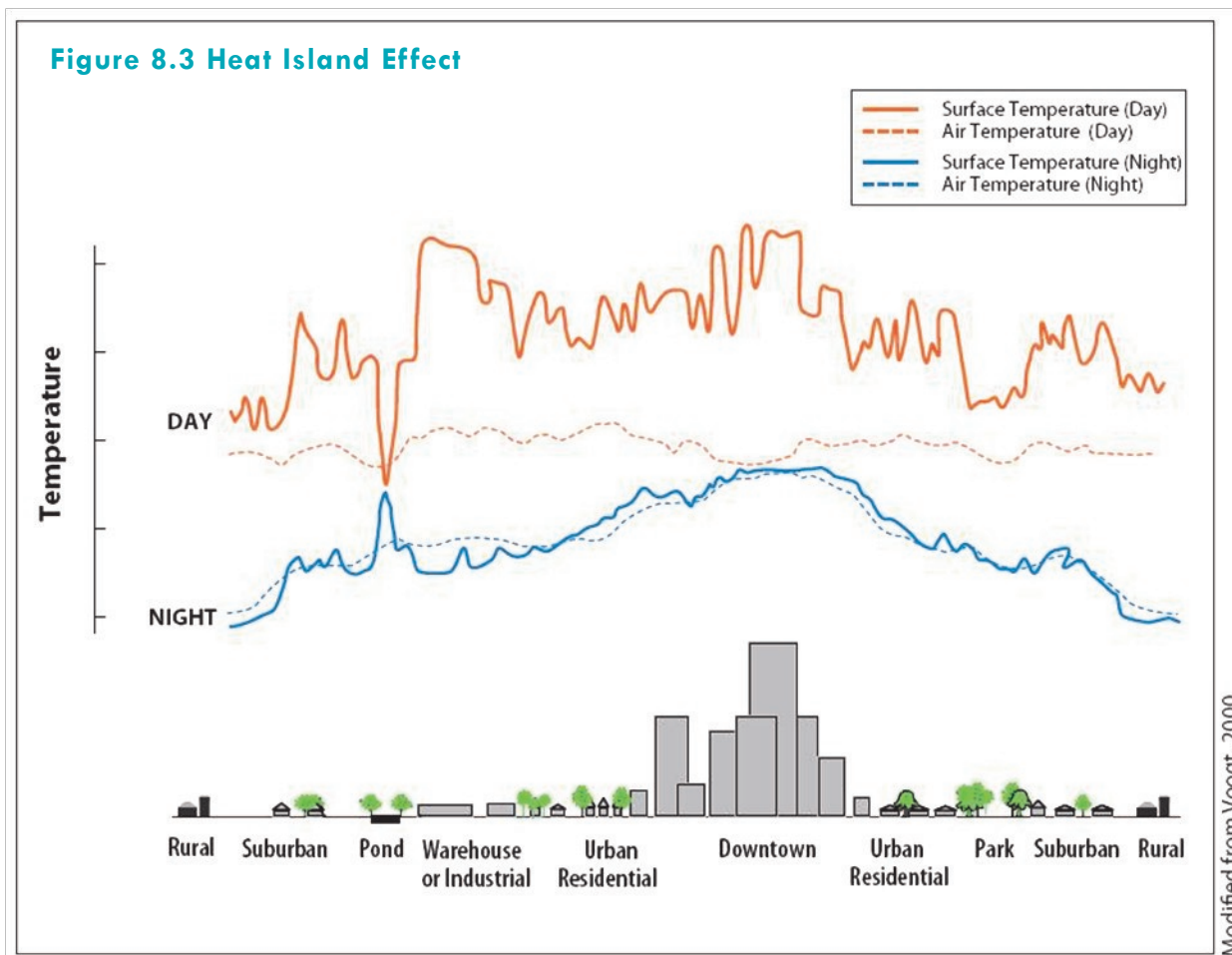


URBAN HEAT ISLAND EFFECT

In urban and suburban areas, exposures to extreme heat events can be complicated and intensified by a general lack of vegetation as well as the materials used in the construction of buildings, pavements and other urban infrastructure. In many urban settings, buildings and pavements collect and retain solar radiation and heat generated by urban activities (e.g., motors), as well as the ambient heat.⁷⁵ As a result, surface temperatures in urban settings may be higher than nearby rural areas, as depicted in Figure 8.3.

Recent research indicates that urban areas can be 9°-27° F higher than nearby rural areas during the same heat event. In general, these summertime urban heat islands are most intense when the sky is clear and there is little wind.

Urban heat islands are also warmer during the nighttime than nearby rural areas. During the night, urban infrastructure re-radiates collected heat into the surrounding area, limiting the amount of local cooling.



Flooding Vulnerability Assessment

Climate scientists say that the Monroe Community and southeast Michigan can expect more frequent storms of increasing severity in the decades ahead. The total amount of rainfall is also likely to increase. However, climate models suggest that the precipitation will be more concentrated in the winter, spring and fall seasons as well as localized intense storms at almost any time. This potential for substantially larger rain events raises concerns over the potential for harm to human health and damage to buildings and infrastructure.

In assessing vulnerability, community planners need to evaluate potential exposures as well as sensitivity to flooding. Buildings, roads, bridges, sewer lines and other infrastructure located in a flood zone are exposed to greater risks than elsewhere. Where flowing floodwaters have the greatest energy, structures may be undercut, collapsed or moved, and soils will erode. Even areas outside of an identified flood plain are subject to flooding from heavy downpours. Where the soils have low permeability and physical drainage is inadequate, water will accumulate and cause ponding during large storm events. Appropriate planning and land-use regulations can help reduce exposures caused by poor site selection. Additionally, the sensitivity of structures can be modified to reduce risk of damage by applying flood-resistant design standards.

Drainage & Stormwater Management

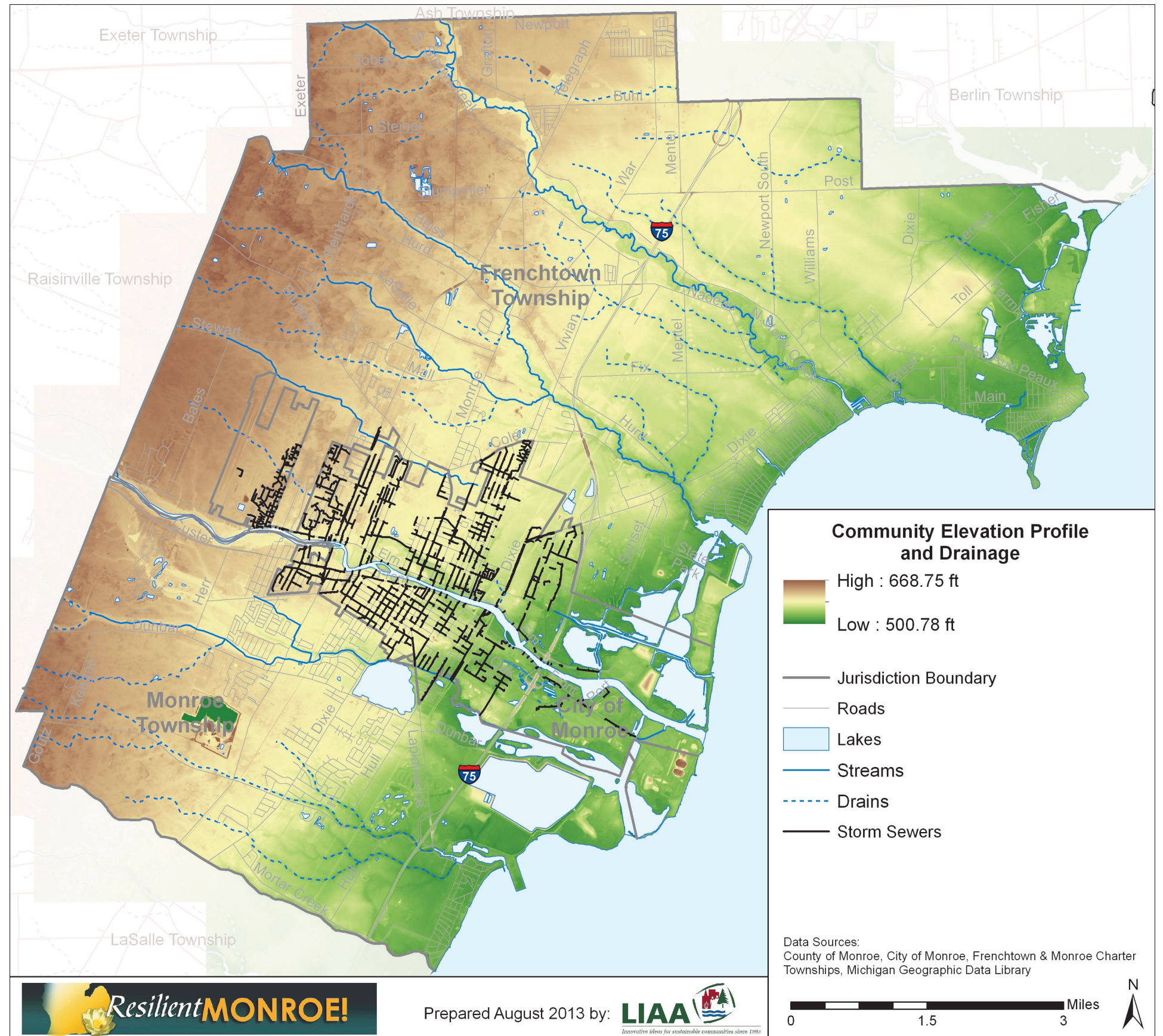
The Monroe Community's topography is relatively flat, with very little difference in elevation from one location to another. Across the Community, there is a very gradual slope from the western edges of Frenchtown and Monroe Charter Townships, with the highest elevations of about 669 feet above sea level, to the far eastern edge of the community at about 572 feet on the shores of Lake Erie (the lake level in July). That is a total drop of about 97 feet over 7 miles.

The *Community Elevation Profile and Drainage Map* (Map 8.11) offers a useful view of the topography of the Monroe Community, including the most prominent drainage patterns. On this map, the darkest green colors identify the lowest elevations, while the darkest brown colors identify the highest elevations. Generally, the streams and rivers flow from the northwest toward Lake Erie in the southeast, including Swan Creek, Stony Creek, Sandy Creek, River Raisin, Plum Creek, and LaPlaisance Creek (listed from north to south). The lowest elevation in the community is a large stone quarry in Monroe Charter Township, visible in the southwest area of this map. This stone quarry is estimated to be over 100 feet deep, with a floor elevation of about 501 feet above sea level.

Given the very low relief and predominance of poorly drained soils throughout the Monroe Community, an extensive set of drains and stormwater management structures are required to remove snowmelt and stormwater. We have displayed most of the major features of this community-wide drainage system on the *Community Elevation Profile and Drainage Map* (Map 8.11). The drains, culverts and other stormwater conveyances outside of the City of Monroe are part of a countywide network managed and maintained by the Monroe County Drain Commissioner. The City of Monroe manages and maintains a system of storm sewers within the city that conveys stormwater directly to the River Raisin.

As discussed in a previous chapter, the City of Monroe also provides separate sewer and wastewater treatment services to most buildings within the city limits and some buildings in urbanized areas outside of the city limits. While the sewer system is separated from the stormwater system, rain and snowmelt may still have an impact on the city's sewer system. For example, water that soaks into the soils may also seep into the sewer pipes at joints and cracks, adding to the amount of wastewater that must be treated. Similarly, stormwater can impact the sanitary sewer system where homes have floor drains or sumps designed to remove stormwater by discharging into the sewer pipe. Though allowed in the past, this practice is no longer acceptable in newly constructed or remodeled homes.

Map 8.11 Community Elevation Profile and Drainage Map



Exposure to Flooding Hazards

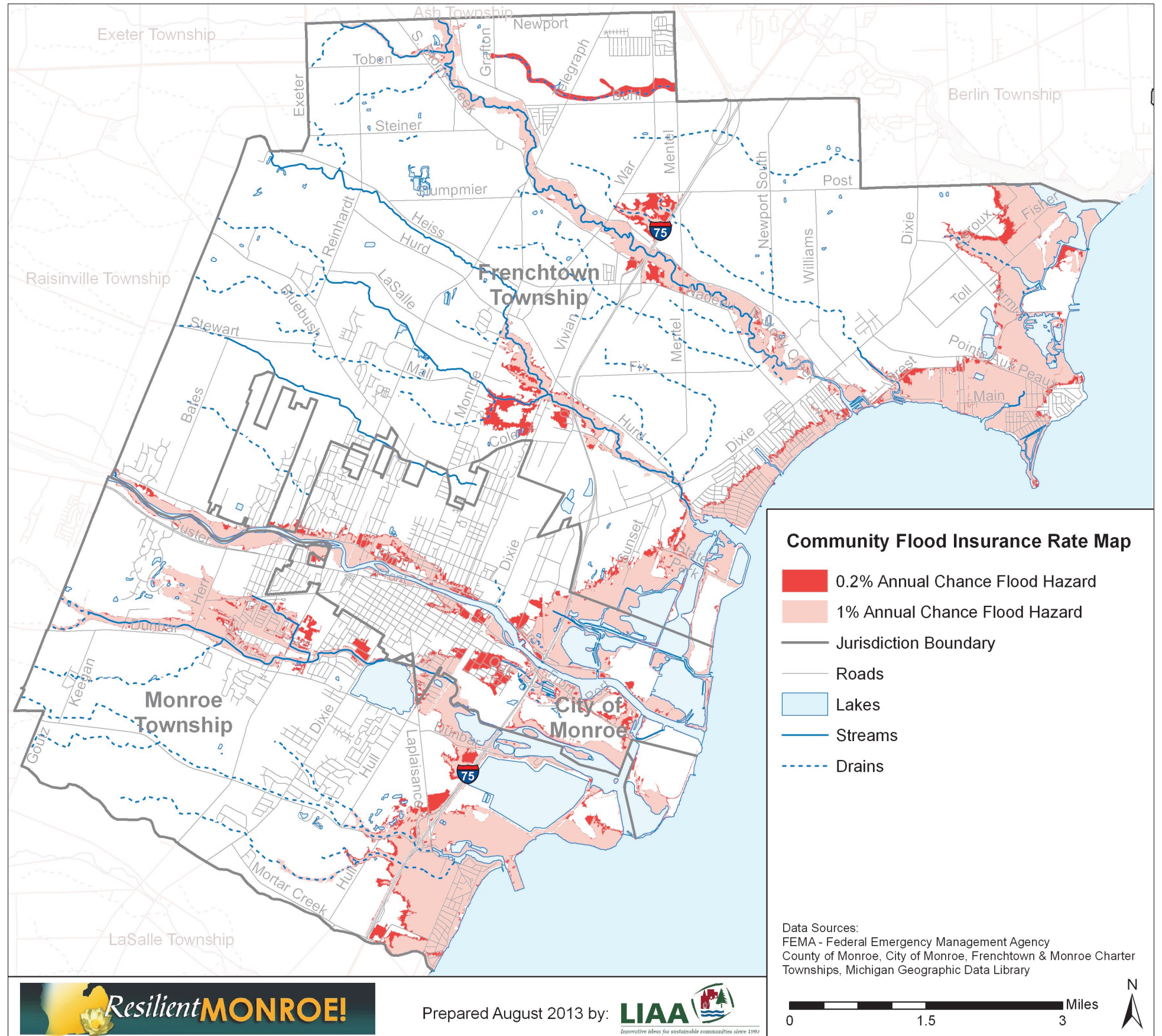
Recently, the Federal Emergency Management Agency (FEMA) developed a new *Flood Insurance Study* together with a new *Flood Insurance Rate Map (FIRM)* for Monroe County. According to FEMA, the FIRM is “the primary tool for state and local governments to mitigate the effects of flooding in their communities.” These are the most recent and most authoritative documents available to define flood hazard exposure in the Monroe Community.⁷⁶

The National Flood Insurance Program was created in 1968 to reduce future damage and provide an insurance program that would help protect property owners from losses. The FIRM shows areas subject to flooding, based on historic, hydrologic, hydraulic and meteorological data as well as flood controls. The maps identify a base flood elevation (BFE), sometimes referred to as the 100-year flood zone. These are areas with a 1% chance of flooding in any given year. The maps also identify the areas with a 0.2% chance of flooding in any given year, sometimes call the 500-year flood zone. FEMA points out that these are only probabilities, not forecasts. Therefore, there is a 26% chance of a flood occurring in the 100-year flood zone during a 30-year period, the term of a residential home mortgage.

