
Source: Times Herald, 2014


Source: Katie Stepp, BWCVB

St. Clair County
Master Plan

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November 15, 2023: St. Clair County Metropolitan Planning Commission
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Photo Credit: Katie Stepp, Blue Water Convention and Visitors Bureau

Yale Bologna Festival. Photo Credit: Katie Stepp, Blue Water Convention and Visitors Bureau

Introduction

The St. Clair County Master Plan 2022 is the next evolution of the County's comprehensive and stakeholder-driven effort to plan for St. Clair County's future with a common vision and key recommendations and actions to achieve that vision.

The planning process began in 2019 - just before the COVID-19 pandemic began in the beginning of 2020. Over the next three years, residents, County leaders, local officials, and other stakeholders have shared their thoughts on how St. Clair County should grow and function over the next ten to twenty years. Public input, combined with analyses of current, historic, and future conditions in St. Clair County, forms the vision for the community's future and the rationale behind the recommendations and strategic actions outline in this plan.

Our Identity

A community's identify is often defined through the common interests and shared experiences of its users. Our identify is also created through the integration of the community's natural resources, geographic characteristics, architecture, history, and economic activity. Community identify is often informed by who we are today, how we got here, and the community context. Additionally, our identity is often defined by unique characteristics in comparison to other communities, which can become a competitive advantage to draw in residents, visitors, and businesses.

How we Got Here

The first inhabitants of the area in and around what is now St. Clair County were Native Americans. Peoples of many nations held ceremonies and buried their dead along the banks of the great Huron waters and the river into which it flows. They hunted game from expansive woodlands, fished from rivers and streams, and honored the land and water from which their sustenance came.

The area's recorded history began in 1679 when an expedition led by French explorers Robert Cavelier de La Salle and Pére Louis Hennepin navigated what later became known as the St. Clair River. As a result of their exploits, the French claimed ownership of vast lands surrounding the Great Lakes and soon established missions and trading posts in the region.

A historical glimpse at Port Huron

In 1686, the French explorer Sieur Daniel Greysolon Duluth built forts, including the oldest in Michigan – Fort St. Joseph – at the mouth of Lake Huron, near the present site of Port Huron.

In 1764, after the British took dominion of the region, Patrick Sinclair built a fort, a mill, houses, and barns on 24,000 acres of land where the Pine River flows into the St. Clair River. Only a few settlers came to the area until twenty years later, after the treaty that ended the Revolutionary War was signed by the United States of America and Great Britain.

In 1820, Lewis Cass, governor of the Northwest Territory, declared the area to be St. Clair County, named after the county's first and largest village. The county's first census reported 79 residents. The first county jail (1821), first post office (1826), first county courthouse (1827), first newspaper (1834), first brick yard, first river ferry, and first salt mine were all in the
village of St. Clair.

In the late 1820's, Ward's Point or Newport (later Marine City) became the second village established in the county. Algonac became the third village, organized in 1836. Prior to 1850, these three downriver settlements were the fastest growing communities in the county.

The first settlers in the area of old Fort St. Joseph came about 1790 and named the settlement Desmond.

In 1814, this became the site of Fort Gratiot, which garrisoned troops. By 1830, the community had only 377 people. In 1837, the same year that Michigan became a state, the community changed its name to Port Huron. By 1840, the community grew to 1,113 people. It was organized as a village in 1849, and L. M. Mason was its first village president.

Port Huron became a city in 1857. By 1870, it was the largest community in the county. Its industries included seven sawmills, four shipyards, three breweries, two dry docks, and a soap factory. Port Huron became the County seat in 1871, after a legal battle with the city of St. Clair. The city-county building was erected in 1873.

Between 1850 and 1900, over 70 small communities in St. Clair County, most of them inland, became officially recognized settlements. Many had a post office and a school, and all sported some kind of commercial trade and at least one church. Many people around these settlements worked a family farm.

This trend toward settlement living was in keeping with Michigan's and the Midwest's economy, which was heavily based on agriculture and extraction of natural resources, such as lumber and minerals. Laborers not directly involved with harvesting crops, cutting trees, or mining were employed in related transport or processing industries. Proximity to a railroad was a dominant factor in determining quality of life and economic development.

In contrast, since the start of the twentieth century, most of St. Clair County's growth has occurred in five waterfront communities and four rural cities and villages. Many rural communities away from the waterfront were abandoned. St. Clair County hamlets and villages such as Tara's Halls, Brockway, Fargo, Blaine, Abbotsford, and Lamb became either much smaller entities or disappeared completely.

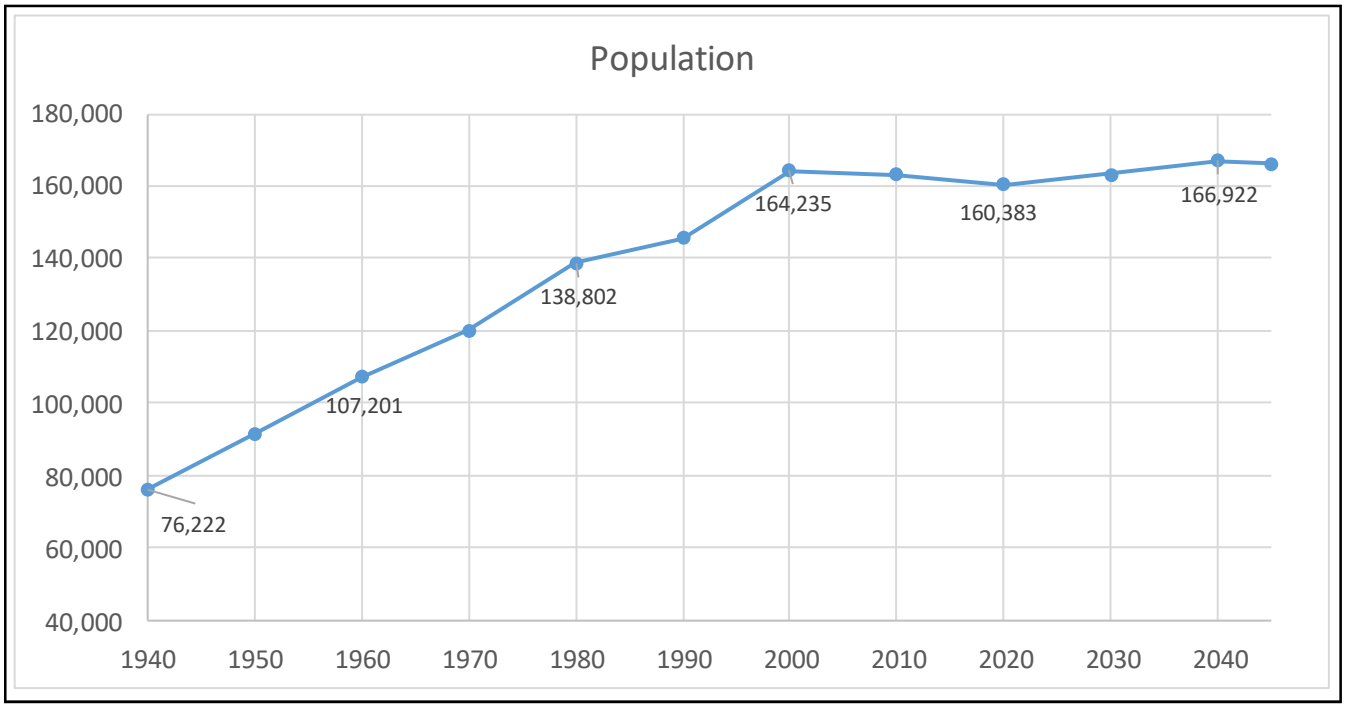
This growth away from agricultural areas was spurred by dwindling lumber and mineral resources in the late 1800s, and the advancement of manufacturing technologies and facilities within city centers that offered a glut of high-paying jobs. Even though many families continued to farm their fields, St. Clair County's economy throughout the first half of the 1900s shifted from being resource-based to manufacturing-based.

After World War II, the population shift changed direction as people began to move from declining central cities to more attractive suburbs. In St. Clair County, development spread a few miles inland and had a large impact on how land was used, where and how people lived, and provision of public services. People measured quality of life on availability of schools, streets, waste removal systems, safe drinking water, hospitals, and police and fire protection.

Today, manufacturing processes are less centralized. Computer technologies and transportation/automotive improvements have facilitated mobility so people can live farther away from their jobs. More and more people now have the option to work remotely from home and are choosing to live in areas that offer a high quality of life, recreational opportunities, and access to services. They no longer have to worry about commuting to a job or living near their place of employment. This transition was accelerated by the COVID-19 pandemic.

St. Clair County Today

Today, St. Clair County is facing new challenges and changing circumstances that require us to rethink our approaches to managing growth and change. The County has an abundance of assets, including significant natural resources and public waterfront access, our proximity to Canada and major automotive firms, and a



Source: U.S. Census Bureau; SEMCOG Community Profiles, 2022.

WHAT IS A MASTER PLAN?

WHAT DOES THE PLAN MEAN FOR ST. CLAIR COUNTY?

A master plan is a long-range guide for the development of a community. Every jurisdiction must adopt some form of master or "comprehensive" plan as a legal predicate for the exercise of the government's land use and zoning powers, but the St. Clair County Master Plan also serves a broader purpose in guiding how our community should manage change and address economic, social, and environmental opportunities and challenges.

The vision, goals, and objectives offered in this master plan are the combined result of input from citizens and government officials – elected and appointed – from throughout St. Clair County. The historical information, statistics, and current trends presented in the master plan are the result of observation, research, and analysis performed by the St. Clair County Metropolitan Planning Commission (MPC), which is also responsible for the overall compilation and content of the plan.

The St. Clair County Master Plan establishes planning goals that, if strived for, will help shape and direct the future of St. Clair County for the next 30 years. The plan does not advocate for growth or no growth. Rather, the plan advocates managed growth and change in order to preserve the rural character, unique features, and natural, cultural, and historic resources that make St. Clair County an attractive place to live, work, and play.

The content of the plan is based on:

- The Metropolitan Planning Commission's analysis of planning activities and development trends within St. Clair County;
- Input and direction from citizens, community groups, and government officials in St. Clair County;
- Targeted input from the St. Clair County Board of Commissioners;
- Information from planners and government officials within the Southeast Michigan region, through active participation in the Southeast Michigan Council of Governments (SEMCOG);
- Information found in planning documents created by other counties and communities within Michigan; and
- State and federal planning guidelines and laws.

The MPC will review and update the master plan every five years, as required by Public Act 33 of 2008 (the Michigan Planning Enabling Act). The plan will be updated as necessary, based on new information, statistics, land use patterns, growth requirements, and emerging trends. The last master plan was adopted by the MPC and endorsed by the St. Clair County Board of Commissioners in November 2016.

The purpose of a 30-year plan is not to predict and respond to a single future, but to become more resilient in the face of multiple, unpredictable futures. The master plan serves as a guide for decision making, as well as a tool for education and communication.

The plan can never be a rigid or static document. Residents and community leaders alike must be nimble and adaptable to deal with disruptions that are happening in real time and certain to evolve in the coming years.

The St. Clair County Master Plan focuses on the values of the community and the strategic actions that the County, its partner local units of government, and other community-focused stakeholders can implement to make smarter, more effective decisions when it comes to land use planning, economic development, and the delivery of public services.

Metropolitan Planning Commission: Mission

The mission of the St. Clair County Metropolitan Planning Commission is to provide innovative and proactive planning services to county residents through the application of professional skills, adopted plans, and standards that foster economic prosperity, enhance the quality of life, and preserve the natural environment for current and future generations.

culture of working together, but we also have a short supply of large tracts of land to attract businesses, our population growth has been stagnant for two decades, and we must do more to manage the effects of climate change and become a more resilient community.

The demographic makeup of St. Clair County is changing. Our residents are aging and are less likely to live in traditional family arrangements. We compete with the Detroit Metropolitan area and neighboring jurisdictions for talent, jobs, and economic development. Amidst this backdrop, our lives and the places in which we live have been forever changed by rapid advancements in technology. On top of that, the COVID-19 pandemic that emerged in early 2020 is profoundly impacting planning in terms of how we travel, how we work, how we learn, and how we interact with our fellow residents and our built environment.

The combination of rapid social, environmental, technological, demographic, and economic shifts at the national and global levels along with changes in our community require us to take a clear-eyed look at our strengths and weaknesses and to challenge the assumptions that have guided us to this point.

Master Plan Background

Master Plan Focus Elements

The master plan outlines strategic actions to accommodate growth and manage change with the primary focus of improving the quality of life for the people who live here, while at the same time making St. Clair County more attractive to new residents and businesses.

St. Clair County will become more diverse, more suburban, and more interconnected in the future. As such, the master plan sets the stage for why and how we need to take steps to become more prosperous, equitable, and resilient as we use growth and redevelopment to create places that are more economically competitive, foster a stronger sense of trust and inclusiveness among people from different backgrounds, and improve environmental quality and public health in the process.

The concepts and recommendations in this plan are organized to center on six overarching and wholly interrelated focal elements, which serve as the remaining chapters of this plan:

- The Economy
- The Environment
- Coastal Resiliency
- Transportation and Mobility
- Public Facilities and Services
- Land Use and Change Management

What Does the Metropolitan Planning Commission Do?

In order to carry out its mission, the MPC serves local units of government and the public in the following ways:

We *PLAN*

In order to proactively plan for the future of the county and its various communities, the MPC firmly believes in the power of visioning processes to get stakeholder input on all projects. It is imperative that county planning is based on best practices and new innovations that cultivate strong assessments, accurate analysis, and reasonable forecasting into the future.

We *FACILITATE*

The Metropolitan Planning Commission strives to bring groups together to seek mutual public benefit. Toward that end, county planners must be champions of collaboration and must work to cultivate relationships between local communities, nonprofit organizations, the private sector, ad hoc interest groups, and residents. The importance of collaboration now and into the future cannot be overstated. Our community's success hinges on how well all of its stakeholders work together to accomplish great things. The MPC will work to promote the coordination of government services, identify opportunities for cooperation, and help partners explore new relationships. As this happens, the overall capacity for managing change in St. Clair County will continue to increase.

We *EDUCATE*

The MPC strives to provide local elected and appointed officials with a myriad of resources to bolster effective decision making and support smart planning. As such, county planners will continue to offer training programs for local planning commissioners and zoning boards of appeals members, as well as other stakeholder groups as appropriate. The MPC works to keep its community partners informed, so that they can be quick to adapt to changing conditions around them. Additionally, we will stay abreast of public policy changes that can impact local governance through the interpretation and explanation of such policies. In short, the MPC works to keep its constituents informed.

When communities or organizations are properly equipped, they become nimble in adapting to change, innovative in their thinking, efficient in their execution, and intelligent in their decision making.

We *IMPLEMENT*

Planning is only effective when real action is taken to implement projects and programs that serve to accomplish the plan's goals and objectives. If a plan sits on a shelf upon completion, it is a failed plan. An overarching goal of the Metropolitan Planning Commission is to make things happen. We strive to be a collection of "doers." That said, planning and the implementation of plans does not occur in a vacuum. We need partners. Sometimes, the MPC will carry out a project or task. Other times, we may simply provide support to another county department, local unit of government or local organization so that they may "get things done." St. Clair County is fortunate to have so many groups working for the common good. In many cases, goals and objectives of varying organizations overlap with one another. These shared visions and goals create opportunities for powerful collaboration to foster positive change in our community.

Guiding Principles

The St. Clair County Master Plan is guided by six principles that are integral to ensuring a sustainable community. Guiding principles reflect the values of community residents and stakeholders expressed through the Master Plan outreach process. They were also informed by analysis of existing conditions, trends and best practices. Listed in random order, they provide clarity for achieving our long-term vision and the community should look to these guiding principles when making planning and land use decisions.

Infusing these principles throughout the master plan ensures an all-community planning approach that addresses environmental, social, and economic well-being. The interrelation and balance of these principles are critical to successful planning. The intent is that these principles will be considered in long-range land use and development decisions, provide guidance in day-to-day operational and longer-term policy decisions, and assist in managing change throughout St. Clair County.

Photos courtesy of Katie Stepp, Blue Water Convention and Visitors Bureau

6 Master Plan Guiding Principles

ECONOMIC PROSPERITY

St. Clair County will continue to nurture and enhance the well-being of the region through the promotion of a resilient economy. Revitalizing the county's economy refers to the overall strategies necessary to promote, increase, and support sustainable economic development. This includes fostering entrepreneurial growth, facilitating industrial development, revitalizing our downtowns, and creating high-skill, high-wage jobs.

SUSTAINABILITY AND RESILIENCY

St. Clair County will protect and preserve natural resources and sensitive environments by creating a cleaner environment, promoting sustainability, and instituting smart growth to preserve farmland by directing growth to areas with existing infrastructure.

QUALITY OF LIFE

Community members have access to safe, stable, and affordable basic needs and can achieve their full potential and optimal health. Quality of life refers to the subjective pleasure and convenience that citizens receive from recreational facilities, public services, cultural opportunities, environmental resources, historic features, good jobs, and affordable housing.

GREAT PLACES

St. Clair County will create great places by capitalizing on unique assets, have safe, stable, and walkable neighborhoods, and have desirable communities that provide residents with quality public services and great schools. Connecting people to healthy food, parks, shops, transportation options and other amenities.

HEALTHY COMMUNITIES

The St. Clair County community will work collaboratively to ensure and sustain an environment of excellence that promotes the health, safety, education, connection, and empowerment that optimizes the health of all residents.

COLLABORATION

St. Clair County leaders will work collaboratively with our local, state, and regional partners to provide outstanding public services, quality infrastructure, and economic opportunities for residents and businesses alike. We will actively engage our neighboring communities to move St. Clair County and Southeast Michigan forward.

Intergovernmental Cooperation and Partnerships

Intergovernmental collaboration is more important to the success of our communities now more than ever. In order for the County and local units of government to accomplish our goals and achieve prosperity, it is imperative that we work together to find innovative solutions to problems. Communities must pool resources together to ensure economies of scale and efficiencies, especially in light of ever-changing budgetary constraints. Public-private partnerships are also increasingly important. Getting buy-in from the private sector on planning and economic development initiatives is an important step in "making things happen." At present, the private and nonprofit sectors' awareness of the importance of placemaking has never been greater.

Additionally, state and federal agencies that offer grant funding opportunities are now recommending – and in many cases, requiring – that applications for funding be regional in scope. Federal stimulus funds emerging during the COVID-19 pandemic kicked off a new wave of resources not previously available to local governments to aid in economic recovery. In 2021, the American Rescue Plan Act (ARPA) kicked off unprecedented federal funding opportunities to cover revenue losses, respond to the ongoing public health crisis, and address large-scale infrastructure issues - including water, sewer, and broadband investments. St. Clair County's ARPA allocation is $30,908,749. These funds are required to be obligated by December 31, 2024 and must be fully expended by the end of 2026. Township, cities, and villages also received ARPA allocations. These funding streams provide additional opportunities for collaboration and partnerships.

Finally, local units of government in St. Clair County will need to continue identifying new partnerships to carry out planning and economic development projects. The Metropolitan Planning Commission can serve in a capacity to bring communities together to explore new collaborative opportunities, joint authorities, and joint planning. In order for land use decision-making to be more proactive, coordinated, and inclusive, local planning commissions will have to collaborate. This updated county master plan acknowledges this need for collaboration and will serve as a catalyst for making it happen.

Regional Context

Located at the base of the thumb area of the lower peninsula of Michigan, St. Clair County is the easternmost of Michigan's 83 counties. It's known as the Blue Water Area because its eastern and southern boundaries are formed by the waters of Lake Huron, the St. Clair River, and Lake St. Clair. The St. Clair River forms a natural boundary separating Michigan from Ontario, Canada. The river flows along the southern part of the City of Port Huron until it reaches the twin Blue Water Bridges under which is the mouth of Lake Huron. It is also one of the heaviest traveled rivers in the world and is part of the world's longest shipping canal, the 2,347 mile St. Lawrence Seaway.

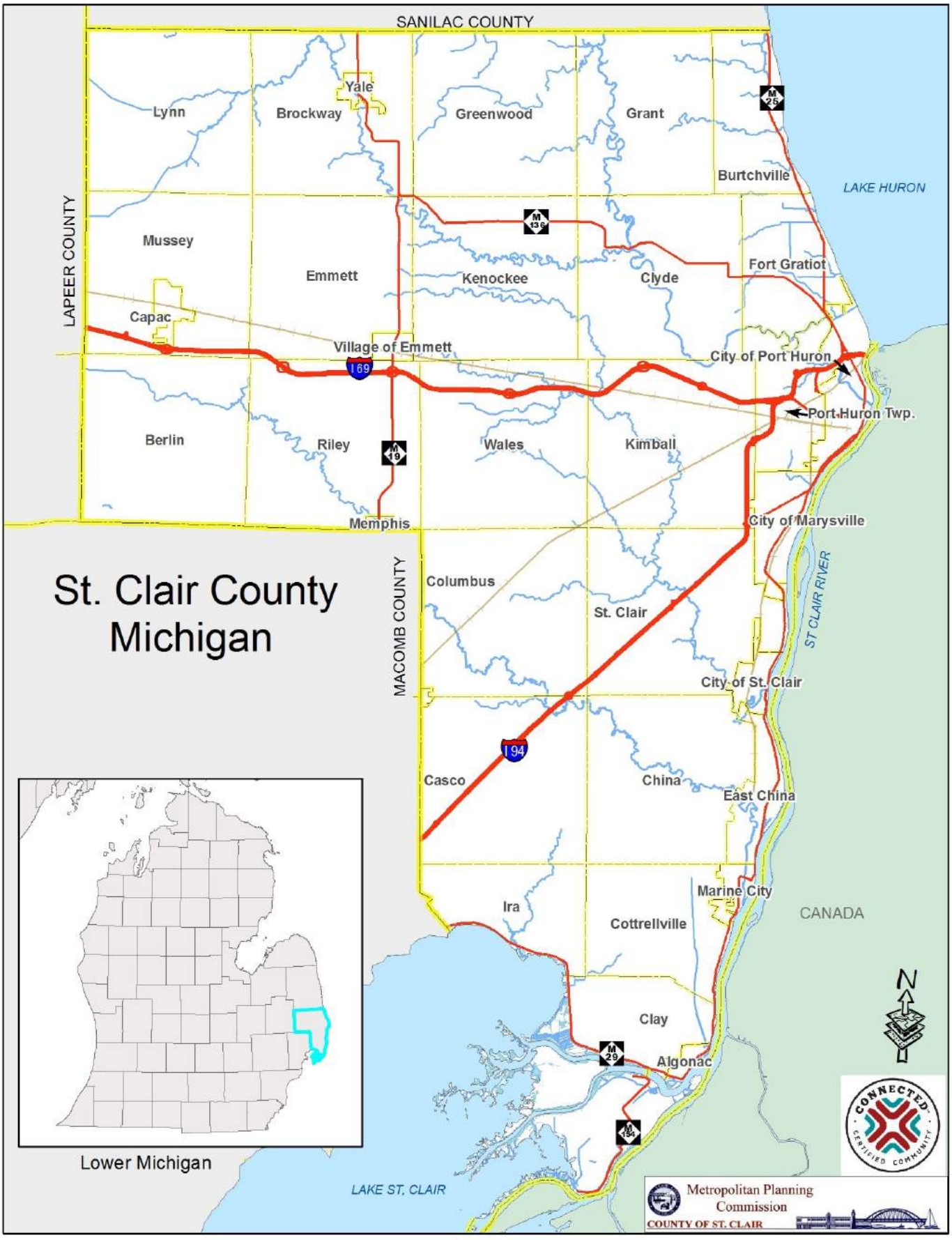
Greatly influenced by Lake Huron, St. Clair County offers a temperate climate which has cold winters, hot summers, and moderate springs and falls. There is 140 miles of shoreline in the county. Within the county are a wide-range of land types and uses, from rural agriculture to urban development to expansive and beautiful coastline; there is even an international border. Wetlands are scattered throughout the County, but are most prevalent along the eastern and southern coastline and along inland rivers. Local governments are comprised of eight cities, including Port Huron which is the county seat, twenty-three townships and two villages: Capac and Emmett. Each municipality maintains its own master plan and zoning ordinance. The various jurisdictions within the county along with many other organizations have proven themselves to be willing to cooperate with one another for the overall benefit of the region.

St. Clair County is a major international trade gateway between the United States and Canada for the movement of people and goods across the St. Clair River via the Blue Water Bridge and the international train tunnel. St. Clair County's stunning waterways as well as its diverse annual events makes it a tourist destination all year long. Residents and visitors alike, are attracted to its vast water resources, its stunning scenic landscapes, beautifully maintained parks, miles of trails, neighborly communities, and its mix of traditional downtowns, and unique rural character.

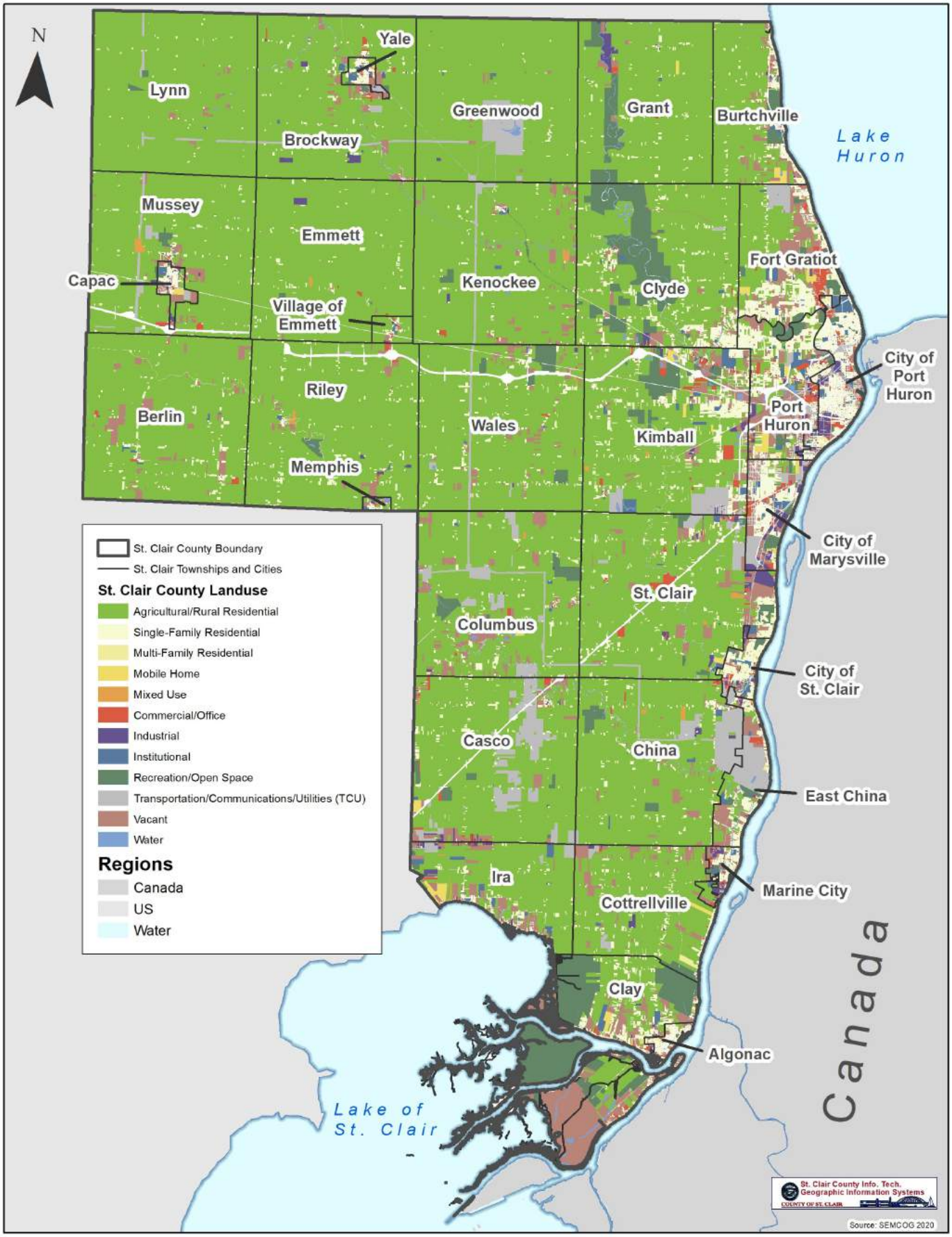
The total area of the county is approximately 726 square miles. An agricultural/village pattern of land use exists in the western portion of the County, supporting a rural lifestyle that residents would like to preserve. The predominant land use is agricultural/rural residential, which covers 542.8 square miles (75%) of the land area. This is followed by a substantial amount of single-family residential land at 41.4 square miles (5.7%), then park, recreation, and open space is the next largest use with 30.1 square miles (4.1%). This part of St. Clair County offers diversity, a change of view and a change of pace from populated commercial communities that have proliferated along the County's eastern and southern waterfront.

More intense land uses such as commercial, industrial, institutional and transportation are primarily found in the Port Huron area and to a lesser extent in village areas and in small parcels on major corridors throughout the county. Residential uses are found scattered throughout the entire county.

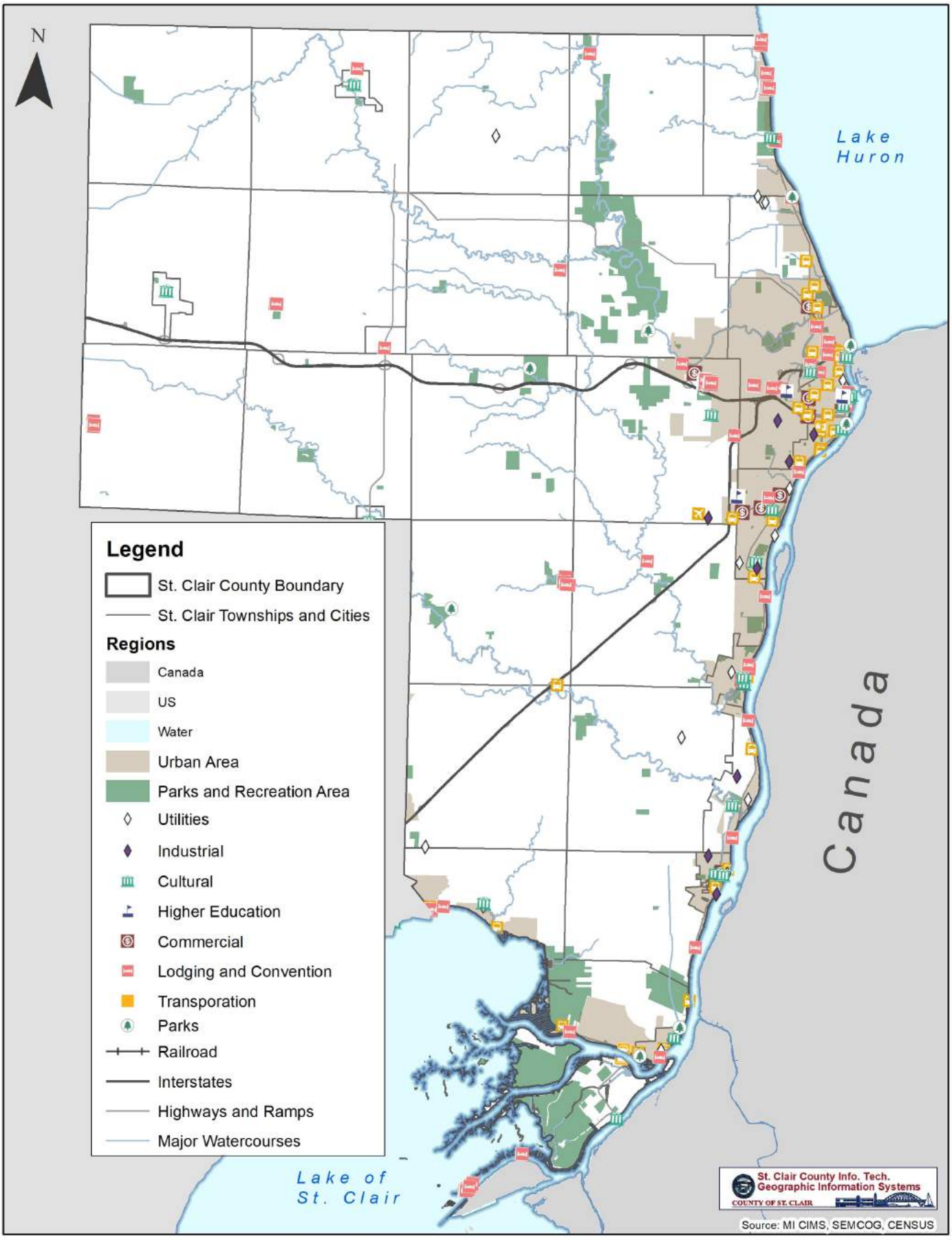
MAP 1-1: ST. CLAIR COUNTY REGIONAL CONTEXT



MAP 1-2: ST. CLAIR COUNTY LAND USE, 2020



MAP 1-3: REGIONAL IMPACT LAND USES



Planning for St. Clair County's Future

The Metropolitan Planning Commission has the responsibility to review the County Master Plan every five years and consider the conditions and trends affecting the county. A wide variety of planning processes and techniques have been utilized in crafting the plan in years past; however, every update to the plan has been grounded in a desire to document current trends in St. Clair County, to gain a clear understanding of the issues affecting the County and its local units of government, and to set a promising course for managing change in the future. With each new rendition of the St. Clair County Master Plan comes an opportunity to proactively shape policy, guide decision making, and improve the quality of life for St. Clair County's citizens.