The 1% and 0.2% chance of flooding areas are mapped on detailed topographic maps, taking into account the occurrence and frequency of floods recorded in the past, drainage channel locations and capacities, engineered structures, and precipitation probability tables. In short, professional hydrologists use the best available data collected from past experience.

Map 8.12 includes the flood plain data from the newly developed FIRM or flood plain map for the Monroe Community. Large areas of all three jurisdictions are included in the 1% and 0.2% chance flood zones. A number of areas were included on this FIRM for the first time, particularly in Monroe Charter Township.

Map 8.12 Monroe Community Flood Insurance Rate Map (FIRM)



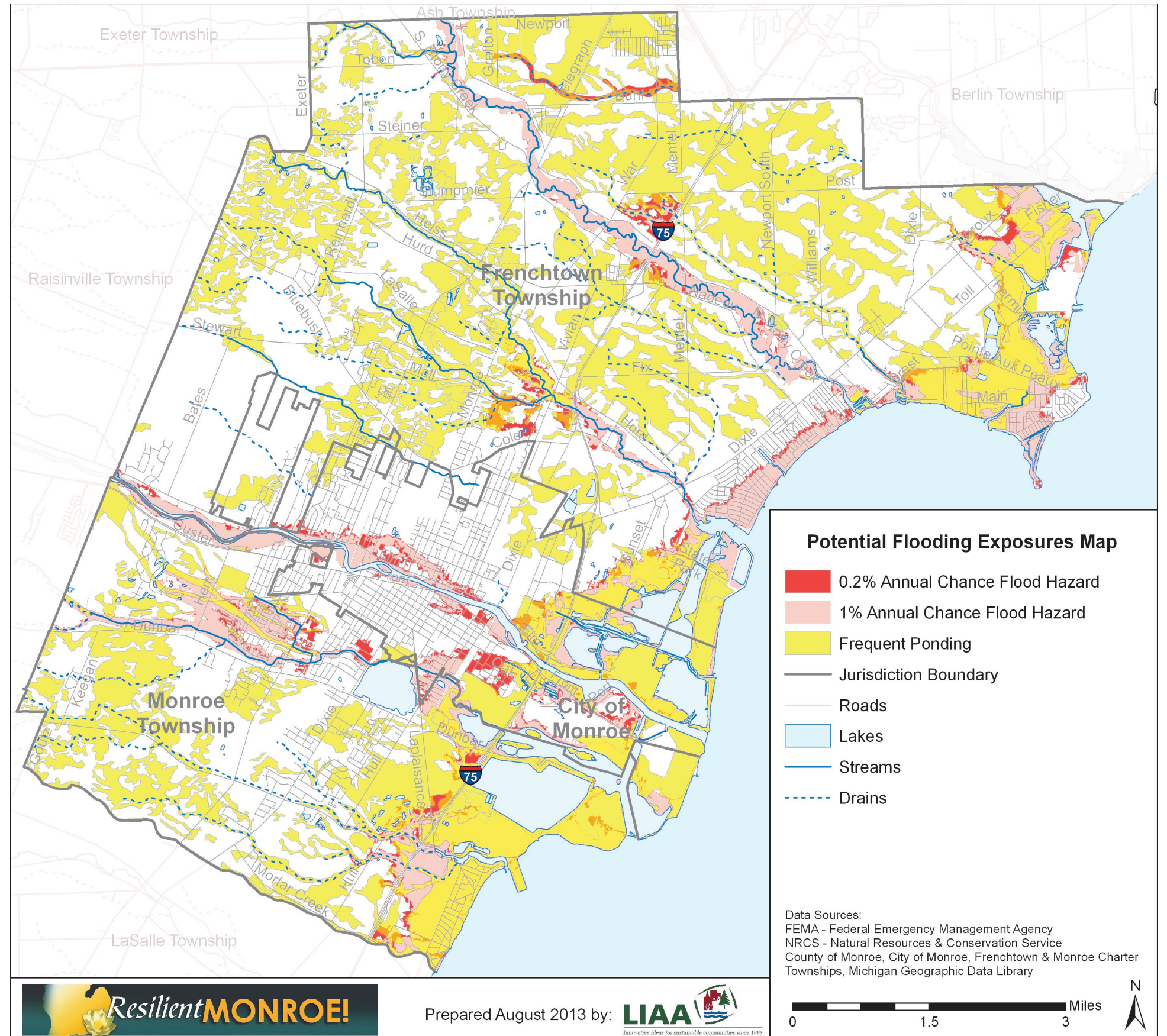
Flooding Hazards

While winter and spring are the most likely flooding seasons in the Monroe Community, flooding due to intense local downpours (e.g., thunderstorms) have occurred in summer months and may occur at any time.⁷⁶ Historically, the most severe flooding has occurred along the Lake Erie shore due to a combination of high water levels and easterly winds (storm surge). However, much of the shorelines of both Frenchtown and Monroe Charter Townships are now protected by seawalls built in the 1970s, with some improvements in Frenchtown ongoing.

Historically, severe flooding has also occurred along the River Raisin and Plum Creek. In 1969, an ice jam at Winchester Street in the City of Monroe caused flooding that closed a 16-block area of the city on both sides of the river and forced the evacuation of 150 families. However, heavy rainfall has also caused urban flooding from runoff on a number of occasions. The most recent example of urban flooding from runoff was in late November 2011.

To better understand the potential for flooding due to the runoff and ponding of stormwater, we identified those soils that are subject to frequent ponding due to a lack of permeability and natural drainage according to the USDA. The *Potential Flooding Exposures Map* (Map 8.13) combines the location of *frequently ponded soils* with the FIRM map of 1% and 0.2% chance of flooding adjacent to rivers and streams to establish the areas most likely to be exposed to storm and flood waters.

Map 8.13 Potential Flooding Exposures Map



Buildings and Flood Hazards

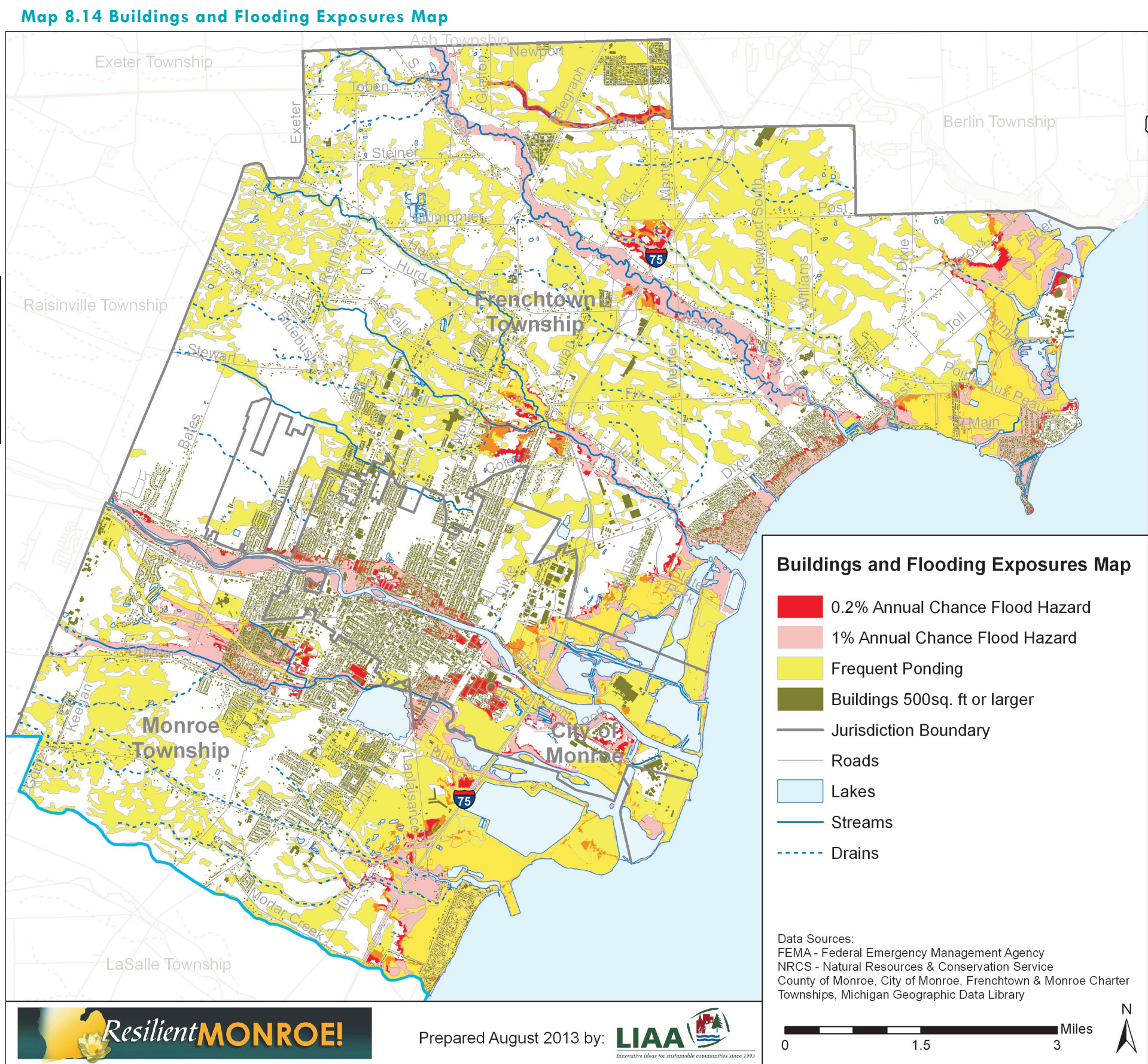
To provide additional information about flooding exposures, we added the outlines or “footprints” of each building that is 500 square feet or larger in size to the flooding exposures map. As depicted in Map 8.14, there are a total of 26,050 buildings across all three jurisdictions.

Figure 8.4 Buildings 500 ft² or Larger

	City of Monroe	Monroe Charter Twp.	Frenchtown Charter Twp.
Total Number of Structures 500 Sq. Ft. or Larger	8,917	6,881	10,252
In 100-year Floodplain	585	1,370	1,497
In 500-year Floodplain	603	221	321
On Frequently Ponding Soils	404	1,889	2,419
Total Structures at Risk	1,592	3,480	4,237

As shown in Figure 8.4, we have calculated the total number of buildings in each jurisdiction. Then, using a GIS, we identified all the buildings that fall within the 100-year and 500-year flood plains, as well as the number of buildings in areas with frequently ponded soils.

Based on the maps available, there are 3,452 buildings located in the 100-year floodplain areas in the three jurisdictions. In total, there are over 9,000 buildings in the Monroe Community that are located in one of more of these flooding hazard areas.



Flooding Sensitivity

This sensitivity analysis was developed to help community planners better identify areas with the greatest concentration of flood-sensitive homes. To conduct this generalized sensitivity assessment, we used some of the criteria recommended by University of Michigan researchers. For example, according to these researchers, homes built prior to 1940 have greater sensitivity to flooding damage due to the use of more porous concrete during those earlier years. We also used home value as a sensitivity criteria, reasoning that relatively low-value homes are less likely to have modern flood-proofing features recommended by FEMA and other agencies. Additionally, households with low incomes are unlikely to have the funding to make significant flood-proofing home improvements.

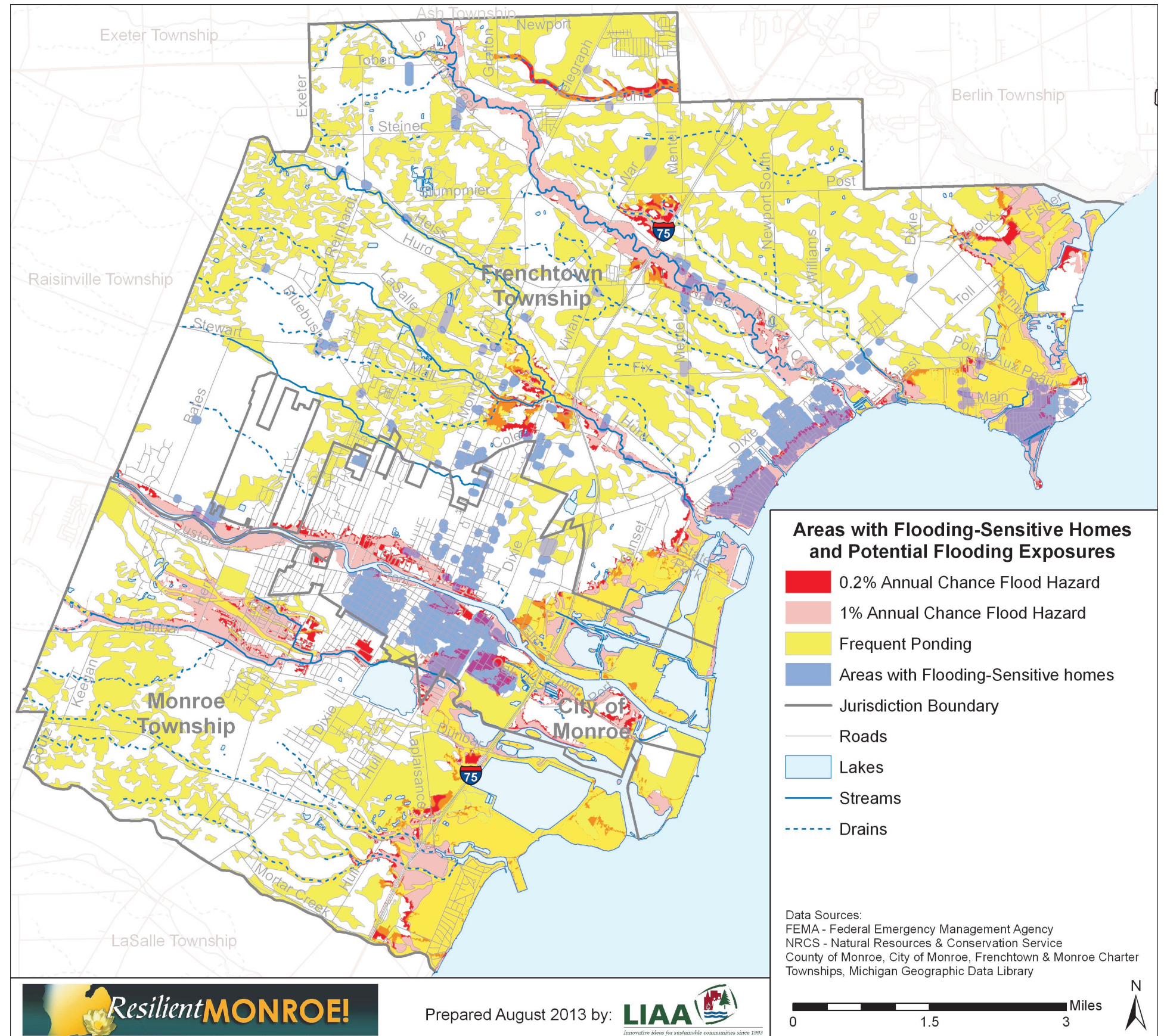
Using a GIS, the first step in this assessment used Monroe County Equalization data to identify all parcels with either agricultural or residential use *class codes*. We then used data provided by the City of Monroe and Frenchtown Charter Township to identify those parcels with residential structures built in 1940 or earlier (some going back to the early 1800s). This process yielded a total of 4,580 homes in the two jurisdictions.

For relative home values, we used the State Equalized Value (SEV) to roughly approximate the value of the home and parcel. We used the natural breaks in this data as calculated by the GIS to divide SEV values into eight categories. Then, we selected the two lowest categories as representing the lowest value homes in the two jurisdictions. This process resulted in identifying a set of highly sensitive, low-value homes built in 1940 or earlier – a total of 1,813 homes within the two jurisdictions.

To complete our assessment, we developed a map that combines the *Potential Flooding Exposures* map with the new map layer showing the *Areas with Flooding Sensitive Homes*. We wanted to offer community planners basic information about where there may be concentrations of homes in flood hazard areas that may not have sufficient protection.

To make the *Areas with Flooding-Sensitive Homes and Potential Flood Exposures* (Map 8.15), we used the GIS program to put a 200-foot buffer

Map 8.15 Areas with Flooding-Sensitive Homes



around all the parcels believed to include flood sensitive homes, then we joined all the buffered parcels for display purposes. The resulting *Areas with Flooding-Sensitive Homes and Potential Flood Exposures* map gives a good indication of locations of where sensitive homes may be found within areas of low to high risk for flooding.

CONCLUSION

The Monroe Community is already familiar with the requirements of the *National Flood Insurance Program* and the role of a FIRM in regulating the construction of structures in the 100-year floodplain. In general, FEMA requires local regulations that prevent new construction and substantial improvements to residential structures with a floor lower than the Base Flood Elevation (BFE) that defines the 100-year floodplain. In fact, FEMA and the Michigan DEQ recommend keeping these high-risk zones as open space, wetlands or other natural areas. Where that's not possible, they strongly recommend that these zones be reserved for low-damage uses such as recreation, playgrounds, reforestation, parking, gardens and created wetlands.⁷⁷

Due to the large amount of poorly drained soils, there are many other areas where residential land uses could include increasing risks from flooding. The Monroe Community appears to have a large number of buildings and homes in high risk areas already. Given the increasing likelihood of intense rain events and an overall increase in flooding potential, community planners should consider new plans and policies that lower the flooding vulnerability of people and property in the Monroe Community.

CHAPTER 9. COMMUNITY PLANNING & DEVELOPMENT

As is typical in most Michigan communities, past Master Plan updates for the three jurisdictions have been done in isolation from one other. Because *Resilient Monroe* takes a coordinated approach to planning, we attempted to integrate the vision and goals of each community into the planning process in a way that maintains the unique characteristics of each municipality, but also adds a regional perspective to land-use planning.

GOALS: SIMILARITIES AND DIFFERENCES

Upon review of all three Master Plans, there were a number of similarities that appeared in terms of land use, neighborhood character, economic development, and transportation investments. All three jurisdictions focus on providing a variety of housing options to meet the needs of everyone in the community (see Figure 9.1, Master Plan Goal Comparisons). The City of Monroe emphasizes preserving historic character, while the two townships emphasize preserving rural character.

The Monroe Community has traditionally had a high percentage of jobs from the industrial sector. All three plans include a goal centered on maintaining existing industrial presence and attracting new industrial enterprises. Both townships and the city have a goal that focuses on attracting commercial activity in a central location; for the city this is downtown, and for the townships it is designated town centers.

All three communities indicated an interest in improving bicycle and pedestrian facilities, especially recreational trails that link key community assets. Disruptive railroad crossings, an excessive number of driveways along congested arterials, and a lack of east-west routes through the community are the primary complaints regarding the transportation system.



Photo courtesy of Bill Saul

Figure 9.1 Master Plan Goal Comparisons

Goal	City of Monroe (2003)	Monroe Charter Township (2006)	Frenchtown Charter Township (2003)
Provide a variety of housing options	✓	✓	✓
Restrict mobile home development		✓	✓
Maintain rural community character		✓	✓
Attract and retain industrial sector	✓	✓	✓
Concentrate development in commercial centers or nodes	✓	✓	✓
Support local businesses	✓	✓	✓
Consolidate Railroad lines and/or add grade crossings	✓	✓	✓
Require vegetation in parking lots and right-of-way		✓	✓
Improve East-West connectivity	✓		✓
Limit driveway entrances on major corridors		✓	✓
Increase connectivity of non-motorized trails	✓		✓
Encourage mixed-use development in central areas	✓	✓	✓
Preserve and protect historic resources	✓		
Enhance public access to lake and riverfront	✓		✓
Protect natural resources in the community	✓	✓	✓

Zoning: Similarities and Differences

We used the City of Monroe Zoning Code (2009), the Monroe Charter Township Zoning Code (2010), and the Frenchtown Charter Township Zoning Code (2004) to compare zoning regulations in the three jurisdictions. We condensed the zoning types into 10 different categories. As shown in Map 9.4, there are a number of disparities adjacent to the jurisdictional boundaries. Some disparities are still compatible; however, some may need to be adjusted to ensure compatibility.

Map 9.1



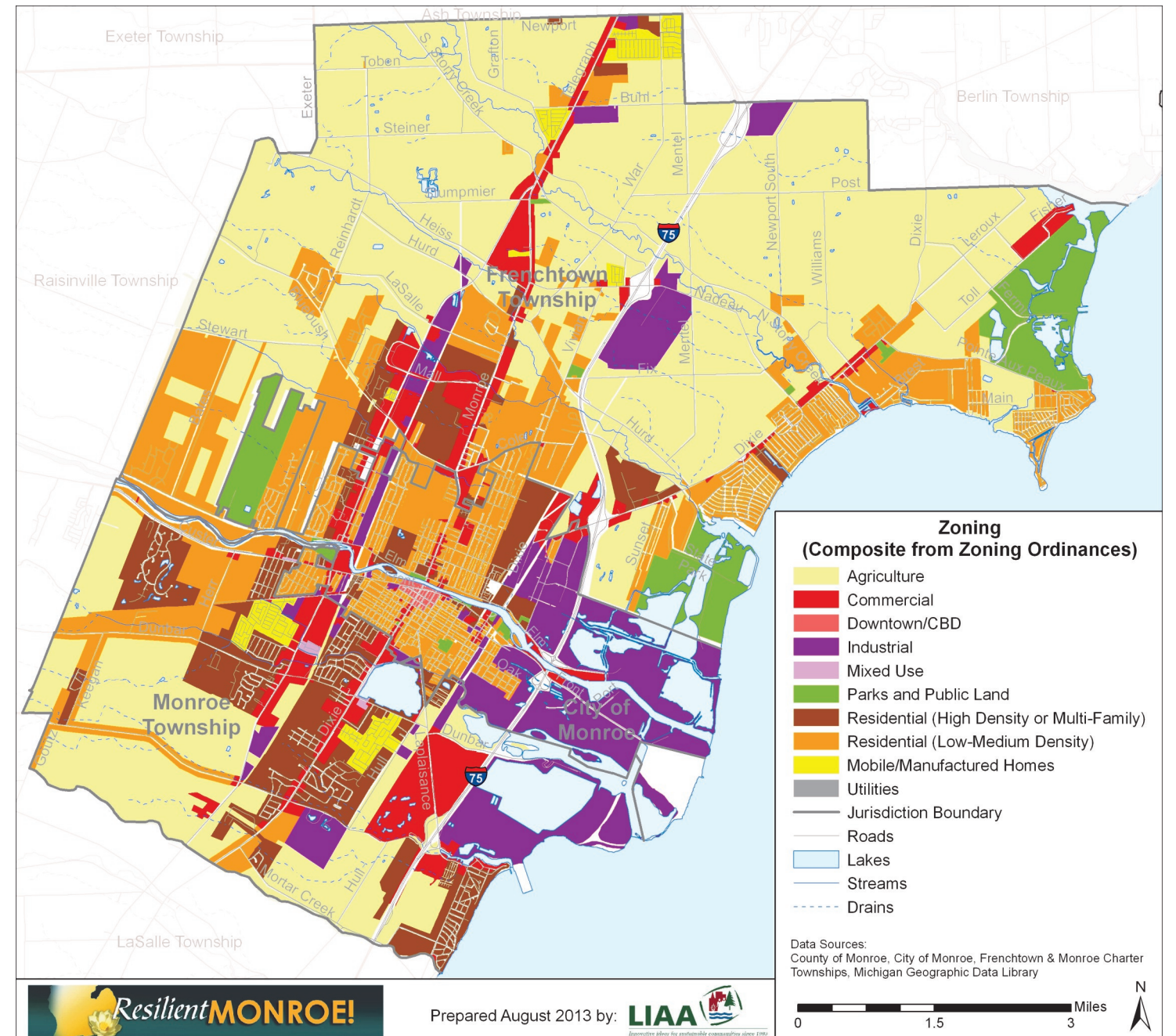
Map 9.2



Map 9.3



Map 9.4 Zoning (Composite from Zoning Ordinances)



At the city's northeast border, the city is zoned high-density residential and commercial while Frenchtown is zoned for agriculture (see Map 9.1). At the southern edge of the city boundary, Monroe Charter Township is zoned high-density residential, while the city is zoned for low-density residential (see Map 9.2 and 9.3).

In addition to a zoning map, the city and both townships have a future land-use map in their Master Plans that projects preferred development patterns over the next 20-30 years. Again, to compare the future land-use maps in the three jurisdictions, we condensed the land-use types into the same 10 land-use categories. As illustrated in

Map 9.5, the communities have a fairly consistent vision for how land is developed along their jurisdictional borders, but there are some contradictions.

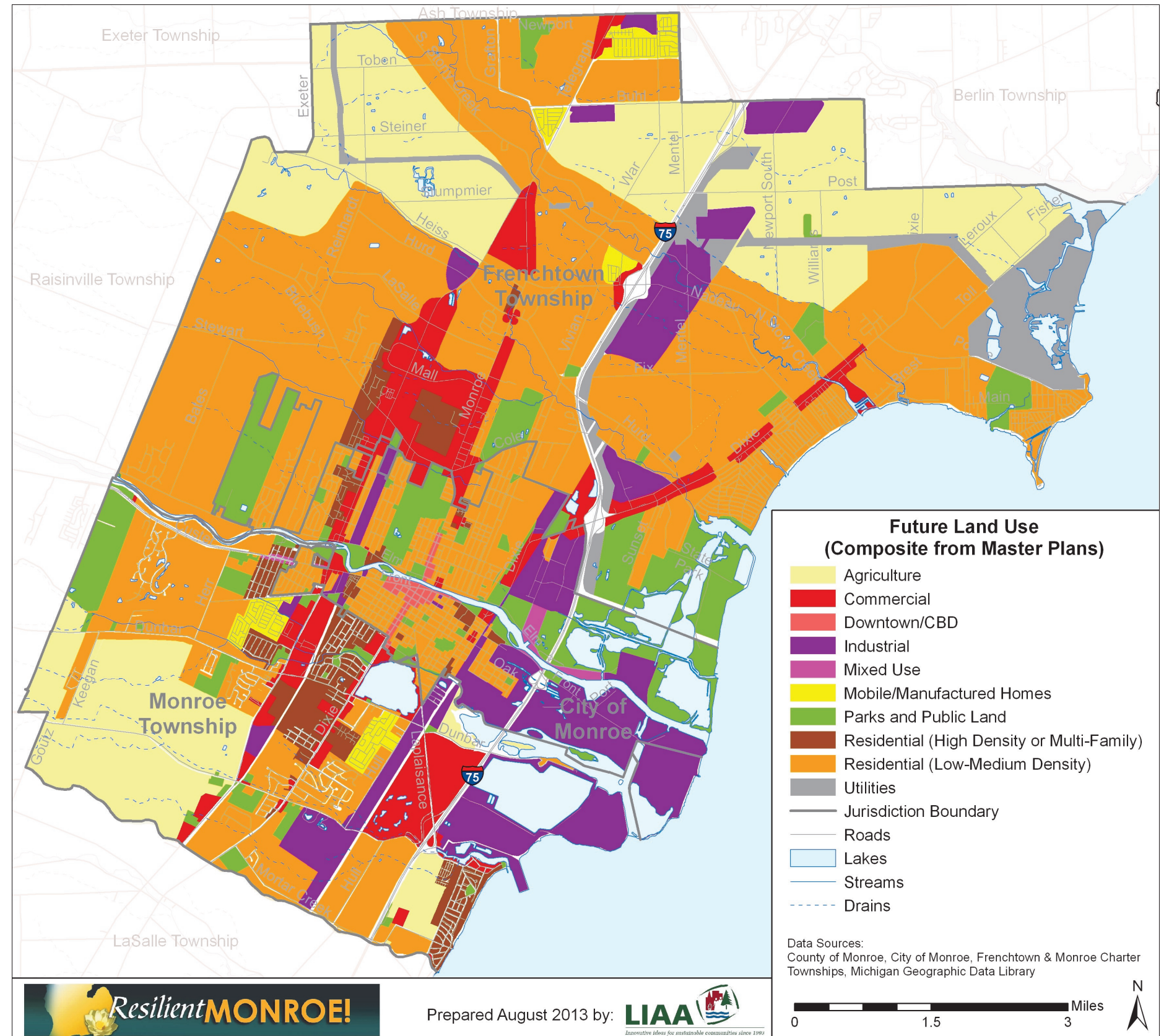
The inconsistencies mirror the zoning inconsistencies. Similar to the composite zoning map, one area of inconsistency is along the border of Frenchtown Charter Township and the City of Monroe, along Stewart Road between Telegraph Road and Monroe Street. Frenchtown Charter Township sees the land developing as commercial; directly adjacent, the city envisions parkland and low-density residential. Just east of there, the city plans for industrial, while on the other side of the border Frenchtown Charter Township is planning for parks and commercial. The city's future land-use vision will likely change with the adoption of the River Raisin Corridor-East Master Plan. Another area of potential conflict is the southwest corner of the city (planned to be low-density residential) and the planned high-density residential and mobile homes in the adjacent Monroe Township segment.

Build-out Analysis

As an exercise to better understand what could happen if the Monroe Community were fully built out according to existing zoning code, we used a modeling tool called a *Build-out Analysis*. A Build-out Analysis is used to estimate the capacity for a community to accommodate new growth under existing zoning and land-use regulations. To accomplish this task, the project team used digital map files and attribute data from a Geographic Information System (GIS) and processed this information using a proprietary software package, *CommunityViz*®, to create a predicative model of the build-out. We used the most recent zoning district map from the three jurisdictions to calculate the maximum density allowed in each residential zoning district in density units per acre.⁷⁸

Before running the model, we removed lands not considered buildable, including lakes, streams, wetlands, steep slopes, existing public lands and parks, existing roads, and lands currently in use for other purposes (e.g., houses, apartment buildings, places of worship). Next, we made a number of assumptions of areas that likely will not be built-out. For example, a 100-foot setback from all roads and right of ways was removed as unbuildable. We also used an efficiency factor of 80% to adjust density values to reflect common density losses such as roads, schools, and other non-residential land uses that support residential land uses.

Map 9.5 Future Land Use (Composite from Master Plans)



The modeling program was then directed to determine the maximum number of dwelling units possible for each area, given all the restraints and zoning limitations. We erred on the conservative side with lower build-out scenarios wherever possible. Figure 9.2 provides an approximate number of dwelling units currently in each jurisdiction, and the total potential number for dwelling units if the land was completely built out. While it is highly unlikely that all these dwelling units would be built in the foreseeable future, the table is instructive.

Figure 9.2 Results of Build-out Analysis

	City of Monroe		Monroe Charter Township		Frenchtown Charter Township	
Land Use Designation	Buildable Area (acres)	Additional Dwelling Units	Buildable Area (acres)	Additional Dwelling Units	Buildable Area (acres)	Additional Dwelling Units
Single Family Residential	1322	338	2523	2795	3448	4098
Multiple Family Residential	94	34	32	0	376	594
Mobile Home Park	0	0	0	0	0	0
Agriculture	0	0	3200	379	14445	1430
TOTAL	1416	372	5755	3174	18269	6122

As illustrated in Figure 9.2, the model indicates that current land-use regulations would allow the addition of 9,668 dwelling units across the Monroe Community. If all these dwelling units were built, the Monroe Community would have a population increase of 24,170 people (using the 2.50 average household size for the Monroe Community as determined by the 2010 Census). Of course, this is not a population projection. However, this information may be useful when considering current land-use regulations and future changes.

Other Community Plans and Policies

In addition to the three jurisdictional Master Plans and Zoning Codes, the following documents were reviewed in coordination with the *Resilient Monroe* planning effort in order to ensure consistency and accuracy.

Monroe County 2010 Comprehensive Plan – The county plan provides background information on natural resources, demographics, land use, and transportation, and outlines broad guiding principles for future land use, economic development, parks and open space, and transportation. The plan is available to download on the Monroe County website.