The St. Clair County Master Plan is intended to have a lasting impact on the community. Relying on a strong foundation of data, research, and public policy analysis, it is reflective of a county with significant assets and emerging challenges. While the plan identifies a number of goals and strategies meant to positively influence the overall quality of life in St. Clair County, it is built on a framework that focuses on action strategies that can actually be implemented. The vision, goals, and strategies identified in this plan will require cooperation and collaboration among community leaders and dedicated stakeholders in all sectors of the community. Just as planning cannot occur in a vacuum, the responsibility of implementing this plan does not rest solely with county government.. Instead, the county and its community partners must build upon our community's strengths, anticipate and adapt to change, and work collaboratively to strengthen St. Clair County's people, places, and economic prosperity.

St. Clair County's Population

St. Clair County is among the 15 most populated counties in Michigan. United States Census Bureau statistics show that St. Clair County had:

- 145,607 people in 1990
- 164,235 people in 2000 (12.8% increase from 1990)
- 163,040 people in 2010 (0.7% decrease from 2000)
- **160,383 people in 2020 (1.6% decrease from 2010)**

The Southeast Michigan Council of Governments (SEMCOG) estimated that St. Clair County's population was 160,229 in July 2021. ***SEMCOG is projecting the county's population to be 166,185 by 2045.***

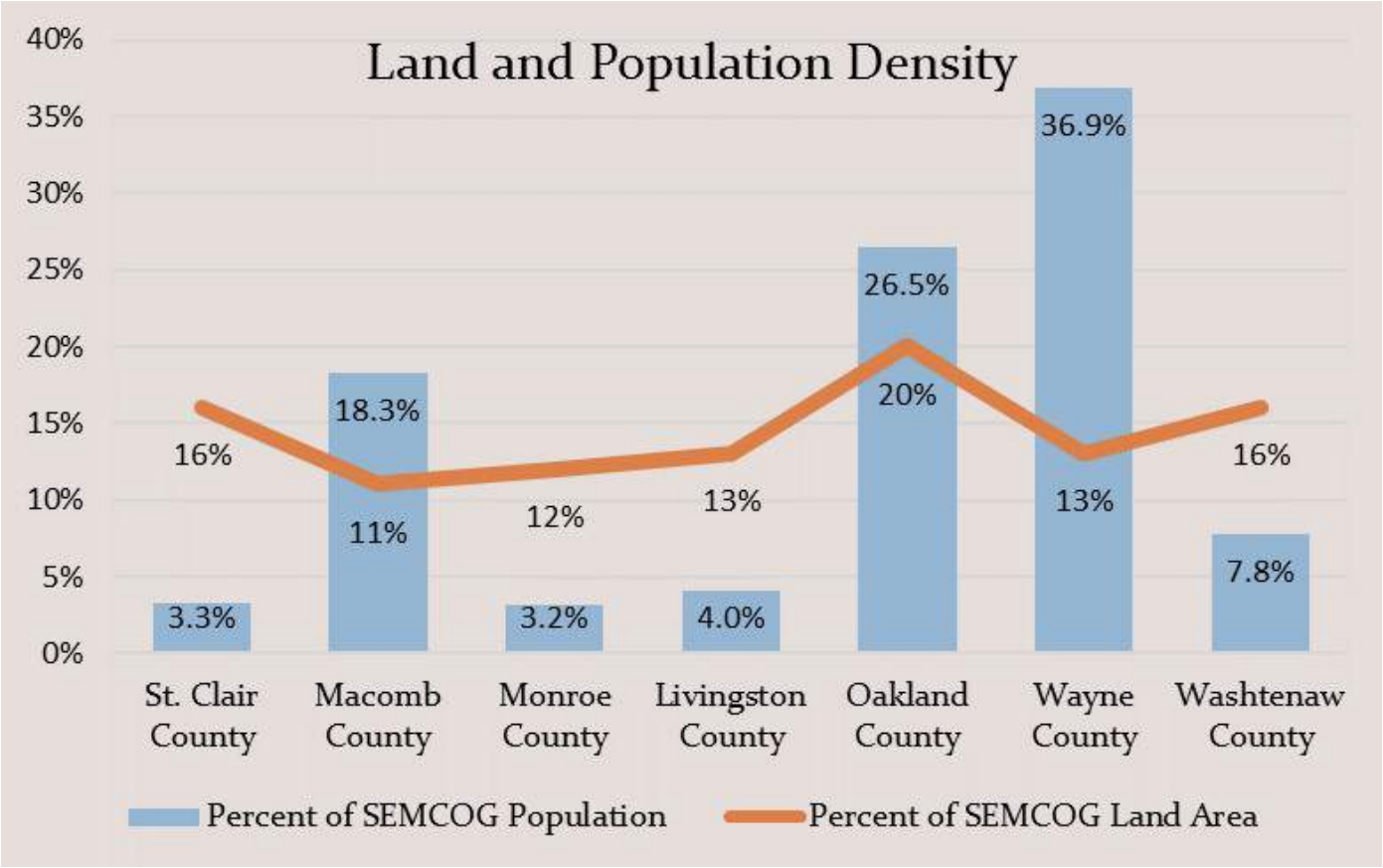
Table 1-1: Population Change, 2010-2020

Jurisdiction	2010 Census	2020 Census	# Change	% Change
St. Clair County	163,040	160,383	-2,3657	-1.6%
SEMCOG Region	4,704,809	4,830,489	125,680	2.7%
State of Michigan	9,883,640	10,077,331	193,691	2.0%

Source: US Census Bureau, Census 2010 and 2020; SEMCOG Community Profiles, 2022.

Our Population is Declining...

From 1940 to 2000, the County's population steadily grew. However, since 2000, St. Clair County's population has declined.



St. Clair County's land area makes up 16% of the entire Southeast Michigan region. The only county with a greater amount of land is Oakland County.

St. Clair County's population makes up 3.3% of the entire Southeast Michigan region.

St. Clair County is the least densely populated county within the Southeast Michigan region.

St. Clair County

726
Square Miles

221
Residents Per Square Mile

SEMCOG REGION POPULATION DENSITY

Livingston County: **331** Residents/Square Mile

Macomb County: **1,822** Residents/Square Mile

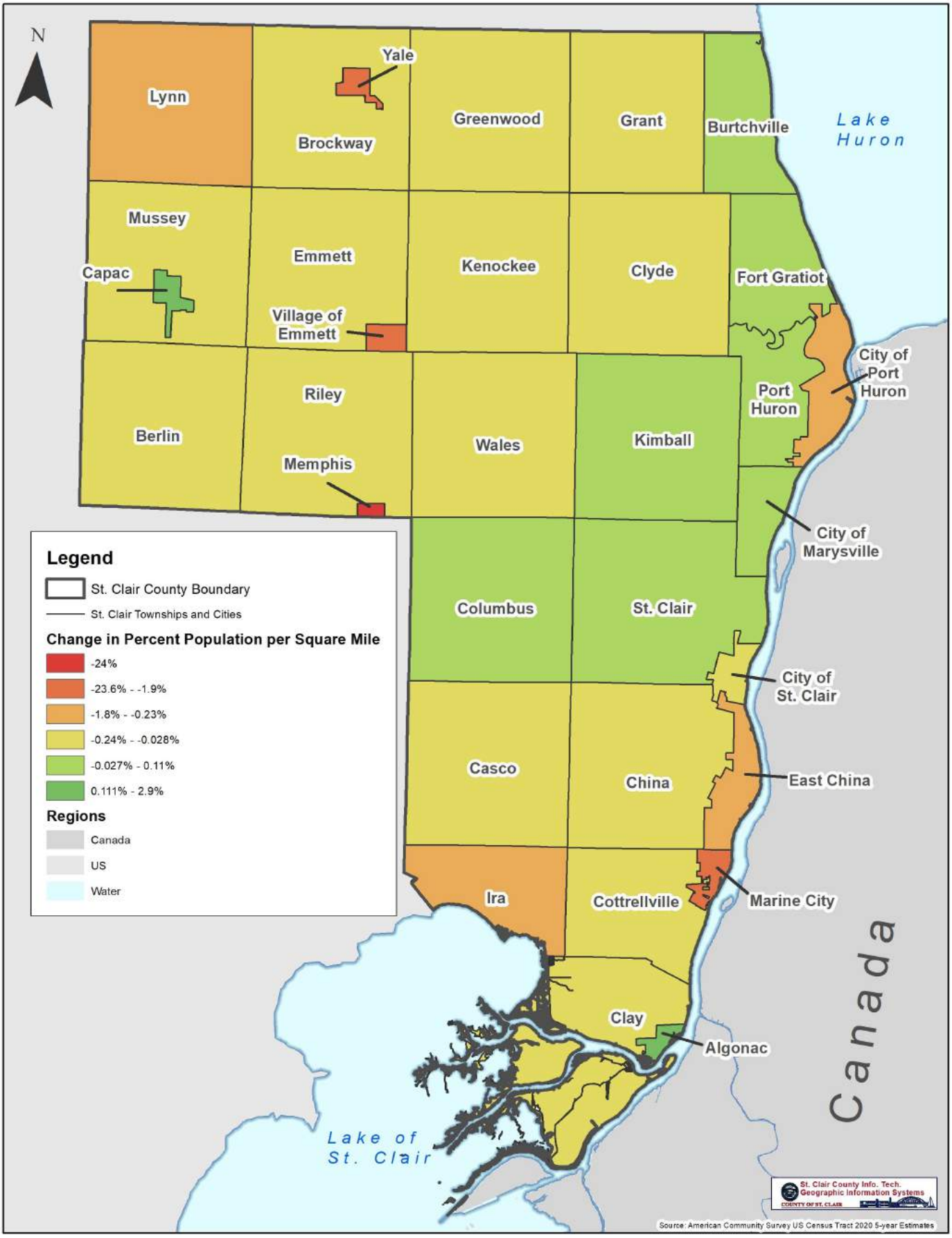
Monroe County: **278** Residents/Square Mile

Oakland County: **1,405** Residents/Square Mile

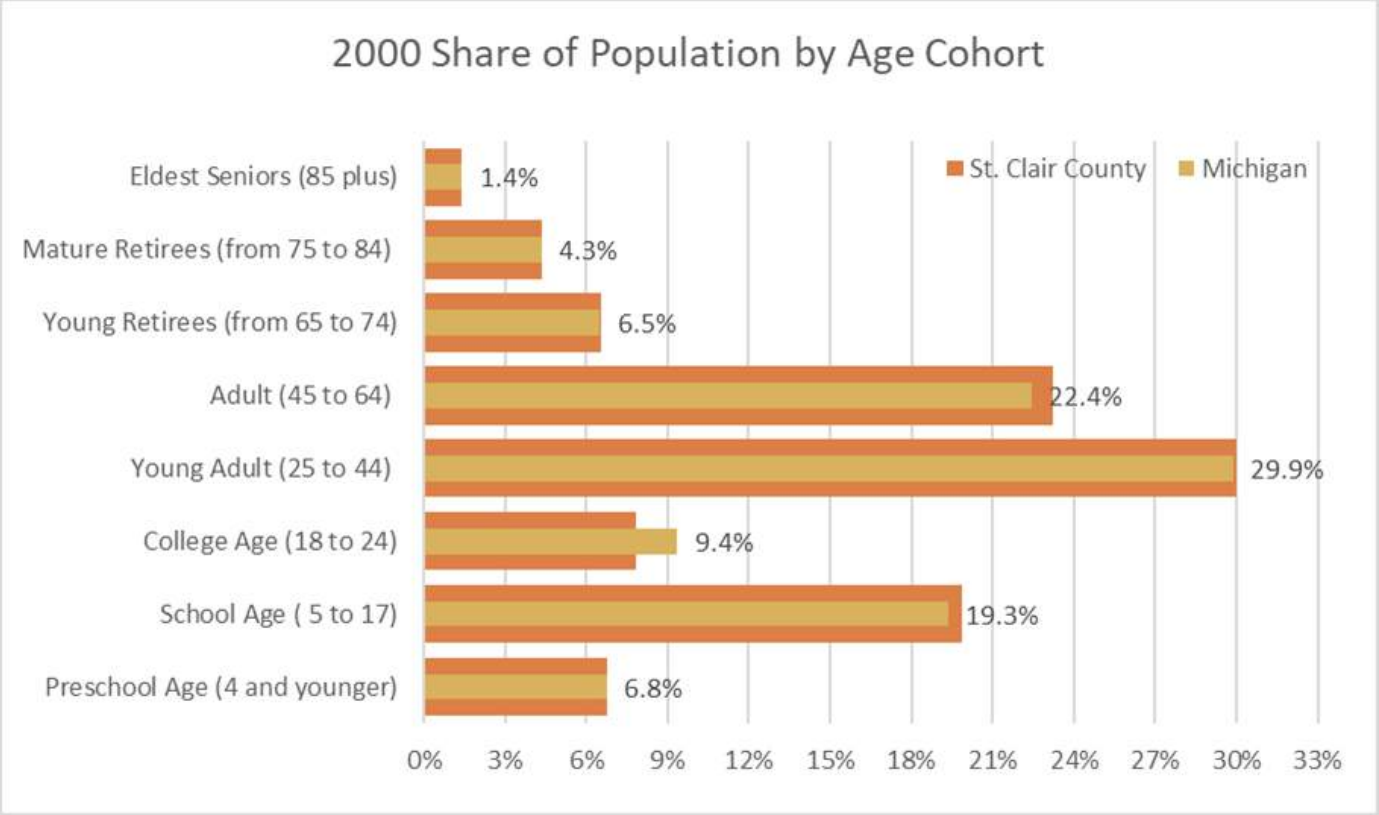
Wayne County: **2,905** Residents/Square Mile

Washtenaw County: **515** Residents/Square Mile

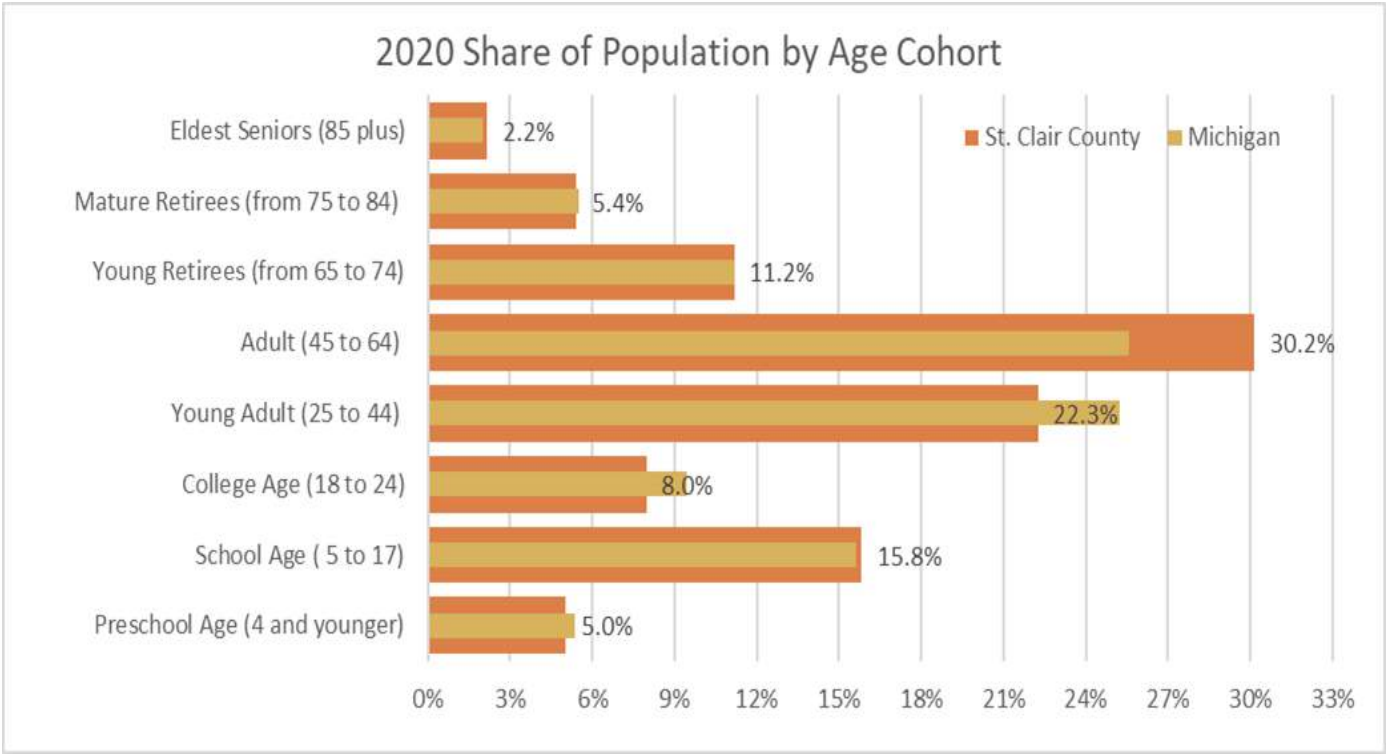
MAP 1-4: ST. CLAIR COUNTY POPULATION CHANGE PER SQUARE MILE 2010-2020



Population Age Trends



Source: U.S. Census Bureau, American Community Survey 2000 5-Year Estimates.



Source: U.S. Census Bureau, American Community Survey 2020 5-Year Estimates.

Our older population is growing...

When looking at population change by age from the 2000 Census to the 2020 Census, there is a clear decline in the number of children and adults of child-bearing age. The number of adults over 45 and seniors is increasing. Also of significance is a decrease in the number of adults 20 to 29 when compared to the five-year age ranges prior to and after those two age groupings. This is typically attributed to our young people going off to college and employment opportunities outside of the county and not returning

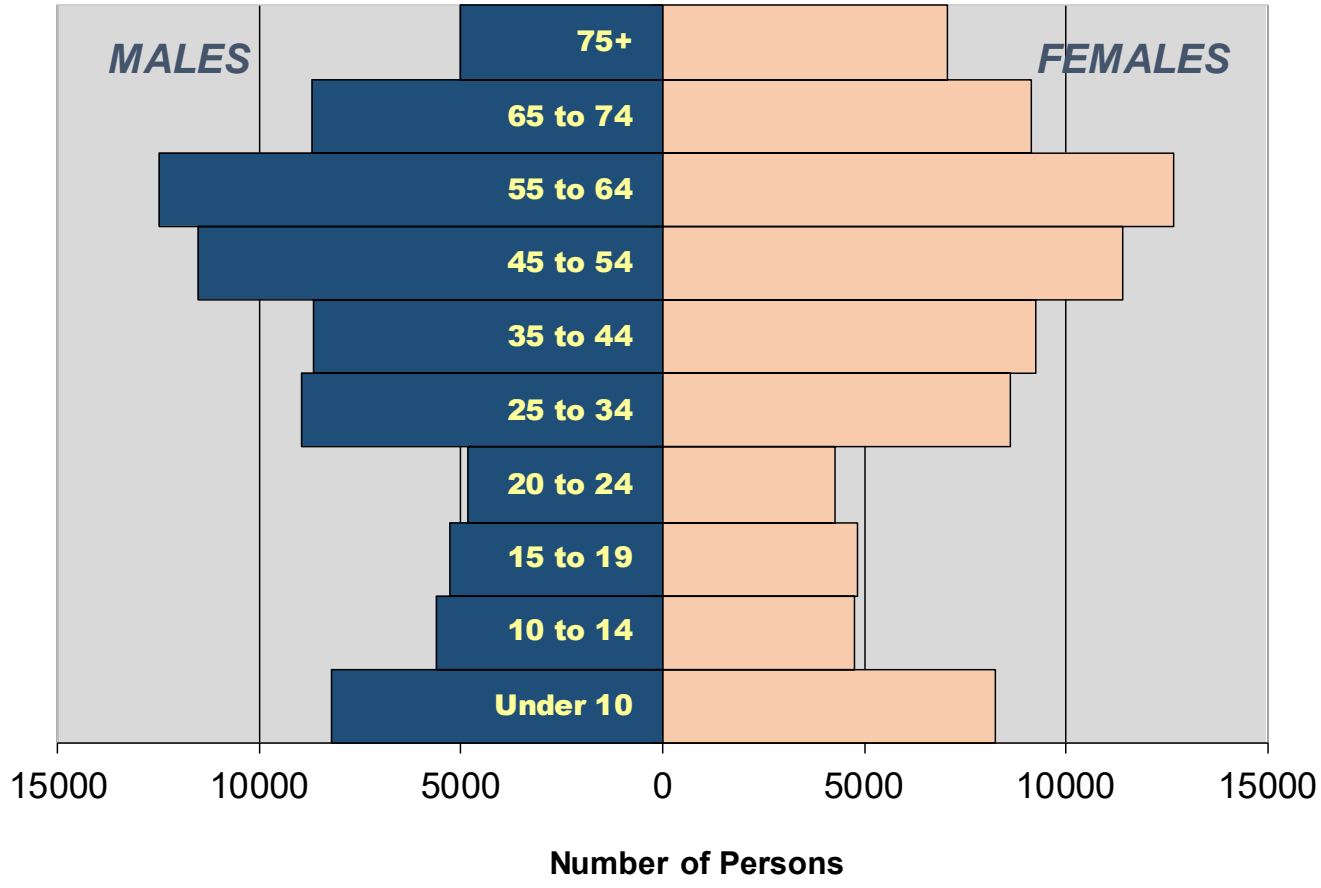
...Our younger population is shrinking

The majority of St. Clair County residents are in what is considered the "baby boomer" generation, which is comprised of persons that were born between 1946 and 1964. As the baby boomers move into their fifties and sixties in the next decade and their sixties and seventies in the following decade, there will be a significant increase in the already expanding elderly population. The aging of the "baby boomer" generation is changing the age structure of communities across the state of Michigan. The loss of young adults in the state of Michigan has been well documented in recent years. In 1990, St. Clair County had 14,090 persons between the ages of 18 and 24. During the next decade, that number decreased by 8% to 12,932 in 2000. The exodus of young adults is continuing in the present decade.

Just over 60% of county residents are age 35 or older. Over the next 20 years, the county will continue to see its residents grow older, which has numerous implications for planning. The most obvious include improved

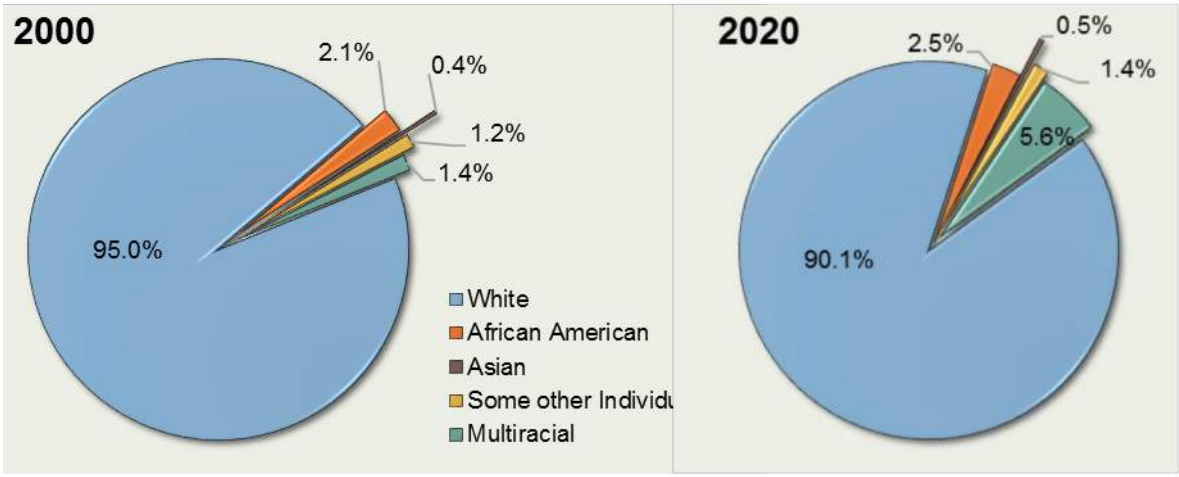
emergency services, availability of health facilities, affordable housing, and transportation, especially in rural areas. Housing for senior citizens will likely have to be integrated into the community transportation system, which encompasses a whole other set of planning issues. A key implication of the county's aging population is the movement toward "Aging In Place," which refers to living where you have lived for years, as opposed to living in a health care environment or nursing home. In short, aging in place allows elderly residents to live safely and independently in the home of their choice.

AGE-SEX PYRAMID, ST. CLAIR COUNTY 2020



Source: U.S. Census Bureau, American Community Survey 2021 5-Year Estimates.

St. Clair County is Gradually Becoming More Diverse



Source: U.S. Census Bureau, American Community Survey 2020 5-Year Estimates.

According to the 2020 Decennial Census, the white population comprised 90.1% of the report area, black population represented 2.5%, and other individual races combined were 1.9%. Persons identifying themselves as two or more mixed races made up 5.5% of the population.

Compared to the 2000 Decennial Census, there has been a seven percent reduction in the white population, a loss of nearly 11,500 people. The African American population experienced a 14% increase with the addition of about 500 residents and all other individual races grew by 18%, or 462 residents. The most significant increase took place among the multiracial population. They made up for about 58 percent of what the white population lost. In 2000, the multiracial population was around 2,250. With the addition of nearly 6,700 residents, a 296% increase, the population has nearly tripled for their most recent count of 8,950 in 2020.

Foreign Born Population

The foreign born population experienced a 17% increase from 2010 to 2020. However, when we look over the course of the past two decades, 2000 through 2020, we see a 3.2% decrease in this population. We can conclude this to be a direct result of our non-white racial population expanding. A decrease in the foreign born population tells us we have more second and subsequent generations settling and expanding families within the county.

Inclusive and Equitable Communities

Local governments that support inclusion and equity in their communities:

- Improve opportunities to recruit long-term residents,
- Provide numerous social benefits, including helping to create a sense of community,
- Promote an entrepreneurial spirit by welcoming residents who may start new businesses,
- Report increased consumption of local products, and
- Support local goods and services driving the community's economic growth and prosperity.

Welcoming newcomers brings diversity into communities and provides economic, cultural and social benefits. It can also lead to a more versatile and skilled workforce. The social benefits of a diverse and equitable community include the thoughts and opinions inclusive of the entire population, when weighing in on essential decisions. Inviting different voices also leads to fewer complaints about discrimination and harassment.

This is especially important now, following a period in which people have experienced shelter-in-place orders and social distancing due to COVID-19, where people may have been feeling lonely. However, according to the American Planning Association, this also allows us to think more creatively in terms of placemaking in our communities using art and cultural knowledge to improve social and economic conditions in St. Clair County. Bridging planning, arts and cultural understanding and using this partnership to an advantage, allows planners to drive economic development, preserve cultural and historic understandings, correct inequalities, and create a healthier community.

Vulnerable Populations

Structurally Disadvantaged People or Populations:

- People who face systemic barriers to health and prosperity due to discrimination based on attributes such as social class, race or ethnicity, gender, educational attainment, and neighborhood of residence. More recent efforts have expanded these attributes to include sexual orientation, gender identity, indigeneity, and disability status.
- Vulnerable populations often have the least access to information, health care, insurance, and other resources.

Priority Neighborhoods or Populations are areas of groups of people that are important to support because:

- They have a higher risk of experiencing health inequities than the rest of the community;
- They have a high percentage of structurally disadvantaged people; and/or
- They have been historically underserved and deprived of investment.

Disabled Population:

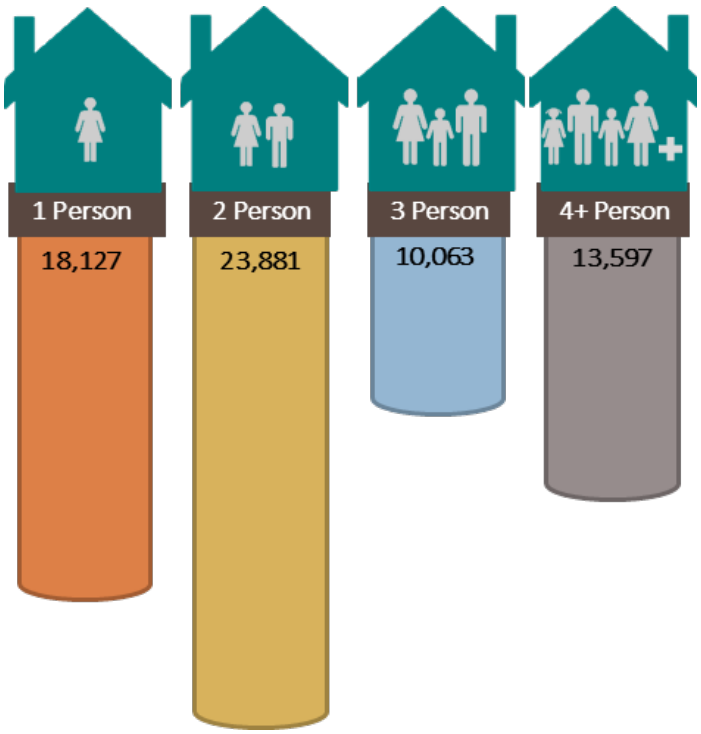
- Nearly 17% of the County's noninstitutionalized population were disabled in some way in 2020 [14% statewide]. Nearly half of all those who are disabled have an ambulatory disability; whereas, 8.3% of the total noninstitutionalized population have an ambulatory difficulty (7.6% statewide). The rate of disability rises with age. For example, an estimated 49.4% of residents at least 75 years of age had some type of disability [47.7% statewide] and 27.5% had an ambulatory disability [30% statewide].
- This vulnerable population is comprised of disabled individuals requiring targeted services and outreach providers.

Household and Family Trends

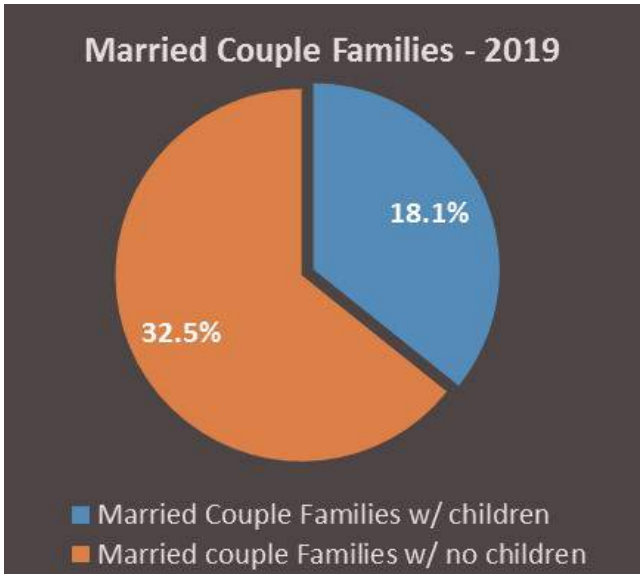
According to the most recent American Community Survey estimates, 28.53% of all occupied households in the report area are family households with one or more children under the age of 18. As defined by the US Census Bureau, a family household is any housing unit in which the householder is living with one or more individuals related to him or her by birth, marriage, or adoption. A non-family household is any household occupied by the householder alone, or with one or more unrelated individuals. The trend across the state and country is a declining percentage of households with children under the age of 18.

Between 2010 and 2020, St. Clair County's average household size dropped from 2.52 to 2.42, slightly below the average for the SEMCOG region (2.46) and the state of Michigan (2.45). The two most common household types in St. Clair County are married couple families at 50.7%, and male or female householders with no spouse present at 41.8%. Combined, these two groups make up 92.5% of St. Clair County households. This shift to smaller households follows a national trend and can be attributed to changing family dynamics and societal characteristics. People are waiting longer to get married, women are delaying having children to focus on careers, divorce is more commonplace than it was in previous decades, and people generally have more mobility and financial means to live on their own. Moreover, Americans are favoring having fewer children than in past decades, according to a 2011 Gallup research poll. From that study, Gallup indicated that "after a brief reversal a decade or so ago in the contemporary trend toward preferring smaller families, Americans are again growing less likely to favor having three or more children and, correspondingly, more likely to say having two or fewer is ideal."

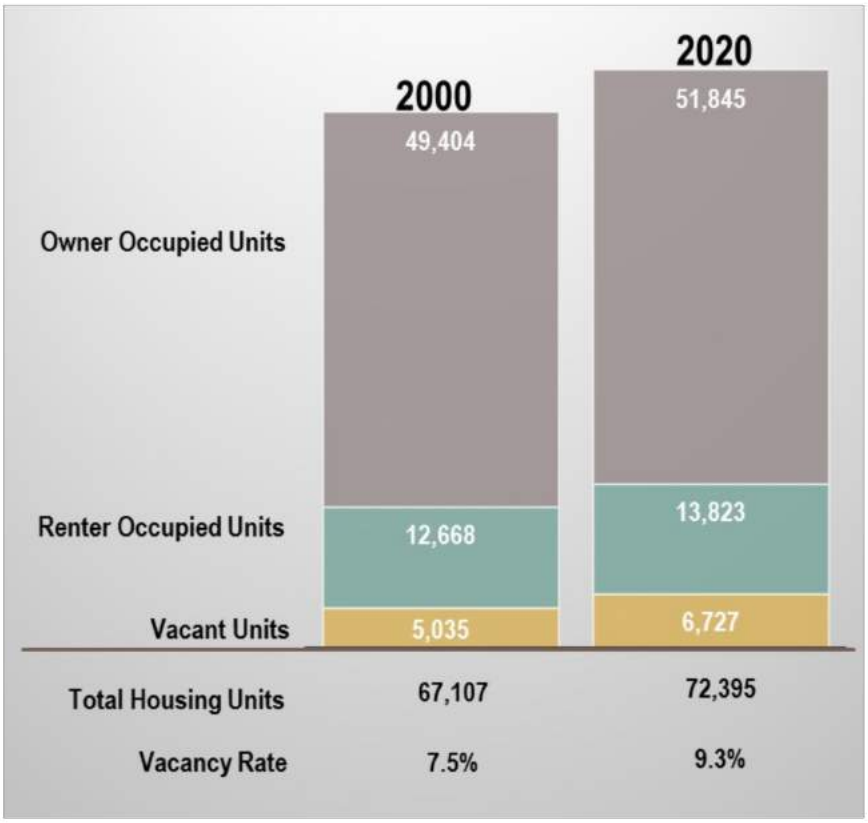
Household Size in St. Clair County, 2020



Source: U.S. Census Bureau, American Community Survey 2020 5-Year Estimates.