A Guide to Water Quality Protection for Monroe County Residents – A basic guide for county residents to encourage best management practices for protecting water quality. Topics covered include catch-basin care, maintaining septic systems, and low-impact development and landscaping advice. The full document can be downloaded from the Monroe County Drain Commissioner’s homepage.

Monroe County Housing Needs Assessment 2013 Update – Produced by the Monroe County Opportunity Program, this document evaluates living and housing conditions in Monroe County. The Needs Assessment outlines a series of recommendations on strategies to improve housing conditions in Monroe County.

Monroe County Hazard Analysis (2012) – An analysis conducted by the Monroe County Emergency Management Division. The document will serve as the technical component of a larger Natural Hazard Mitigation public

planning process. The analysis includes basic jurisdictional information, types of hazards possible, the history of hazards in the community, and a risk assessment of each hazard.

Monroe County Comprehensive Economic Development Strategy (2012) – A document prepared by the Monroe County Planning Department and Commission. The plan addresses challenges and opportunities of economic development in the county and also discusses goals, objectives, and specific redevelopment sites of interest to the county. The report can be downloaded from the Monroe County Planning Department website.

Monroe Metropolitan Area Stormwater Management Plan – A document that calls for environmental stewardship and protection of area water quality through education and coordination of local jurisdictions and permitting process.

City of Monroe Pilot Watershed Improvement Plan (2006) – A pilot project that aimed to establish baseline data on stormwater, identify opportunities for riparian habitat restoration, and develop a series of goals and recommendations for managing stormwater in the City of Monroe.

City of Monroe Stormwater Management Plan (2010) – A series of best management practices for stormwater runoff that include a measurable goal, a timeframe, and a responsible party.

Downtown Monroe Handbook (2011) – A handbook developed by the Downtown Development Authority (DDA) designed to support business development in Monroe and to make downtown more inviting for visitors and patrons in the community. The handbook is available to download on the Monroe DDA website.

Geology for Environmental Planning in Monroe County (1970) – A report summarizing the surface and subsurface geology of Monroe County.

River Raisin Watershed Hydrologic Study (2006) – A study of the River Raisin watershed conducted by the Michigan Department of Environmental Quality (MDEQ) in support of a River Raisin Nonpoint Source (NPS) watershed planning project to identify priority areas for wetland restoration.

Monroe County Developer’s Streamlining Guide (2012) – A guide updated in 2012 that aims to streamline development opportunities to foster economic development in the industrial and commercial sector. The stated goal is to enhance a collaborative partnership among all jurisdictions involved with the development and permitting processes within Monroe County for use by these partners to promote and grow Monroe County.

River Raisin Heritage Corridor-East Master Plan (2013) – This placemaking and economic development plan was developed in partnership between the City of Monroe and the Monroe County Historical Society. Key elements of the plan include a Visitor Center, Peace Gardens, Frenchtown Settlement re-creation, area for Battle Reenactments, Mixed-use Waterfront Development, a 10,000 Person Amphitheater, and a System of Non-motorized Paths and Greenways. The plan is available on the National Battlefield website.

River Raisin Watershed Management Plan (2008) – Prepared by the Lenawee Conservation District, University of Michigan School of Natural Resources, Stantec, and J.F. New for the entire River Raisin Watershed covering 1,059 square miles (677,800 acres).

CHAPTER 10. PUBLIC PARTICIPATION & CIVIC ENGAGEMENT FOR A RESILIENT MONROE

Resilient Monroe is a community-wide planning project for all citizens of the City of Monroe, Frenchtown Charter Township and Monroe Charter Township. This year-long project is designed to convene and foster broad-based public discussions about the future development of the Monroe Community — with an emphasis on resilience. To manage and oversee this project, a *Community Planning Committee* (CPC) was formed by bringing together the appointed planning commissioners and many elected officials from the City of Monroe and Frenchtown and Monroe Charter Townships. Meeting monthly in open public forums, the CPC is responsible for evaluating and recommending changes and updates to local government master plans. However, this is only part of the public process for Resilient Monroe.

Project staff members have reached out to people across the community for their vision and goals for Monroe. By holding public meetings and focused discussions with people from across the community, we hoped to build a greater public understanding of climate and economic resilience. By engaging citizens in working sessions for visioning and goal setting, we hoped to inform the local government planning process while building citizen leadership. By conducting an extensive community survey of opinions on development and change in Monroe, we hoped to inform and encourage a far-reaching community planning discussion.

PUBLIC DISCUSSIONS & FORUMS

Throughout the early spring of 2013, Resilient Monroe project team members worked to gather information from state and local government agencies, community organizations and nonprofit groups, public schools, and business leaders. We also met with community leaders individually and in focused discussion settings to help identify shared issues of concern and opportunities for cooperative community development.

Public Gatherings – During April and May of 2013, the Resilient Monroe project team distributed 1,000 project brochures and dozens of posters announcing the project and encouraging public participation. The project team convened three public gatherings in different parts of the community, making brief presentations about the potential for improving community resilience to better manage the challenges of global climate change and economic turbulence. These gatherings also provided an opportunity to receive public comments on issues of concern and hopes for the future.

Leadership Summit – On Friday, April 26th, 2013, the Resilient Monroe project team offered a day-long *Leadership Summit* to engage interested citizens, public officials and community leaders in a more in-depth discussion. This summit asked community leaders to better understand and come to grips with the challenges of climate change and our changing global economy. Presentations were made by the experts from the University of Michigan, Michigan State University, Michigan Municipal League, Michigan Association of Planning, Michigan Department of Community Health, the Huron River Watershed Council and LIAA. At the end of the day, participants broke up into

smaller groups to discuss their vision and goals for the community's future. This exercise helped foster and support more in-depth discussions undertaken by Community Action Teams.

YOUTH INITIATIVE: PLANNING GOALS FOR THE MONROE COMMUNITY

Early in the Resilient Monroe project, the CPC asked project staff members to engage young people in this discussion about the future of their community. They wanted to learn more about what young people thought would help make their community a vibrant and attractive place to live.

The *Youth Initiative* was designed as a two-day asset mapping, community visioning, and goal setting project involving approximately 60 students from Monroe High School and Jefferson High School. The *Resilient Monroe* project team spent half-days with the students on two consecutive weeks. Because of school transportation difficulties, the process was duplicated at each high school separately.

The curriculum consisted of interactive, hands-on, and group-focused planning activities. On the first day, after discussing the importance of local government and land-use planning, students worked together to identify the most important assets in the Monroe Community in an activity called *Crayon your Community*. Following that, students used aerial photographs to envision the best possible scenarios for their community, assuming no monetary or political constraints. The second session focused on challenges that the Monroe Community faces, and innovative, community-driven ideas for overcoming those challenges. Students were asked to brainstorm ways to thrive with an aging population, a transitioning economy, and a variable climate.

The students compiled a listing of their recommended community development projects. Then, the students conducted a survey to find out how highly the proposed projects would be rated among their peers. Approximately 100 participants at these schools were asked to rate the importance of each proposed



development project to the community using a scale of 1 for not-at-all important to 5 for extremely important. The following are the results gathered at the two schools.

Monroe High School

Proposed Development Project	Average Rating
1. Water Park	4.30
2. More shopping options at the Mall	4.28
3. Dave and Buster’s	3.83
4. Zip Line	3.63
5. Five Guys Burger and Fries	3.62
6. Starbucks	3.70
7. Topper’s	3.48

Jefferson High School

Proposed Development Project	Average Rating
1. ‘Mackinaw’-type Island at the mouth of the Raisin River	3.80
2. More shopping options at the Mall	3.77
3. Drive-In or Outdoor Theater	3.75
4. Recreation Area for 4-wheelers/dirt bikes/mud buggies	3.58
5. Theme Park with emphasis on local history/Monroe culture	3.30
6. Streetcars in Downtown	3.10
7. Young Adult Club	2.90

COMMUNITY ACTION TEAMS – CITIZEN WORKING GROUPS FOR RESILIENCE

As part of the Resilient Monroe project, citizens from throughout the community were invited to join a set of working sessions to develop topic-specific community planning recommendations for the City of Monroe, Frenchtown Charter Township and Monroe Charter Township. Participants were asked to select one of six topics to examine and discuss together in groups known as *Community Action Teams (CATs)*. The topics were (1) Access and Transportation, (2) Business and Economy, (3) Buildings and Neighborhoods, (4) Agriculture and Food, (5) Human and Social, and (6) Natural and Environmental (see www.resilientmonroe.org for detailed descriptions of each system). Each team had the opportunity to learn about the workings of the topic or system, as well as its strengths and weaknesses.

A diverse group of approximately 75 individuals participated in a series of four CAT meetings during the months of May, June, and July of 2013. CAT members represented the public and private sector, and included farmers, elected officials, church leaders, nonprofit directors, private business leaders, and numerous other stakeholders. Participants chose the system or topic they were most interested in working on. At each meeting, all six teams gathered in a large meeting space to hear a short presentation on aspects of planning for community resilience.

Then, the teams conducted separate discussions followed by a short period for reporting out to the larger group. Each team had a discussion leader (sometimes two), a facilitator for note-taking, and at least one Community Planning Committee representative.

The primary work of the participants focused on identifying key goals that would address community-wide issues and concerns. These goals were further developed by each CAT to include underlying objectives and specific task lists. The CAT participants have submitted a full report, including a complete list of goals, objectives and tasks, as their community planning recommendations to the City of Monroe, Frenchtown Charter Township and Monroe Charter Township. The report is available online at www.resilientmonroe.org. The following is a listing of the overall goals developed by the CAT participants for possible inclusion into the master plans and local government policies of the Monroe Community.

Access and Transportation

- Goal 1:** Improve the physical appearance of regional highways and freeways.
- Goal 2:** Reduce impacts of noise from highways and railways.
- Goal 3:** Create a multi-modal, connected, integrated transportation system.
- Goal 4:** Improve connectivity throughout the three jurisdictions.
- Goal 5:** Develop and conduct pavement preservation program.

Buildings and Neighborhoods

- Goal 1:** High property standards for owner occupied, rental, and commercial buildings.
- Goal 2:** Sustainable, maintainable infrastructure and housing.
- Goal 3:** Affordable housing and lifestyle options.
- Goal 4:** Optimized linkages between all major community features (natural, cultural, historical, & economic).

Business and Economy

- Goal 1:** Develop base jobs and expand local commercial and retail businesses.
- Goal 2:** Increase the number and diversity of business start-ups.
- Goal 3:** Raise the level of the community’s average educational attainment.
- Goal 4:** Attract and retain younger professionals and entrepreneurs.
- Goal 5:** Create a comprehensive, coordinated multi-jurisdictional tourism corridor.
- Goal 6:** Maintain and enhance existing legacy manufacturers.

Food and Agriculture

- Goal 1:** Preserve existing farmland and maintain open space.
- Goal 2:** Develop and expand local agriculture and food-based business.
- Goal 3:** Transition young farmers into farming profession.
- Goal 4:** Develop new crops for a new climate.
- Goal 5:** Increase the community knowledge and appreciation of local produce through community gardens and Community Supported Agriculture.
- Goal 6:** Evaluate opportunities for local food processing.

Human and Social

Goal 1: Expand the MCANS (Monroe County Alert Notification System) emergency communication system to reach appropriate citizens during non-emergency times.

Goal 2: Support interaction of diverse groups.

Natural and Environmental

Goal 1: Create, expand and enhance science and environmental education.

Goal 2: Adopt rigorous runoff pollution controls and best practices for all types of drainage.

Goal 3: Develop a Living/Working Watershed that capitalizes on community assets.

Goal 4: Build regional collaboration for managing water resources.

Goal 5: Develop and install monitoring along River Raisin.

Goal 6: Create more green space, including planting more trees.

Goal 7: Improve tax structures for farms, including incentives for environmental best practices.

Goal 8: Develop policies focused on oil exploration and hydraulic fracturing.

RESILIENT MONROE COMMUNITY PLANNING & DEVELOPMENT SURVEY

The *Community Planning Committee (CPC)* worked with staff members to develop a public opinion survey for the residents of the City of Monroe, Frenchtown Charter Township and Monroe Charter Township. Our goal was to learn more about what residents like most about the Monroe Community and what cultural and natural features are most important. We also wanted to learn what residents thought about key land-use planning and development concerns identified by the CPC.

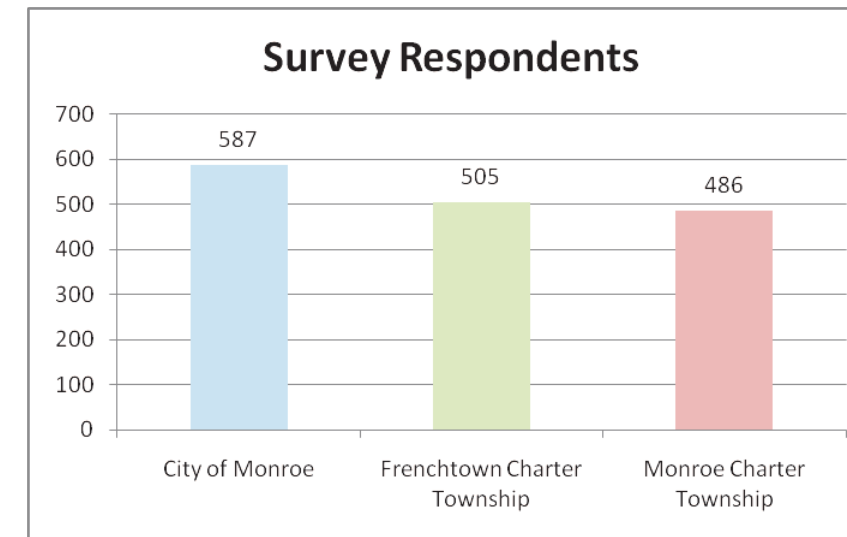
To obtain opinions from a representative sample of community residents, we selected a random sample of names and addresses from the lists of registered voters maintained by each of the three participating jurisdictions. At that time, there were a total of 40,639 voters registered in the three jurisdictions. With help from the U.S. Postal Service, we were able to select a total of 10,870 voter names with valid addresses at random from the lists. To achieve a statistically significant, representative sample for each jurisdiction, we needed a response rate of about 10%.

The survey questions were written in clear, simple language. Only checks and circles around specific choices were required to complete most of the survey, though some of the questions included space for long-form answers. To help encourage a high response rate, the survey was sent in an attractive, large format envelope, with a postage-paid return envelope enclosed. Additionally, we promised to give away four \$100 gift certificates to people drawn at random from all the completed surveys.

The survey was mailed during the second week of July 2013. By August 9th, we had received 1,578 properly completed surveys (32 surveys were rejected for lack of an identified jurisdiction). This is a very respectable 14.5% response rate to the mailed survey, yielding a good representative sample of all registered voters in the Monroe Community. We caution that this cannot be considered a true random sample of registered voters since each individual decided whether or not to complete the survey (self-selection bias). However, the survey did yield a

large number of responses from a broad cross-section of the population (based on the demographic data), providing valuable information about the preferences of voting citizens with an active interest in the community.

The figure below provides a breakdown of the number of surveys received from each jurisdiction. Again, there is a sufficient number from each jurisdiction to assure a reasonably representative sample of the population.



Demographics of Survey Respondents

The first nine questions on the survey were intended to help us determine how representative the survey respondents are of the overall population of the Monroe Community as a whole. While the survey participants are representative of the overall population, more of them are over 65, female and retired than the general population. However, the sample population is similar to the whole population in many other ways. Further, the large number of surveys completed helps to assure that we have a substantial number of respondents in most demographic categories.

The first question asked respondents how many people live in their household. According to the U.S. Census Bureau, the average household size for all residences in the Monroe Community was 2.5 persons in 2010. The survey responses indicate that 61.2% of respondents had either 2 or 3 people in their household, while 75.8% had between 1 and 3 people.

We also asked about property ownership such as a house. Of all survey respondents, 80.4% said they own property in the Monroe Community. We assume the majority of these respondents own their home. By comparison, about 67% of the total population lives in owner-occupied housing, according to the American Communities Survey for 2010.

Other survey questions asked the respondents to identify their age category, gender, employment status, household income, number of children in the household, and length of residency in the Monroe Community. Overall, the percentage of respondents 65 years or older was considerably higher (31.9%) than the general

population (13.6%) and more were female (60.1%) than the overall population (50.7%). However, employment (45.3%) and unemployment (7.7%) levels in respondents were only slightly higher than the figures for the whole Monroe County population. About 41% of survey respondents say they are retired, a fairly high percentage.

The median household income of \$47,167 for all of Monroe Community is slightly lower than that of the median survey respondent. About 17.4% of survey respondents reported a household income between \$35,000 and \$49,000. However, 54% reported a household income of \$50,000 or more. Additionally, about 24% (378) of survey respondents have children less than 18 years of age in their household. This compares with 37.5% of the Monroe Community.

Summary of Community Survey Results

The survey asked participants to answer two questions regarding their civic activities in the Monroe Community. Over 37% of the survey respondents said they had volunteered in the community over the last year (e.g., scouts, events, parades). Rates of volunteerism reported appeared highest in the city (40.9%) and the lowest in Frenchtown Township (34.1%). Only 3% of the 1,575 respondents identified themselves as an appointed or elected official or government staff member.

Most of the survey questions asked participants to select a level of importance of favorability on a 5-point scale, from 1 as very negative to 5 as very positive. Respondents were free to give positive ratings in every case. In fact, the averages or means of responses to a majority of the questions are in the positive. In general, about 15% to 30% of responses were in the middle or neutral (3 on the 5-point scale). Occasionally, however, large proportions of responses are neutral, suggesting a “no opinion” or lack of knowledge on the subject. These cases will be pointed out in the following discussion.

Popular Activities – At the end of the demographic section, the survey asked respondents to identify their favorite activity in the Monroe Community. This was an open-ended question, giving space for a one-line answer. While predictable in many ways, the collection of responses is also meaningful to community planning and development officials, emphasizing the importance of recreation, cultural events, and natural resources. The most frequently identified activities include: 1. Walking (176); 2. County Fair (154); 3. Fishing (97); 4. Jazz Fest (87); 5. Biking (78); 6. Golfing (77); 7. Water sports (67); 8. Parks (63); and 9. Concerts (56).

Favorite Activities Word Cloud (www.wordle.net)



Most Important Reasons to Live in the Monroe Community – We asked survey respondents about their decision to live in the Monroe Community, offering 11 specific community characteristics often cited in meetings with community members. The following lists the characteristic and the percentage of respondents who identified that characteristic as *important* (4) or *very important* (5) on a 5-point scale. As indicated, there is very little difference in the responses from the different jurisdictions. The two most important or highly rated characteristics of the Monroe Community appear to be: 1. *safe place to live, work and play*; and 2. *desirable neighborhoods*. Clearly, the *amenities* of the Monroe Community and its *affordable housing* are also compelling characteristics.

	Community	City	Frenchtown	Monroe Twp.
Safe place to live, work & play	94.7%	94.2%	94%	95.9%
Amenities such as libraries, parks & historic buildings	75.9%	75.1%	76.5%	76.4%
Desirable neighborhoods	91.9%	91.1%	91.6%	93.3%
Access to River Raisin & Lake Erie	58.8%	54.4%	64.3%	58.4%
Public school system	66.4%	66.6%	68.8%	63.7%
Recreation opportunities	71.3%	71.0%	71.4%	71.5%
Affordable housing	78.8%	80.2%	77.6%	78.1%
Friends or relatives live here	72.2%	71.1%	69.5%	76.4%
Close to big cities (e.g., Toledo, Detroit)	56.5%	55.0%	53.9%	61.0%
Easy commute to work	63.2%	64.9%	61.3%	63.3%
Have a job in the Monroe Community	52.9%	59.1%	46.5%	52.2%

Visiting Downtown Monroe – Two questions asked respondents to comment on why they would and would not visit downtown Monroe. The survey asked people to write short responses to this open-ended question. The vast majority cited parking issues (469) and the lack of things to do (244) as reasons not to go downtown. On the other hand, asked what would make them more likely to visit downtown, the vast majority called for *more shops, stores and shopping variety* (601). *Better parking options* (291) as well as *more restaurants and fine dining* (192) were also common responses.

Safe Place to Live, Work & Play – 90.8% of respondents.
Friendly Welcoming People – 78.2% of respondents.
Events & Festivals (e.g., Jazz Festival, County Fair) – 74.6% of respondents.
Affordable Housing – 71.1% of respondents.
Bicycling & Walking Paths – 68.5% of respondents.

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Stores (average 3.98), and *Visitor & Tourist Attractions* (average 3.94). The improvement considered least important among the commercial developments listed were *Fast Food Restaurants* (average 2.60), according to these survey participants. There appears to be little difference of opinion between the three jurisdictions on this question.

	Average (mean) Rating on 1 to 5 scale of Importance			
Commercial Development	Community	City	Frenchtown	Monroe Twp.
Retail Clothing & Shoe Stores	3.98	3.99	3.92	4.02
Fast Food Restaurants	2.60	2.57	2.62	2.63
Major Destination Restaurants	3.99	3.98	4.01	3.99
Food or Grocery Stores	3.78	3.73	3.81	3.82
Automobile Sales & Services	2.95	2.90	2.96	2.99
Business Offices	2.98	2.98	2.94	3.01
Boutiques & Specialty Shops	3.63	3.66	3.57	3.64
Visitor & Tourist Attractions	3.94	3.89	3.97	3.98

Transportation Improvements – When asked to rate the importance of specific transportation improvements, survey participants responded strongly. All but one of the suggestions listed received ratings of *important* or *very important* by well over 50% of respondents. Again, the rating scale ranged from 1 for *not at all important* to 5 for *very important*. As noted in the summary table below, the highest importance scores were given to *Better Safety Features* for Telegraph Road (average 4.36) and Dixie Highway (4.23).

	Average (mean) Rating on 1 to 5 scale of Importance			
Transportation Improvements	Community	City	Frenchtown	Monroe Twp.
Improvements for pedestrians	4.15	4.14	4.13	4.18
Improved appearance for Telegraph Rd.	4.10	4.04	4.13	4.14
Better safety features for Telegraph Rd.	4.36	4.28	4.41	4.41
Improved appearance for Dixie Hwy.	4.04	3.93	4.07	4.12
Better safety features for Dixie Hwy.	4.23	4.16	4.22	4.32
New & improved bicycling routes in suburban areas	3.94	3.93	3.90	3.98
Additional bus service in suburban areas	3.44	3.39	3.50	3.43

Rating Importance of Community Services – We asked survey participants to use a scale of importance from 1 to 5 to rate community services. In this case, every community service identified was given relatively high ranking as important to the community, particularly in comparison to other question responses in this survey. Additionally, the proportion of survey participants who chose the middle of the scale (i.e., 3) was smaller than with other question responses. Among the services listed, *roads and bridges*, *street lights*, *parking*, and *sidewalks* received slightly higher importance ratings than the other service listed.

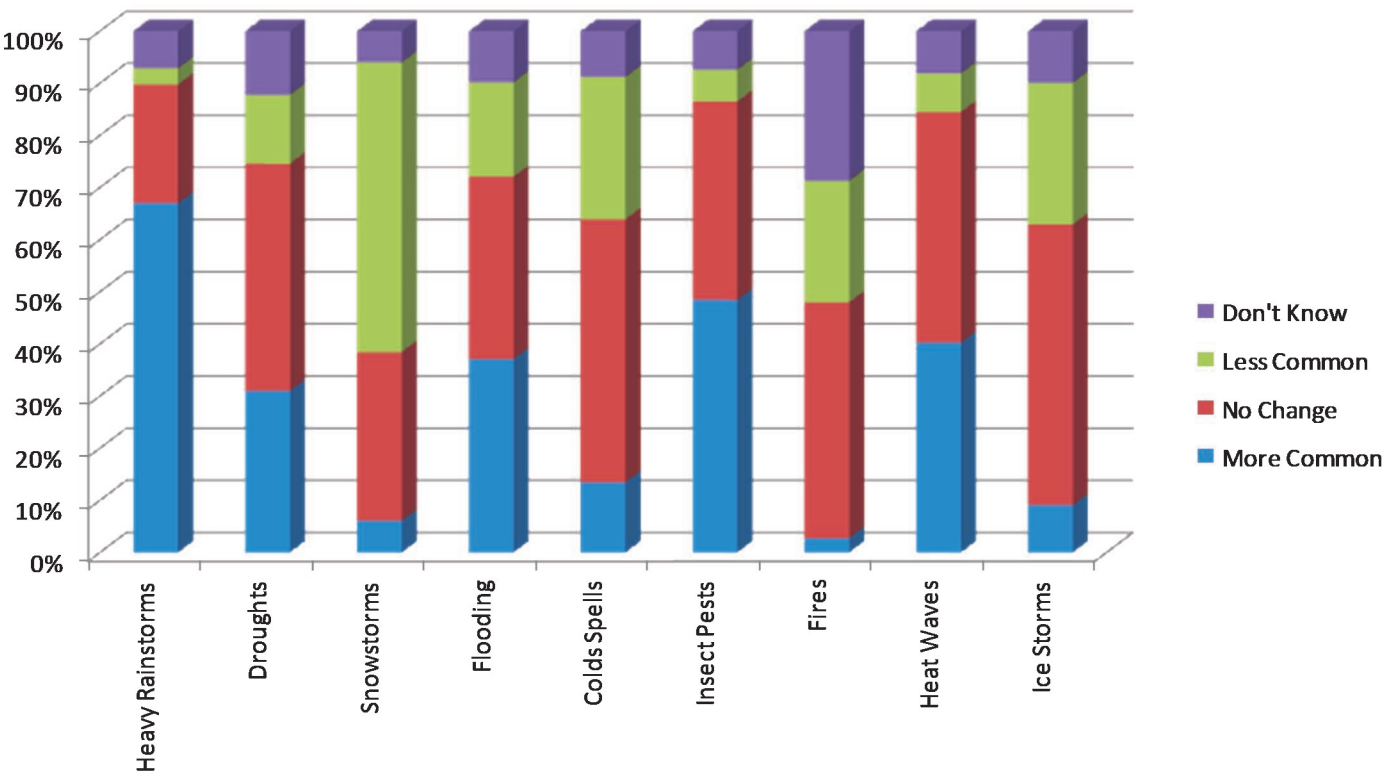
	Average (mean) Rating on 1 to 5 scale of Importance			
Community Services	Community	City	Frenchtown	Monroe Twp.
Festivals, Parades & Local Celebrations	4.12	4.12	4.06	4.19
Public Libraries	4.27	4.27	4.22	4.32
Properly Maintained Sidewalks	4.38	4.44	4.34	4.36
Automobile Parking Near Business & Retail Locations	4.39	4.34	4.42	4.42
Roads & Bridges for Automobiles	4.43	4.38	4.46	4.45
Street Lights	4.41	4.43	4.38	4.42
Public Schools	4.30	4.31	4.29	4.19
Services for the Poor	4.17	4.17	4.16	4.19

Protecting Water Quality – We asked survey participants what local government activities or requirements they would favor to protect the water quality of lakes, streams and groundwater in the Monroe Community. Respondents were asked to rank each of four different government interventions on 5-point scale going from 1 for *totally opposed* to 5 for *completely in favor*. The relatively high average response scores suggest that survey participants strongly favor protections for water quality. There is a particularly strong approval or favorability rating given to protecting lakes from invasive species.

	Average (mean) Rating on 1 to 5 scale of Favorability			
Water Quality Protection	Community	City	Frenchtown	Monroe Twp.
Work to reduce runoff from streets & parking lots	4.18	4.16	4.17	4.22
Maintain shoreline vegetation to filter stormwater runoff	4.23	4.19	4.24	4.25
Require maintenance of on-site septic systems	4.32	4.33	4.30	4.33
Work to protect lakes from invasive species	4.56	4.49	4.57	4.63

Changes in Weather Events – The survey includes a number of questions concerning general weather trends in the Monroe Community. Given accumulating evidence about climate change and its impacts on Michigan, we wanted to know if Monroe residents had perceived changes in the weather over the past 10 years. We asked respondents to select from one of four possible options about particular weather events: 1. *More common*; 2. *No change*; 3. *Less common*; and 4. *Don’t know*. Substantial majorities of survey respondents indicate that they have seen an *increase in heavy rainstorms* (67.0%) and a *decrease in snowstorms* (55.5%). At the same time, a fairly large percentage of respondents say that there have been *increases in insect pests* (48.5%) versus those who report fewer pests (6.1%). Similarly, a large percentage of respondents say heat waves have become more common (40.3%) versus those who say less common (7.4%).

Changes in Weather Events over the Last 10 Years



Controlling Stormwater Runoff & Flood Hazards – Survey participants were asked their opinions on the various methods for managing stormwater and reducing flooding. Specifically, we asked respondents to rate the importance of eight common stormwater control measures on a 5-point scale from 1 for *not at all important* to 5 for *very important*. The average survey response appears to strongly emphasize the *planting of more trees and other vegetation* (4.22), *wetland preservation* (4.21), *educational support for homeowners* (4.17), and the *effective landscaping of new developments* (4.12).

There appears to be very little support for *reducing or limiting the size of paved parking areas* (3.17), even though this is a measure usually considered to be very effective in reducing runoff. However, in this case, the average score is somewhat misleading. Nearly 40% of all respondents gave this stormwater management measure a middle or neutral score on the 5-point scale, suggesting a good deal of uncertainty. In fact, about 35% identified this control measure as important or very important.

Stormwater Control Measure	Average (mean) Rating on 1 to 5 scale of Importance			
	Community	City	Frenchtown	Monroe Twp.
Use effective landscaping with new developments	4.12	4.10	4.10	4.17
Require more on-site storage of stormwater	3.66	3.61	3.58	3.79
Reduce or limit the size of paved parking areas	3.17	3.26	3.05	3.19
Provide incentives for upgrading sump pumps & footer drains	3.93	3.91	3.91	3.96
Encourage the use of rain gardens & rain barrels	3.74	3.74	3.75	3.73
Preserve existing wetlands	4.21	4.19	4.21	4.24
Provide more information to homeowners	4.17	4.16	4.18	4.17
Encourage the planting of more trees & shrubbery	4.22	4.16	4.25	4.27

Improving the Monroe Community Economy – Survey participants were asked for their opinions on four different approaches that local governments could use to help improve the local economy of Monroe. We asked respondents to rate each approach using a 5-point scale ranging from 1 for *totally opposed* to 5 for *completely in favor*. All four options received favorable ratings by the vast majority of participants, but *incentives for locally-owned businesses* received substantially stronger backing.

Actions to Improve Economy	Average (mean) Rating on 1 to 5 scale of Favorability			
	Community	City	Frenchtown	Monroe Twp.
Work to increase all forms of tourism	4.07	4.02	4.09	4.12
Work to increase local food production	4.17	4.09	4.23	4.20
Provide incentives for locally owned business	4.38	4.36	4.38	4.42
Help develop a local business incubator	4.01	3.96	3.98	4.08

Improving Municipal Facilities – We identified 10 different improvements that local governments in the Monroe Community could undertake over the next 10 years. Survey participants were asked whether they favored or opposed these strategies. Once again, we asked respondents to use a 5-point favorability scale of ranging from 1 for *totally opposed* to 5 for *completely in favor*. Of the 10 improvements suggested, two received more opposition than support: *adding new passenger train service* and *improving and increasing bus service*.

One of the suggested improvements had a particularly high favorability rating, *re-pave and repair roads* (average 4.67) — one of the highest in this survey. Several other suggested improvements received substantial favorability ratings as well, including: *improve the “curb appeal” throughout Monroe* (4.09), *improve municipal parks* (3.91), *build new bicycle and walking trails* (3.82), and *increase availability of recreation programs* (3.80).