Housing Occupancy



Owner-occupied housing accounts for 79% of St. Clair County's occupied housing units, while renter occupied housing accounts for 21% of all occupied housing.

Source: U.S. Census Bureau, American Community Survey 2020 5-Year Estimates

Housing Occupancy Trends

- The amount of occupied housing in St. Clair County has remained fairly consistent over the years, fluctuating by less than 3.5%. The percentage of occupied housing units ranged between 89.2% to 92.5% between 2000 and 2020.
- The county's ratio between owner-occupied and renter-occupied housing units has also remained fairly consistent throughout the past two decades. The counts for each decennial census are nearly identical with about a 60% gap between renter and owner-occupied structures. The percentages have sustained about an 80% and 20% rate for owner and renter-occupied homes, respectively.
- In 2015 the gap closed a tad with the county having about a 50% difference between the two types of tenure. Approximately 76% of homes were owner-occupied and 24% renter-occupied.
- Owner-occupied housing has seen a nearly 5% overall increase over the course of the past two decades, with the majority occurring between 2000 and 2010 when the county increased by 14,316 homes, a 39% increase. The amount of owner-occupied homes then experienced a decline of 2,185 homes, or -4.3% from 2010 to 2015, but recouped the loss, plus some, with the addition of over 3,000 homes, between 2010 and 2015, a 6.3% increase. This resulted in a net gain of 877 owner-occupied homes throughout the course of 2010 to 2020.
- Conversely, rental-occupied housing has experienced an overall decrease of 12%. There had been a steady increase of rental homes from 2000 to 2015, with the county gaining over 3,000 rentals, nearly a quarter increase (24.5%). However, from 2015 through 2020, the county lost about half of what it had just gained in the previous 15 years, a ten percent loss overall, for a net change of about two percent during the past decade, 2010 to 2020.

COUNTYWIDE BUILDING PERMITS

Table 1-2: Building Permits in St. Clair County 2000-2022

Year	Single Family	Two Family	Attached Condo	Multi Family	Total Units	Total Demos	Net Total
2000	919	38	16	112	1,085	102	983
2001	797	30	20	77	924	71	853
2002	842	28	33	131	1,034	93	941
2003	818	8	42	8	876	102	774
2004	855	14	48	12	929	102	827
2005	660	26	12	6	704	86	618
2006	439	4	4	0	447	99	348
2007	183	2	0	0	185	59	126
2008	92	0	0	55	147	42	105
2009	52	0	0	0	52	92	-40
2010	48	0	0	0	48	163	-115
2011	48	0	0	0	48	67	-19
2012	60	0	0	0	60	68	-8
2013	75	0	0	8	83	88	-5
2014	103	0	0	0	103	50	53
2015	125	0	0	0	125	64	61
2016	174	0	0	0	174	66	108
2017	220	0	4	123	347	43	304
2018	257	0	31	0	288	58	230
2019	189	0	0	108	297	40	257
2020	189	0	0	36	223	45	178
2021	224	0	0	180	404	65	339
2022	185	0	10	242	437	66	371
2000-2022	7,552	150	220	1,098	9,020	1,731	7,289

Source: SEMCOG Community Profiles, 2023.

Planning Process and Public Engagement

Since the development of the 2000 St. Clair County Master Plan, the public has been actively engaged in helping determine the overall direction for planning in St. Clair County and its various local units of government. The following summary of public involvement pertains to this current update of the St. Clair County Master Plan and, as such, captures the time period from August 2020 to adoption of the plan in December 2023. The MPC recognizes and is grateful for the ongoing interest and valuable input from both the public and officials from local units of government to help shape and enhance the quality of life in St. Clair County.

Change is inevitable. The challenge is to anticipate change, plan for it, adapt to it, and thus benefit from it. For St. Clair County, the primary changes between 2022 and 2050 will be centered around demographic shifts (i.e. an aging population), infrastructure needs, and economic diversification. Therefore, there is one overriding recommendation within the St. Clair County Master Plan: Ensure that St. Clair County is a resilient community. Resilience is the capacity to adapt to change, whether gradual or sudden. Resilient communities can effectively adapt to changes in economic conditions, environmental conditions, and other societal disruptions.

The success of any planning process is reliant upon public involvement. The MPC was committed to pursue a proactive public outreach effort throughout the development of this plan. Efforts were focused on soliciting community input to maximize awareness of the planning process. For the development of this master plan, the MPC turned to new methods of obtaining input and ideas from residents and other stakeholders. Namely, county planners took the process to where people already were and where residents could have easy access to the process. This included online engagement opportunities and in-person visioning meetings later in the process, once it was safe to do so during the COVID-19 pandemic.

The Planning Process

The process that led to the development of this St. Clair County Master Plan included:

- A decision by the Metropolitan Planning Commission to update the plan in accordance with the Michigan Planning Enabling Act (PA 33 of 2008).
- A review of the existing master plan by the Metropolitan Planning Commission staff.
- A leadership survey distributed to members of the St. Clair County Board of Commissioners, Parks and Recreation Commission, PARC Committees, and the Metropolitan Planning Commission in August 2020.
- An online survey of small focus groups centered on land use, transportation, and economic development. The survey was completed by 38 individuals from August through October 2020.
- An online, countywide recreation survey, allowing residents to provide input from May through July in 2021. The survey was completed by 306 respondents.
- A stakeholder focus group meeting held virtually on July 13, 2021 and facilitated by MPC staff. Stakeholders included economic development leaders, nonprofit leaders, business owners, and local planning commissioners.
- An online, countywide survey focused on Hazard Mitigation, allowing residents to provide input from July through September in 2021. The survey was completed by 142 respondents.
- Utilization of the *Social Pinpoint* online engagement platform, allowing residents to provide identify

3,000+ Public Engagement Touchpoints

Master Plan Visioning Session in Fort Gratiot Township, April 27, 2022

issues, provide ideas, and identify areas for improvement on a map. The Social Pinpoint platform was live for a one year period, from 2021 to 2022.

- Three public visioning meetings to engage residents and solicit ideas and suggestions on the future of St. Clair County:
  - April 26, 2022 - Fort Gratiot Township
  - April 28, 2022 - Clay Township
  - May 4, 2022 - Goodells County Park
- An online survey for the Marine City Highway Corridor Plan that was open from June 1, 2022 to July 15, 2022. A total of 1,444 people completed the survey.
- A public forum about the Marine City Highway Corridor Plan held on June 29, 2022 in Marine City.
- A public open house on the Marine City Highway Corridor Plan held on November 10, 2022 in Marine City.
- A 63-day public review and comment period for the general public and local units of government .
- A public hearing held by the Metropolitan Planning Commission on November 15, 2023 to receive additional citizen comments.
- Adoption of the master plan by the Metropolitan Planning Commission on November 15, 2023.
- Adoption of the master plan by the St. Clair County Board of Commissioners on December 14, 2023.

Local Leaders Survey

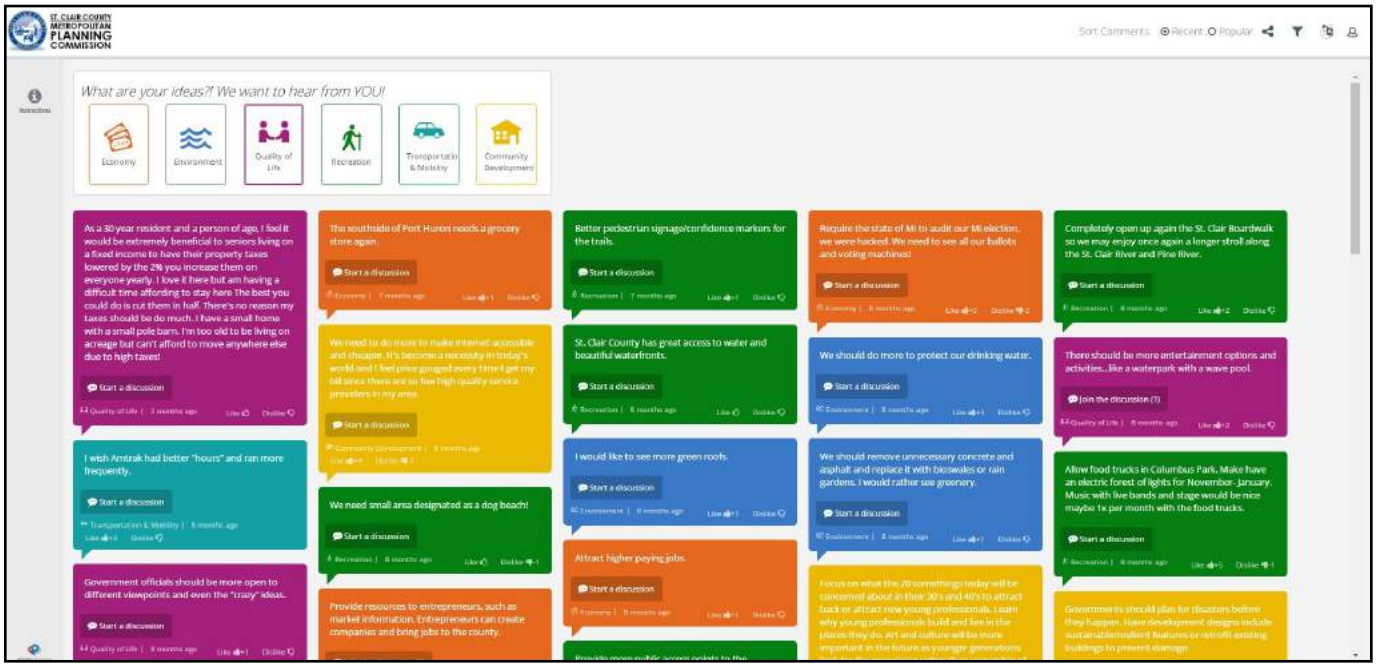
During August and September 2020, members of the Board of Commissioners, Parks and Recreation Commission (PARC), Metropolitan Planning Commission (MPC), and PARC committees were given a survey to establish a framework on key planning issues related to parks and recreation in St. Clair County. There were 15 responses to the Local Leaders Survey.

Focus Group Topical Surveys

An online survey of small focus groups centered on land use, transportation, and economic development. The surveys were completed by 38 individuals from August through October 2020. The individuals surveyed for these specific topical surveys included local planning commissioners, economic developers, business owners, transit providers, transit riders, and transportation engineers.

SWOT ANALYSIS: ST. CLAIR COUNTY

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Quality of Life	Countywide Mobility Options	State/Federal Grants	Lack of Housing Options
Strong Collaboration	Affordable Housing	Alternative Energy Development	Blight/Weak Code Enforcement
Abundant Natural Resources	Aging Infrastructure	Connecting Regional Trails	Being Reactive, Not Proactive
Parks & Recreation Amenities	Broadband/Cell Coverage	Infrastructure Improvements	Political Divisiveness
Proximity to Detroit and Canada	Childcare Options	More Housing Options	Climate Impacts
Tourism	Antiquated Regulations	Remote Work Growth	Shoreline Flooding/Erosion
Public Access to Waterfront	High-Wage Job Opportunities	Redevelopment/Adaptive Reuse	Lack of High-Wage Jobs



Screenshot of the Master Plan "Ideas Wall" from the Social Pinpoint engagement platform.

Community Stakeholder Focus Group Workshop

On July 13, 2021, MPC staff facilitated a virtual focus group meeting of 40+ stakeholders from the private sector, the nonprofit sector, local planning commissioners, and representatives from the Economic Development Alliance (EDA) of St. Clair County. This workshop allowed MPC planners to gather information about the strengths, weaknesses, opportunities, and threats in the county from the perspectives of those directly involved in business attraction/retention, real estate, education, and working with entrepreneurs.

Public Survey on Parks and Recreation

From May through July 2021, an online survey was available to residents to provide input on parks and recreation in St. Clair County and the update of the County's Master Recreation Plan. Respondents were presented with 23 questions on the survey, covering such topics as park visitation habits, preferred method of receiving information, recreation preferences, and open ended questions that allowed for written answers and open idea submittals. In total, there were 306 respondents to the online survey. The online survey was an optimal solution for gathering public input during the COVID-19 pandemic that began in March 2020. In-person events were not able to be held during the planning process.

While the responses came from all parts of the county, the largest percentage (62%) of respondents lived in Port Huron and its surrounding communities - Port Huron Township, Fort Gratiot Township, Kimball Township and the City of Marysville. Approximately 42% of respondents were between the ages of 30 and 49. Another 34% were between ages 50 and 65. Roughly 8.25% of respondents were age 29 or younger.

About half of the respondents said they visited St. Clair County parks more than ten times in the past year. 22% visited one or more of the County parks between three and six times over the past year. 58% of respondents are satisfied with the overall amount of park land in St. Clair County and 85% would like the County to develop additional parks or add to existing parks.

Social Pinpoint Engagement Tool

From March 2021 to March 2022, an engagement platform called Social PinPoint was available online, allowing citizens and other interested stakeholders to provide open-ended comments and suggestions on a virtual idea wall and an interactive map. The Social PinPoint tool provided planners with a number of issues to explore deeper, including suggestions on recreation, community character, and mobility. With public gathering limitations during the COVID-19 pandemic, Social PinPoint was an additional virtual opportunity to harness public input.

St. Clair County Broadband Survey

From November 2020 through May 2021, Connected Nation Michigan surveyed St. Clair County residents and businesses to get their perspectives on broadband accessibility, services gaps, and broadband usage. The Broadband Survey brought in 869 responses from county residents, 32 responses from businesses, and an additional 36 responses from stakeholders in government, agriculture, education, healthcare, and public safety. The survey showed that 80.6% of respondents currently subscribed to a broadband service.

Online Hazard Mitigation Public Survey

As County planners worked on the master plan update, the County's multi-jurisdictional Hazard Mitigation Plan was concurrently being updated. An online public survey was available to citizens from July 2021 through September 2021. A total of 142 people completed the survey. The survey gauged people's level of concern and preparedness in dealing with emergency or hazardous incidents. Moreover, the survey asked respondents if they were aware of local evacuation plans, emergency or evacuation plans at their place of employment or their children's schools, and their knowledge of any preparedness or emergency plans their local communities might have in place.

Three Master Plan Visioning Sessions

The Metropolitan Planning Commission held three master plan visioning sessions for the public in 2022:

- April 26, 2022 - Fort Gratiot Township
- April 28, 2022 - Clay Township
- May 4, 2022 - Goodells County Park (Wales Township)

Master Plan Visioning Session in Clay Township, April 29, 2022.

Marine City Highway Corridor Study Public Forum, June 29, 2022.

These public visioning sessions were in-person meetings where County planners presented some background information on recent demographic and land use trends and then facilitated discussions around the strengths, weaknesses, opportunities, and threats in St. Clair County. Participants were able to provide their ideas for the future of the County, as well as identify current issues that should be addressed. Approximately 50 people attended the visioning sessions.

Marine City Highway Corridor Plan - Public Forum and Online Survey

Given the multiple regulatory jurisdictions, increasing traffic patterns, and development pressures facing the Marine City Highway corridor, St. Clair County, in conjunction with the four townships, road commission and the Economic Development Alliance (EDA), initiated an effort to conduct a comprehensive corridor study for the Marine City Highway Corridor. The scope of work for the corridor study included an analysis of existing corridor conditions, demographic and market conditions. The project study area was the 11-mile stretch of Marine City Highway, from County Line Road to King Road.

An online public survey was available to stakeholders from June 1, 2022 through July 15, 2022. The survey was completed by over 1,400 individuals. Additionally, there were two public forums held to get additional ideas and suggestions for the future of the corridor. The first public forum was held in Marine City on June 29, 2022. The second public forum was held in Marine City on November 10, 2022. Between the two public forums, a total of approximately 285 people attended.

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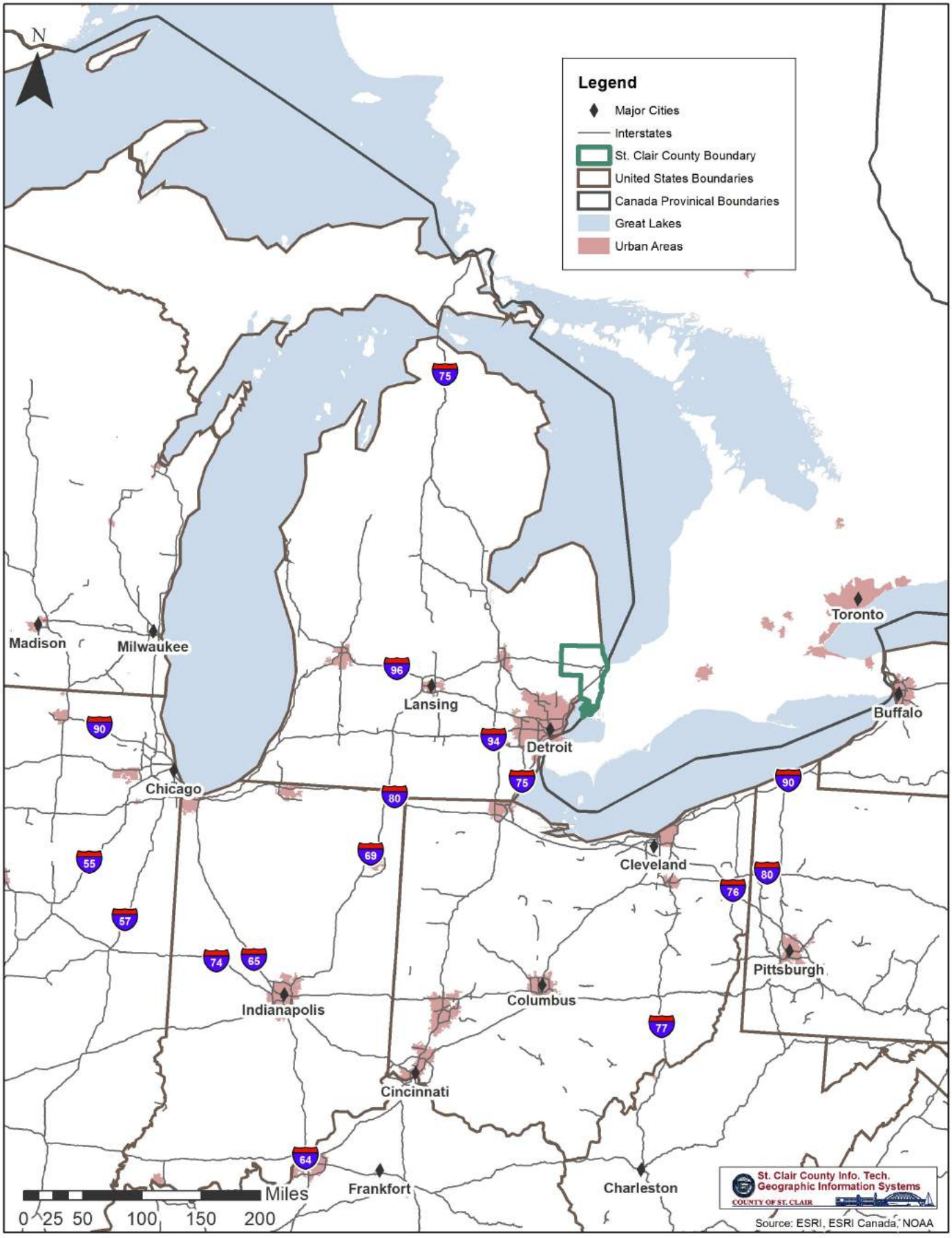
The Economy 2

Photo Credit: Katie Stepp, Blue Water Convention and Visitors Bureau

MAP 2-1: COMPETING REGION

MAP 2-2: URBAN ECONOMIC CENTERS



Economy, People, and Land Use

The economy of a region, county, or community depends on many factors, all of which are related to:

- Population characteristics, including age, average income, and other factors.
- Business, industry, and commerce centers.
- The workforce, whether employed or unemployed, and educational and training opportunities.
- Special or unique characteristics that attract new residents, workers, and tourists.
- Trade among residents and trade with other communities, even with Canada and Mexico.

Likewise, economic activity impacts land use in a variety of ways:

- Populations move to follow employment opportunities.
- Different industries affect the type and capacity of public services and facilities.
- Industries have specific site and location requirements.
- Site development alters the physical landscape around the site.
- Businesses either fail, maintain, or grow, depending on market evolution.

Industrial development also affects land use indirectly due to the need for secondary service industries and workforce housing.

Economic History

In the late 1800s, St. Clair County was an area of agriculture, lumbering, and mining. People worked on family farms, lumber mills, quarries, or in businesses that provided goods or transported products to other markets.

Technology, the Industrial Revolution, and the reward of high-paying jobs brought people to the cities in the early 1900s. These people also lived near their work, often relying on public transportation to get between home and job.

The end of World War II brought a proliferation of automobiles, which allowed people to commute from new near-city suburbs to established in-town industrial centers. These suburbs were like a middle ground between cities and farms, offering some semblance of country life as well as city conveniences and culture.

The continued proliferation of automobiles in the form of multiple-car families, improved highways, and computer and communication technologies allow people to live farther from their work. The COVID-19 pandemic ushered in an era where employees were able to work remotely from their homes and that trend is continuing to expand post-pandemic. More and more companies are realizing their employees can work from anywhere without any operational or production impacts and are now allowing their employees to continue to work remote as both a way to save money and as an additional perk to attract and retain talent.

Income

Income refers to the money earned by individuals in the population, either through employment or from government assistance, such as pensions, social security, welfare, child support, etc. Personal income refers to money earned by individuals, either through employment or from other sources. Transfer payments refers to income received by a person for which that person has not rendered direct services, such as liability payments, corporate gifts, and insurance benefits. Government supported transfer payments refers to income a person receives from the government, such as workers compensation, social security, Medicaid reimbursements, veterans benefits, unemployment compensation, and food stamps.

Knowing the population's income helps determine the community's standard of living, ability to support individuals and families, spending capacity to stimulate additional jobs and economic growth, and housing opportunities for which the community should plan.

Measures of Wealth

There are measures of wealth that reflect the health of the local economy by describing the incomes of local residents: per capita, median household and median family incomes, as well as the percent of people for whom poverty status was determined. Per capita income is equal to the total incomes generated by a population divided by the number of persons in that area. Communities with a higher number of persons per household or smaller household incomes would likely have smaller per capita income figures.

Persons in households who are related by blood, marriage or adoption constitute family households, and the sum of their incomes is referred to as family income. A household consists of all people who occupy a housing unit regardless of relationship. A household may consist of a person living alone or multiple unrelated individuals or families living together.

Five communities had median household incomes over $80,000 - China, Columbus, Riley, and St. Clair Townships, and the City of St. Clair. At the other end of the spectrum, the lowest household incomes were concentrated in the cities of Yale and Port Huron, as well as the Village of Capac. In those communities, the median income level was roughly $43,000 or lower.

Poverty Trends

Persons in poverty have less capability to obtain the shelter that they need, in terms of either size or location, and have less ability to inject money into the local economy.

In terms of the broadest measure of poverty available (the overall percentage of persons that have incomes lower than the poverty line), the city of Port Huron has the largest concentration of poverty in the county. At 23.5% of the population, its rate is double that of the county's, and over seven times that of the community with the least amount of poverty measured (Clyde Township). Other areas with comparatively high rates are the City of Yale, Port Huron Township, Kenockee Township, and Burtchville Township. The lowest levels of poverty are in Clyde, Berlin, St. Clair, and Wales Townships.

Poverty among children is a significant issue in a number of townships and cities in the county. Just over 20% of the county's population are children under the age of 18 in poverty. Greenwood Township leads in this indicator, with 28% of related children in poverty. However, 20 other communities in St. Clair County also have figures over 20%.

Among senior citizens (aged 65 and older) in poverty, the pattern changes slightly, in that the areas with the largest percentage are East China Township (at 28%), followed by Clay Township (27%), Fort Gratiot Township (25.3%), Lynn Township (23.2%), Marine City (23.2%) and Marysville (23%). Countywide, senior citizens in poverty represent 18.6% of the population.

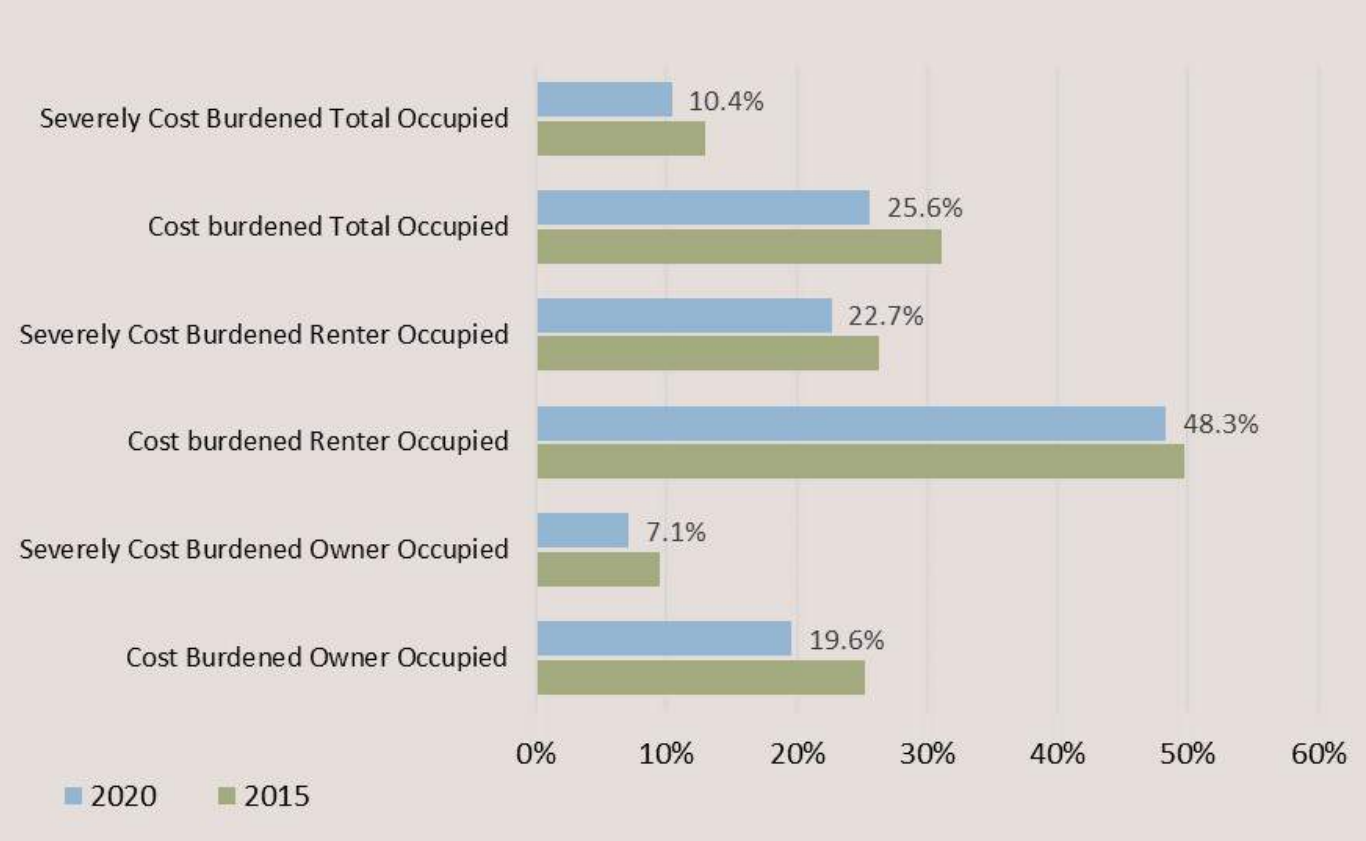
Income trends in the county seem to underline the differences between the northern, southern and Port Huron areas of the county. Areas of increasing household income could also increase the demand for housing—not only in terms of the number of units demanded, but also the quality of those units. Again, these trends seem to mimic those at the national level, in that higher incomes tend to cluster in suburban or exurban areas, while central cities tend to lag.

Table 2-1: Measures of Wealth, St. Clair County Communities					
Community	2020 Population	2020 Per Capita Income	2020 Median Household Income	2020 Median Family Income	2020 Persons Below Poverty
Algonac	4,196	$24,053	$48,925	$54,646	14.8%
Berlin Twp	3,115	$33,805	$77,011	$78,702	4.3%
Brockway Twp	1,897	$28,212	$66,667	$71,855	14.3%
Burtchville Twp	4,077	$28,696	$51,816	$60,625	18.6%
Capac Village	1,983	$22,983	$41,778	$ 45,000	15.8%
Casco Twp	3,990	$33,612	$71,087	$81,328	6.0%
China Twp	3,509	$40,491	$82,260	$105,673	5.1%
Clay Twp	8,446	$38,700	$61,750	$80,517	9.3%
Clyde Twp	5,523	$37,682	$72,961	$88,583	3.2%
Columbus Twp	4,112	$35,370	$87,784	$97,353	5.4%
Cottrellville Twp	3,406	$26,820	$54,875	$68,176	11.6%
East China Twp	3,704	$32,660	$51,141	$59,679	8.5%
Emmett Twp	2,515	$34,509	$79,074	$83,214	10.0%
Emmett Village	258	$33,652	$76,875	$67,321	8.2%
Fort Gratiot Twp	11,242	$39,482	$70,781	$79,430	9.3%
Grant Twp	1,829	$36,344	$74,688	$88,846	9.0%
Greenwood Twp	1,490	$30,619	$71,375	$78,542	15.9%
Ira Twp	4,967	$41,081	$77,892	$100,820	6.7%
Kenockee Twp	2,405	$27,968	$63,875	$73,000	21.4%
Kimball Twp	9,609	$27,315	$56,012	$64,957	15.3%
Lynn Twp	1,117	$28,750	$53,393	$64,464	12.4%
Marine City	4,079	$32,177	$52,718	$62,873	10.3%
Marysville	9,997	$31,278	$52,906	$73,051	8.8%
Memphis	315	$24,481	$71,250	$101,875	6.8%
Mussey Twp	4,234	$28,363	$56,067	$65,234	8.3%
Port Huron	28,983	$24,321	$41,165	$50,411	23.5%
Port Huron Twp	10,792	$26,420	$48,244	$58,320	17.5%
Riley Twp	3,199	$40,444	$94,727	$100,208	6.0%
St. Clair	5,464	$37,242	$82,674	$89,917	6.3%
St. Clair Twp	7,085	$40,772	$82,917	$94,333	4.6%
Wales Twp	3,180	$34,052	$70,764	$86,139	4.6%
Yale	1,903	$21,342	$43,072	$50,268	20.6%
St. Clair County	163,040	$31,724	$58,722	$73,484	12.4%

Source: US Census Bureau; SEMCOG Community Profiles, 2020

Housing Affordability

Cost Burdened	Severely Cost Burdened
Households spending 30% or more of their income on housing costs and utilities are considered cost-burdened.	Those households who spend more than half of their income on housing costs are considered severely cost burdened.



Source: US Census Bureau, American Community Survey 2015 and 2020 5-Year Estimates.

26% of St. Clair County Residents are Cost Burdened

- This is identical to the entire state of Michigan's rate as a whole.
- Households generally should not spend more than 30% of their income on housing costs and as a result may have difficulty affording necessities such as food, clothing, transportation, and medical care.

Cost Burdened Renter Households

- 1 in 2 renter households have extremely low incomes and cannot afford rent.
- Having to pay high and unaffordable housing costs prevents the spending of wages on other important needs, such as health care and healthy food, making it more challenging to be healthy

Median Home Values

- The median home value in St. Clair County decreased approximately 20% between 2010 and 2015 before increasing by over 34% by 2020.
- Rising housing costs and property taxes are displacing residents from their communities and people are losing a sense of belonging as a result

St. Clair County has an Affordable Housing Gap

- High quality affordable housing includes a mix of rent-restricted and/or subsidized and market units that all residents can afford.
- Having to pay high and unaffordable housing costs prevents the spending of wages on other important needs, such as health care and healthy food, making it more challenging to be healthy.
- Although housing cost burdens are trending downward, there is still a significant portion of the population where housing expenses exceed 30% of income. For renters, over 46% of households are spending more than 30% of their incomes on rent. The percent decreases to 34% for homeowners with a mortgage and 13% for homeowners without a mortgage (usually seniors on fixed incomes trying to pay property taxes).
- Property values have been on the decline, though may have started back up in 2019 when construction of new property also started to regain ground.

Table 2-2: Median Home Values, St. Clair County 2010-2020

	2010	2015	2020	2015-2020	
Median Home Value	$150,300	$120,800	$162,300	$12,000	8.0%
Median Mobile Home Value	$25,600	$20,600	$22,600	-$3,000	-11.7%
Median Value no mortgage	$135,200	$111,400	$151,100	$15,900	11.8%
Median Value with mortgage	$155,000	$125,500	$168,600	$13,600	8.8%

Table 2-3: Median Rent Paid

	2010	2015	2020	2010-2020	
St. Clair County	$691	$736	$840	$149	21.6%
Michigan	$723	$783	$892	$169	23.4%

Table 2-4: Median Gross Rent by Bedrooms

Occupied Units Paying Rent	2015		2020	
Number of Units computed	14,012	91.2%	12,913	93.4%
No Bedroom	1,631	11.6%	1,620	12.5%
1 Bedroom	1,495	10.7%	1,604	12.4%
2 Bedroom	1,715	12.2%	1,538	11.9%
3 Bedroom	1,539	11.0%	1,476	11.4%
4 Bedroom	1,626	11.6%	1,419	11.0%
5+ Bedrooms	6,006	42.9%	5,256	40.7%

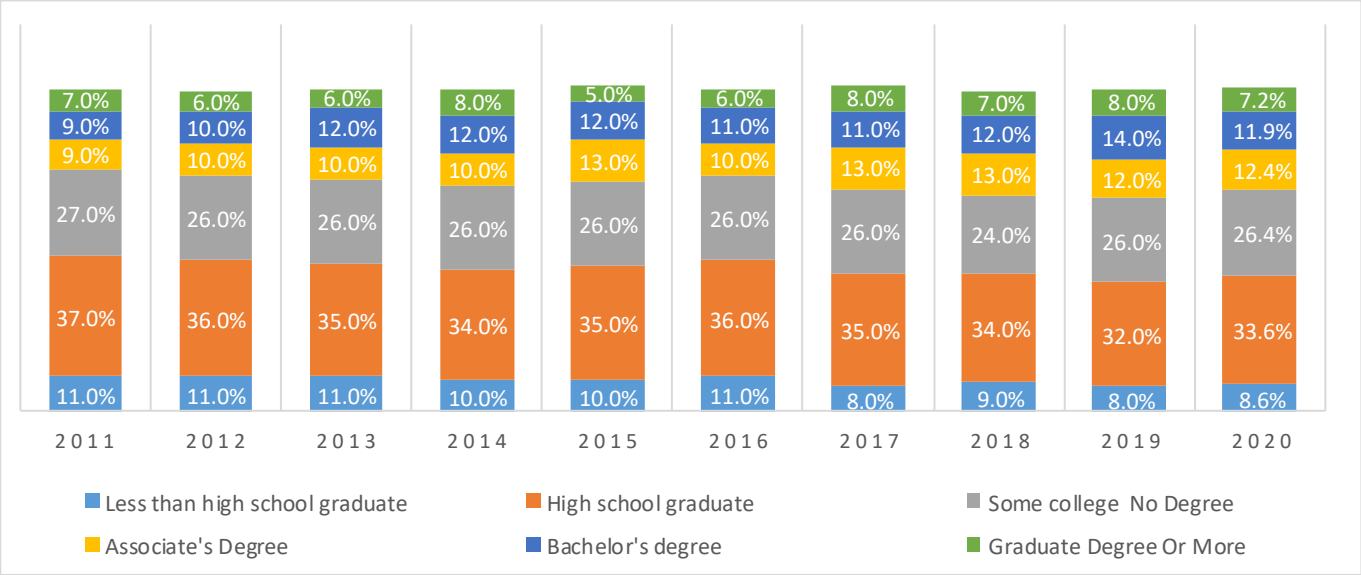
Source: US Census Bureau, American Community Survey 2020 5-Year Estimates.

Owner Occupied Housing Costs

Table 2-5: Selected Monthly Owner Costs, With Mortgage				
Housing units with mortgage	**2015**		**2020**	
Number of Units	31,080	63.7%	30,632	59.1%
Less than $500	505	1.0%	616	2.0%
$500 to $999	9,022	29.0%	7,911	25.8%
$1,000 to $1,499	11,611	37.4%	12,226	39.9%
$1,500 to $1,999	6,128	19.7%	5,866	19.1%
$2,000 to $2,499	2,281	7.3%	2,705	8.8%
$2,500 to $2,999	1,054	3.4%	770	2.5%
$3,000 or more	479	1.5%	538	1.8%
Median (dollars)	**$1,232**		**$1,261**	

Table 2-6: Selected Monthly Owner Costs, No Mortgage				
Housing units without	**2015**		**2020**	
Number of Units	17,703	36.3%	21,213	40.9%
Less than $250	1,544	8.7%	1,340	6.3%
$250 to $399	5,087	28.7%	5,229	24.6%
$400 to $599	7,202	40.7%	8,168	38.5%
$600 to $799	2,735	15.4%	4,213	19.9%
$800 to $999	678	3.8%	1,359	6.4%
$1,000 or more	457	2.6%	904	4.3%
Median (dollars)	**$454**		**$493**	

Source: US Census Bureau, American Community Survey 2020 5-Year Estimates.



Source: U.S. Census Bureau, American Community Survey 2020 5-Year Estimates

EDUCATION

Education refers to formal schooling, either through private academies, public schools, colleges, universities, and technical or trade schools. Knowing the educational level of St. Clair County residents helps determine the educational facilities and training required to meet desired economic growth.

Education Trends

There are three indicators of educational attainment in St. Clair County. The first is the percentage of the population that has not graduated from high school. In 2020, just over 8.5% of the population over 25 years old had not graduated from high school - a number that has remained steady since 2016.

The second indicator is the percentage of persons that have at most a high school diploma or equivalent. Overall, nearly 34% of county residents over the age of 24 have graduated from high school as their highest educational attainment.

The final indicator is the percentage of adults with a bachelor's degree or higher. Overall, the county's figure is 19.1%, which is down 3% from 2019, but similar to the general figures over the last five years.
There is a strong correlation between high incomes and high education levels, and, in general, higher incomes tend to be associated in turn with heightened demand for housing.

The St. Clair County Community College (SC4) University Center is an educational center that houses four-year degree programs and courses offered by several universities. Located in Port Huron, on SC4's campus in the Citizens First Michigan Technical Education Center (M-TEC), the SC4 University Center offers you the convenience of completing a bachelor's or master's degree close to home or online.

Other educational opportunities available at SC4 lead to associate degrees in nearly forty different areas of study (most are considered occupational programs). The college also offers certificate programs in approximately eighteen different areas.

Some county residents also attend classes offered by Macomb Community College or at online schools across the nation.

St. Clair County Workforce

Workforce refers to residents who are 16 years of age or older and able to work, whether employed or unemployed. These are the number of people available to fill jobs. An effective workforce is necessary for economic strength, growth, stability, and competitiveness.

Workforce Trends

Statewide, the workforce actually shrunk in size, with a decrease of 135,000 persons – or nearly 3% - from 2017 to 2021. Within the region the relative size of the workforce decreased in all counties from 2019 to 2021, in part because of the impacts of the COVID-19 pandemic in 2020. St. Clair County's workforce shrunk by 1,816, or 2.4%, from 2017 to 2021. In neighboring Macomb County, the workforce decreased by 1.8% during the same time period.

St. Clair County's labor force includes 74,255 residents, of which 94% were employed in 2021. These labor numbers are on par with the State of Michigan, which also had 94% of its labor force employed that year. As you can see in Table 2-7, the number of employed St. Clair County residents increased between 2020 and 2021 - particularly as the county and region recovered from the impacts of COVID-19 on the economy. However, the 2021 employment numbers were roughly 4% less than pre-COVID employment levels in 2019. Over the past five years, St. Clair County's unemployment rate has been slightly higher than the state as a whole. The county's unemployment rate is closely tied to that of the state and the nation as a whole, both of which saw similar increases in unemployment during the COVID-19 pandemic.

St. Clair County's employment has, for the most part, relied on manufacturing in the past, with a focus on the automotive and plastics industries. Employment trends in the county have followed the patterns of the larger state economy for the last few years.

The level of educational attainment in St. Clair County must increase in order to attract new economy companies to the area. The county can no longer afford to rely on the manufacturing sector to provide jobs, which makes earning a bachelor's degree even more important than ever.

Workforce and education must be aligned with economic development goals. In order to align, there must be an understanding of the requirements of industries in the region. The knowledge, skills and education required by industry in order to successfully compete must also be understood. Educational opportunities must be expanded to meet these needs. Building career pathways requires good information, ongoing assessment and certification of skills, and access to learning opportunities. In order to ensure that individuals have the skills necessary to advance, partnerships with business and education must be built within the workforce development system.

The higher education institutions in St. Clair County are the most important assets the county has in developing the concentration of talent needed to be successful in this knowledge-based economy. St. Clair County residents must heighten their value for instilling the love of learning at a young age. A common pattern seen across the country is that most children from households with college-educated adults attend good K-12 schools, get a four-year degree and then pursue advanced degrees. Ultimately, what St. Clair County needs are schools that prepare students for the changing economy, schools that give students the best chance to take advantage of the many options that the shifting global economy will provide.

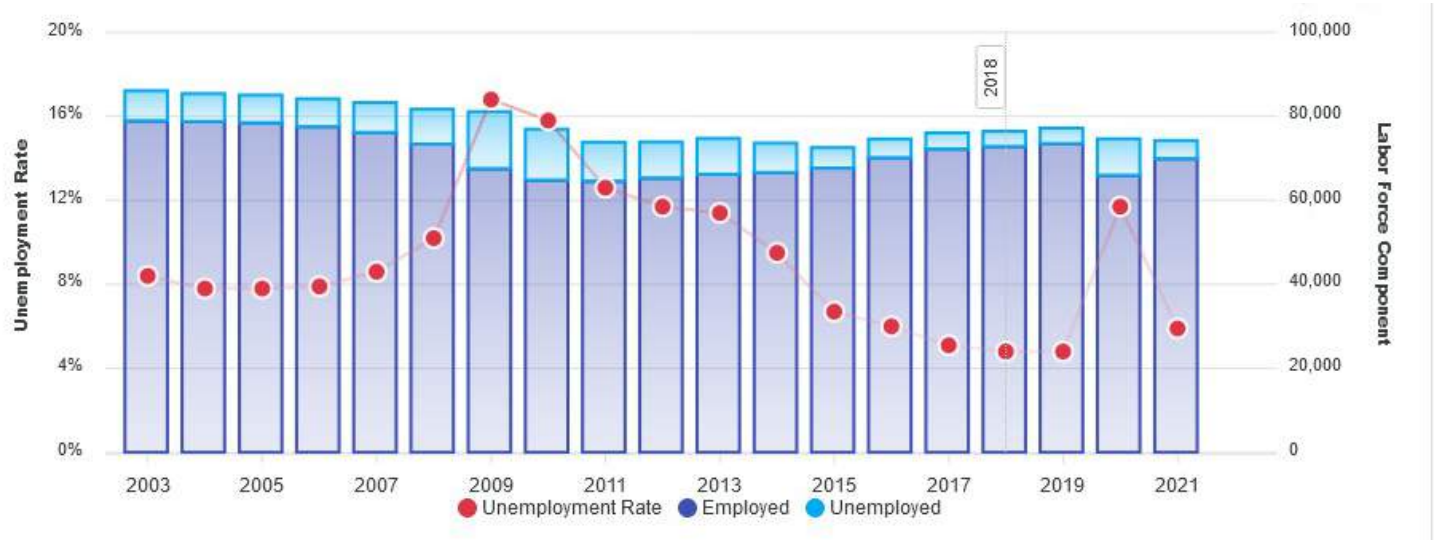
That said, a college education is not the only pathway to a high-wage job. There is also a need for skilled trades within the county and community partners need to ensure there are quality opportunities for students and workers to learn these valuable skills that can lead to a good career.

Table 2-7: St. Clair County Labor Force and Unemployment Rate, 2017-2021					
Year	**Labor Force**	**Employed**	**Unemployed**	**SCC Unemployment Rate**	**State Unemployment Rate**
2021	74,255	69,862	4,393	5.9%	5.9%
2020	74,653	65,913	8,740	11.7%	10.0%
2019	77,195	73,476	3,719	4.8%	4.1%
2018	76,430	72,759	3,671	4.8%	4.2%
2017	76,071	72,179	3,892	5.1%	4.6%

Source: Michigan Bureau of Labor Market Information and Strategic Initiatives, June 2022.

Table 2-8: Civilian Workforce, Southeast Michigan Region, 2017-2021			
	2017	**2019**	**2021**
St. Clair County	76,071	77,195	74,255
Livingston County	102,925	106,042	101,855
Macomb County	447,838	456,825	439,812
Monroe County	76,087	75,772	72,149
Oakland County	673,030	688,661	660,330
Washtenaw County	194,316	198,915	189,511
Wayne County	800,940	817,145	797,703
State of Michigan	4,911,000	4,969,000	4,776,000

Source: Michigan Bureau of Labor Market Information, July 2022.



Source: SEMCOG Economic Trends; Bureau of Labor Statistics Local Area Unemployment Statistics (LAUS) , 2022

Top 10 Largest Employers in St. Clair County, 2022

1) McLaren Port Huron (1,375)
2) SMR Automotive (1,054)
3) St. Clair County (983)
4) ZF Marysville (921)
5) Port Huron Area School District (793)
6) DTE Energy (747)
7) Lake Huron Medical Center (559)
8) Marysville Public Schools(446)
9) East China School District (425)
10) US Farathane (413)

Source: Economic Development Alliance of St. Clair County, 2022

Table 2-9: Business Establishments in St. Clair County

Establishments by Number of Employees	Establishments
All Establishments	3,005
Establishments with less than 5 employees	1,498
Establishments with 5 to 9 employees	654
Establishments with 10 to 19 employees	455
Establishments with 20 to 49 employees	260
Establishments with 50 to 99 employees	73
Establishments with 100 to 249 employees	53
Establishments with 250 to 499 employees	9

Source: County Business Patterns, US Census Bureau, 2020

Employer and Establishment Trends

Employer refers to individual companies, nonprofit organizations, governmental institutions, public institutions, and schools that hire members of the workforce to perform jobs over a period of time. Employer is different than industry, which refers to the type of business, such as automotive or plastics, in which an employer engages.

St. Clair County's top employer is McLaren Port Huron Hospital with 1,375 employees, followed by SMR Automotive, which employs 1,054 workers. St. Clair County government employs 983 workers and ZF Marysville employs 921. Three school districts in the county are among the top 10 largest employers.

According to the U.S. Census Bureau's 2020 County Business Patterns, there were 3,005 business establishments in St. Clair County in 2020. Roughly half of those establishments (49.8%) employed five or less people. Another 37% were establishments with between five and 20 employees.

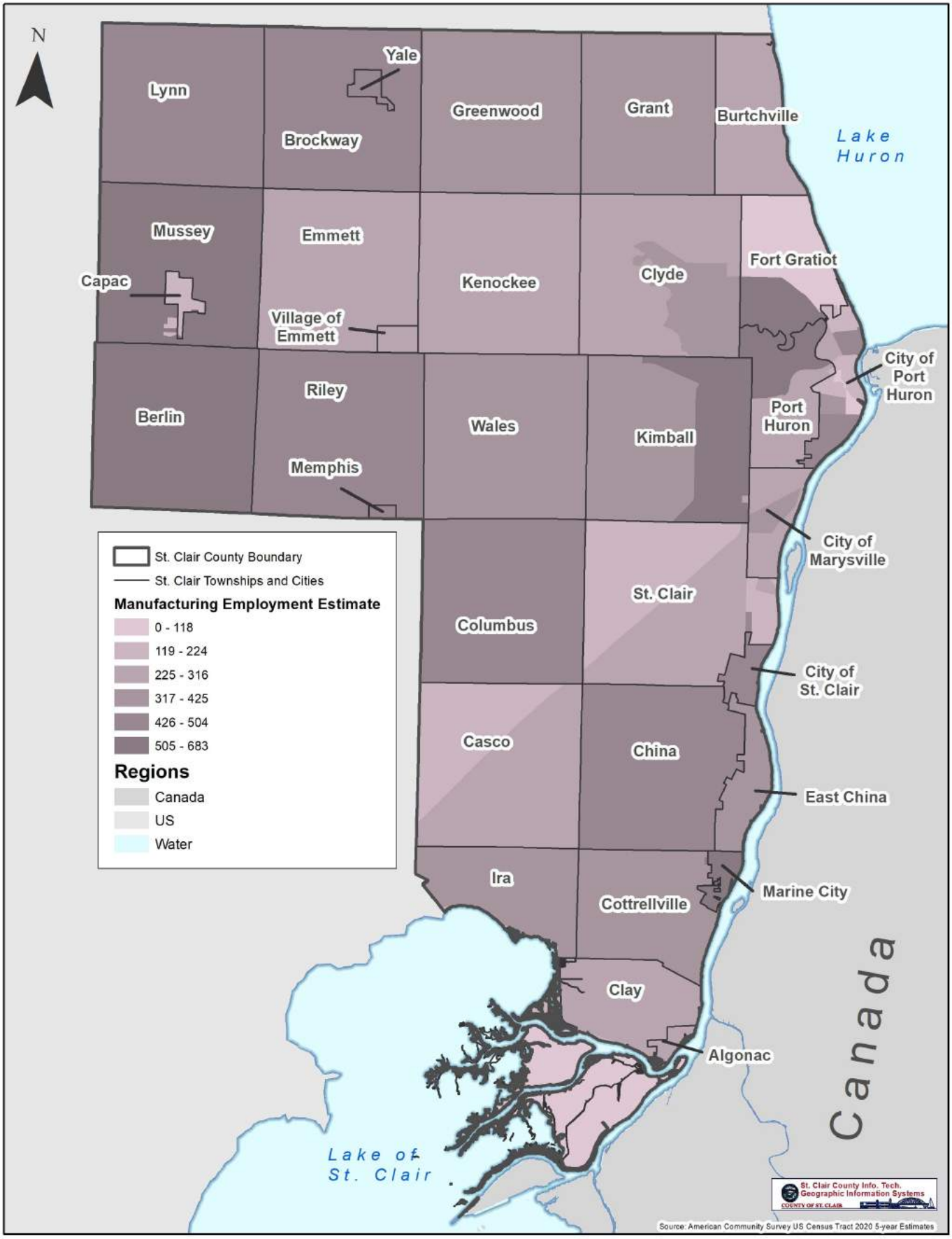
Employment by Industry

As portrayed in Table 2-10, the most prevalent industries in St. Clair County are: Manufacturing, Education, Health Care and Social Assistance, and Retail Trade. Since 2010, the manufacturing industry has been the County's largest employer, followed by the health care and social assistance industry. The health care and social assistance industry has steadily been adding jobs since 2016, resulting in a 2% increase in its employment from 2016 to 2020. The manufacturing and retail sectors have held relatively steady from their 2016 levels, seeing just a 0.01% decline in employment.

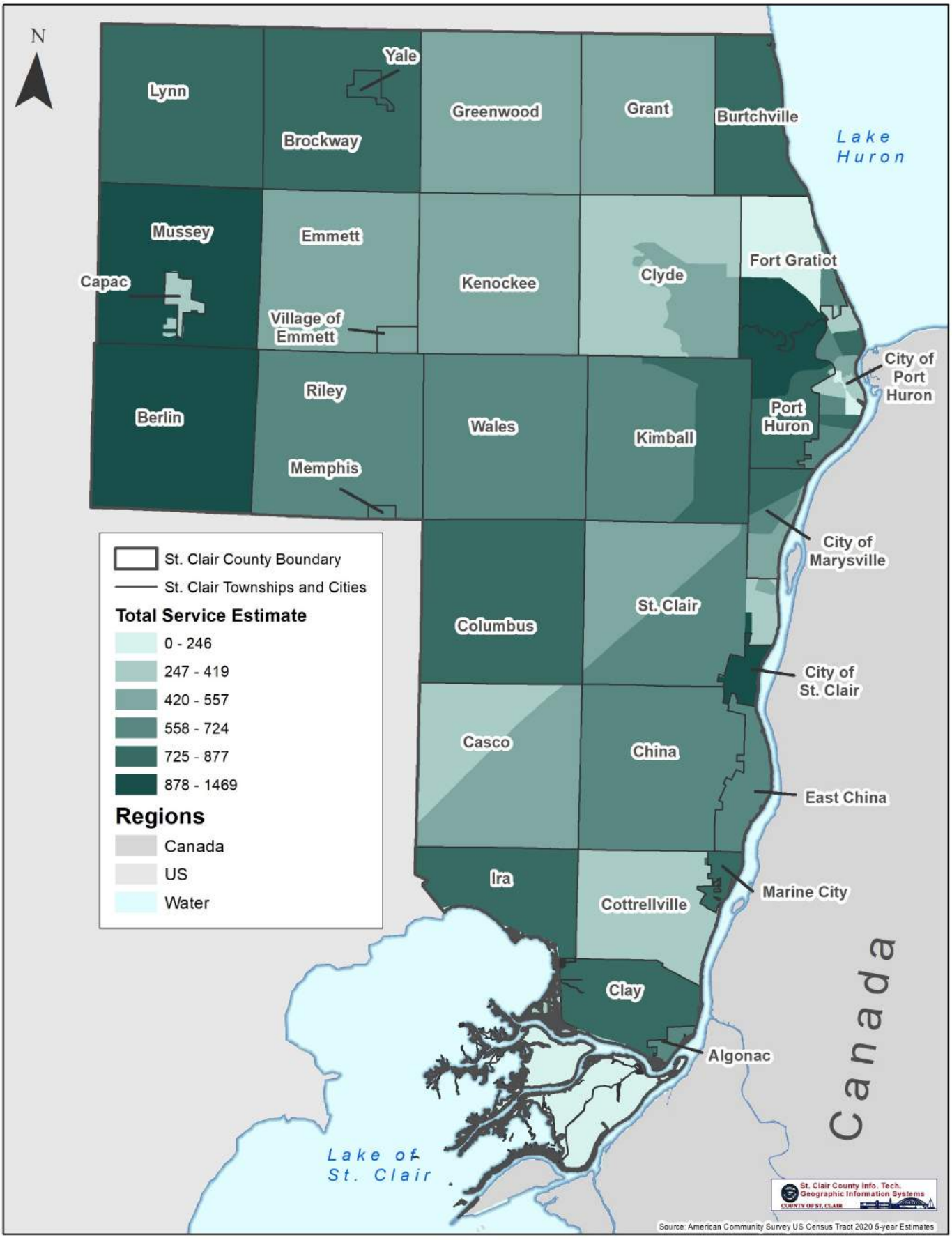
Table 2-10: Employment by Industry (Civilian employed population 16 years and over), 2021		
Industry	**Number Employed**	**% Employed**
Agriculture, forestry, fishing and hunting, and mining	783	1.1%
Construction	5,926	8.1%
Manufacturing	16,197	22.0%
Wholesale trade	1,179	1.6%
Retail trade	8,698	11.8%
Transportation and warehousing, and utilities	3,948	5.4%
Information	815	1.1%
Finance and insurance, and real estate and rental and leasing	2,495	3.4%
Professional, scientific, and management, and administrative and waste management services	5,105	6.9%
Educational services, and health care and social assistance	15,621	21.2%
Arts, entertainment, and recreation, and accommodation and food services	5,684	7.7%
Other services, except public administration	3,451	4.7%
Public administration	3,689	5.0%

Source: US Census Bureau, American Community Survey 2021 5-Year Estimates

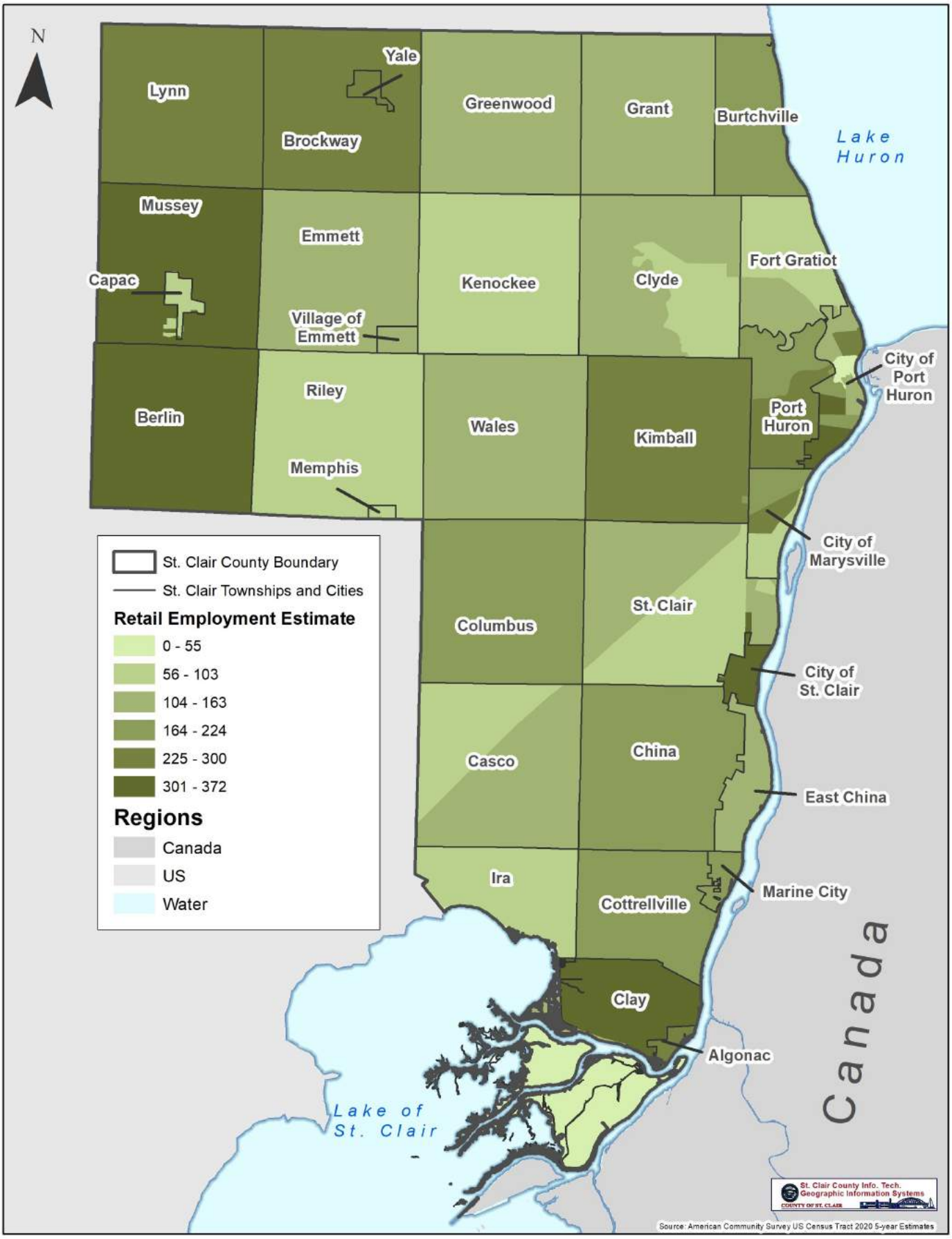
MAP 2-3: MANUFACTURING EMPLOYMENT ESTIMATES, 2021



MAP 2-4: SERVICE SECTOR EMPLOYMENT ESTIMATES, 2021



MAP 2-5: RETAIL EMPLOYMENT ESTIMATES, 2021



Regionally, the automotive industry remains a major employer in Southeast Michigan. The "Big Three" automakers have created a demand for educated and technically skilled workers, many of whom commute from St. Clair County. Because the region is so dependent on the automotive industry, when it struggles, the region's workforce is greatly affected. Economic diversification into knowledge-based and services-based jobs will require a more highly skilled and educated workforce.

Workforce Mobility

Workforce mobility refers to the workforce's ability to commute to work, both within and outside of St. Clair County. A significant portion of St. Clair County's workforce commutes to their jobs outside of the county each day. In 1980, slightly more than 21% of the entire workforce, or 13,600 persons, commuted outside of the county for work. This was balanced against only 2,500 persons coming into the county. By 1990, those commuting out of St. Clair County had increased to 30% or 21,200 persons. Those coming into the county totaled 4,900, significantly more than in 1980.

According to the 2020 American Community Survey, 61.4% of St. Clair County workers that live within the county also work in St. Clair County. The percentage (37.9%) of the workforce that travel to jobs outside St. Clair County is higher than the state average (23.6%) of people who work outside their home county. Throughout Michigan, roughly 72.8% of the workforce work in their county of residence. Most of the St. Clair County residents who are leaving the county to work are commuting to jobs in Macomb, Oakland, and Wayne counties.

Residents of St. Clair County tend to leave for work earlier than the state average, which means that the morning peak hours are earlier than in most counties. Therefore, roads are generally more congested in the morning rush hours than in the evening return home hours.

For residents who work within the county, the amount of time it takes to get to work is less than the state average. This is due to the relative compactness of employment centers in Port Huron, Marysville, and St. Clair.

Table 2-11: Where County Residents Work, 2016

Where Residents Work	Workers	Percent
St. Clair County	43,280	62.5%
Macomb County	16,245	23.5%
Oakland County	3,600	5.2%
Wayne County	3,155	4.6%
Out of Region, Instate	2,163	3.1%
Out of State	606	0.9%
Washtenaw County	55	0.1%
Monroe County	50	0.1%
Livingston County	40	0.1%

Source: U.S. Census Bureau, 2012-2016 CTPP/ACS Commuting Data, SEMCOG, June 2022

Table 2-12: Travel Time to Work, St. Clair County Residents, 2020

Travel Time	Percent of Workers
< 10 Minutes	15.2%
10 to 14 Minutes	13.8%
15 to 19 Minutes	13.4%
20 to 24 Minutes	9.1%
25 to 29 Minutes	5.2%
30 to 34 Minutes	10.4%
35 to 44 Minutes	7.6%
45 to 59 Minutes	11.4%
1 Hour or More	13.9%

Source: 2020 American Community Survey 5-Year Estimates, U.S. Census Bureau.

Metropolitan areas with high job compactness have lower commuting times because it is difficult to design a high-speed transportation network for dispersed jobs. Nearly 45% of the workers who live in the county and do not work at home, travel twenty minutes or less to get to work.

Over 67% of residents travel one-half hour or less to get to work and over 83% commute alone to work, compared to nearly 75% of Michigan residents who commute alone to work. Urban sprawl is contributing to longer commute times and increasingly congested road networks. This is attributed to a large number of users trying to utilize the same transportation network in dense areas, slowing everyone down. However, sprawl is not the only cause of congestion. Commuters in rural, low-density communities have more empty space to traverse to reach their destinations. The Texas Transportation Institute estimates the cost of congestion to be around $63 billion from time delay and wasted fuel.

Roughly 94% of St. Clair County workers commute via private automobile. This is comparable to the state average. Just over 10% carpool, most of these with only one other person.

Workforce Mobility Projections

Commuting within St. Clair County will likely increase as centers of population increase in the southern and western parts of the County, while centers of employment remain mostly unchanged except for a slight shift southward. In 2045, St. Clair County's population is projected to be concentrated in Port Huron, Marysville, and the townships of Fort Gratiot, Kimball, Port Huron, and Clay. In contrast, the employment centers will be in Port Huron, St. Clair, Marysville and the townships of China, East China, and Ira. Lack of public transportation between these residential and employment areas may make it difficult for some residents to access jobs that are available.

Inter-county commuting is likely to increase as well due to a sagging economy and the transition from a manufacturing-based economy to a service-based economy. Large centers of employment will continue to exist in Macomb, Oakland, and Wayne Counties, while St. Clair County residents will be among those competing for available jobs in those areas. Additionally, an increasing number of county residents will work remotely from their homes in St. Clair County, regardless of where their employer is located.

Workforce Issues

Expansion of the county's workforce is an issue that has been of considerable concern to many during this planning process. The presence of this issue is likely based on several factors, the actual size of the workforce, the quality of the individuals that are available, and the aging population.

This first factor, the number of persons in the workforce, becomes a very important issue when unemployment rates hit the lows that they have. During boom times there are plenty of opportunities for work as manufacturers attempt to keep up with market demands for their products. At the same time, support industries such as the service and retail sectors also feel the need for employees as consumers have money to spend. A shortage of employees will lead to competition for the few persons that are available.

The second factor that likely drives this concern for an expanded workforce is the quality and ability of the workforce. Local employers tell many stories of employees that are hired and within a very short period of time they are gone. Many employers struggle with poorly motivated employees, those lacking commitment, and an unskilled workforce to pull from.

Lastly, as the population in St. Clair County continues to get older, an increasing number of workers are reaching retirement age and are ready to leave the workforce. This creates a need for employers to find people to replace retiring workers or requires people to continue working even though they are eligible to retire.

Impacts of Remote Work

Remote work is also impacting the workforce and the economy. On the one hand, employers that offer remote work options can potentially cast a wider net to find employees who do not need to live near the work place. That also benefits the employee, who is able to choose where they want to live based on quality of life issues instead of simply being close to their job. In a Harvard Business School survey during the COVID-19 pandemic in 2021, 81% of the respondents said they either didn't want to go back to the office or would prefer a hybrid schedule going forward. Further, 27% hoped to work remotely full-time and 61% preferred to work 2-3 days a week from home. For companies looking to fill positions, offering remote work is an additional incentive that may mean the difference between filling those positions or not.

According to the Joint Center for Housing Studies of Harvard University:

> *"In a future less tethered by the job-housing link there is a strong possibility that neighborhood amenities could play a larger role in housing choices beyond simply cities vs. suburbs. While increased mobility may open up new neighborhoods and opportunities to some, it could also further neighborhood inequality between amenity-rich and distressed neighborhoods and household inequalities between those who can work from home and those who can't. Therefore, as we prepare for the impacts of increased working from home on mobility and neighborhood change, we must be sure to consider both the areas in which to expect newfound growth and demand, but also the neighborhoods and households at risk of being left behind."*

From an urban planning, economic development and public policy standpoint, communities are increasingly focusing on broadband access and availability, shared co-working spaces, and better recreational amenities to accommodate remote workers. According to Pew Charitable Trusts, the shift to remote work is also depressing commercial property values and reducing property tax revenues for communities, as there is less demand for office space.

Impact of COVID on Childcare Programs

According to a September 2022 article in the Detroit Free Press, Michigan lost 637 childcare programs since the beginning of the COVID-19 pandemic, which was a 7% reduction. Many childcare providers opted to shut down during the pandemic, as navigating challenges posed by COVID became difficult as many parents were forced to or chose to work remotely.

Photo by Chris Montgomery on Unsplash.com

St. Clair County had 118 licensed childcare providers in 2019 according to RESA, with over 9,500 children between newborn and five years old in need of care and space for only 3,008. In 2022, the number of providers drastically decreased to about 70 providers. According to RESA, St. Clair County is considered a "childcare desert" and there are three children eligible for every opening in a childcare program.