	Average (mean) Rating on 1 to 5 scale of Favorability			
Municipal Improvement	Community	City	Frenchtown	Monroe Twp.
Re-pave & repair roads	4.67	4.61	4.68	4.74
Improve municipal parks	3.91	3.91	3.91	3.92
Construct stormwater retention facilities	3.71	3.68	3.69	3.76
Add new sidewalks	3.74	3.64	3.78	3.84
Build new bicycle & walking trails	3.82	3.78	3.80	3.90
Add passenger train service	3.01	2.90	3.01	3.14
Improve & increase bus service	3.33	3.27	3.38	3.34
Expand recreation facilities	3.74	3.70	3.80	3.74
Increase availability of recreation programs	3.80	3.80	3.83	3.77
Improve the “curb appeal” throughout Monroe	4.09	4.06	4.08	4.14

Protection from Environmental Hazards – Given the challenges of climate change and related environmental hazards, we asked survey participants about their willingness to take actions for self and community protection. We asked respondents to tell us about eight different actions they could take or may have already taken for protection. As noted below, substantial proportions of the survey participants say they have already taken many protective actions. Over a third to nearly one-half of all respondents appear willing to go further and take at least seven of these eight actions to protect themselves and others from environmental hazards.

	Community-Wide Survey Response			
Protective Action to Take	Have Done	Would Do	Would Not	Don’t Know
Learn about local hazards & the best ways to deal with them	36.9%	47.7%	2.5%	12.9%
Participate in and/or organize family or neighborhood voluntary response	8.3%	48.0%	16.1%	27.7%
Purchase an emergency kit	41.4%	46.5%	6.6%	5.5%
Install water efficient household appliances to conserve water	51.0%	35.2%	4.7%	9.1%
Install energy efficient household appliances and lights to conserve energy	68.1%	25.4%	2.3%	4.1%
Install rain barrels at my home	6.7%	44.0%	27.9%	21.4%
Plant more trees, shrubs & greenery	44.3%	34.5%	12.9%	8.2%
Increase the amount of insulation in my home to save energy	48.1%	37.3%	6.1%	8.4%

This survey included several questions that address citizen understanding about the cleanup and restoration efforts being undertaken for the River Raisin Area of Concern (requested by the AOC). First, they asked how familiar survey respondents were with a number of improvement projects recently completed on the River Raisin. We asked respondents to use a 5-point scale to rate their familiarity with these projects, from 1 for *not at all*

familiar to 5 for *very familiar*. The responses indicate that about 35% to 45% of the respondents were familiar with these projects, selecting 4 or 5 on a 5-point scale. As the relatively low response averages indicate, the majority of respondents claimed little familiarity with these projects.

	Average (mean) Rating on 1 to 5 scale of Familiarity			
River Raisin Improvement Project	Community	City	Frenchtown	Monroe Twp.
Dredging to remove contaminated sediment	3.04	2.97	3.05	3.11
Low-head dam modification and removal	3.07	3.09	2.98	3.13
Invasive species management	2.86	2.83	2.86	2.88
Riverfront habitat restoration	2.80	2.80	2.78	2.82

We also asked survey participants to consider a series of actions that they could take or may have already taken to improve water quality in the River Raisin. For each action, respondents were asked to select from four choices: *Have Done, Would Do, Would Not Do, or Don’t Know*.

	Community-Wide Survey Response			
Protective Action to Take	Have Done	Would Do	Would Not	Don’t Know
Volunteer for a local watershed group	1.8%	22.1%	36.3%	39.8%
Participate in a river cleanup	5.9%	35.6%	33.2%	25.3%
Organize an environmental education event	2.3%	13.9%	50.3%	33.5%
Financially support or donate to a watershed project	2.4%	24.5%	32.5%	40.6%

We asked survey participants for their opinions on the relationship between environmental quality and the local economy. Over 76% of the 1,505 respondents said that environmental quality and watershed quality are either important or very important to the economic vitality of the Monroe Community. In fact, only about 3% of the respondents said that environmental quality was not important to the local economy.

The final question of the survey asked participants what they like to do when visiting the River Raisin. This question asked about four specific activities. Again, the AOC requested this question to help better understand how people viewed the river at this point in the cleanup and de-listing process. The following is a simple tally of the number of times respondents selected a particular activity (all or none of the activities could have been selected).

	Community	City	Frenchtown	Monroe Twp.
Fishing	454	164	142	148
Canoeing/Kayaking	317	121	91	105
Bird Watching	432	164	145	123
Rarely Visit River	582	188	202	192

TELEGRAPH ROAD CHARRETTE

Telegraph Road is one of the primary north-south corridors in the Monroe Community, connecting all three jurisdictions. Approximately 30,000 vehicles use the corridor in a day. The Telegraph Corridor is dominated by the automobile. Sidewalk infrastructure is inconsistent, disjointed and even absent in many areas. Adjacent land use is primarily commercial, featuring many small “strip-mall” type developments and expansive parking lots. Despite the commercial success of some areas along the corridor, there are a number of vacancies. The architecture and condition of buildings along portions of the corridor is very inconsistent and appears outdated and dilapidated in places.

It is in this context that a planning *charrette* was conducted for the Telegraph Corridor as part of the Resilient Monroe project. A charrette is a multi-day collaborative planning event that engages local officials, state and regional agencies, business owners, local stakeholder groups, and interested citizens to create and support a feasible and transformative plan for a specific issue or area of the community. The focus of our charrette was on a seven-mile portion of Telegraph, roughly bound by Dunbar Road to the south and Stewart Road to the north.



Charrette Findings

The Telegraph Road Charrette was conducted over three consecutive days in September 2013. Intensive public and stakeholder engagement identified four major themes as the primary focus for planning and design activities:

- ▮ **Establish an Identity and Sense of Place along the Telegraph Corridor**
- ▮ **Development of Mill Race Park**
- ▮ **Telegraph Road and Custer Road/Front Street Gateway Improvements**
- ▮ **Redevelopment of the Telegraph Road La-Z-Boy Site**

Identity and Sense of Place Along the Telegraph Corridor

Participants determined that the Telegraph Corridor currently has no unique character. In many ways, it looks like the average suburban corridor that you would expect to find in any community. In order to attract new businesses and reinvestment along the corridor, a unique identity and sense of place needs to be established. Due to the fact that Telegraph runs through each jurisdiction and that it functions as a gateway into the greater Monroe Community, it has the potential to become an important part of the identity of the



entire Community. The charrette pointed toward placemaking strategies to transform the character of the Telegraph Corridor, with high priorities placed on:

- ▮ Landscaping and streetscaping.
- ▮ Improved access management (i.e., combining driveways).
- ▮ Greater walkability and pedestrian access.
- ▮ Deterring expansive parking in front of businesses.
- ▮ Improved sign and building design standards.
- ▮ A Community-wide strategy for improving east-west connectivity across Monroe.

Mill Race Park and River Access

The charrette identified Mill Race Park is an underutilized public space that has the potential to serve as an access point to the River Raisin. Charrette participants were enthusiastic about the potential redevelopment of Mill Race Park to include amenities such as an ADA accessible boat launch, picnic area pavilion, a boardwalk system, viewing platforms, and educational programming.



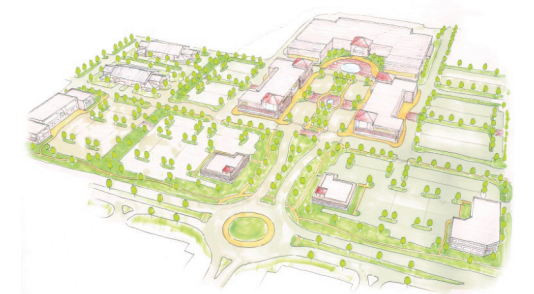
Telegraph Road and Custer Gateway

The intersection of Telegraph and Custer Road/Front Street is one of the main gateways into the Monroe Community. Charrette participants identified the triangular block at the southeast corner of this intersection — bound by Telegraph, Front Street and Stone Street — as a prime target for redevelopment. The presence of retail, the position and unique architectural quality of some of the buildings, and the planned redevelopment of a nearby supermarket site were all cited as possible building blocks for improvement of the gateway experience.



The La-Z-Boy Site

La-Z-Boy plays an important role in the Monroe Community. After 80 years, the furniture giant will be moving its world headquarters from Telegraph to a new site about a mile to the east. The Telegraph site consists of about 29 acres, with direct frontage on Telegraph Road. The charrette identified this as an ideal redevelopment opportunity, one that could drastically change the future viability of the entire corridor.



CHAPTER 11. RECOMMENDATIONS & OPTIONS FOR ACTION

This final section of the *Resilient Monroe Resource Atlas* provides a wide range of recommended community goals and options for action. Most of these recommendations and options were presented during the Resilient Monroe planning project by city and township staff members, planning commissioners, citizens at community meetings and working sessions, and the working groups called *Community Action Teams (CATs)*. Some of these recommendations and options for action have been gathered from recent research as well as from other communities that are working to remain vibrant, resilient places.

INTRODUCTION: STRONGER TOGETHER

Together, Frenchtown and Monroe Charter Townships and the City of Monroe comprise a single community with a shared heritage and cultural institutions, interconnected commerce and infrastructure, and treasured natural resources. When the three local governments work together with the people and organizations of the Monroe Community, great things happen: new businesses get started (e.g., Ventower Industries) and others mature in place (e.g., La-Z-Boy); expanding trails and walkways connect neighborhoods with cultural and natural resources; regional historical sites tell compelling stories of our national heritage; human visitors and wildlife return to a recovering River Raisin and Lake Erie waterfront; and people stream in from across the Midwest to celebrate a culture of jazz.

While these things are critical to sustaining Monroe as a vibrant community, they are not solely government functions. Local governments do not build businesses or provide historical interpretation. Rather, the city and two township governments support business and community development by providing public safety services, maintaining streets and other infrastructure, regulating land uses, controlling nuisances, and helping to build key community facilities like libraries, playgrounds and parks. Local governments also convene community discussions and help focus the attention of citizens and organizations on local challenges and opportunities. To succeed and remain a vibrant community, businesses, organizations and citizens must work with their local governments toward shared goals.

MOVING MONROE: ACCESS & TRANSPORTATION SYSTEM

Most large, vibrant communities offer their residents and visitors many modes of transportation with effective connections between neighborhoods, businesses, schools, parks and other places of interest. Such multi-modal transportation systems can help limit the use of automobiles, saving fuel and money while reducing pollution and encouraging healthful exercise. However, planning is needed to assure that all people, regardless of socio-economic status, have transportation options.

In the Monroe Community, there are many ways people and products move from place to place. Highways like I-75, Telegraph Road (M-24), Custer Road (M-50), and South Dixie Highway (M-125) support freight and passenger traffic in and out of the community. Walking and biking paths like the *River Raisin Heritage Trail* are also part of

the transportation system. In fact, sidewalks and bike lanes provide key connections to businesses, public buildings and neighborhoods. At the same time, *Lake Erie Transit* provides 400,000 rides each year countywide.

The results from the *Monroe Community Planning Survey* demonstrate that residents are still heavily dependent on automobiles and trucks to get around. Survey respondents called for the repair and improvement of roads and bridges throughout the community, including an emphasis on reducing the hazards presented by major corridors like Telegraph Road and South Dixie Highway. At the same time, the survey participants gave strong support to improving the walkability of the Monroe Community, including better access to trails and bicycle paths.

Build Better Community Connections

Reflecting the opinions of survey participants, the *Access and Transportation Community Action Team (CAT)* identified major goals to enhance roadway appearance, surface conditions and overall safety of Monroe's major roadways. The *Access and Transportation CAT* also expressed concern over the conflicts between the community and the railways — concerns repeated in many public discussions. For example, controls over noise should be considered (e.g., sound barriers, modern railroad horn system). Additionally, many people agreed that railroad crossings could be substantially improved.

Based on all of the information gathered through the Resilient Monroe project and reviews of recent research, we offer the following recommendations to community planners for *building better connections*. More specific objectives and action steps will be presented to the *Monroe Community Planning Committee*.

- ▮ **Focus efforts on existing roadways first.**
- ▮ **Improve South Custer (M-50) and West Front as a major east-west connection.**
- ▮ **Develop and conduct a pavement preservation program.**
- ▮ **Improve safety on Telegraph Road and other routes through access management.**
- ▮ **Reduce the impacts of noise from roadways and railroads.**
- ▮ **Improve the physical appearance of regional highways and freeways.**
- ▮ **Engage railroad operators in efforts to improve railroad crossings.**
- ▮ **Establish a multi-jurisdictional Corridor Improvement Authority for Telegraph Road as recommended in the *Telegraph Corridor Charrette Final Report*.**



More Choices, More Resilience

As described in this Resource Atlas, communities can become more resilient by incorporating a wide range of transportation choices in their planning and development. A transportation system that supports cars, bicycles, public transit and walking can also foster strong neighborhoods, improve property values, support vibrant shopping districts, and contribute to better public health.

Respondents to the *Community Planning and Development Survey* identified walking as a favorite local activity and offered clear support for expanding and improving the network of sidewalks, paths and trails across the community. The *Access and Transportation CAT* also called on community planners to set a goal of creating a multi-modal transportation system that addresses the increasing demand for non-motorized transportation options. By increasing transportation choices for citizens, the community would help residents save on oil and gas (keeping money local), increase Monroe's appeal to young professionals as well as recently retired people, and assure greater access to commerce centers as well as social services.

In *Chapter 4, Community Assets: Built Systems*, we presented information on the Monroe Community's transportation network, including a map of all current and proposed walking and biking paths. Both the *City of Monroe Greenways Plan* and the new *River Raisin Heritage Corridor Master Plan* call for a number of new trails or pathways. We noted that the Southeast Michigan Council of Governments is developing a non-motorized transportation plan that may lead to new linkages to other parts of southeast Michigan.

The following recommendations are based on the information presented at public meetings, opinions expressed in the community survey, and the *Access and Transportation CAT*. We will provide more specific strategies for increasing resilience through transportation choices to the *Monroe Community Planning Committee*.

- † **Create a multi-modal, connected, integrated transportation system.**
- † **Develop a non-motorized transportation plan for the Monroe Community.**
- † **Expand the Raisin River Heritage Trail and provide wayfinding signage to downtown.**
- † **Provide additional non-motorized connections between the waterfront, the National Park and downtown.**
- † **Work to expand ridership and the service area of Lake Erie Transit and consider the placement of future infrastructure in key locations (e.g., move main station downtown).**
- † **Improve connectivity throughout the three jurisdictions.**
- † **Expand safe pedestrian and bicycle transit options along Telegraph Road.**

OPTIONS FOR ACTION: ACCESS AND TRANSPORTATION

There are many actions that can help improve connectivity between the jurisdictions while increasing safe pedestrian and bicycling options in the Monroe Community. One set of actions that the City of Monroe should consider is connecting the east-west Lorain Street corridor as part of a longer non-motorized biking and walking pathway.

Currently, the City of Monroe has an access easement between Toll Street and Huber Drive. The IHM Sisters own the right-of-way between Lavender Street and Godfroy Avenue. By making non-motorized connections between Toll Street and Huber Drive and across the IHM property, pedestrians will be able to access goods and services along the Telegraph Road corridor. Another possible non-motorized connection could be considered along the east-west Hendricks Drive corridor. Currently, the City of Monroe owns a parcel of land that connects Hendricks Drive to a city park near the intersection of Roessler Street and Hendricks Drive.



Above at left is a view of the IHM Sisters' property heading west at the end of Godfroy Avenue. It is evident that cyclists and pedestrians are already using the Lorain corridor as a direct connection. Above at right is a view of the end of Hendricks Drive heading west, where the city park is located. Non-motorized connections could provide connectivity without increasing neighborhood vehicular traffic. Dead-end roads would still be marked to deter cut-through traffic (as illustrated at bottom right).



FEEDING MONROE: AGRICULTURE & FOOD SYSTEMS

Based on the interpretation of aerial photographs, roughly 4,200 acres of land in the Monroe Community (about 13%) are used for active farming. While this is a relatively small amount of farmland, agriculture and farming are part of the community’s heritage and its sense of place. The rich clay soil has supported generations of farmers. The agricultural lands and open spaces in Frenchtown and Monroe Charter Townships provide residents a powerful connection to the land and their local food system. Furthermore, agriculture, food processing and food sales represent important parts of the local economy.