There are a number of state grant programs that have been implemented to help people open or reopen licensed facilities, train staff, pay salaries, and purchase equipment. In 2022, the Metropolitan Planning Commission joined a regional coalition applying for a Child Care Regional Planning Grant through the State of Michigan. Partners include representatives from St. Clair, Lapeer, Genesee, and Shiawassee Counties.

Planning for Future Industrial Growth

Economic development officials in the county note that there is a lack of "development ready" land that could be used to attract new industrial development or for existing industrial development to expand. As local, regional, and state agencies work to attract companies to the county and to the state to create jobs and expand the tax base, there is a concerted focus on finding appropriate sites to accommodate such growth.

In St. Clair County, the lack of suitable land to accommodate larger industrial investment will require communities to work collaboratively to assemble the land necessary to attract potential projects. This will also require communities within St. Clair County to ensure their master plans and zoning ordinances are proactive and clear about local goals and land use policies as it pertains to future land use and industrial development. Communities will need to find a balance between protecting rural character and identifying appropriate and desirable locations for new development or employment centers. Finding that balance will require community engagement on future land use and assessing existing infrastructure capacities and carefully planning for new infrastructure in accordance with local master plans and other local policies.

Brownfield Redevelopment

Brownfields are abandoned, idle, or under-used industrial and commercial properties, often in urban areas, where expansion or redevelopment is hindered or complicated by real or perceived environmental conditions. Many areas across the country that were once used for industrial and commercial purposes have been abandoned or are underused for their location - some are also contaminated. Brownfield problems are not limited to large cities with long histories of heavy industry and large-scale manufacturing activity. Small towns and villages in Michigan also have properties suspected of contamination, or old buildings which have become eyesores in need of demolition. Brownfields present challenges to potential developers, whether contamination is discovered or suspected.

At first thought, most people associate "brownfield" sites with environmentally contaminated property. Federally (and in Michigan), that is one definition; however, in Michigan, properties that are "blighted," "functionally obsolete" or a "historic resource" are also considered to be included in the definition of a "brownfield." It is important to understand this distinction since many properties that a municipal official may get complaints about may not be contaminated, but are likely just downright ugly and falling down but may qualify as a brownfield site.

St. Clair County's Brownfield Redevelopment Program

In May of 2005, the St. Clair County Board of Commissioners established the St. Clair County Brownfield Redevelopment Authority (SCCBRA) to assist in the revitalization of contaminated, blighted and functionally obsolete properties throughout the county. In 2010, the SCCBRA was awarded a $1,000,000 Brownfield Coalition Assessment Grant from the U.S. Environmental Protection Agency and in 2017, they were awarded a $400,000 grant. With these funds, the SCCBRA has partnered on various brownfield assessment activities including:

- Phase I and II Environmental Site Assessments
- Soil and Groundwater Sampling
- Lead and Asbestos Surveys
- Baseline Environmental Assessments
- Due Care Plans
- Brownfield Plans, Cleanup Planning, and activities required to pursue additional Brownfield resources.

The St. Clair County Brownfield Redevelopment Program continues to bring together local, state, regional and federal agencies with private sector, non-profit and community organizations to improve the quality of life for residents throughout St. Clair County. They do this by continuing to provide communities and developers of brownfields with:

- Liability protection
- Opportunities for reimbursement of environmental expenditures
- Opportunities for grants and low-cost loans
- Reimbursement of demolition, asbestos/lead abatement costs and cleanup activities.
- Infrastructure improvements and site preparation activities in the cities of Marine City and Port Huron, which are both designated Core Communities by the State of Michigan. In June of 2000, the State of Michigan initiated an effort to spur private development in its urban communities and traditional centers of commerce. The incentives, unique to core communities, target critical needs of older communities through new housing development, redevelopment of obsolete facilities and development of contaminated properties.

St. Clair County Land Bank

The St. Clair County Land Bank Authority (SCCLBA) was established in 2009 with an intergovernmental agreement with the Michigan Land Bank Fast Track Authority. The SCCLBA is a separate legal entity and public body corporate which administers and executes the purposes and objectives of the Agreement.

The SCCLBA was part of a wave of land banks that formed across the State of Michigan in the wake of the housing crisis that hit Midwestern cities particularly hard. St. Clair County was facing a mounting problem of vacant and blighted parcels that were a drag on the resources of local government, who were not equipped to transform blighted spaces. Before land banks came into popular use in Michigan, houses in challenged neighborhoods would undergo tax foreclosure, were put up for auction and were often purchased by speculators who didn't invest in fixing up the properties. Many of these properties would then cycle back through the foreclosure process in a few years in even worse condition than they started. The SCCLBA stepped into this gap, pulling together the expertise and resources to deal with blighted properties and breaking the cycle of decline and blight seen throughout St. Clair County's struggling neighborhoods.

What is a Land Bank?

A land bank is a public authority created to efficiently acquire, hold manage and develop tax-foreclosed property, as well as other vacant, blighted, obsolete and abandoned properties.

What is the problem?

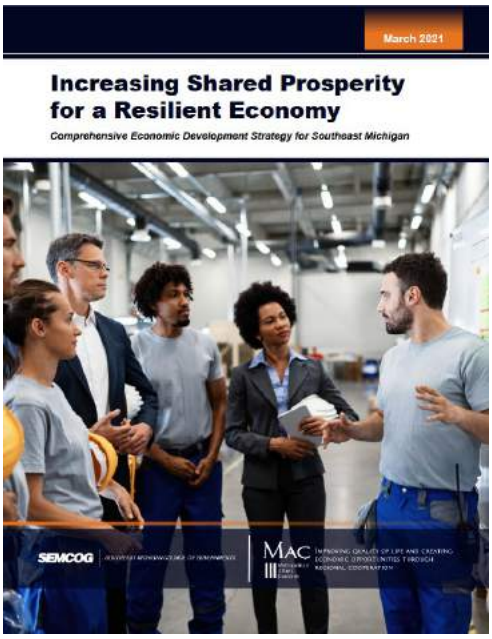
Past changes to Michigan's tax foreclosure laws were helpful, but the Land Bank concept provides the following solutions:

- Eliminates the loss of local control common to property sales at tax auctions
- Minimizes contagious blight
- Eliminates low-end speculation
- Increases land sale proceeds resulting from higher property value

Mission Statement

The Mission of the SCCLBA is to address mortgage and tax foreclosed properties, eliminate blight, and preserve neighborhoods through strategic acquisition and disposition of abandoned and underutilized properties in collaboration with local stakeholders to ultimately add value to the community.

SEMCOG'S "INCREASING SHARED PROSPERITY FOR A RESILIENT ECONOMY"



The Southeast Michigan Council of Governments (SEMCOG), and the Metropolitan Affairs Coalition (MAC) developed *Increasing Shared Prosperity for a Resilient Economy* in March 2021 with the guidance and support of a regional Economic Development Strategy Task Force. Leaders from government, business, economic development, education, workforce, labor, nonprofit, as well as other stakeholders and advocacy groups across the region participated. This public/private sector collaboration identified, planned, and facilitated the policies and actions contained in this document to produce a dynamic strategy that evolves to reflect the region's current and future needs.

No single organization can advance all of the strategies and policies in Increasing Shared Prosperity. Many organizations – government, business, education, nonprofit, and other stakeholders – will each play their own roles in advancing six interrelated strategies that underlie the three pillars of Place, Business, and Talent. These strategies are supported by 22 policies and 99 actions. They were developed through the lenses of Health, Diversity, Equity, and Inclusion. The six interrelated strategies are shown in the figure below.

BLUE MEETS GREEN

In 2009, at the very first meeting of what became the Blue Meets Green (BMG) campaign, 150 residents of St. Clair County gathered to form the Economic Development Strategic Plan (EDSP) for our region. In time, the EDSP transformed into the Blue Meets Green collaborative, and is led by the 40-person Leadership Council.

Since its inception, the public, private and non-profit sectors have collaborated to stimulate economic growth and prosperity. About every two years, the Leadership Council begins the process to update the Blue Meets Green Strategic Plan by hosting a planning retreat with community stakeholders. Blue Meets Green's goals are focused on Place, People, and Prosperity.

MISSION

Develop the Blue Water Region into a prosperous, sustainable economic environment through the united effort and commitment of the private, nonprofit and public sectors.

KEY AREAS OF FOCUS

- Population Growth
- Career Pathway Exploration & Readiness
- Small Business & Entrepreneurs
- Downtowns
- Housing & Neighborhoods
- Tourism
- Waterfront Development
- Workforce Development
- Healthy Communities
- Broadband Access

Place

- Promote and enhance quality of life
- Grow neighborhoods and downtowns
- Leverage our close proximity to metro Detroit in marketing, awareness and PR campaigns

People

- Develop an outstanding business workforce aligned with the business development goals of the Blue Water Region
- Support a career and college readiness system and initiatives that bolster talent development and attraction
- Promote equitable growth that provides all residents with the same opportunities to reach their full potential

Prosperity

- Retain, strengthen, and support existing businesses, including small business
- Encourage economic diversity
- Foster entrepreneurship and innovation
- Promote cultural diversity, inclusion, and sustainable populations

Tourism and Promotion: Discover the Blue

The Blue Water Area Convention and Visitors Bureau (BWACVB) is the organization that promotes tourism for the Thumb area of Michigan, including communities in St. Clair, Sanilac, and Huron counties. *"Discover the Blue"* is a marketing campaign that was established in 2009 to highlight the Blue Water Area as a tourism destination - one of Michigan's great PLACES to visit.

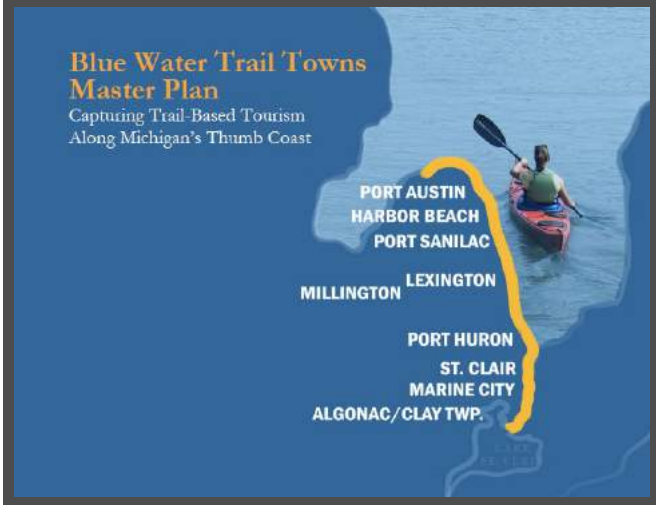
Nine communities participate in the Discover the Blue campaign: Clay/Algonac, Marine City, St. Clair, Marysville, Port Huron, Lexington, Port Sanilac, Harbor Beach, and Port Austin. BWACVB maintains a website (www.bluewater.org) that highlights each of these communities and informs visitors about things they can do and see while visiting. The marketing campaign continues to be a huge success and is now directly connected to the state's "*Pure Michigan*" tourism campaign that is considered to be the best state-run tourism marketing campaign in the nation.

The Discover the Blue website includes short videos highlighting the best of what each community has to offer. Additionally, it includes a photo gallery that allows potential visitors to "virtually visit" a community before actually going there.

The Discover the Blue program is one tool that participating communities have to help market the community and bolster placemaking efforts. As long as it is financially feasible, communities should continue to participate in the campaign.

Source: Blue Water Area Convention and Visitors Bureau. Residents and tourists gather for the Algonac Rotary Art Fair.

PLACEMAKING IN SCC: BLUE WATER TRAIL TOWNS



One of the most important drivers of economic development in the Blue Water Area is tourism. Many communities throughout the Thumb are working to increase their share of visitation by enhancing local attractions and amenities, or placemaking. Central to these efforts is an emphasis on the region's extensive blueways and greenways trail systems. According to the American Trails organization, "a trail can bring at least one million dollars annually to a community, depending on how well the town embraces the trail."

In 2013, the St. Clair County Metropolitan Planning Commission (MPC), along with regional partners in the Thumb and the Land Information Access Association (LIAA), kicked off a project to help local communities build on existing bike trail and water trail assets by developing a comprehensive "Blue Water Trail Towns Master Plan." The Trail Towns approach identifies trails as the focal point of a tourism-based strategy for economic development and revitalization. The Blue Water Trail Towns Master Plan provides community leaders and business owners with detailed guidance on ways to capitalize on greenways and blueway connections for a more vibrant tourist trade.

Economic Goals

The economic goals desired by St. Clair County residents are:

1. Provide leadership to pursue countywide economic goals and, thus, provide sustained and stable economic growth.
2. Use existing and emerging technologies to develop a sustainable economy countywide.
3. Ensure all county residents have access to quality education, job training, and skills development.
4. Re-use and redevelop vacant, blighted, and underutilized sites and properties.
5. Preserve agriculture as an economic component.
6. Encourage and assist people and agencies to provide quality, affordable housing opportunities for all income groups.
7. Preserve historical and cultural centers as economic drivers.
8. Promote and participate in focused placemaking efforts and tourism initiatives.
9. Plan and think regionally.

Master Plan Guiding Principles
The Economy

ECONOMIC PROSPERITY
St. Clair County will continue to nurture and enhance the well-being of the region through the promotion of a resilient economy. Revitalizing the county's economy refers to the overall strategies necessary to promote, increase, and support sustainable economic development. This includes fostering entrepreneurial growth, facilitating industrial development, revitalizing our downtowns, and creating high-skill, high-wage jobs.

SUSTAINABILITY AND RESILIENCY
Communities with a healthy and diverse economy have the ability to bounce back faster than unhealthy ones because they have faster population, job and income growth. Resiliency allows communities to be nimble and adapt to sudden changes in the economy or environment and often has a positive impact on fiscal resources.

QUALITY OF LIFE
Economic stability within a community allows people the ability to access resources essential to life, including financial resources, affordable housing, food, quality education, and a job providing a stable, living wage.

GREAT PLACES
Placemaking efforts add value to a community by utilizing a local community's unique assets, history, and character. Placemaking has the ability to draw people to a place and benefit the economy by attracting retail opportunities, creating desirable neighborhoods, and providing options for recreation and entertainment.

HEALTHY COMMUNITIES
The health of a population plays an increasingly important role in a community's economic performance. Healthier workers are more likely to show up for and be more productive at work. Those in better physical and mental health are also more likely to engage in education and skills training.

COLLABORATION
Continued collaboration among government, businesses, economic development organizations, nonprofit organizations, and other entities to support local and regional economic development is paramount for success. Economic prosperity requires communities to think regionally and to seek out innovative partnerships to foster growth.

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The Environment 3

Introduction

Environment refers to the physical conditions surrounding an individual or group of individuals living in a certain habitat. Environment can be the out-of-doors over a vast, far-reaching geographic area, or it can be conditions within a single room, dwelling, or office cubicle. Environmental conditions can either occur within nature or be created or affected by humans. Therefore, environment is not the same as nature, which refers exclusively to out-of-doors, non-man-made conditions.

Environmental Responsibility

Humans are the Earth's dominant species. We can communicate, use tools, and organize ourselves into clans, tribes, and societies. Because we have these skills, we also have a responsibility to use and preserve the rest of nature wisely.

Preserving the natural environment requires that we:

- Be aware of natural resources, where they come from, how much we're using, if and how they can be replenished, and then strive to use renewable resources.
- Appreciate all other species, including animals, plants, microorganisms – whether we can see them or not – and respect the habitat in which they live.
- Construct our own habitats (houses, dwellings, and commercial/industrial centers) in a manner that blends into the natural conditions of the out-of-door space in which they are constructed.

Environmental Trends

Throughout prehistoric and early historic eras, human societies hunted, gathered, farmed, fished, herded, and sought to understand their place and role within their environment. Early industrial societies made crude tools from natural resources that were readily available to them, primarily stones and animal bones. These tools eventually advanced to a stage of mass production in which vast resources were rapidly consumed and the natural environment was mostly forgotten in favor of manufactured items and conditions. Industrial societies are now transitioning from mass production towards a post-mass production mentality in which service and knowledge-based industries are most prevalent.

Service industries are characterized by care for others – children, elderly, customers, and suppliers. Service-oriented people are also interested in caring for the environment – both the out-of-doors environment, in which

Black River - Grant Township

Belle River - Columbus Township

Mill Creek through Yale City Park

Farmland in Berlin Township

their communities are located, and the indoor environment found within their homes, offices, and places of commerce.

People are realizing after witnessing over-consumption and pollution, we can survive better by caring for and preserving the natural environment in which all species, including humans, exist.

Geology

Geology refers to the physical features and processes that have occurred, or are occurring, in a region of the earth and which result in general subsurface and land surface formations.

More than 570 million years ago during the Precambrian Era, much of the Great Lakes region was a crater-like basin, now called the Michigan Basin. The soils derived from this bedrock are generally acidic and not agriculturally productive.

After the Precambrian Era, however, marine and near-shore sediments - limestone, dolomite, evaporates, sandstone, and shale - were deposited over the bedrock. The soils derived from these marine deposits are typically less acidic loams and clays that contain more nutrients and moisture and are better suited for agriculture.

Salt, oil, and natural gas deposits are also found below the surface in St. Clair County. Mining these subsurface geological resources affects land use activities above the ground.

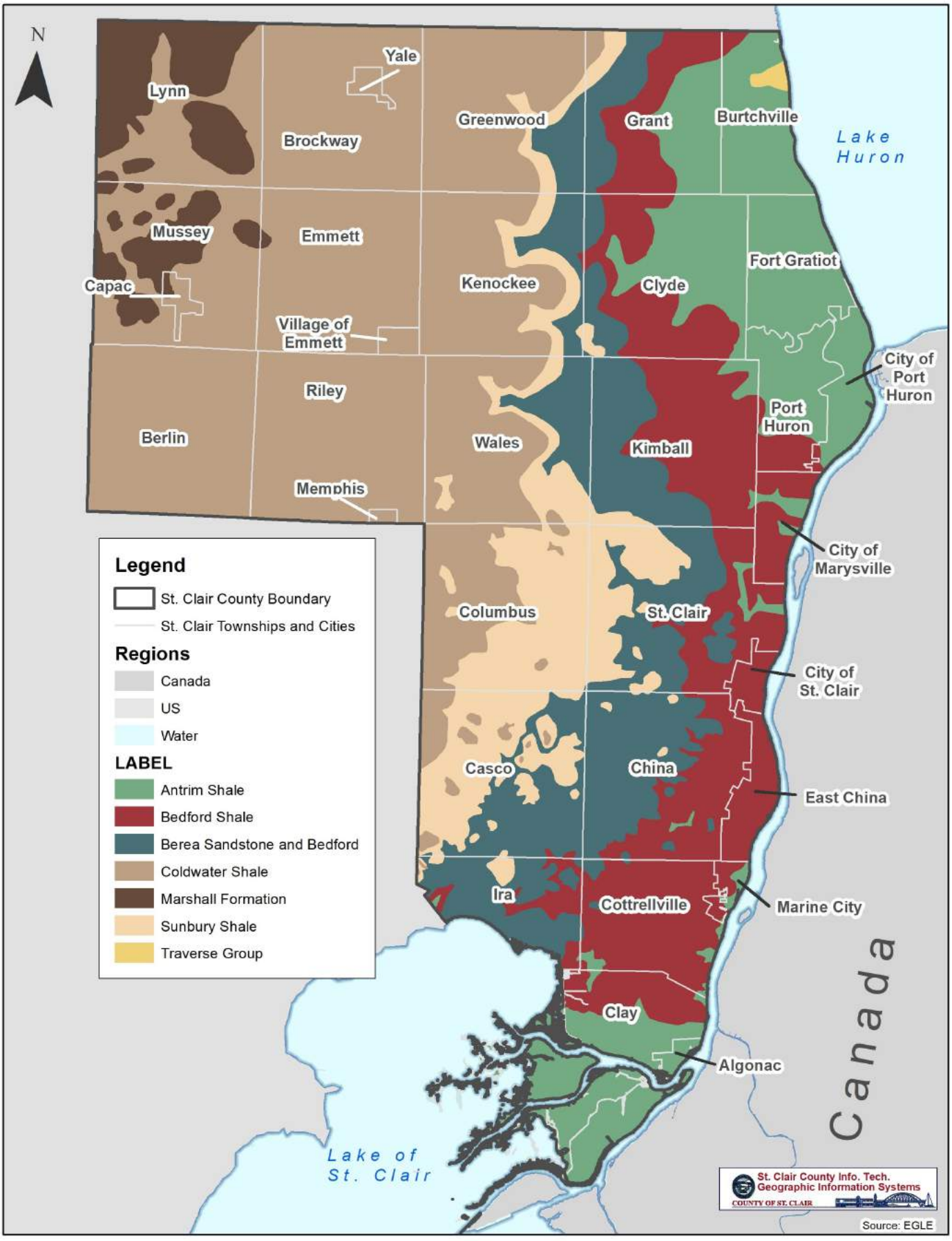
Topography

Topography refers to the elevations, relief features, or surface conditions of a geographic area.

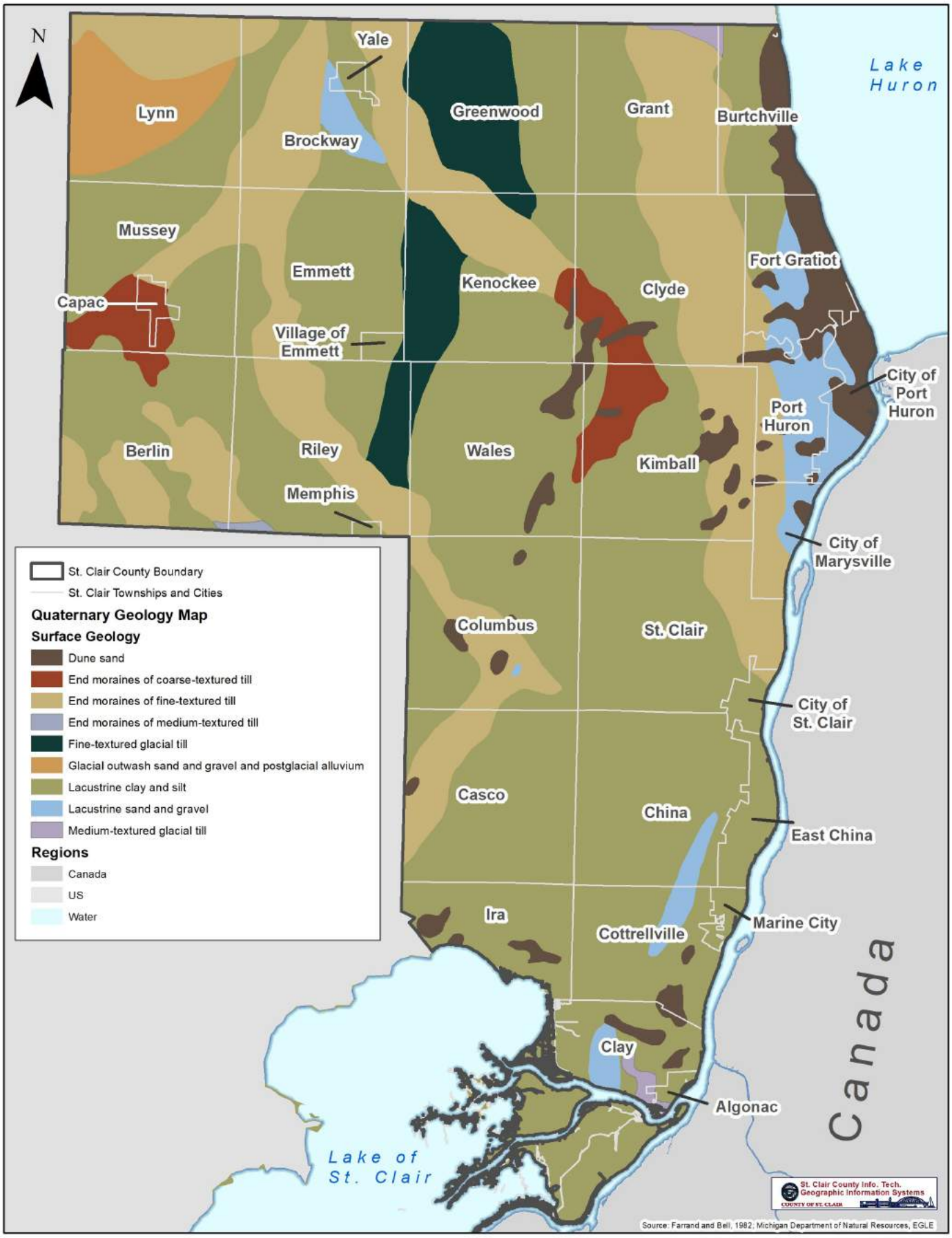
The land surface of the county is a glacial landform known as the Washtenaw-Maumee Lake Plain, consisting primarily of clay soils, along with several one- to three-mile-wide end moraines that have been reshaped by water and runoff. Beach ridges and small sand dunes are common on the sand channels, which are visible from Fort Gratiot Township to St. Clair, running parallel to the shoreline.

Elevations throughout the county range from 580 feet to 800 feet above mean sea level. The highest points are in a glaciated area in the western part of the county, along the Black River in the northern part of the county, and

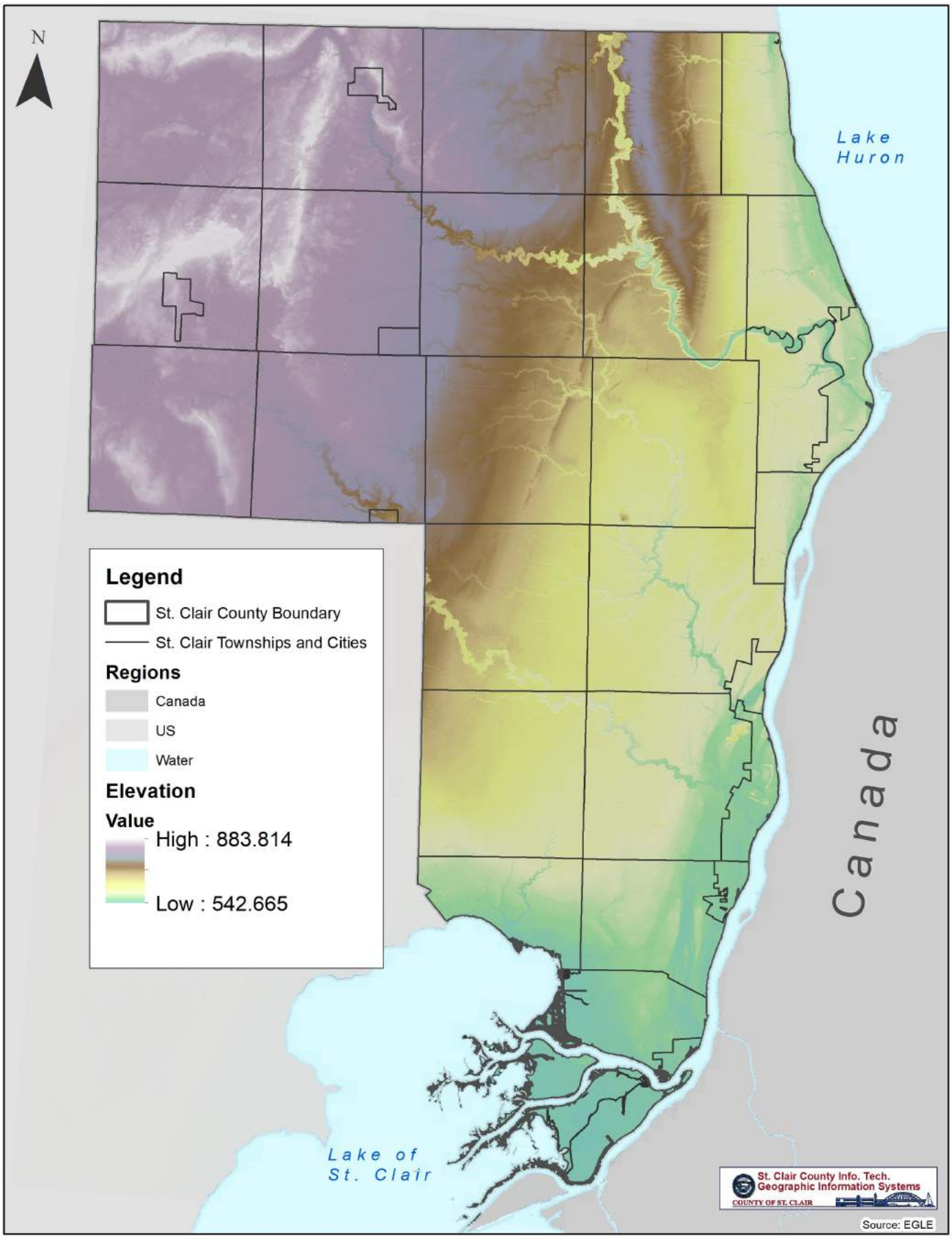
MAP 3-1: BEDROCK GEOLOGY



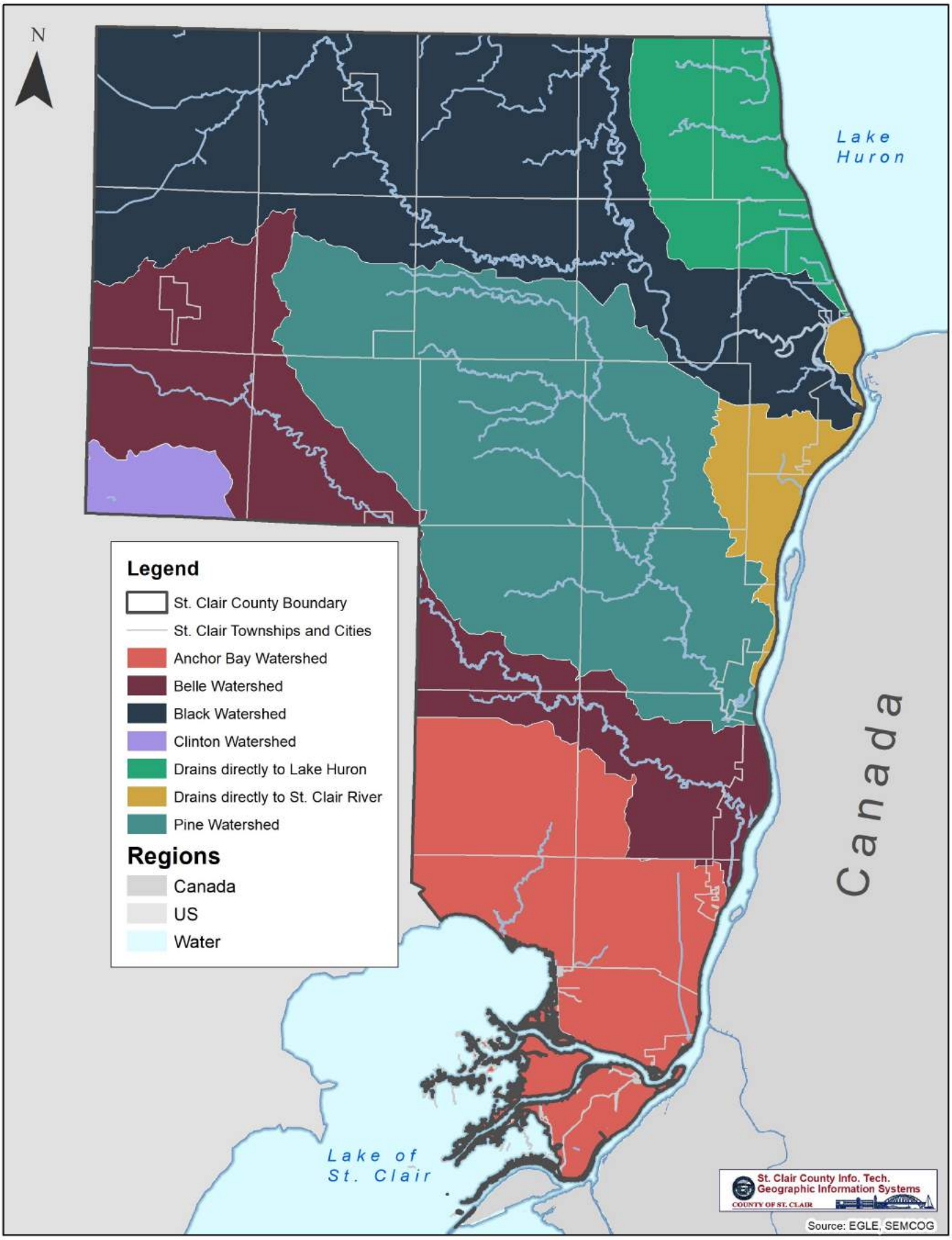
MAP 3-2: SURFACE GEOLOGY



MAP 3-3: ELEVATION IN ST. CLAIR COUNTY



MAP 3-4: MAJOR WATERSHEDS



along Lake Huron and the northern part of the St. Clair River. The lowest part of the county is in the south in an area known as St. Clair Flats, which is within the Lake St. Clair floodplain.

CLIMATE

Climate refers to the weather pattern that can be expected in a geographical region, based on the average weather for a month or season in previous years.

The climate in St. Clair County is the product of latitude, air masses that flow across the land predominantly from west to east, and the county's proximity to Lake Huron.

Weather conditions affect the community's economic base. Variations in average conditions, especially during the summer months, can cause fluctuations in tourism and outdoor recreation activities, upon which the local economy is dependent.

The Great Lakes are a major control factor on the climate for the Midwest; however, St. Clair County is less strongly influenced by climate because of its southeastern location in the State. The most obvious effect of the lakes on the county is the increased percentage of cloudiness in late fall and early winter, when prevailing westerly winds move cold air across the warmer lake water. In addition, the county's southeastern location provides it with five to ten percent more sunshine than those counties at the same latitude on the western side of the State.

Because the day-to-day weather is controlled by the movement of pressure systems across the U.S., the county rarely experiences prolonged periods of hot, humid weather in the summer or extreme cold during the winter. July and August are the warmest months in St. Clair County, with an average bi-monthly temperature of 71° F . In contrast, temperatures average near 23° F in January and February.

The growing season in St. Clair County ranges from 150 to 180 days, with the greater number of days along the shoreline of Lake St. Clair and Lake Huron. The county receives an average of 31 inches of rain annually, primarily during April through September. Average snowfall is 42 inches annually, but this varies considerably from year-to-year. According to the Michigan Department of Natural Resources, in a calendar year, there will be an average of 13 days above 90° F and five days below 0° F.

A beautiful clear day in Algonac. The Great Lakes are a major control factor on the climate for the Midwest.


Woodsong County Park

Watercourses

Watercourse refers to a stream of water, such as a river or creek, the bed of a stream that flows only seasonally, or a natural channel that conveys water. In addition to Lake Huron, six major watercourses flow in, through, or adjacent to St. Clair County.

Lake Huron

Lake Huron is the largest neighboring watercourse. It creates a 12.5-mile shoreline boundary on the northeast corner of the county and is an integral recreational and economic factor. The cities of Detroit (60 miles south), Flint (75 miles west), and 90 other communities pump 400 million gallons of water per day from Lake Huron. The quality of the water, from Lake Huron and the Great Lakes has been, in general, an environmental concern since the mid-1970s due to degradation through urbanization, poor agricultural practices that contaminate tributaries, sedimentation, temperature change and a number of other factors that affect water quality.

St. Clair River

The St. Clair River is 34 miles long and borders most of the east side of St. Clair County. The St. Clair River extends from Lake Huron in the north, from which it receives water at a rate of 194,000 cubic feet per second, to Lake St. Clair to the south, where it empties at a rate of 184,000 cubic feet per second. The city of Port Huron gets its water from the St. Clair River.

Except for a few drains that flow into Lake Huron or Lake St. Clair, the St. Clair River is the receptor of all drainage basins within St. Clair County, and water level fluctuations of two to three feet are common. This fluctuation, plus

Mill Creek in Avoca. Photo courtesy of Katie Stepp, Blue Water Convention and Visitors Bureau.

rapid currents, causes tree mortality, shoreline erosion, and major alterations on the composition and habitat of marshes and wet prairies. Six locations along the St. Clair River, plus one in Lake Huron, are monitored monthly to determine water level fluctuations. Water levels are usually lowest in February, then rise through July, and decline through the rest of the year.

The St. Clair River's predominance of large lake freighters result in enhanced recreational and tourism opportunities, especially in areas such as Algonac State Park and Vantage Point in Port Huron, which provide visitors with prime viewing locations as the freighters drift by.

Shipping has also brought an infestations of non-indigenous aquatic species that are potentially detrimental to the environmental health of the river. The St. Clair River Binational Public Advisory Council (BPAC) is having remarkable success in improving the quality of both water and habitat in and along the river.

Lake St. Clair

Lake St. Clair borders 11 miles on the southern corner of St. Clair County and is a recreational destination for boaters, anglers, and sightseers. The largest fleet of pleasure boats on the Great Lakes is on Lake St. Clair, and about 1/3 of all the fish caught on the Great Lakes are caught there. However, the general public has limited access to the lake.

The largest remaining marshland in the Great Lakes Basin is located at Canada's Walpole Island near Lake St. Clair. Environmental concerns abound in Lake St. Clair, evidenced by beach closings due to bacterial contamination, visible changes in the lake, and changes to lake plants and animal populations.

Black River

The Black River is the major tributary of the St. Clair River. It flows south from the Minden Bog in Sanilac County through Port Huron. Along with its major tributary Mill Creek, the Black River drains almost all of the northern and western parts of St. Clair County.

The river's watershed – 159,930 acres – is the largest in Southeast Michigan and is primarily a broad, flat plain bounded on three sides by hills ranging from 20 to 100 feet high.

According to the Michigan DNR, the river traditionally supported diverse and high-quality fish populations and sport fisheries. At present, fish populations have been degraded in numbers and species due primarily to man-made channelization, siltation, and other poor land management practices. However, significant angling fisheries still exist for smallmouth bass, channel catfish, panfish, and various members of the sucker family.

DNR biological surveys indicate diverse mussel and fish populations; however, sedimentation is a threat. The Black River also provides high quality wildlife habitat along its riparian shoreline.

Pine River

The Pine River is a tributary of the St. Clair River and is the largest watershed – 126,110 acres – contained within St. Clair County. It flows through flat land from the central part of the county and through the city of St. Clair.

Belle River

The Belle River is also a tributary of the St. Clair River. It originates in the west central part of the county, passes a short distance through a corner of Macomb County, then continues southeast through Marine City, draining 83,000 acres of relatively flat land. The largest power generating facility in the county is located near the Belle River across Recor Road.

Clinton River

In addition to the watercourses within St. Clair County, the North Branch of the Clinton River drains 8,600 acres in the southwestern part of the county, even though the river itself does not flow through the county.

St. Clair River Area of Concern (AOC)

The United States-Canada Great Lakes Water Quality Agreement (Annex 2 of the 1987 Protocol) defines AOCs as "geographic areas that fail to meet the general or specific objectives of the agreement where such failure has caused or is likely to cause impairment of beneficial use of the areas ability to support aquatic life." In short, an AOC is an area that is suffering degradation of environmental resources. In 1988, the International Joint Commission identified 43 specific locations in the Great Lakes where action was needed to control and cleanup pollution. The St. Clair River is one of these areas, known as an Area of Concern. The St. Clair River was listed as an Area of Concern because of significant historical pollution problems. Thirty years later, the St. Clair River still remains an Area of Concern.

The St. Clair River branches into several channels near its mouth at Lake St. Clair, creating a broad delta region. The Area of Concern (AOC) includes these important wetlands from St. Johns Marsh on the west (near Anchor Bay) to the north shore of Mitchell's Bay in Ontario.

Agriculture is the predominant land use within the river's watershed, but intensive development has occurred in and near the cities of Port Huron and Sarnia. The heaviest industrial concentration (including a large number of petrochemical facilities) lies along the Ontario shore near Sarnia. Several communities along the St. Clair River rely on the river as their primary source of drinking water, including Algonac. Industrial facilities such as petroleum refineries, manufacturing facilities, paper mills, and power plants need high quality water for successful operations as well.

Friends of the St. Clair River

St. Clair River Beneficial Use Impairment Status

This chart provides the status of Beneficial Use Impairments on both the Canadian and American side of the St. Clair River for the Area of Concern Program

St. Clair River Area of Concern Impairment Status

Beneficial Use Impairment	Status Canada	Status American
Restrictions on Fish and Wildlife Consumption	Impaired	Impaired
Tainting of Fish and Wildlife Flavor	Not Impaired Restored 2011	Not Impaired Restored 2010
Degraded Fish and Wildlife Populations	Requires Further Assessment	Not Impaired
Fish Tumours and other Deformities	Not Impaired Restored 2021	Not Impaired
Bird or Animal Deformities or Other Reproductive Problems	Not Impaired Restored 2018	Not Impaired Restored 2017
Degradation of Benthos	Impaired	Not Impaired Restored 2015
Restrictions on Dredging Activities	Not Impaired Restored 2018	Not Impaired Restored 2011
Eutrophication or Undesirable Algae	Not Impaired	Not Impaired
Restrictions on Drinking Water Consumption or Taste and Odor Problems	Impaired Draft assessment report prepared 2021	Impaired
Beach Closings	Not Impaired Restored 2018	Not Impaired Restored 2016
Degradation of Aesthetics	Not Impaired Restored 2016	Not Impaired Restored 2012
Added Costs to Agriculture or Industry	Not Impaired Restored 2012	Not Impaired Restored 2012
Degradation of Phytoplankton and Zooplankton Populations	Not Impaired	Not Impaired
Loss of Fish and Wildlife Habitat	Impaired	Not Impaired Restored 2017

Learn more at: https://www.epa.gov/great-lakes-aocs/st-clair-river-aoc and at www.scriver.org
Updated August 2021

ST. CLAIR RIVER AREA OF CONCERN

A BINATIONAL SUCCESS STORY

The St. Clair River provides approximately 64 kilometers (40 miles) of fish and wildlife habitat, is a popular destination for recreational swimming and boating, and is an important resource for local food and water supply. Together with Lake St. Clair and the Detroit River, it forms a connecting channel between Lake Huron and Lake Erie, making it a key shipping channel in the Great Lakes Seaway system.

Much of the shoreline on both sides of the St. Clair River has been urbanized and industrialized, altering the natural environment over time. Significant effort has been made since the late 1980's to restore and replace natural features on both sides of the river to improve water quality and restore fish and wildlife habitat in the St. Clair River.

A. Port Huron North Shoreline
B. Port Huron South Shoreline
C. Blue Water River Walk
D. St. Clair County Parks Wetland
E. Marysville Living Shoreline
F. Cuttle Creek Habitat Restoration
G. Hart's Light Reef
H. Cottrellville Township Shoreline Restoration
I. Marine City Drain Habitat Restoration
J. Pointe Aux Chenes Reef
K. Krispin Blueway Restoration
L. Middle Channel Reef
M. Talfourd Creek Enhancement
N. Dow Wetlands
O. Guthrie Park Shoreline Restoration
P. Bickford Oak Woods
Q. Bowen's Creek Habitat Creation
R. Terra Nitrogen Habitat Creation
S. Branton Cundick Park
T. Swan Lake Marsh
U. Griffore Coastal Wetland
V. Mitchell's Bay Habitat Restoration

Blue Water River Walk

Nearly 1 mile (1.6 Km) of shoreline was naturalized and off-shore shallow water habitat created with boulders. Native shrubs and wildflowers are critical to this habitat project because they provide food and cover for fish and wildlife and offer protection for the shoreline. A 1 mile (1.6 Km) paved path and two beaches provide public access to the river in this urban landscape.

Marysville Living Shoreline

This project removed 1,800 feet (549 m) of steel seawall and added rock, a boardwalk, and shallow-water spawning beds. The naturalized shoreline is providing habitat for fish, while wetland and native vegetation benefit wildlife. Plantings create a transitional area between the deep waters of the St. Clair River and the upland shoreline.

Krispin Blueway Restoration

The Krispin Blueway, St. Clair County's newest paddling route, runs the length of Harsens Island and empties into Lake St. Clair. Decades of sedimentation and invasive species had severely degraded the habitat of this water course. Restoration included 3 miles (4.82 km) of dredging to re-shape the waterway, Phragmites removal, and establishment of native plants in the water and shoreline.

Guthrie Park & Mission Park Shoreline Restoration

At Guthrie and Mission Parks, failing steel wall was replaced with large armour stone that was 'stepped' down into the water, providing hiding and resting places for fish. The completion of these projects resulted in approximately 1 kilometer (0.62 miles) of naturalized shoreline, combined.

Bowen's Creek Habitat Creation

At Bowen's Creek, a retired agricultural field was converted into a 12 hectares (30 acres) wetland with 5 hectares (12 acres) of prairie, and over 50,000 trees planted. This project created a total of 24 hectares (60 acres) of valuable wildlife habitat adjacent to the St. Clair River.

Mitchell's Bay Habitat Restoration

Significant wetland alteration and loss has occurred in the Mitchell's Bay area. Through partnerships with landowners along the eastern shore of Mitchell's Bay and Walpole Island First Nation, a total 217 hectares (420 acres) of wetland habitat was created or restored.

FOR MORE INFORMATION, PLEASE VISIT
www.scriver.org

FOR MORE INFORMATION, PLEASE VISIT
www.friendsofstclair.ca

According to the Friends of the St. Clair River, each Great Lake and their rivers have 14 protected beneficial uses by the U.S. and Canadian governments. The St. Clair River had ten impaired Beneficial Uses, but through almost three decades of collaborative efforts, conditions in the St. Clair River are improving.

In recent years, significant progress has been made to clean up the St. Clair River and remove beneficial use impairments. As of August 2021, only five beneficial use impairments remained. See the graphics from Friends of the St. Clair River on the previous pages.

Floodplains

Floodplain refers to a nearly flat plain along the course of a stream or river or around a lake that is naturally subject to flooding. When flooded, floodplains serve as a natural retention area for floodwaters and, thus, reduce the danger of vast amounts of water moving too rapidly downstream.

The 100-year flood describes a flood that has a 1% chance of hitting an area in any given year. An area that has a 1% chance of flood is on the 100-year floodplain. 100-year floodplains exist in St. Clair County along the lower portions of the Black, Pine, and Belle Rivers and along numerous creeks and drains.

A 500-year flood is something that has a 1-in-500 chance of happening in any given year.

Wetlands

According to the federal Wetland Protection Act of 1979, wetland refers to "land characterized by the presence of water at a frequency and duration sufficient to support - and under normal circumstances does support - wetland vegetation or aquatic life and is commonly referred to as a bog, swamp or marsh."

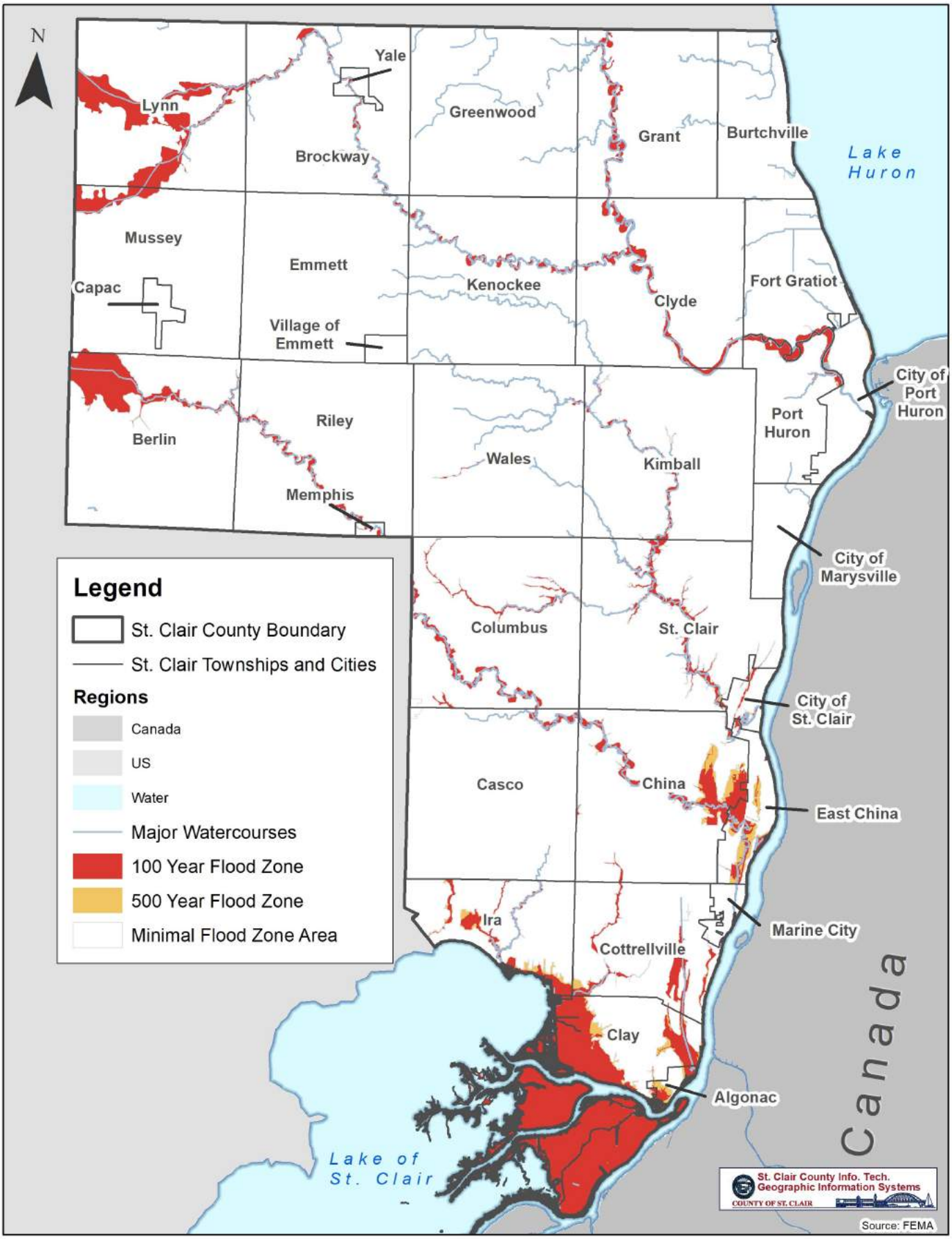
Because wetlands are a valuable natural resource, they are protected by Part 303 Public Act 451 of 1994. Part 303 requires that permits be acquired from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) prior to altering or filling a regulated wetland.

Wetlands cover approximately 62 square miles, or 8.6% of St. Clair County's land area. These wetlands are scattered throughout the county, but are more abundant along the eastern and southern coastline and along inland rivers. They are covered with lowland hardwoods, lowland conifers, shrub or scrub growth, or aquatic beds.

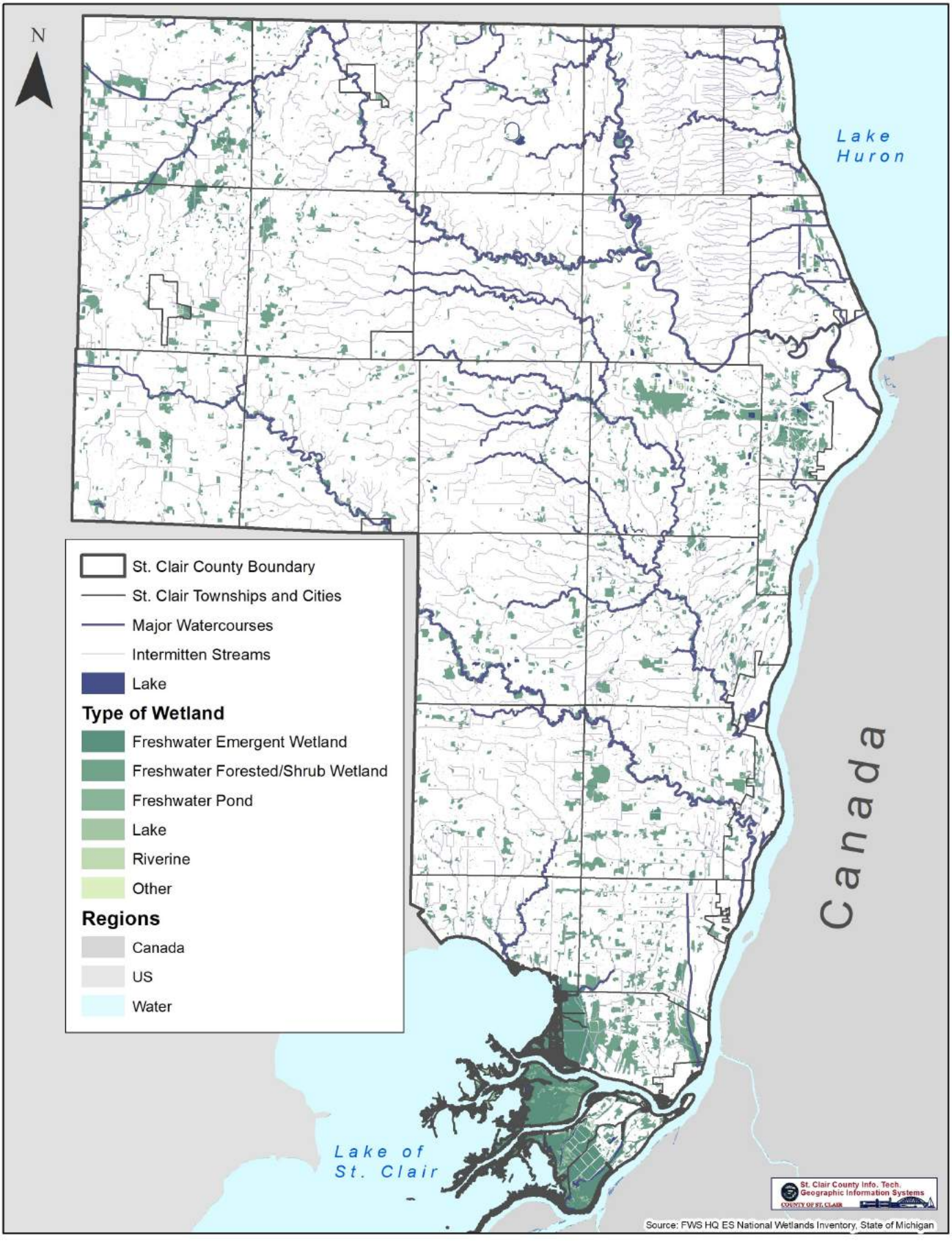
Shorelands

Shoreland refers to the banks and adjacent land along a lake or stream. St. Clair County has a total of 58 miles of shoreland along Lake Huron, the St. Clair River, and Lake St. Clair. Most of this shoreland is fully developed or is not suitable for development. Much of the shoreline, especially along the St. Clair River, has been stabilized with sea walls.

MAP 3-5: FLOOD HAZARD LOCATIONS



MAP 3-6: WETLANDS AND WATER



SOILS

Soil refers to the portion of the Earth's surface that consists of disintegrated rock or humus - the ground used for vegetation and for cultivating crops.

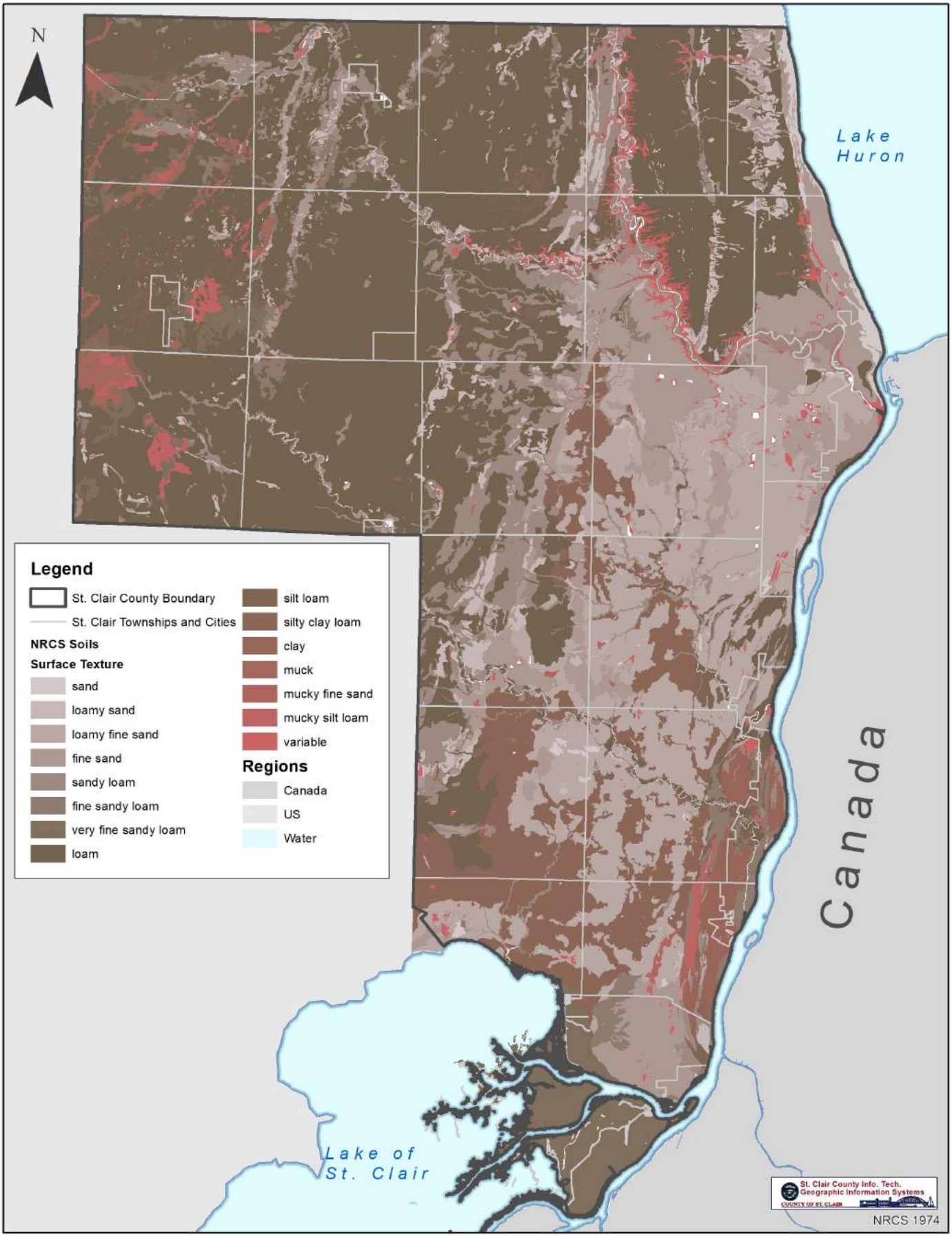
Prime farmland is defined by the U.S. Department of Agriculture (USDA) as land with soils best suited to produce food, feed, forage, fiber, and oilseed crops. Prime farmland differs from unique farmland, which refers to land used to grow high-valued vegetables and specialty crops. The USDA defines cropland as pasture, woodland, or other land that is not urban, built upon, or water. Appropriate farmland refers to land that has soil quality, growing season, and moisture supply necessary to economically produce a sustained high yield of crops if acceptable farming methods are used.

Soils in St. Clair County are largely wet loam and clay. These are calcareous (non-acidic) at shallow depths, have low permeability, and generally require drainage for agricultural purposes.

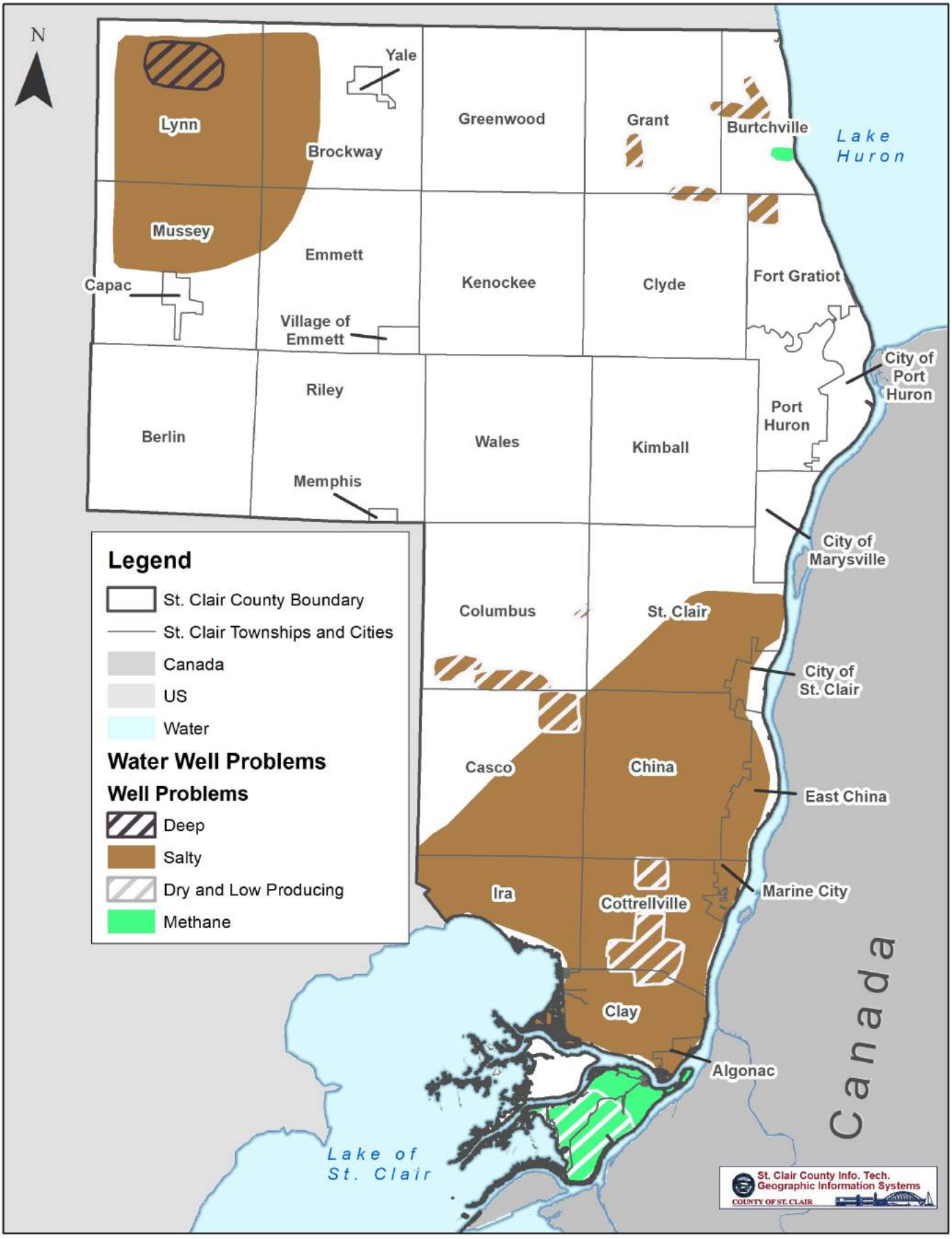
Sand is common along – and a few miles inland from – the St. Clair River and Lake St. Clair. These areas are poorly or very poorly drained in depressions, excessively drained on dunes, and subject to wind erosion if cultivated. Sand in lower slope positions is calcareous, while sand on ridges is acidic.

The majority of St. Clair County has drainage problems and more than 95% of the soils are severely limited for development, especially near the shoreline and on farmland. The soils most suitable for development are away from the shoreline and in areas that are flatter and less susceptible to flooding, erosion, and fading or sinking.
Hydric soils refer to wet or moist soils that merit particular consideration because they cover nearly 444 square miles, or more than half of St. Clair County, chiefly in the southern portions. Hydric soils generally have been exposed to water saturation conditions for extended periods, such as in a wetland. They are very poorly drained, saturate easily and retain large quantities of water. If artificially drained, they are often suitable for farmland use. They are commonly populated by cattails, sedges, bulrushes, water plantain, wild rice, wild celery, duckweed, and other wetland vegetation. Hydric soils are another limitation on development.