Despite the strong agricultural heritage, local food systems in the Monroe Community are under stress. Climate variability can increase soil erosion, chemical runoff, and flooding. Weather stressors can damage agricultural systems both directly (e.g., hail) and indirectly (e.g., weakening plants, enhancing conditions for pests and diseases, decreasing yields, increasing production costs). The average age of a Michigan farmer is 56 and climbing. Every year, veteran farmers retire and leave the profession, taking with them knowledge, wisdom, and decades of experience. As of 2012, farming accounts for only 2.5% of jobs in the Monroe Community workforce. Although these obstacles will not disappear, the Monroe Community has an opportunity to address these difficulties. By increasing the share of food grown and processed locally, Monroe can increase its resilience to economic hardships and reduce its demand for imported foods, providing a measure of independence.

Buy Nearby

The vast majority of *Community Planning Survey* respondents support actions to increase local food production. Most also support providing incentives for locally owned businesses. According to research conducted by the Robert Wood Johnson Foundation, 6% of people in Monroe County have limited access to healthy food. Farm stands offer some income to farmers while providing important connections for residents to healthy, local produce. Based on all the information collected in public meetings, CAT discussions, results from the Community Planning Survey, and recent research, we offer the following recommendations for community planners.

- Amend township and city master plans to identify the expansion of local food production, storage, processing and packaging facilities as local economic development goals.
- Work with local grocery stores and farmers to get local products in stores.
- Expand the Monroe Farmers Market and increase marketing efforts.
- Work to get locally produced food into local schools, hospitals, and restaurants.
- Adjust zoning laws and business incentives to promote agri-tourism for economic development.
- Identify and support programs and incentives to help young people enter the farming profession.
- Encourage the development of additional Community Supported Agriculture (CSA) farming operations to promote locally grown and locally consumed foods.
- Increase the community knowledge of local produce by increasing access to Community Gardens.



- Investigate opportunities for increasing local government support of small-business financing programs and business development services to encourage entrepreneurs of small-scale urban agriculture.
- Support and encourage efforts to develop and test new locally-viable crops that will thrive in the changing climate of southeast Michigan.
- Research and develop new low-interest and/or guaranteed loan programs to encourage and support the development of value-added agricultural enterprises.

Grow It and Make It

By recent measures, Monroe County’s 12,000 acres of farmland generate over \$130 million worth of agricultural goods annually. Given this quantity of agricultural output, the Monroe Community appears to be well-positioned for additional food processing facilities. Based on all the information collected in public meetings, CAT discussions, results from the Community Planning Survey, and recent research, we offer the following recommendations for community planners.

- Conduct an inventory of the community’s food consumption, including restaurant needs.
- Conduct a market study to evaluate opportunities for additional local food processing capacity.
- Adjust regulations to permit agricultural processing, packaging and direct sales at scales appropriate to the zoning districts.
- Create local business incentives to encourage the development of additional local food production, storage and processing facilities (e.g., develop a “Food Hub”).

Cultivating Resilience

From 2000 to 2010, there was a 22% decrease in total land area being farmed in Monroe County. However, the majority of survey respondents said that farms and open fields are important features in Monroe. At the same time, less than half of total respondents said large lots for homes are important, implying that residents place a high value on farmland and open space. In addition to economic benefits, farmland can offer many services to the greater community such as storing stormwater and moderating extreme heat events. By preserving farmland, the Monroe Community can retain these benefits for future generations. Based on all the information collected in public meetings, CAT discussions, results from the Community Planning Survey, and recent research, we offer the following recommendations for community planners.

- ▮ **Amend township and city master plans as necessary to identify farmland preservation as a significant community goal.**
- ▮ **Revise and strengthen land-use controls to promote the preservation of existing farmland and open spaces.**
- ▮ **Develop and implement a Purchase of Development Rights (PDR) program for farmland preservation.**
- ▮ **Minimize infrastructure development outside urban areas to preserve farmland.**



Food & Access: A Systems Perspective

In November 2012, the American Planning Association (APA) published a report that took a detailed look at ways local comprehensive plans (i.e., Master Plans) can integrate food-related policies into their goals and objectives. The research team found that only about 12% of local plans explicitly address an aspect of local or regional food systems. The report concludes with a series of recommendations to local governments for integrating food access into the planning process. Among others, recommendations include:

- ◆ Develop a “food policy council” to facilitate coordination, communication and collaboration among food-system stakeholders within and outside of local government.
- ◆ Partner with and include key local government stakeholders in the planning process.
- ◆ Develop a cross-appointed, intergovernmental “food systems planning” staff position.



HOUSING MONROE: BUILDINGS & NEIGHBORHOODS

Make Great Neighborhoods

The character of a house is shaped and defined by a wide range of elements, from the location of the front door, the yard and the front porch to the number of windows, the pitch of the roof, the number of stories, and the color of the exterior. It is the unique character of each home, along with the sidewalks, streets, trees and the people who live there, that help to define a neighborhood. Neighborhoods are the lifeblood of a community. They are the place where people spend most of their time in the community. They are the place that people most often consider when describing community identity and sense-of-place. In the Monroe Community, neighborhoods also provide a present-day connection to the rich history of the community and the people who shaped it.

Most community residents find safety, comfort and social connections in their neighborhood. It’s the place where they chat with their neighbors, celebrate holidays, play in the park, meet for coffee and walk to school. Neighborhoods can also bring about great change in the way communities function. According to the Project for Public Spaces, “Neighborhoods are the level of social organization at which people interact most regularly and naturally, providing a ready-made forum for tackling problems that arise in the community — like restoring a park, enlivening a business district or boosting the sense of community.”

Build Your Curb Appeal

In the Monroe Community, there are approximately 24,090 housing units. According to the 2010 Census, approximately 8% of the housing units are vacant. From 2000 to 2010, the number of vacant homes increased by 81% in the City of Monroe, 67% in Monroe Charter Township, and 61% in and Frenchtown Charter Township. Citizens have noted a perception within the community that the high number of vacant homes (in addition to the high number of rental properties) is resulting in lower property standards and contributing to an unmaintained character in some neighborhoods. The *Buildings and Neighborhoods Community Action Team (CAT)* identified better enforcement of property maintenance ordinances as a major goal.

Results from the *Monroe Community Planning Survey* demonstrate that residents value safe, attractive and vibrant neighborhoods. When asked to rank the 10 municipal facilities that needed most improvement, “Improve the Curb Appeal” ranked highest. Nearly 92% of survey respondents rated “Desirable Neighborhoods” as “Important” or Very Important” in their decision to live in the Monroe Community

Based on information collected in public meetings, CAT working group discussions, the Community Planning Survey, and recent research, we offer the following recommendations for building neighborhood identity and maintaining property values through community planning.

- ▮ **Amend township and city master plans as necessary to describe a community-wide goal of supporting high-quality neighborhoods with properly maintained structures and yards.**
- ▮ **Improve enforcement of all current building maintenance codes and explore options for issuing more stringent citations.**
- ▮ **Update and continue to maintain the inventory of rental properties in each jurisdiction.**
- ▮ **Develop a property maintenance assistance program mediated by the local governments.**
- ▮ **Develop a program that educates and engages residents and landlords on home maintenance issues and best practices.**
- ▮ **Explore the creation of neighborhood associations in areas where there are none.**
- ▮ **Create public spaces (parks, squares, sidewalk libraries) where neighbors can meet and socialize.**
- ▮ **Provide housing options for all types of incomes and stages of life.**



CHARACTERISTICS OF A GREAT NEIGHBORHOOD

1. *Has a variety of functional attributes that contribute to a resident's day-to-day living (i.e., residential, commercial, or mixed-uses).*
2. *Accommodates multi-modal transportation (i.e., pedestrians, bicyclists, drivers).*
3. *Has design and architectural features that are visually interesting.*
4. *Encourages human contact and social activities.*
5. *Promotes community involvement and maintains a secure environment.*
6. *Promotes sustainability and responds to climatic demands.*
7. *Has a memorable character.*

- American Planning Association

WATER ACCESS ENHANCES NEIGHBORHOODS

Water features are some of the most notable assets within the Monroe Community. The River Raisin, Lake Erie, the Port of Monroe, and the inlets and harbors that dot the Lake Erie coastline contribute to the community’s coastal and freshwater identity. There are many ways local jurisdictions can work together to provide access to and market these water resources. One thing the three local jurisdictions should continue to do is participate in the current water trail planning effort headed by Monroe County. In June 2013, the Monroe County Planning Department (in cooperation with several project partners) received a grant to develop a water trail plan for Monroe County. The plan will focus on the Lake Erie coastline and the River Raisin. The water trail plan will provide a framework for the future development, enhancement and management of water trails and water access sites within the county.



In support of the ongoing water trail planning effort, the City of Monroe should consider providing access to the Raisin River at Mill Race Park. Currently, Mill Race Park sits as an undeveloped and underutilized public space, just off busy Telegraph Road. Through the recent *charrette* process, preliminary concepts were brought forward calling for plans to establish an ADA accessible kayak launch, picnic pavilion, a boardwalk system and viewing platforms. The city should work to develop a more detailed site plan for the park and incorporate it into their Parks and Recreation Master Plan. The city should also pursue matching dollars toward a Michigan Trust Funds Grant to develop the park.

Design Matters

Retail shops, offices, government buildings, schools, libraries, restaurants, apartments and even gas stations are significant contributors to the character and scale of a community, greatly influencing the quality of nearby neighborhoods. Individually, each structure has its own unique use and style. However, when viewed together within the context of the community and the surrounding landscape, these buildings help to define the shape of a community, including the circulation of traffic and people. The size and architectural features of buildings and the manner in which buildings are arranged and placed help to create sense-of-place and can significantly affect the social, physical and mental well-being of a community’s citizens. In the Monroe Community for example, many of the buildings have special historic character that help residents and visitors connect to a common heritage.

The built environment also plays an important role in how communities adapt to climate variability. According to the U.S. Environmental Protection Agency (EPA), increasing energy efficiency of U.S. buildings by 10 percent would reduce the discharge of greenhouse gases by an amount equal to the emissions of 30 million vehicles, improving air quality and saving money. In addition to reducing greenhouse gases, energy-efficient buildings help mitigate the effects of heat events, particularly for vulnerable populations such as small children, senior citizens and households without air conditioning. Green roofs and/or reflective roofs can also help reduce the heat island effect, especially in dense urban settings where there is an abundance of large impermeable surfaces and little tree canopy.

Participants at public meetings and CAT meetings, as well as city and township staff members, have raised a number of concerns about maintaining community character, improving the appearance and aesthetic qualities of buildings and streets, and reducing impacts on environmental quality. Respondents to the *Monroe Community Planning Survey* also prioritized the maintenance of high-quality neighborhoods, enhancing the “curb appeal” of the community, and improving transportation safety while endorsing more walkable and bikeable connections. Based on the information gathered through the survey as well as public meetings and working group discussions, we offer the following community planning recommendations for buildings and neighborhoods.

- † Amend township and city master plans as necessary to emphasize the integration of pedestrian and bicycle connectivity in new developments and redevelopments.
- † Establish design guidelines for new developments, possibly through a form-based zoning code approach.
- † Review and revise parking lot design standards to address key climate change concerns such as better stormwater management and reduced heat retention (e.g., stormwater storage, porous pavements, additional vegetation).
- † Establish a community-wide tree planting program to add neighborhood appeal, increase the community’s aesthetic appeal, and reduce impacts of extreme heat events (saving energy costs).
- † Review and modify existing regulations to permit and encourage “out of the box” approaches to new developments such as accessory dwellings and mixed-use development.
- † Consider how new buildings interact with the public realm during the site plan review process.
- † Review and revise building codes to increase the use of energy-efficient design and building materials.
- † Create programs or offer incentives to retrofit existing buildings with energy-efficient applications.
- † Further explore the use of alternative and renewable energy sources to heat and power buildings.

COMMUNITY ENERGY EFFICIENCY

The energy to operate the buildings in which we work, shop and go to school costs the U.S. about \$200 billion annually. It also accounts for about half of our greenhouse gas emissions. On average, buildings waste about 30 percent of the energy they consume.

- U.S. Environmental Protection Agency (EPA)

ECONOMIC DEVELOPMENT THROUGH COOPERATION

There are many different economic development tools that the three jurisdictions could utilize to improve the overall character and economic environment of Telegraph Road. For example, the City of Monroe and Frenchtown Charter Township could establish a unique overlay zone to allow for an innovative redevelopment of the La-Z-Boy site. Monroe Charter Township could construct a bike path to provide better pedestrian access to businesses along the corridor. Although the three jurisdictions could each establish their own set of design guidelines for new development along the corridor and still make significant improvements to Telegraph Road, a cooperative and collaborative approach to corridor planning would be more effective and efficient. As such, the three jurisdictions should consider creating a joint **Corridor Improvement Authority** for Telegraph Road.

A Corridor Improvement Authority functions in a way similar to that of a Downtown Development Authority (DDA). It would allow for the three jurisdictions to jointly oversee a more concerted effort to plan for, fund and implement mutually beneficial public infrastructure projects and the redevelopment and revitalization of underperforming commercial properties. The joint Corridor Improvement Authority would be overseen by a board made up of residents, business owners and public officials from each of the three jurisdictions.



GROWING MONROE: BUSINESS & ECONOMY

Uncertain forces such as climate change and the global economy can feel uncontrollable at the local level. Resilience thinking helps people and organizations take back some of that control by consciously planning and preparing for change. Building a stronger local economy can enhance a community’s independence, limit surprise costs, and help the community respond positively and dynamically to shifting circumstances.

The Monroe Community has suffered in the recent national and global economic upheavals, including large losses of manufacturing jobs and significant levels of under-employment. Changes such as more extreme temperatures and more intense rainfall events could lead to all kinds of new economic costs and disruptions. Ensuring the vitality of the local economy and businesses under changing conditions is critical to the long-term resilience of the Monroe Community.

LOCAL DOLLARS MAKE LOCAL SENSE

A community that is able to maintain local cash flow and provide jobs for its residents is likely to have a more stable economy. An unstable economy can lead to increases in unemployment, increases in illicit activities, and an increase in delinquency among youth.

While recruiting new businesses from outside the community is important, recent research has shown that expansion of existing small- to medium-size businesses generates the largest number of jobs. Locally-owned and operated businesses tend to spend more of their money locally, are less likely to move, and are more accountable to the greater community. Further, when people spend money at a locally-owned business, more of the money circulates within the community. A study in Chicago showed that for every dollar spent at a locally-owned store, 68 cents stay within the local economy as opposed to only 43 cents of every dollar spent at a non-local business.

The CAT teams identified a number of concerns related to economic resilience in the Monroe Community. The concerns most frequently cited were an aging population, the impacts of a flagging economy on public infrastructure and local businesses, and a lack of education and training opportunities. For example, many farmers and local business owners are older and soon to be retiring. How can those farms and businesses be maintained? Older adults are also more vulnerable to severe heat events. Further, an aging population is likely to result in a higher demand on social services like community cooling centers.

The economic recession has hurt southeastern Michigan more severely than other places in the country, and that is evident in Monroe. As the tax base and public funding streams are declining, CAT members cited aging and deteriorating infrastructure as a serious concern for the region. Many roads and highways are in need of repair, some buildings and homes are blighted, and the port is in need of dredging and repair. CAT members noted that much of the private sector is homogeneous and lacks the diversity to attract young, creative and talented people. Parts of the economy are industry specific and may not fare well in the age of technology. It was noted that air quality suffers because of industrial processes in the community.

Education and training opportunities were another weakness cited by some CAT participants. Several noted that Monroe does not rank high in educational achievement. Factors like the high cost of education, lower literacy

rates within the community, lack of investment in education, and skill gaps between available jobs and the necessary education to perform them were listed as detriments to the community.

Plugging the Leaks, Filling the Gaps

With these concerns in mind, the *Business and Economy* CAT coalesced around a vision of “an economically prosperous, highly-educated business environment that attracts and maintains a diverse multi-generational community and leverages our historical, natural, and cultural resources.” Getting there will require cooperation and creativity across a range of sectors and expertise.

For example, our retail leakage analysis identified several opportunities to plug retail gaps in the Monroe Community, ranging from lawn and garden equipment to shoe stores to specialty food and beverage establishments (see *Chapter 6*). Many of these same needs were mirrored in results from the *Monroe Community Planning and Development Survey*, where the highest-ranked desires for new commercial development included Major Destination Restaurants, Retail Clothing & Shoe Stores, and Visitor & Tourist Attractions. Plugging leaks like these, particularly with locally owned businesses, would improve local cash flow, create jobs, and capture more benefit from tourism assets such as the International Wildlife Refuge, Sterling State Park, and the River Raisin National Battlefield.

As identified earlier, generational transitions for local farms and businesses remain a gap of concern, as does the training and support needed to ensure that the next generation is equipped to assume these mantles in an era where the past is no longer a good predictor of the future. The following recommendations to community planners are entirely appropriate to help *plug the leaks and fill the gaps*.

- ▮ **Expand local commercial and retail businesses, particularly where retail leakages have been identified.**
- ▮ **Increase the number and diversity of business startups.**
- ▮ **Raise the level of the community’s average educational attainment.**
- ▮ **Attract and retain younger professionals and entrepreneurs.**
- ▮ **Create a comprehensive, coordinated multi-jurisdictional tourism corridor.**
- ▮ **Redevelop the Telegraph Road La-Z-Boy site into a mixed-use lifestyle center as recommended in the *Telegraph Corridor Charrette Final Report*.**

Energy Town

The Monroe Community is uniquely home to two large, regional-scale electricity generation facilities. The jobs and other significant economic benefits provided by Fermi 2 and the Monroe Power Plant were balanced by the CAT teams against environmental concerns, disaster concerns, and even nuisances such as frequent traffic flow disruptions and noise problems from freight train traffic.

However, perhaps in no small part due to its long and intimate familiarity with power generation, the Monroe Community is also proving to be a unique leader in alternative energy and energy efficiency efforts. Prominent examples include several innovative solar installations (see *Chapter 6*) as well as the entire IHM campus, which is viewed as “a living laboratory for sustainable communities.” Local jurisdictions have also recently completed several cost-cutting energy efficiency upgrades to public infrastructure.

With technical expertise and cooperative public/private relationships already at hand, the Monroe Community has an opportunity to take a prominent regional lead on energy innovation. The impact of such an effort would benefit the entire community in terms of energy cost savings, pollution and greenhouse gas reductions, and improved resilience. Renewable energy and energy conservation can play a role in every one of the recommendations listed above, in addition to the following areas of focus.

- † **Maintain and enhance existing legacy manufacturers, particularly by improving energy efficiency to reduce costs and increase profit margins.**
- † **Increase and expand public/private partnerships and incentive programs such as DTE’s SolarCurrents program.**
- † **Market and promote alternative energy and energy efficiency opportunities to residents and businesses to increase awareness and participation.**
- † **Market and promote alternative energy and energy efficiency successes to attract outside businesses and enhance the community’s image as an energy leader.**

PROTECTING MONROE: HUMAN & SOCIAL SYSTEMS

Where people care about their neighborhoods and work cooperatively together to improve their community, experts say there is good *social cohesion*. By working together and socializing, people build meaningful connections and supportive relationships that can be the basis for sharing tools and resources or even new business partnerships. That stored-up *social capital* can make communities more resilient after natural or economic disasters and give everyone greater opportunities for success.

The Monroe Community has a rich history of volunteerism, civic engagement, and cooperation between organizations. For example, the *Building Healthy Communities Coalition* brings representatives from a number of organizations together to work cooperatively on addressing health challenges. Groups like the United Way of Monroe County and Habitat for Humanity of Monroe County engage volunteers on a regular basis to deliver services and support to people in need. At the same time, signature celebrations like the River Raisin Jazz Festival and the Monroe County Fair provide lots of opportunities for social interaction between diverse members of the community. All of these personal interactions build connections between people and place, adding to the community’s capacity to manage economic hardships and climate challenges.

By building social cohesion and adding to existing stores of social capital, the Monroe Community can dramatically increase its economic and climate resilience. Strong social cohesion is particularly important in the event of community emergencies such as flooding events and extreme heat waves.

While social cohesion and social capital are important to the community’s resilience, basic human needs must also be met on a day-to-day basis. People must have access to food, water and shelter. Social service agencies and the Monroe County Health Department have suggested that more work is needed to provide for proper public safety and health. For example, publicly available cooling centers appear to be lacking across the Monroe Community, adding to human health risks during extreme heat events. Additionally, private drinking water supply wells in rural and semi-rural parts of the community may be subject to contamination from surface pollutants, particularly during major rain events.

The following sections provide a summary of concerns and considerations raised by citizens, planning professionals and stakeholders who are participating in the Resilient Monroe community planning process. These observations are followed by a number of suggested community planning goals and objectives for consideration by public officials.

Embracing Community Seniors

According to the Southeast Michigan Council of Governments, the Monroe Community’s population is expected to grow by a few thousand people over the next 25 years. However, the total number of children and young people in the community is predicted to decrease, while the number of senior citizens is expected to increase substantially. In general, people over the age of 65 are more vulnerable to extreme weather events such as heat waves and flooding. If they live alone, these older adults are even more vulnerable. Based on recent Census data, there are nearly 2,300 people over the age of 65 living alone in the Monroe Community. Based on population projections, that number is expected to increase over the coming years.

Changing characteristics of Monroe’s population present a number of challenges and opportunities. Social services, recreational facilities, educational offerings and a host of other community-based programs may need updating and revision. However, meeting these challenges head-on will build both economic and climate resilience. Based on all the information presented in the public discussions, we offer the following recommendations for *embracing community seniors*.

- † **Create a comprehensive and centralized inventory of older adults in the community who live alone (special focus on medication dependent, mobility dependent, diabetic, and persons who rely on oxygen tanks).**
- † **Expand the Lake Erie Transit (LET) bus buddy program to increase the number of seniors who feel confident navigating the fixed-route transit system.**
- † **Expand housing options for seniors in walkable neighborhoods near a variety of amenities.**
- † **Provide adequate street and sidewalk lighting as well as streetside curb improvements to make movement easier for persons with disabilities.**

Emergency Preparedness: Expect the Unexpected

Community members should be aware of relief locations and protocols for extreme heat events, floods, tornadoes, fires, and severe storms. In the event of an emergency, service centers and institutions are especially important because this is where residents will go in the event that they cannot return home. A resilient community has designated community service centers that are accessible, evenly distributed across the population, open 24 hours, and are familiar to the residents. Based on all the information presented during public discussions, we offer the following recommendations for *emergency preparedness*.

- † **Designate Cooling Centers throughout the community and ensure that all residents can access a Cooling Center within a 20-minute walk or bus ride during extreme heat events.**
- † **Ensure that Cooling Center locations are well-publicized and open 24 hours a day during emergencies.**
- † **Update building codes to require that new construction and redevelopment projects that open to the public include a backup power source, such as a generator.**
- † **Create and distribute maps of designated Cooling Centers and locations with generators.**
- † **Support Neighborhood Watch programs to provide improved safety, security, and community trust.**
- † **Encourage and assist in creating disaster preparedness and recovery plans for local businesses.**
- † **Using the 2013 Natural Hazard Analysis, local governments should work together to develop a county-wide Natural Hazard Mitigation Plan (NHMP).**
- † **Continue to advertise MCANS (Monroe County Alert Notification System), aiming to achieve 100% community participation by 2015.**
- † **Launch a public awareness campaign regarding the importance of emergency readiness kits at home and in personal vehicles.**
- † **Amend local plans and land-use controls to incorporate improved floodplain management practices such as restricting residential structures and eliminating concrete slab construction (these cannot be raised if located in a floodplain).**
- † **Incorporate a requirement that large developments provide an Emergency Facilities Plan as part of the site plan review process.**

Protecting Public Health

Land-use planning, community development and public health are all closely linked and interactive. Local governments and community planners need to consider the public health impacts of their land-use planning and regulatory decisions. In fact, the Monroe County Health Department has raised a number of concerns over potential health impacts associated with land development patterns in the Monroe Community. For example, where new residential developments concentrate a large number of on-site wastewater disposal systems, groundwater quality can be adversely impacted by contaminants. State and national health agencies have pointed

out that roadway expansions and large new parking areas can increase and exacerbate the problems associated with extreme heat events.

On the other hand, the Monroe County Health Department and the Michigan Department of Community Health have suggested that planners can help improve public health by supporting the construction of non-motorized pathways, sidewalks and bicycle lanes. These infrastructure investments can help increase overall physical activity in a community. Based on all the information presented in the public discussions, we offer the following recommendations for *protecting public health*.

- † **Offer curbside recycling as a complementary service with garbage pickup (both services paired as one) to all Monroe Community residents.**
- † **Limit commercial and high-density residential construction in the absence of sanitary sewer infrastructure.**
- † **Provide for sidewalks, lighting, resting benches and similar infrastructure as part of new developments to support walking and bicycling (e.g., within the site plan review process).**
- † **Consider new requirements for alternative water supplies and stricter rules on private drinking water wells in areas that do not have access to public water supply (particularly in areas where groundwater is highly vulnerable to surface contamination).**
- † **Review and reconsider rules related to open burning in both townships.**

Build Social Capital through Communication and Collaboration

Shared interests can generate shared benefits. Civic engagement and a culture of volunteerism are important building blocks of a resilient community. Based on all the information presented in the public discussions, we offer the following recommendations for *building social capital through communication and collaboration*.

- † **Expand the MCANS (Monroe County Alert Notification System) emergency communication system to reach all citizens in need during non-emergency times.**
- † **Establish ways to communicate with people who do not have access to phone or email.**
- † **Engage a diversity of faith-based organizations in regularly scheduled meetings to characterize needed human services, opportunities for resource sharing, and opportunities for collaborative community function.**
- † **Create an area-wide arts and culture calendar.**
- † **Schedule “town hall” meetings for public discussions on new initiatives, issues and concerns involving community leaders and people from throughout the community.**
- † **Promote, support and expand successful community-sponsored cultural events such as the very popular regional event, the *River Raisin Jazz Fest*.**

PRESERVING MONROE: ENVIRONMENT & NATURAL SYSTEMS

Take a spring walk along the *River Raisin Heritage Trail* and you're likely to hear warblers singing. On a summer hike through the *Erie Marsh Preserve* you are likely see the American lotus or the swamp rose-mallow, both threatened flowers. The Monroe Community is home to a number of critical natural habitats.

Natural resources play an integral role in a community. Trees, wetlands, rivers, and lakes offer ecosystem services vital to the health and well-being of residents. High-quality natural areas add value to the community by attracting visitors and supporting a high quality of life. As climate change increases the prevalence of severe heat, heavy rain events and invasive species, existing habitats will be increasingly stressed.

Water is the Lifeblood of Monroe

Results from the *Monroe Community Planning and Development Survey* indicate that *clean water* tops of the list of environmental priorities. There was virtually unanimous support for protecting the Great Lakes water supply. The majority of respondents feel that access to Lake Erie and the River Raisin is important. Survey respondents also specified a desire to protect the Great Lakes from invasive species. Based on all the information collected in public meetings, CAT discussions, and results from the Community Planning Survey, we offer the following recommendations for *water quality protection*.

- † **Develop and install a monitoring system along the River Raisin.**
- † **Build regional collaboration for managing water resources, including appropriate land-use regulations.**
- † **Launch a public education campaign on the transitioning of the River Raisin from *Area of Concern* to *Living/Working Watershed*.**
- † **Increase control over the amount of nutrients, particularly phosphorous, that enters the River Raisin and Lake Erie.**
- † **Coordinate better communication between dam operators along the River Raisin.**



TREE NURSERY

An urban tree canopy cover of 35-40% helps reduce the urban heat island effect, improves visual elements of the streetscape in neighborhoods and commercial districts, and reduces stormwater runoff during heavy rain events. However, much of the Monroe Community has low levels of tree canopy, and many of its trees are at risk from disease and climate change. The local jurisdictions should consider ways of working together to encourage private tree planting and increase tree cover in public spaces, including rights of way.

One approach that should be considered is the development of a community-owned tree nursery. The city and/or townships could dedicate existing publicly-owned and underutilized land to a community tree nursery as one strategy to increase the diversity of tree species and total canopy. This approach is working today in Ypsilanti, Michigan. In partnership with ReLeaf Michigan (a nonprofit group), the City of Ypsilanti has created a successful tree nursery on city property. With the help of volunteers, this nursery grows trees inexpensively for transplant to parks and streets of the city, contributing to the urban tree canopy and combating the urban heat island effect.



Increase Vegetation, Increase Preservation

Wetlands, trees, and other vegetation provide important ecosystem services in communities. Wetlands remove sediments and pollutants from runoff and reduce the impacts of flooding by retaining stormwater. Great Lakes coastal wetlands, like those on Monroe's Lake Erie shoreline, are threatened by increases in heat stress, enhanced evaporation and a declining water table. Trees and other vegetation help reduce the urban heat island effect through evaporation and transpiration of water and by providing shade. Based on all the information collected in public meetings, CAT discussions, and results from the Community Planning Survey, we offer the following recommendations for *increasing vegetation*.

- **Promote the restoration of wetlands in vacant industrial areas and open areas that are not currently farmed. Focus on areas with *high wetland potential*.**
- **Implement a tree-planting program that aims to establish a 35-40% canopy cover in the Monroe Community.**



- **Research projected shifts in tree population and aggressively transition street tree-planting program to trees that will thrive in hotter summers and wetter winters.**
- **Increase the diversity of tree species planted in the city and townships.**
- **Focus new vegetation and tree canopy efforts on areas identified as *high relative exposure*.**

Tame the Stormwater

It appears most Monroe Community members support local controls for environmental protection. The vast majority of survey respondents support local government action to reduce runoff from streets and parking lots. Most respondents also support the requirement of on-site water storage and minimum shoreline vegetation standards. At the individual household level, survey respondents expressed an interest in learning about rain gardens and gray-water catchment techniques. Based on all the information collected in public meetings, CAT discussions, and results from the Community Planning Survey, we offer the following recommendations for *stormwater management*.



- Adopt rigorous runoff pollution controls and best practices for all types of drainage.
- Enforce regular upkeep of private septic tanks.
- Offer information on best practices for stormwater management to homeowners, farmers, and businesses.
- Create a digital map and database of all drains and streams in the Monroe Community.
- Consider Rain Gardens in association with traditional drains to reduce runoff of sediments and pollutants.
- Raise elevations of key infrastructure during the site plan review and/or redevelopment processes (consistent with FEMA recommendations).
- Provide incentives to property owners who retain stormwater on-site (e.g., rain gardens, bioswales).
- Update zoning and construction codes to eliminate new construction of reverse slope driveways.
- Exempt most native vegetation and rain gardens from weed and grass mowing ordinances.
- Provide incentives to limit parking lot sizes and encourage the use of pervious surfaces during development and redevelopment.
- Eliminate the construction of new housing and commercial developments in the 100-year floodplain.

Green Brings in More Green

Placemaking and economic development are closely linked with natural resource protection. Most survey respondents see a definitive link between environmental quality and economic vitality in the Monroe Community. Based on all the information collected in public meetings, CAT discussions, and results from the Community Planning Survey, we offer the following recommendations for *leveraging natural assets for economic development*.

- Expand and market *Nature Recreation* and *Agricultural Tourism* opportunities in the Monroe Community (e.g., continue to participate in the development of a water trail plan for Monroe County).
- Develop a living/working watershed for the River Raisin that capitalizes on community assets.
- Work to educate high school and college students about environmental-related career opportunities in the Monroe Community.

LOW IMPACT DEVELOPMENT

There are a variety of actions that control runoff pollution and improve drainage. In association with traditional drains, rain gardens can be effective in reducing runoff of sediments and pollutants. In 2008, the Southeast Michigan Council of Governments (SEMCOG) published a *Low Impact Development Manual* for conditions specific to Michigan, with over 500 pages of technical and policy guidance on stormwater management. One featured example is in Ingham County, Michigan. Residents in the Towar Neighborhood petitioned the Drain Commissioner to create a drainage district because the community had experienced severe flooding every time it rained for almost 80 years. In 2006, the neighborhood and the county formed a partnership and installed 150 individual rain gardens. All the work was performed under the Michigan Drain Code, with more than 100 easements gathered to install over 5.5 acres of rain gardens along streets and in rear yards. To this day, the neighborhood reports better overall performance from the rain gardens as compared to traditional drains.



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