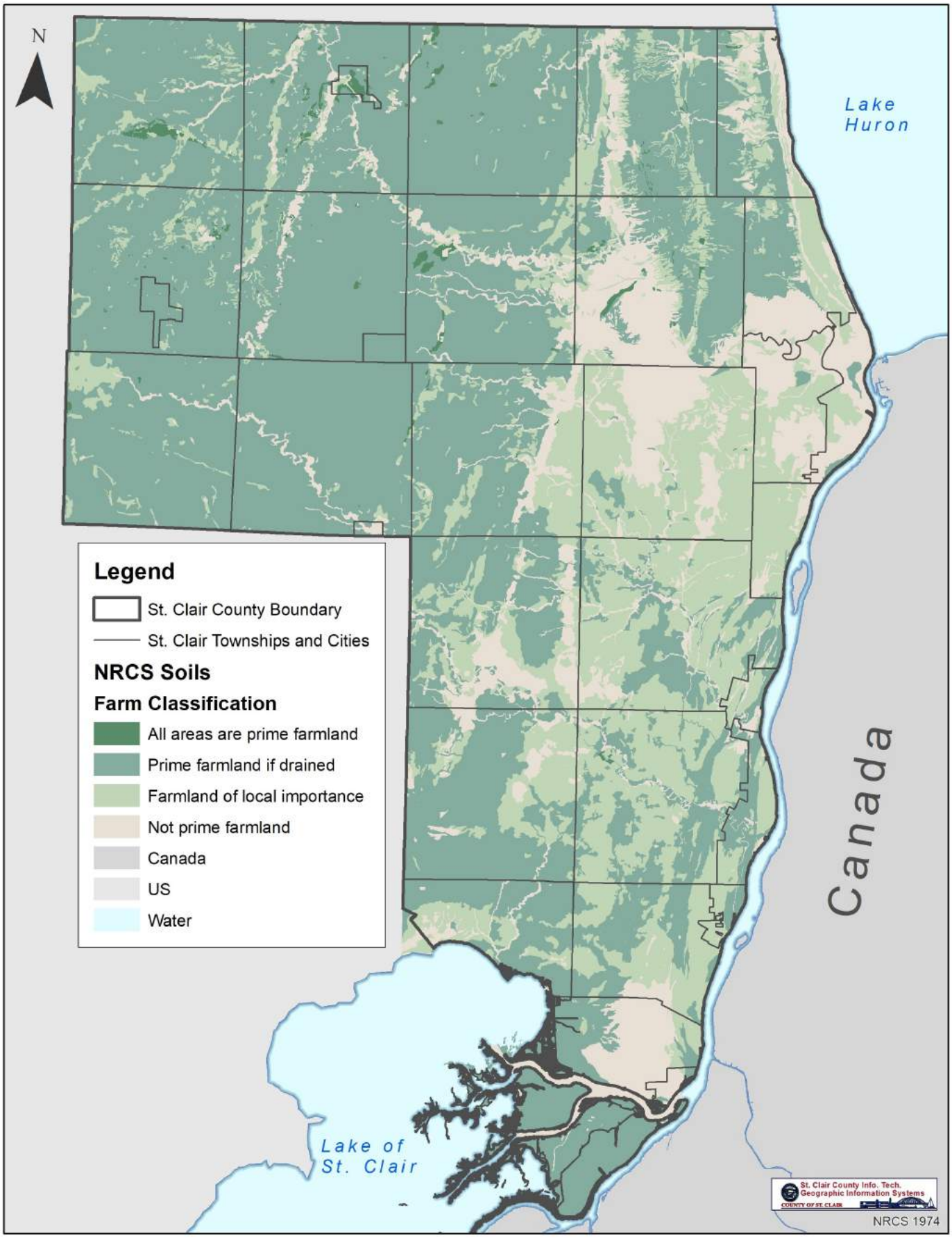
MAP 3-7: SURFACE SOILS



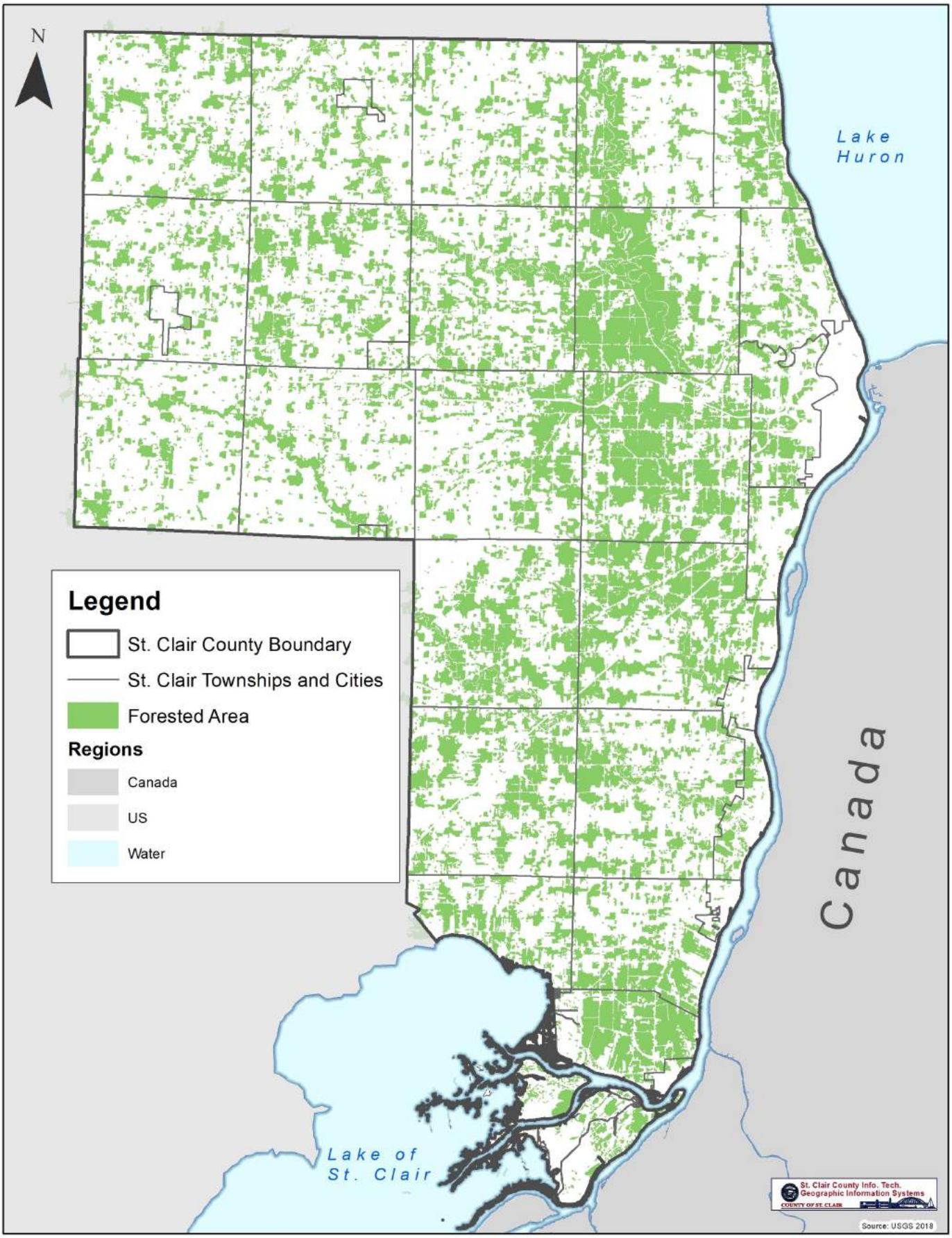
MAP 3-8: WATER WELL PROBLEMS



MAP 3-9: PRIME FARMLAND



MAP 3-10: FORESTED AREAS



More than half of the soils in St. Clair County are classified as prime farmland soils. Crops grown on these soils will produce the highest yields with the smallest input of energy and economic resources. This land is primarily north and west of a line from Port Huron to Memphis.

Woodlands

Woodlands refer to land covered with woods or trees. Some of the largest woodlands in St. Clair County are along the inland banks of the Black, Pine, and Belle Rivers. Other smaller patches of central hardwoods, lowland hardwoods and conifers are scattered throughout the county. Woodlands cover roughly 113 square miles, or 15% of the county; two-thirds of that land is managed by the Michigan Department of Natural Resources. Mature trees represent a valuable resource in maintaining the aesthetic character of the area, not to mention their overall importance to wildlife and the natural environment.

Wildlife Habitat

Wildlife habitat refers to land and water, including wetlands, that have appropriate soils, vegetative cover, and/or water resources to provide animals and birds with food and protection from predators during mating, nesting, and migratory seasons.

Nearly all of the Great Lakes Basin is potential wildlife habitat. The wetlands, shoals, open waters, rural areas, and some urban land provide ecosystems that have appropriate soils and food to support a wide variety of plant and animal organisms.

The Great Lakes Basin is also a major flyway for thousands of North American waterfowl and breeding territory for several hundred species. Bird species tend to be the leading indicator of wildlife habitat quality. Many bird species are highly visible and easily tabulated within much of St. Clair County. Bird sightings indicate that the county is rich with wildlife habitat, not only for birds but for less noticeable vertebrate, invertebrate, and micro-organic species, especially in aquatic places, on publicly-owned land, and at the edges of agricultural land.

Unique Features

Unique features refers to land, recreational parks, archeological and historical areas, vistas and lookouts, countywide events, and miscellaneous sites or businesses that are rare in the region or found only in St. Clair County.

Many of St. Clair County's unique features include the natural environment features, such as St. Johns Marsh, St. Clair Flats, the St. Clair River, watercourses within the county, Goodells County Park, the Regional Educational Service Agency's (RESA's) Pine River Nature Center, and hiking/biking trails.

St. Clair County is also the home of Michigan champion black oak, red maple, alternative-leaf dogwood, and scarlet oak trees.

More than 100 archeological and historical sites, as designated at the federal, state, or local levels, are located within St. Clair County. These include Indian villages, mounds, and burial grounds, Fort Gratiot, which was built by the U.S. Army during the War of 1812, sawmill and gristmill sites, shipwrecks, the Blue Water Bridge, the Huron Lightship, preserved or utilized buildings and houses, and sites of houses that have been destroyed or removed.

Water Quality

Water quality refers to the capability of water to support healthy aquatic life, to be used for recreational purposes, and potability.

Surface water refers to bodies of water on the surface of the Earth. For St. Clair County, surface water includes the waters of the neighboring Lake Huron, rivers and streams, and inland lakes and ponds. Groundwater refers to water below the surface of the Earth.

Point source pollution refers to pollution that flows into a watercourse from an easily identifiable single source or point, such as a drain pipe from an industrial complex or a sewage system.

Nonpoint source pollution refers to pollution that flows into a watercourse from any number of sources that are not easily identifiable. These points may be hidden by natural surroundings or visible only during certain times of the year or under certain conditions. Examples of nonpoint source pollution include sewage leaching from underground septic systems, fertilizers and pesticides running off agricultural fields and urban lawns, E. coli contamination of streams from cattle or wild animals, and oil from roadways.

Surface Water

The Great Lakes contain 20% of the world's fresh surface water, and are a vital resource for both Michigan and St. Clair County because of their commercial and recreational usage. St. Clair County is unique because its entire eastern and southern shores border on part of the Great lakes System. The water quality of the open waters of the upper Great Lakes, including Lake Huron, is quite clean, with only a few exceptions.

High nutrient levels, which cause an overabundance of algae in water, were a concern for many parts of the Great Lakes in the 1950s and 1960s. Fortunately, the nutrient level has been greatly reduced in recent decades due to the reduction of phosphorous loading from point sources.

Other problematic pollutants include the persistence of toxic substances, such as polychlorinated biphenyl (PCB), chlordane, and dioxin. PCB and the pesticide DDT were banned in the 1970s, and levels found in fish have declined. But the rate of decrease appears to have slowed, and fish samplings from this area show that Michigan Water Quality Standards for these chemicals are not being met.

In 1986, the St. Clair River was declared an Area of Concern (AOC) by both the Canadian and U.S. governments. Industry was determined to be the main source of pollution. Municipal sewage treatment plants and other point source and nonpoint source pollutants were also contributors to the problem.

Groundwater

Groundwater from wells is an unseen resource and is therefore particularly vulnerable to poor management and contamination. The leading causes of groundwater contamination in Michigan are from small businesses and agriculture.

The origin of the problem stems from careless storage and handling of hazardous substances. On paved surfaces where hazardous materials are stored, substances can seep through or flow off the edge of the pavement. Materials can get into floor drains which discharge to soils, wetlands or watercourses.

The depth of groundwater in St. Clair County ranges from 50 to 170 feet below the Earth's surface. In the eastern part of St. Clair County, wells dug into glacial deposits generally yield a low volume of less than 10 gallons of water per minute. Water pumped from greater depths is highly mineralized, which limits household use. In the western part of the county, wells dug into glacial deposits provide greater yields and mineralization is generally not a problem.

The St. Clair County Health Department issues all water well and septic system permits. A total of 1,900 septic permits were issued from 2015 to 2021. The number of permits has fluctuated over the last seven years. In 2015, there were 127 septic permits issued. That number climbed to 352 in 2018 before dipping to 262 permits in 2019 and 285 permits in 2020. In 2021, the number of permits issued went back up to 340. Several large areas of the county have natural water well problems, including salty taste, sporadically dry or low-pressure yield, and gaseous odors.

There are no known areas of groundwater contamination from human sources within the county. However, there is a threat to groundwater by a chemical known as Methyl Tertiary Butyl Ether (MBTE), an oxidation additive that helps automotive gasoline burn cleaner. The chemical leaches quickly into groundwater from damaged underground gas station storage tanks. Leaking underground storage tanks are a problem throughout St. Clair County.

Green Infrastructure

Green infrastructure is our system of natural resources that provide the critical ecological services necessary to maintain a healthy environment for humans and wildlife. The various components of the natural environment function, change, and interact as part of a delicate ecosystem that must maintain a balance of biodiversity to remain healthy. Because hydrology is a critical component of the ecosystem, the impact of stormwater runoff needs to be considered. For development to be sustainable, communities must ensure that it occurs in a manner that has the least impact on the overall system.

Green infrastructure helps sustain life on the planet. It provides important natural benefits like maintaining air and water quality and protecting people and property from flood hazards. This is especially important in St. Clair County communities that have poorly draining soils and where most drinking water comes from lakes, rivers, streams, and wells.

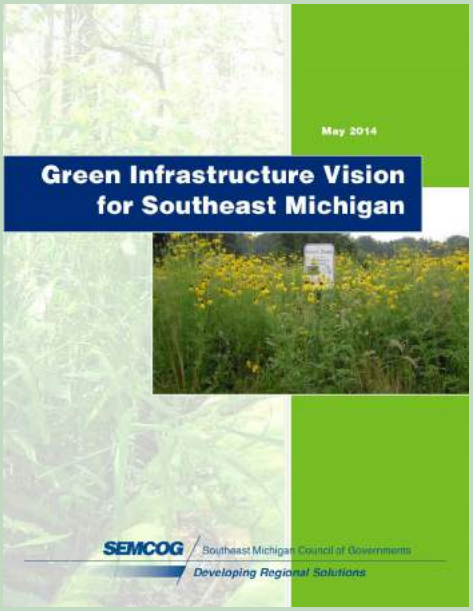
Parks and open space are important components of green infrastructure. This includes local, state, and federal parks, land conservancy properties, and other natural areas. Open space that extends across community boundaries provides opportunities for parks and recreational use. It can also conserve natural features such as habitat for plants and animals.

Green infrastructure also provides recreational resources that help us live healthy lives. A system of linked natural areas creates places for bike paths, trails, river trails, beaches, and other outdoor recreation that help us

Black River in Clyde Township

Brockway Township Park

SEMCOG GREEN INFRASTRUCTURE VISION FOR SOUTHEAST MICHIGAN

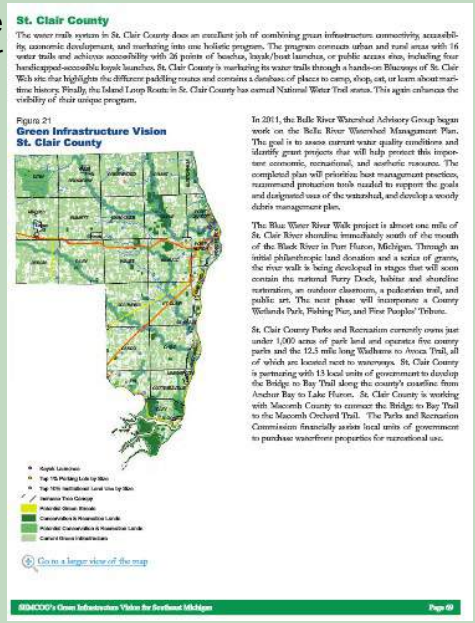


In May 2014, SEMCOG completed the *"Green Infrastructure Vision for Southeast Michigan."* The vision, for the first time:

- Benchmarked green infrastructure in Southeast Michigan,
- Established a regional visions for where we want to go, and
- Identified regional policies on how to get there.

Among other things, the Green Infrastructure Vision examined green infrastructure's impact on the economy, tourism, transportation, infrastructure, water quality, air quality, vacant land, and health. It also zoomed in on each of the seven counties in Southeast Michigan, including St. Clair County, and identified existing green infrastructure assets, connections, and goals.

Among the highlighted green infrastructure assets in St. Clair County, the document focuses on the Blueways of St. Clair, the Belle River Watershed Plan (and other watershed planning efforts), the Blue Water River Walk, and the numerous assets of the St. Clair County Parks and Recreation Commission (PARC).


St. Clair County

The water trails system in St. Clair County does an excellent job of combining green infrastructure, connectivity, accessibility, economic development, and marketing into one holistic program. The program connects urban and rural areas with 16 water trails and achieves accessibility with 26 points of beaches, kayak/boat launches, or public access sites, including four handicapped-accessible kayak launches. St. Clair County is marketing its water trails through a hands-on Blueways of St. Clair Web site that highlights the different paddling routes and contains a database of places to camp, shop, eat, or learn about maritime history. Finally, the Inland Loop Route in St. Clair County has earned National Water Trail status. This again enhances the visibility of their unique program.

Figure 21
Green Infrastructure Vision
St. Clair County

In 2011, the Belle River Watershed Advisory Group began work on the Belle River Watershed Management Plan. The goal is to assess current water quality conditions and identify grant projects that will help protect this important economic, recreational, and aesthetic resources. The completed plan will prioritize best management practices, recommend protection tools needed to support the goals and designated uses of the watershed, and develop a woody debris management plan.

The Blue Water River Walk project is almost one mile of St. Clair River shoreline immediately south of the mouth of the Black River in Port Huron, Michigan. Through an initial philanthropic land donation and a series of grants, the river walk is being developed in stages that will soon contain the restored Perry Doyle, habitat and shoreline restoration, an outdoor classroom, a pedestrian trail, and public art. The next phase will incorporate a County Wetlands Park, Fishing Pier, and Pine Pumpkin Tribute.

St. Clair County Parks and Recreation currently owns just under 1,000 acres of park land and operates five county parks and the 12.5 mile long Wadhams to Avoca Trail, all of which are located next to waterways. St. Clair County is partnering with 13 local units of government to develop the Bridge to Bay Trail along the county's coastline from Anchor Bay to Lake Huron. St. Clair County is working with Macomb County to connect the Bridge to Bay Trail to the Macomb Orchard Trail. The Parks and Recreation Commission financially assists local units of government to purchase waterfront properties for recreational use.

Go to a larger view of the map

SEMCOG's Green Infrastructure Vision for Southeast Michigan Page 69

Regional policy areas identified in the Vision include:

- Increasing tree canopy in SE Michigan;
- Protecting existing high quality wetlands through land use regulation;
- Using green infrastructure to manage stormwater runoff;
- Increasing public green infrastructure in local and regional parks;
- Encouraging preservation of high-valued agricultural lands and development of community gardens to provide a quality local food network and continue the economic vitality of the agricultural industry;
- Increasing green infrastructure along riparian corridors and connecting these corridors to parks and other natural areas;
- Seeking opportunities to construct green infrastructure in priority areas such as roadways, institutional properties, parking lots, riparian corridors, and downtown areas;
- Ensuring natural areas have maintenance plans to maintain quality;
- Increasing public access to public parks in small towns within rural areas;
- Using access to green infrastructure as a means to attract young professionals;
- Increasing public access along the Great Lakes and connecting channels, including the St. Clair River and Lake St. Clair;
- Prioritizing funding for trail improvements to fill gaps within the Southeast Michigan trail network;
- Integrating water trails with public green infrastructure along riparian corridors to the extent possible, including canoe/kayak launch areas;
- Coordinating nonmotorized trail planning with green infrastructure planning to assist in meeting the needs of a green infrastructure network that uses trails as a linkage;
- Incorporating green infrastructure elements into publicly-funded projects;
- Promoting the use of complete and green streets as appropriate in transportation improvements; and
- Using vacant land to increase protected green infrastructure around existing parks and natural areas.

remain active. Greenway systems along natural drainage courses can also be integrated into the community's stormwater management system.

Land that has major development constraints can be targeted as future protected open space or parks. Areas with steep slopes, poorly draining and unstable soils, and poor access should be identified to help plan future land acquisition priorities.

A community's open space and greenway network should connect to the network of neighboring communities to create a connected regional network. This will help ensure ecological health as well as expand recreational opportunities for all residents.

Our master plan surveys and community visioning input consistently tells us that the residents of St. Clair County value clean water and air, as well as great parks and trails. Key strategies in melding growth and development with environmental goals are found in implementing green infrastructure techniques.

Tools for Enhancing Green Infrastructure in St. Clair County

Tools and techniques that communities in St. Clair County can utilize to enhance green infrastructure assets include:

Native Landscaping

Native plants are well adapted for local weather conditions and require minimal maintenance. Landscaping with native plants can be maintained with minimal use of fertilizers, pesticides, or water, all of which contribute to water quality problems. The impact of non-native plants is that they quickly replace native plants unable to compete for available sunlight, water, and nutrients.

Plants found natively within the community have many advantages, including hardiness to Michigan weather, resistance to pests and disease and longer root systems that naturally retain and absorb stormwater while minimizing soil erosion. Because native plants require less irrigation, yards landscaped with a significant portion of these materials will use less water and create less runoff.

St. Clair County communities should adopt regulations that will require native landscaping in new development and development proposals should be checked during site plan review to verify that native landscaping provisions are being met.

Native landscaping along waterways will help stabilize shorelines from erosion. The vegetation will also intercept sediments that are contained in sheet flow runoff prior to entering a waterway.

Tree Protection

Trees have been shown to have a significant effect on reducing runoff. Trees not only reduce the amount of impervious surface, but they slow drainage from a site by providing a location where water may be absorbed. A tree preservation ordinance can be implemented to reduce the number of trees removed from a new development site. A natural features inventory and a site design that incorporates natural features are typical requirements.

Local site plan review processes should require the identification of all trees and plants on a site prior to development. Forest vegetation moderates the effects of winds and storms, stabilizes and enriches the soil, and slows runoff from precipitation, allowing water to be filtered through the forest floor and into the groundwater reserve. Preserving naturally vegetated areas involves no cost for construction or maintenance.

Low Impact Development (LID)

Low Impact Development (LID) techniques mimic pre-development site hydrology to store and detain stormwater runoff. This is unlike conventional approaches that typically convey and manage runoff in large facilities located at the base of drainage areas. These multifunctional site designs incorporate alternative stormwater management practices such as functional landscape that act as stormwater facilities, flatter grades, depression storage and open drainage swales. The goal of low impact development is to reduce large runoff volumes that traditionally have been created by development. LID techniques can be encouraged with all new development and incorporated into redevelopment where possible.

A LID system of controls can reduce or eliminate the need for a centralized best management practice (BMP) facility for the control of stormwater runoff. Although traditional stormwater control measures have been documented to effectively remove pollutants, the natural hydrology is still negatively affected, which can have detrimental effects on ecosystems, even when water quality is not compromised.

Long-term maintenance cost savings of living in a Low Impact Development is an incentive for many builders. Communities in St. Clair County should consider creating a stormwater BMP certification program for developers to assist in marketing strategies. Zoning regulations should have provisions for encouraging use of LID techniques and incentives such as density bonuses, reduced permitting fees or expedited review process.

Many strategies exist to reduce the amount of impervious surface in development areas. Designing residential streets for the minimum required width needed to support traffic, on-street parking and emergency service vehicles, can reduce imperviousness. Other practices include shared driveways and parking lots, alternative pavements for overflow parking areas, center islands in cul-de-sacs, alternative street designs rather than traditional grid patterns and reduced setbacks and frontages for homes.

Other LID techniques include bioretention areas composed of a mix of functional components, each performing different functions in the removal of pollutants and attenuation of stormwater runoff. These components could include:

- Grass buffer strips that reduce runoff velocity and filter particulates.
- Sand beds providing aeration and drainage of the planting soil and assisting in the flushing of pollutants from soil materials.
- Grass swales or channels functioning as a mechanism to reduce runoff velocity and as a filtration/ infiltration device.
- Green roofs that can minimize runoff from buildings.
- Rain gardens that can be used to treat stormwater on-site.

Best Management Practices (BMPs)

Best Management Practices (BMP) and techniques mitigate the adverse impacts caused by land development on water quality. BMPs can be structural, such as vegetated swales or bioretention facilities, or they can be non-structural practices, such as policies, plans, and educational programs. Common BMPs include:

- Rain gardens
- Green rooftops
- Vegetated swales and strips
- Grassed swales
- Porous pavement
- Water quality inlets (oil/grit separators)

BMPs provide flood control by detaining a large quantity of water from running off-site, limiting the chance for a 'flash flood'. BMPs also improve area water quality by removing sediment and runoff from entering water systems. Vegetated BMPs promote a natural appearance and contribute to area wildlife.

Environmental Goals

The environmental goals desired by St. Clair County residents are:

1. Sustain the health, diversity, and extent of natural resources.
2. Increase environmental awareness of citizens and government officials.
3. Pursue environmental goals and comply with environmental regulations.
4. Protect surface and groundwater quality.
5. Protect the environment from a systems perspective, rather than within jurisdictional boundaries.
6. Consider environmental impacts prior to providing public services.
7. Identify high-value agricultural lands and implement innovative programs for preservation, conservation, and enhancement.
8. Encourage tree planting, in general, throughout the county.
9. Protect citizens and resources from hazardous materials.

Master Plan Guiding Principles
The Environment

ECONOMIC PROSPERITY
Our environment provides land, water, air, energy resources, oil, forests, minerals and metals and other natural resources which are essential inputs for production and for economic development.

SUSTAINABILITY AND RESILIENCY
Conserving and restoring habitats help communities meet goals related to biodiversity, recreational access, and community green space. These activities can also improve the ability of coastal communities and watersheds to withstand natural hazards and climate risks.

QUALITY OF LIFE
The health of our natural resources is a key factor in people's well-being because quality of life is strongly affected by the quality of our environment. Citizens also benefit from environmental resources such as clean air and water, healthy forests and access to green spaces, because these allow them to enjoy leisure time and to satisfy basic needs.

GREAT PLACES
People generally prefer natural over hardscape settings. A study in the *American Journal of Community Psychology* found that people in cities dislike treeless, empty common spaces. The addition of trees and grass dramatically changed their perceptions of those areas. Parks and open space are typically filled with people of all ages and backgrounds.

HEALTHY COMMUNITIES
Environmental pollutants can cause health problems like respiratory diseases, heart disease, and some types of cancer. The conditions in and around our homes, schools, playgrounds, and workplaces have a big impact on our friends and families.

COLLABORATION
We can better preserve and protect our environmental resources through partnerships and collaboration. There are a number of organizations in St. Clair County and in the Southeast Michigan region pulling together to protect our land and water resources, manage invasive species, protect critical habitats, and build great places.

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Coastal Resiliency 4

How are Great Lakes Water Levels Measured?

Great Lakes water levels are measured via the International Great Lakes Datum (IGLD), a reference system of benchmarks at various locations on the lakes that approximate sea level. Great Lakes water levels are expressed as measurements above this reference elevation.

The Importance of Planning in Coastal Communities

It is no secret that the Great Lakes are one of the most unique and precious environmental systems in the world. In fact, "the Great Lakes basin contains more than 20% of the world's surface freshwater supplies and supports a population of more than 30 million people."[1] Michigan is home to nearly 3,300 miles of Great Lakes shoreline, along with 36,000 miles of rivers and streams, and 11,000 inland lakes.[2]

Yet in general, riparian land (land adjacent to a water body) throughout Michigan is not adequately protected from development pressures.[3] Coastal communities especially have an important role to play in protecting the Great Lakes. In 2001, the Michigan Department of Environmental Quality (MDEQ) acknowledged "fragmentation of coastal habitats, loss of agricultural and forest lands, increased impervious surfaces and resulting stormwater runoff, and the increased development in coastal hazard areas, wetlands, and Great Lakes Islands, could be improved through better coastal land-use planning."[4]

Planning for coastal areas at the local level requires knowledge of both local conditions and state and federal regulations. This chapter aims to address these needs for St Clair County and provide clear, well-founded recommendations for future land-use planning.

Overview of Coastal Dynamics and the Great Lakes

The Great Lakes function differently than other inland water bodies and tidal oceans. Understanding these dynamics can help St Clair County plan for naturally occurring changes along the shoreline.

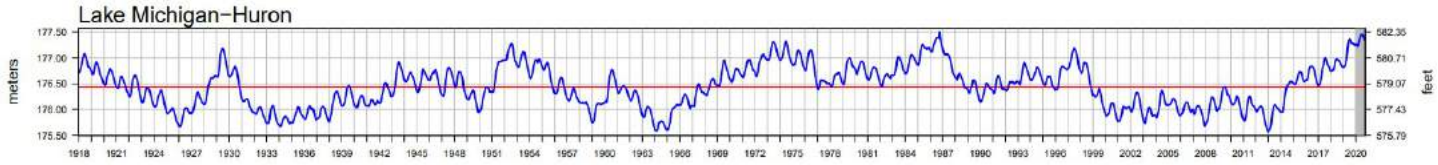
Changing Water Levels of the Great Lakes

Great Lakes water level changes result not from the moon's gravitational pull, but from cyclical changes in rainfall, evaporation, and river and groundwater inflows.[5] These factors work together to raise and lower the water levels of the Great Lakes in small increments daily, and larger increments seasonally and over the course of years and decades. Long-term water levels fluctuate by multiple feet. Figure 1 illustrates the water level of Lake Huron from 1918 to 2020 (Lake Michigan and Lake Huron are technically considered one lake). However, under certain climate conditions, water levels can dramatically fluctuate over short periods of time. For example, following the extreme winters of 2014 and 2015, water levels in Lake Michigan rose between three to four feet from an all-time low (576 feet) set just a year earlier.

The Great Lakes have been experiencing a period of rising lake levels (see Figure 2). Since the early 2000s, water levels had remained low, but historical patterns over the last century indicated that higher water levels were sure to return.[6] After a period of lows in 2013, Lake Huron's water level in July of 2020 averaged 582.2 feet, which was 34 inches above its long-term average level for the month. According to a recent U.S. Army Corps of Engineers summary, based on current conditions, Lake Huron is expected to see lake levels decline through March of 2021 after seeing record highs throughout 2020 (see Figure 4-3).

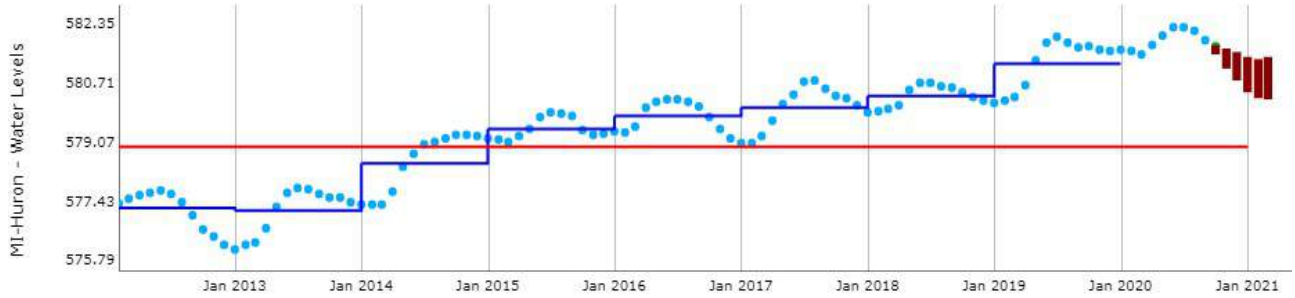
It is important to note that changes in water levels are not solely responsible for the movement of the shoreline landward and lakeward over time. The velocity and height of waves, erosion of shorelines, and the pace of fluctuating water levels also contribute to coastal dynamics on the Great Lakes.

Figure 4-1. Lake Michigan-Huron Water Level Changes, 1918 – 2020



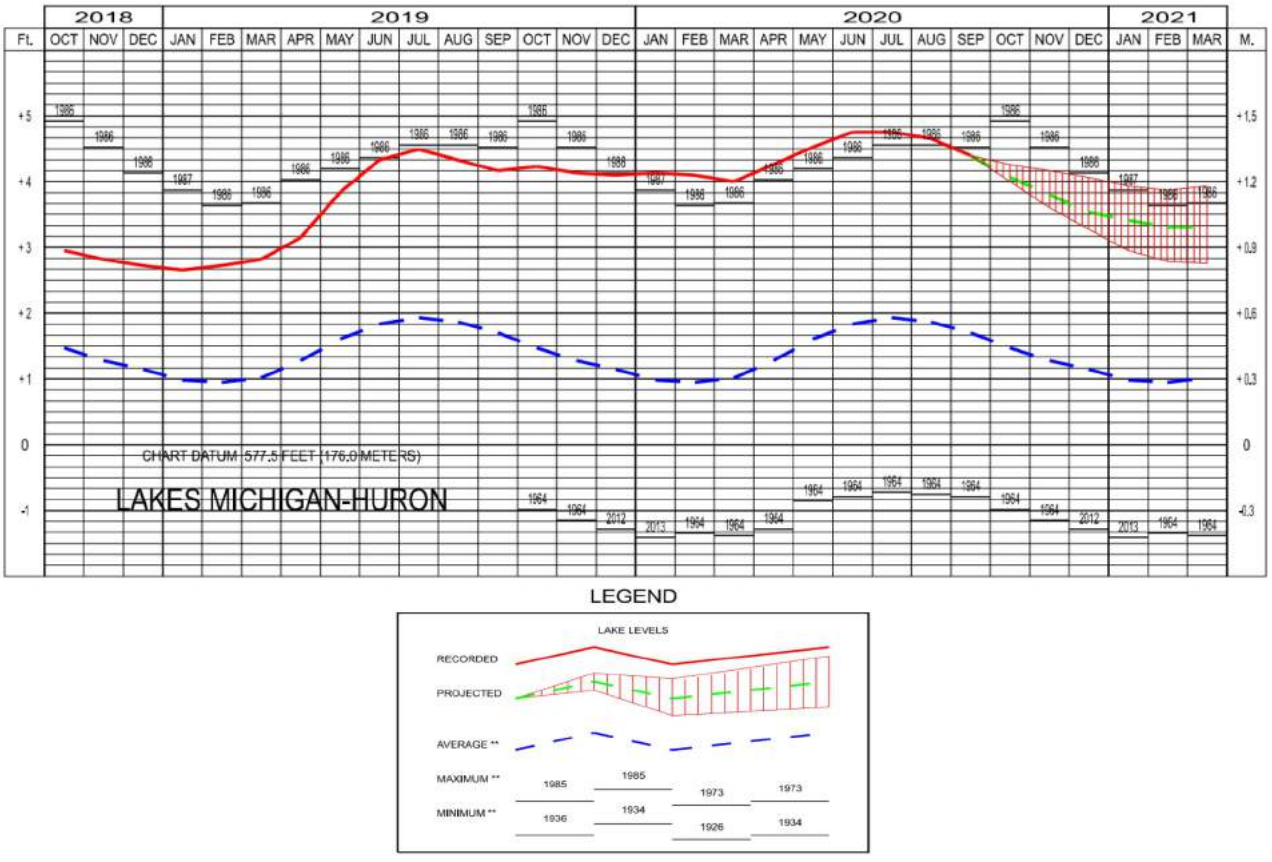
Source: http://lre-wm.usace.army.mil/ForecastData/GLBasinConditions/LTA-GLWL-Graph.pdf

Figure 4-2. Lake Michigan-Huron Water Levels



Source: glerl.noaa.gov/data

Figure 4-3. Lakes Michigan-Huron Water Levels—September 2020



Wave Energy and Height

The Great Lakes experience high-energy waves and wave setup along the coastline. High-energy waves are high in speed and strong in intensity and are primarily created as fast winds move across the surface of the water for extended distances.[8] "Wave setup" is the height of the water as waves reach the shore. High wave setup results as regional storms create high winds on the Great Lakes.[9] Powerful and tall waves can quicken the rate of erosion and damage structures near the shoreline.[10] In St Clair County, the prevailing winds are predominantly from the west (June to August and October to March) and north (March to June).

Erosion

The shorelines of Lake Huron are mostly made of gravel and sands that easily erode during times of high-energy waves.[11] Coastal erosion can cause flooding and damage infrastructure along bluffs and beaches. Erosion is caused mainly by storms and winds, and is exacerbated when lake levels are high.[12]

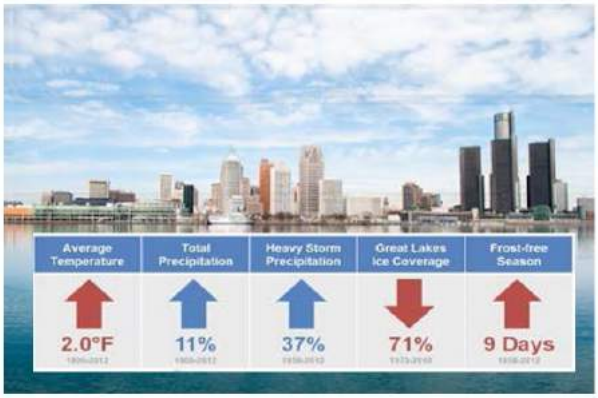
Quickly Changing Conditions

The Great Lakes are contained in gradually shifting and tilting basins. This tilting results as the Earth slowly decompresses and rebounds from the immense weight of the glaciers that created the Great Lakes.[13] This shifting causes water levels to change more quickly in some places than others, because the shape of the water basin varies along the coast.[14] This attribute of the Great Lakes makes it difficult to predict the pace of shoreline movement. Therefore, it is safest to plan for great variability and rapid change in water levels.[15]

Climate Change and the Great Lakes

Powerful waves, erosion, and changing shorelines on the Great Lakes have been well-documented throughout history, and each has implications for planning efforts along the coast. Climate change exacerbates these natural processes and requires preemptive planning in coastal communities. This section will discuss climatologist predictions of increased precipitation and storminess in the Great Lakes region, variable lake water levels, and rising water temperatures. First, it is important to understand the global context of climate disruption.

Figure 4-4.



Global Changes in Climate

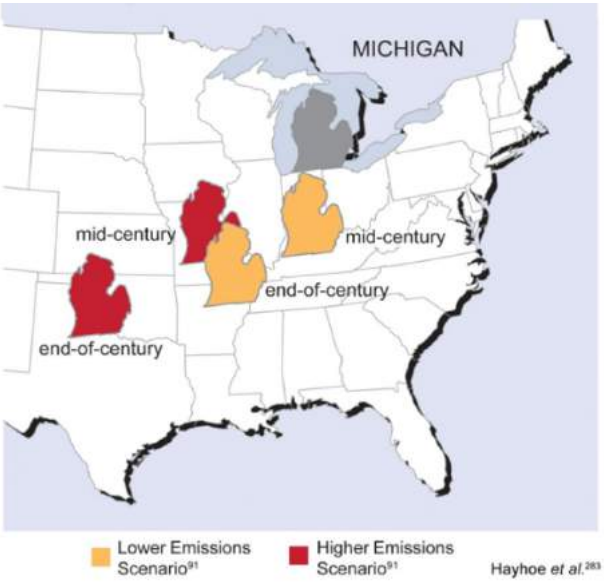
Climate and weather are directly related, but not the same thing. Weather refers to the day-to-day conditions in a particular place, like sunny or rainy, hot or cold. Climate refers to the long-term patterns of weather over large areas. When scientists speak of global climate change, they are referring to changes in the generalized, regional patterns of weather over months, years and decades. Climate change is the ongoing change in a region's general weather characteristics or averages. In the long term, a changing climate will have more substantial effects on the Great Lakes than individual weather events.

Evidence collected over the last century shows a trend toward warmer global temperatures, higher sea levels, and less snow cover in the Northern Hemisphere. Scientists from many fields

have observed and documented significant changes in the Earth's climate.[16] Warming of the climate system is unequivocal and is now expressed in higher air and ocean temperatures, rising sea levels, and melting ice.[17]

To help predict what the climate will be in the future, scientists use computer models of the Earth to predict large -scale changes in climate. These General Circulation Models (GCMs) have been improved and verified in recent years, resulting in relatively reliable predictions for climate changes over large regions.[18] Scientists downscale these techniques to predict climate change for smaller regions.

Figure 4-5.



Model projections of summer average temperature and precipitation changes in Illinois and Michigan for mid-century (2040-2059), and end-of-century (2080-2099), indicate that summers in these states are expected to feel progressively more like summers currently experienced in states south and west. Both states are projected to get considerably warmer and have less summer precipitation.

Climate Change on the Great Lakes

The Great Lakes Integrated Sciences and Assessments Program (GLISA) is a consortium of scientists and educators from the University of Michigan and Michigan State University that provides climate models for the Great Lakes region in support of community planning efforts like this Master Plan. Figure 4 illustrates the historical and predicted climate changes from GLISA for the Great Lakes region. According to GLISA, the Great Lakes region experienced a 2.3° Fahrenheit increase in average air temperatures from 1951 to 2017.[19] An additional increase of 3° to 6° F in average air temperatures is projected by 2050. Although these numbers appear relatively small, they are driving very dramatic changes in Michigan's climate and greatly impact the Great Lakes.

The National Climate Assessment for 2009 included a number of illustrations to help us understand the extent and character of anticipated climate change impacts.[20] One of these illustrations, Figure 5, shows Michigan under several emissions scenarios, each leading to changes in Michigan's climate. Just by maintaining current emission levels, Michigan's climate will feel more like present-day Arkansas or Oklahoma by the end of the century.[21]

Increased Precipitation and Storminess

There is strong consensus among climate experts that storms greater in number and intensity will occur in the Great Lakes region as a result of climate change.[22] This is already happening as "the amount of precipitation falling in the heaviest 1% of storms increased by 35% in the Midwest from 1951 to 2017."[23] As storms drop more precipitation and generate stronger sustained winds, the Great Lakes will see stronger and higher waves. In addition to direct damage caused by storms, sustained increases in the number of storms and their intensity can both directly and indirectly pollute waters by overloading sewage and stormwater capabilities.[24] Increases in the intensity of storms also quickens the pace of erosion on Great Lakes shorelines. In fact, the Federal Emergency Management Agency (FEMA) projects approximately 28% of structures within 500 feet of a Great Lake shoreline are susceptible to erosion by 2060.[25]

Variability of Lake Water Levels

The natural ups and downs in the water levels of Lake Huron will continue regardless of the impacts of climate change.[26] However, climate change is likely to augment this natural process, resulting in more variable water levels as warmer air temperatures result in fewer days of ice cover and faster evaporation.[27] In other words, lake levels will rise and fall faster and with less predictability than in the past. Fortunately, much of Michigan's coastal

infrastructure was built in previous decades during times of high water levels.[28] However, fast-rising waters can erode shorelines, damage infrastructure, and cause extensive flooding in inland rivers.[29] When lake levels fall, access to infrastructure like docks may be restricted and navigation hazards in shallow waters may be exposed. Low lake levels pose a threat to coastal vegetation and can reduce the pumping efficiency of drinking water intake pipes.[30] Additional ramifications of changing lake levels include a drop in water supply,[31] restricted fish habitats,[32] more invasive species,[33] faster erosion, and an overall decline in beach health.[34] Climate change is likely to augment the natural highs and lows of lake levels, causing more variability and a faster rate of change, making each of these potential ramifications both more likely and less predictable.

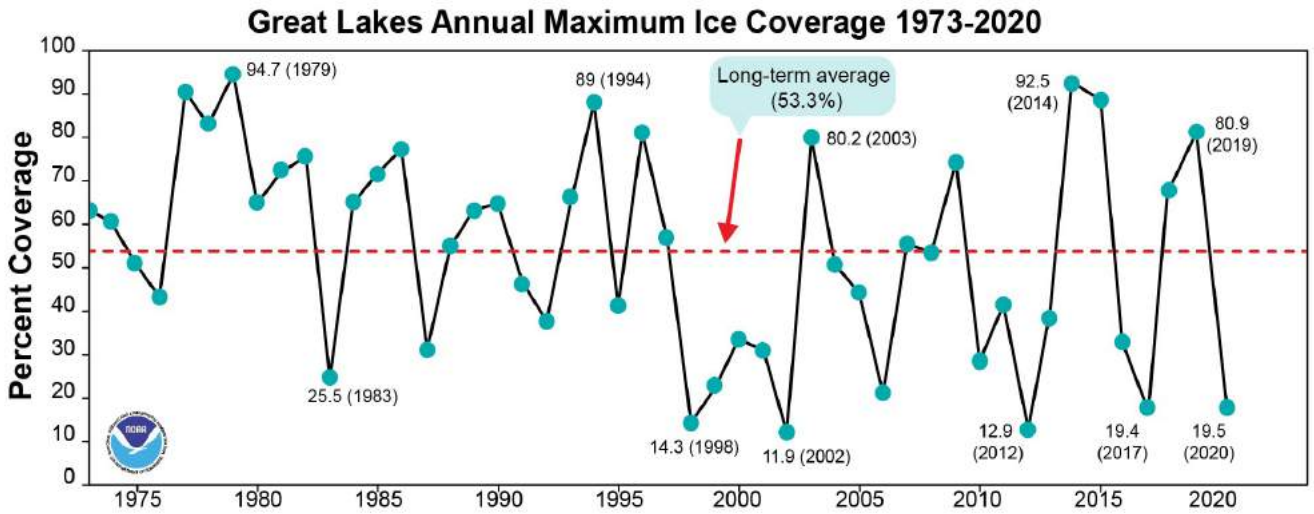
Water Temperature

Climatologists predict there will be fewer days below freezing in Michigan and other Great Lakes states. As temperatures remain warm for a greater part of the year, the winter season will shorten and the lake ice cover that accompanies winter weather will decline. In general, annual average ice cover on the Great Lakes underwent a shift from higher amounts prior to the 1990s to lower amounts in recent decades. However, there remains strong year-to-year variability, and high ice years are still possible.[35] Figure 6 illustrates the variability in ice coverage in the Great Lakes between 1973 and 2020.

Lake ice cover allows heat radiation from the sun to be reflected, so when ice declines, the surface water temperature will increase as more heat is absorbed by the water. In the Great Lakes, average summer lake surface temperatures have been increasing faster than the surrounding air temperatures, with Lake Superior surface temperatures increasing by 4.5°F between 1979 and 2006.[36]

The associated impacts of rising water temperatures include changes to where fish and other aquatic animals can live, increased vulnerability to invasive species, and increased risk of algae blooms.[37] Rising water temperatures also enable winds to travel faster across the surface of the lake, increasing the vulnerability of coastal

Figure 4-6.



communities to damaging waves as storms and winds increase.[38] Lastly, ice cover protects the shoreline during winter storms. With less ice cover, the shoreline is more susceptible to erosion and habitat disruption.

Defining Vulnerability in St. Clair County

The effects of climate change have been felt by everyone. With planning and preparation, communities can weather the storms and recover, becoming even better places to live and thrive. Through community-wide planning, resilient communities actively cultivate their abilities to recover from adverse situations and events, working to strengthen and diversify their local economies and communication networks, increase social capital and civic engagement, enhance ecosystem services, improve human health and social systems, and build local adaptive capacity.

Building Community Resilience

As defined by the Urban Sustainability Directors Network, community resilience is the ability of a community to anticipate, accommodate and positively adapt to or thrive amidst changing climate conditions or hazard events and enhance quality of life, reliable systems, economic vitality and conservation of resources for present and future generations. The Rockefeller Foundation emphasizes equity as an important component of resilience, stating that community resilience is the capacity of people — particularly the poor and vulnerable — to survive and thrive no matter what stresses or shocks they encounter. Communities that are resilient are able to learn from adversity and adapt quickly to change. In general, the most important qualities of resilient communities are: (1) Reflective, (2) Flexible, (3) Integrated, (4) Robust, (5) Resourceful, (6) Redundant and (7) Inclusive. The Rockefeller Foundation has identified 12 indicators within these qualities that make for a resilient community (see inset). However, it is important to acknowledge that St. Clair County is unique, and not all of these indicators or characteristics may be necessary for the county to be "resilient."

According to the Rockefeller Foundation, a Resilient Community has…

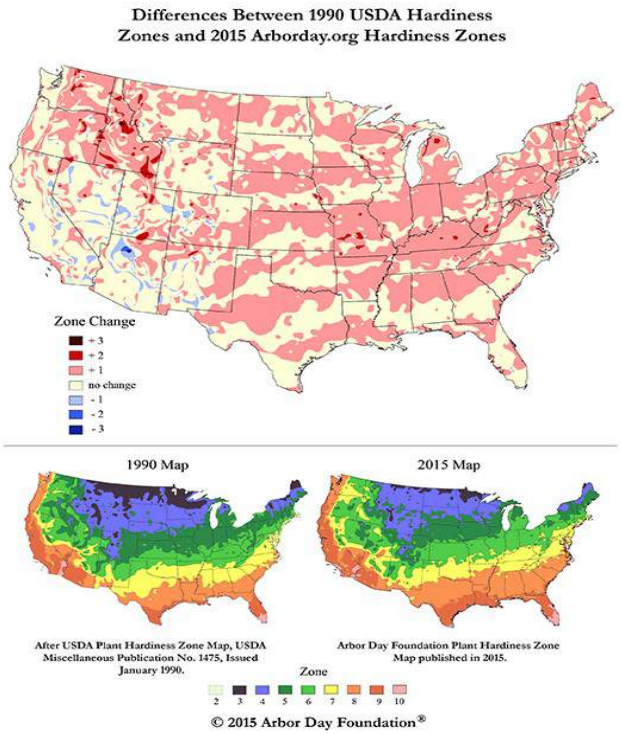
1. Minimal human vulnerability
2. Diverse livelihoods and employment
3. Effective safeguards to human life and health
4. A collective identity and mutual support
5. Comprehensive security and rule of law
6. A sustainable economy
7. Reduced exposure and fragility
8. Effective provision of critical services
9. Reliable mobility and communication
10. Effective leadership and management
11. Empowered stakeholders
12. Integrated development planning

The St. Clair County planning process aimed to increase community resilience by fostering civic engagement and improving communication and cooperation between local officials, citizens and neighboring jurisdictions. To improve economic resilience, St Clair County and communities throughout northeast Lower Michigan should work to encourage and support local production of goods and supplies, increasing self-reliance and reducing the flow of funds out of the community. Zoning policies and programs to encourage local investing and entrepreneurship can be 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.

The following is a community vulnerability assessment focused on the coastal communities in St. Clair County. This assessment begins with an overview of regional climate trends and predicts societal impacts, then transitions to detailed assessments of the community's vulnerabilities to extreme heat and flooding events. Although the assessment is concentrated on these two specific types of events, many of the considerations and societal impacts identified would be present in other stresses and shocks within the community (e.g., a winter storm).

In completing the assessment, a variety of factors are considered, such as demographics, environmental conditions, locations of critical facilities and essential services, and the built environment. This assessment informs recommendations for reducing identified community vulnerabilities through policies, programs and projects, which will inevitably lead to a more resilient community.

Figure 4-7.



Climate Variability

Based on the most recent models, the climate of St. Clair County will continue to warm, with greater increases in average temperatures during the winter months and at night. There are a variety of weather impacts expected with this change in average temperatures. Some of the potential impacts of climate change in the county are listed below:

- Storms are expected to become more frequent and more severe
- Increases in winter and spring precipitation
- Less precipitation as snow and more as rain
- Less winter ice on lakes
- Extended growing season (earlier spring/later fall)
- More flooding events with risks of erosion
- Increases in frequency and length of severe heat events (heat waves)
- Increased risk of drought, particularly in summer

It is important to note that increased flooding and more intense drought are not mutually exclusive nor contradictory. In the Great Lakes region, scientists are predicting more intense rain events in the fall and winter along with more intense droughts in the summer months.

These changes in climate could have a number of both positive and negative effects in St. Clair County. For example, an extended growing season could help support new crops and 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.

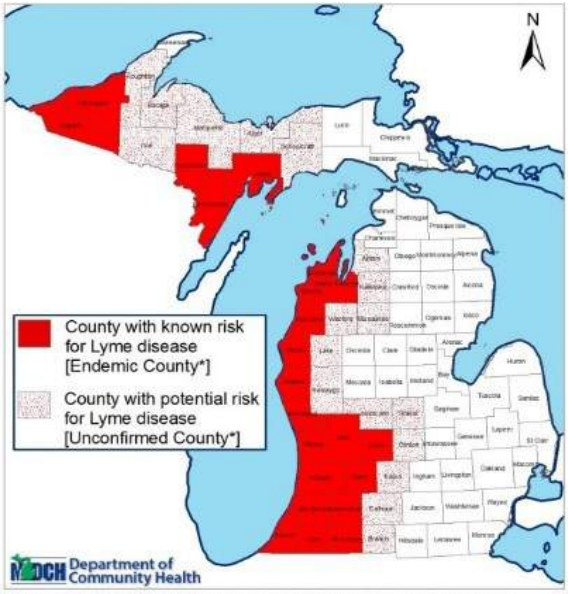
Much of the U.S. has been warmer in recent years, and that affects which plants grow best in various regions. The Arbor Day Foundation completed an extensive update of U.S. Hardiness Zones based on data from 5,000 National Climatic Data Center cooperative stations across the continental United States. As illustrated in Figure 4-7 on the previous page, zones in Lower Michigan are shifting northward. A few decades ago, St Clair County was solidly in Zone 5; today, Zone 6 plants that once thrived far to the south can now successfully survive in St Clair County.

Public Health and Climate

Major health effects of long-term climatic change are predicted for the U.S. Midwest. Already, people in Michigan are experiencing higher rates of skin and eye damage from increased exposure to ultraviolet radiation, increased incidence of respiratory and cardiovascular diseases, and increased incidence of vector-borne and water-borne diseases.[39] Weather conditions and high heat events exacerbate health conditions like allergies, asthma, and obesity.

The Michigan Department of Health and Human Services (MDHHS) published the Michigan Climate and Health Adaptation Plan in 2011. The Plan indicates there is an increase in the number of illnesses and deaths as a result of extreme heat events; declining air quality as a result of increased production of ozone and particulate matter from heat and drought events; and adverse changes to water quality and availability following severe weather events. In the long term, health experts are most concerned with a rising incidence of infectious diseases and outbreaks of new diseases not currently endemic to Michigan; increasing numbers of disease vectors and the appearance of new vectors not currently established in Michigan; and a degradation of food safety, security and supply. For example, blacklegged ticks are one disease vector that has increased in recent years. According to the MDHHS, the first official reported human case of Lyme disease in Michigan was in 1985. Cases have now been reported in both the Upper and Lower Peninsula and are increasing. It is anticipated that the number of cases reported will continue to increase due to public and medical personnel education and expanding tick ranges. Figure 4-8 illustrates the distribution of the risk for Lyme disease in Michigan, which has increased in recent years.

Figure 4-8.



Local and Regional Hazards: Severe Weather in St. Clair County

The following text summarizes the major weather-related hazards in St Clair County. Oftentimes, severe weather events result in negative impacts to the local economy and to vulnerable populations in the community. According to the St Clair County 2022 Hazard Mitigation Plan:

Most Recent Extreme Heat and Cold Events

There have been 15 extreme temperature events reported in St. Clair County since 1950. Of the 15 extreme temperature events, seven have been extreme cold events and eight have been either record warmth or excessive heat.

- *July 15-19, 2013:* An extreme heat warning was in effect for four days. Temperatures topped out in the mid 90s with heat index values that reached the low 100s. The conditions caused concern for the elderly and people with health conditions as heat indices reached 103 degrees. Cooling stations opened during this period.

- *January 14-18, 2009:* An arctic air mass became firmly established over the Great Lakes region on January 14th and persisted through the 18th. Temperatures fell below zero all four days, with wind chill values in the 5- to 30-below range during the majority of the time.

Flooding Events

There have been eight major flood events in St. Clair County since 1980. Between 2008 and 2013 there were five major flood events, resulting in $65,050,000 in damages. About 32% of those properties have been mitigated.

On April 10, 2013, a frontal boundary stalled over Michigan, dropping 3 to 6 inches of rain. This resulted in the flooding of some rivers, streams and low-lying areas. Dozens of roads were closed across the following counties: Midland, Bay, Saginaw, Tuscola, Lapeer and St. Clair. Several roads were also reported to be damaged. Hundreds

of basements were flooded, with some property damage also reported. Due to the flooding, $25 million in property and crop damage was reported.

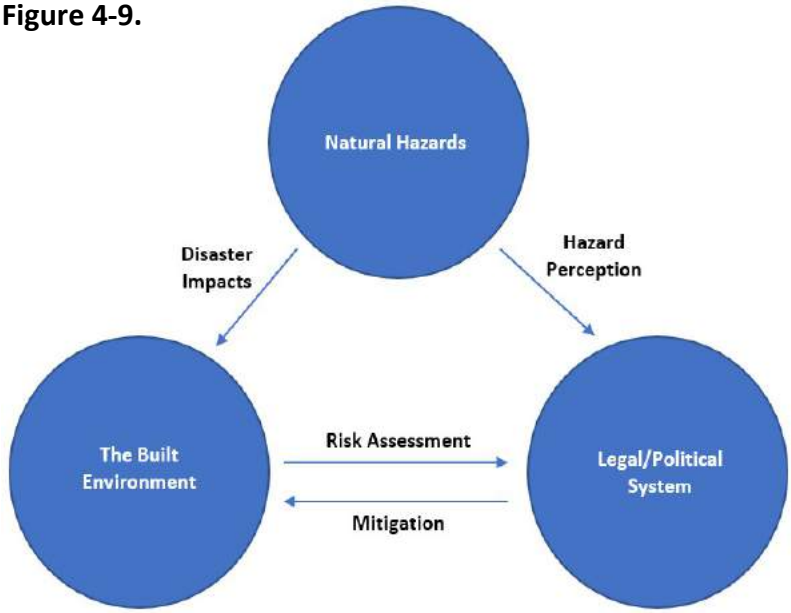
Extreme heat and cold as well as major flood events can have a detrimental impact on the economic, social and environmental well-being of a community. As changes in long-term climate trends continue to exacerbate the frequency and severity of such events, it will be up to the community and local leaders to decide on appropriate actions to mitigate the effects of severe weather.

Exposure **refers to hazards in the natural or built environment, while** ***sensitivity*** **refers to the degree to which a community or certain segments of a community could be impacted by an adverse event.**

Vulnerability Assessments

Communities interested in becoming more resilient assess their vulnerabilities and make action plans to reduce their sensitivities and exposures to hazards of all kinds. This Community Vulnerability Assessment has been compiled by the Land Information Access Association (LIAA) to provide a wide variety of useful information aimed at improving climate resilience by reducing human and community vulnerabilities.

Figure 4-9.



Vulnerability = Exposure + Sensitivity

A Vulnerability Assessment is designed to identify and help prioritize adaptation strategies in the community planning process. A model that defines vulnerability as "exposure plus sensitivity" is used to complete the assessment.[40] "Exposure" refers to hazards in the natural or built environment, while "sensitivity" refers to the degree to which a community or certain segments of a community could be impacted by an event. This concept has been used recently in a variety of studies, such as equity and adaptation assessments conducted by the NAACP,[41] vulnerability and its relationship to adaptation,[42] and hazard-specific vulnerability assessments aimed at measuring exposure, sensitivity, and resilience.[43]

By assessing the potential for exposure to a hazard and the sensitivities of specific populations, maps are generated that identify the community's areas with relatively greater vulnerability (that is, where exposure and sensitivity overlap). This tool provides direction for community planners and public health workers in reducing risks to human health by understanding where the areas of vulnerability lie and why the vulnerability exists.

For the purposes of this tool, based on the greatest risks in Michigan and most likely predicted climate changes, the vulnerability assessment for St. Clair County was limited 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, severe winter storms).

Our assessment was based in part on data obtained from the American Community Survey (ACS), a continuing survey program operated by the U.S. Census Bureau. This data includes information on housing, income and education characteristics of the population in geographic areas called "Block Groups," which contain between 600 and 3,000 individuals. Data from the 2010 Census was also used, including population age and racial composition collected at the Census "Block" level, which is the smallest available geographic area for demographic data.

Heat Vulnerability

Community vulnerability to heat events varies spatially on local, regional and national scales. In Michigan communities, there are varying degrees of vulnerability to heat based on proximity to the Great Lakes, access to air conditioning, and surrounding environmental factors like tree canopy and impervious surfaces.

Table 4-1. Needs of Stakeholders and Participants in Disaster Recovery

	Immediate and long-term needs
Individuals and families	Housing
	Restoration of employment
	Health and welfare
	Restoration of schools and other educational facilities
Business and industry	Reconstitution of business, business recovery
	Rehiring of workers
	Insurance supplementation or coverage of uninsured losses
	Business altruistic activity
Communities and local government	Restoration of utilities and lifeline services
	Support of nonprofit charitable organizations
	Infrastructure repair and replacement
	Supervision of local recovery
	Debris removal
	Post-disaster planning
State and federal government	Repair or replacement of state-owned infrastructure or facilities
	Repair or replacement of federally owned infrastructure or facilities

Cited in Disaster Policy & Politics (Sylves, 2008). Original source: Introduction to Emergency Management (Haddow & Bullock, 2006).

Studies have shown that heat-related mortality generally occurs in areas of the community that are warmer, less stable, and are home to more disadvantaged populations.[44] One study found that neighborhoods with the highest temperatures and the least amount of open space and vegetation were also likely to be the most socioeconomically disadvantaged.[45] The same study also found the strongest protective factor for residents was access to air conditioning in the home and in other places, as well as having access to transportation.

A 2012 literature review conducted by researchers at the University of Michigan indicates that children under five and persons over age 65 are highly sensitive to heat events, as are persons living in lower -income Census tracts and minority populations. Living alone, being confined to bed, having a mental illness, not leaving home daily, living on higher floors of multistory buildings, and suffering from alcoholism are additional factors that are associated with increased risk of heat-related mortality.

Many Michigan communities are rural and suburban. There have been limited studies conducted on how heat events impact rural and suburban communities, but one study notes that rural populations may exhibit patterns of vulnerability different from those of urban populations.[46]

Heat Sensitivity Assessment

To create the sensitivity and exposure maps, as well as the resulting vulnerability maps, the project team relied on methodologies developed at the University of Michigan's Taubman College of Architecture and Urban Planning in a 2012 report.[47]

To conduct the heat sensitivity assessment of St Clair County, the project team used a geographic information system (GIS) for spatial data analyses to show the relative distribution of people most at risk. Five factors have been identified as primary contributors to the sensitivities and risks of people exposed to a heat wave, including: people over 65 years of age; people living alone; people over 25 with less than a high school education; minority populations; and people living below the poverty line. Using U.S. Census data, the project team identified the percentages of people living in each area (by Block Group or Block) for each sensitivity factor.

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 1 for each community) depicts the relative concentration of older adults in the community by Census Block.

Another sensitivity factor is living alone, which serves as a measure of social isolation. Although living alone is not necessarily a risky thing, people who are socially isolated are at greater risk during an extreme heat event. Isolated people may not be able to recognize symptoms of heat-related illness and take proper action. In this case, the project team used the American Community Survey data for Census Block Groups, broken out into individual Census Blocks for geographic representation (Blocks with no population were not included). Map 2 for each community depicts the concentrations of people living alone.

Literature suggests 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.[48] Census Blocks were used to map the relative percentages of non-white populations in in each community (see Map 3).

Two socioeconomic factors associated with increased heat-related morbidity and mortality are the 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 an extreme heat event. Census Block Groups were used to map the relative percentages of households living below the poverty threshold in each community (please see Map 4).

Similarly, University of Michigan researchers found studies that demonstrate a direct link between low education attainment and poor health as well as income.[49] There is also an established correlation between lower educational attainment and income. Based on these findings, Census Block Groups were used to map the relative percent of persons 25 years and older with less than a high school education in each community (see Map 5).

To complete the heat sensitivity assessment, a cumulative score for all five sensitivity factors for each Census Block was created. In each of the sensitivity factors, the percentages were grouped into five categories (ranging from a very low percentage of people to a relatively high percentage living with the identified sensitivity). The five categorical groupings were generated by the GIS software ArcMap using natural breaks in the data (groupings). A ranking of 1 to 5 was assigned to each of the categories, ranging from 1 for the lowest percentage to 5 for the highest. Finally, the team combined the scores within each Census Block. Thus, the most sensitive Census Blocks could be scored up to 25. The sensitivity is color-coded for ease of identifying areas with the greatest sensitivity.

The Sensitivity to Excessive Heat Map (Map 6 for each community) provides a reasonably detailed map of locations where the highest percentages of at-risk residents live. This does not mean 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. These are populations that could be sensitive to extreme heat events.

The Census data used likely double-counts some people, such as in cases where a person is both a minority and over 65; this may overestimate the severity of the sensitivities in some locations. Conversely, the sensitivity

analysis may underestimate risk in some areas because it leaves out several key sensitive populations, such as those with preexisting health concerns that denote vulnerability to heat (for example, cardiovascular disease or psychiatric disorders), since such health data is not often available publicly. Emergency managers, hospitals, and community health departments may have additional data available that can be included as the community looks to better understand its sensitive populations. To further improve the analysis, additional variables could be collected through local surveys and observations, such as the degree of social connections among individuals within a community, or materials used in housing.[50]

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 then radiated back into the surroundings, and this heat continues to radiate even after the sun has set. Conversely, tree canopy and other vegetation tend to help cool an area through evaporation and transpiration of water, and by providing shade. In places with a high percentage of impervious surface and little tree canopy, the immediate surroundings can be much warmer. Urban areas typically have higher heat indexes (combinations of temperature and humidity) than surrounding suburban or rural areas. This condition has been termed the Urban Heat Island Effect.[51]

FOUR PHASES OF DISASTER MANAGEMENT

Mitigation
Mitigation involves deciding what to do where a risk to the health, safety, and welfare of society has been determined to exist, and then implementing a risk reduction program.

Preparedness
Preparedness involves developing a response plan and training first responders to save lives and reduce disaster damage, identifying critical resources, and developing necessary agreements among responding agencies, both within the jurisdiction and with other jurisdictions.

Response
Response entails providing emergency aid and assistance, reducing the probability of secondary damage, and minimizing problems for recovery operations.

Recovery
Recovery involves providing the immediate support during the early post-disaster period necessary to return vital life-support systems to minimum operational levels and continuing to provide support until the community returns to normal.

From Disaster Policy & Politics (Sylves, 2008)

People living in settings with an Urban Heat Island Effect suffer greater exposures to heat over longer periods of time (e.g., warmer nights), making them more vulnerable to health impacts. Studies of the Urban Heat Island Effect (whereby air temperatures in an urban area are 2° to 9° F higher than in a nearby rural area) have shown that the albedo, or reflectivity, of an urban area is one of the most important determinants in reducing the magnitude of the heat island.[52] Increasing the tree canopy cover can also reduce air temperature by 2° to 5° F. Green roofs (vegetative plantings on roofs) may also decrease the Urban Heat Island Effect and decrease stormwater runoff and building energy use. Added benefits from increasing albedo and vegetation include reductions in ground level ozone pollution and reduced energy costs associated with air conditioning use.[53]

To complete a heat exposure assessment, the project team focused on the Urban Heat Island Effect, and two separate exposure maps were created. The first exposure map depicts the percentage of impervious surfaces within each Census Block, as used in the sensitivity assessment (Map 7 for each community). These percentages are divided into five categories using the GIS software's natural breaks calculation. Since exposure is lowest in areas with the lowest percentage of impervious surfaces, those scored a 1, with a rating of 5 assigned to areas with the highest percentage of impervious surfaces.

The second exposure factor is percentage of tree canopy. Here, tree canopy is mapped within each Census Block (Map 8) and scored using a similar five-category process. On Map 8, the highest percentage of tree canopy (and therefore the lowest heat exposure) received a score of 1, and the areas with the least amount of tree canopy received a 5.

The project team combined the results of the two exposure maps to provide a single Community Excessive Heat Exposure Map for each community (Map 9), which provides a reliable depiction of where the Urban Heat Island Effect would be most or least intense during a heat wave. Officials in St Clair County can use this map to better assess where new vegetation and tree canopy would be helpful to reduce the heat impact.

Composite Heat Vulnerability Map

The Heat Vulnerability Map is a simple additive combination of the overall sensitivity map and the overall exposures map (see Map 10 for each community). 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 22 to 27 (red) have residential populations that may be particularly vulnerable to extreme heat events.

Heavy Rain and Flooding

Climate scientists say that St. Clair County and Lower Michigan can expect more frequent storms of increasing severity in the decades ahead. The total amount of rainfall per year is also likely to increase. However, climate models suggest the precipitation will be more concentrated in the winter, spring and fall seasons and there will be more localized, intense storms at almost any time of year. The 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 to flooding, community planners evaluate potential exposures as well as sensitivity. Buildings, roads, bridges, sewer lines and other infrastructure located in a flood zone are exposed to greater risks. Where flowing floodwaters have the greatest energy, structures may be undercut, collapse or move, and soils will erode. Even areas outside of an identified floodplain 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. The sensitivity of structures can be modified to reduce risk of damage by applying flood-resistant design standards.

Exposure to Flooding Hazards

The Digital Elevation Model Map (Map 11 for each community) offers a useful view of the coastal topography of St Clair County, including the most prominent drainage patterns. On this map, the darkest green colors identify the lowest elevations, while the darkest red colors identify the highest elevations. Map 4-12 shows FEMA flood zones in each community.

Coastal Hazard Analysis

As part of this master planning process, LIAA and the University of Michigan analyzed shoreline and riverine ecosystem and physical dynamics to help St. Clair County manage its shoreline and riverine areas. This section presents a brief summary of the team's framework, results and recommendations.

Overview of Research Framework

The Research Framework for this study employs scenario planning to assess environmental and land-use conditions under different climate futures. Scenario planning, in general, identifies driving forces to inform a range of scenarios that are then analyzed and evaluated. In this context, the project team identified natural forces, especially increasing storminess and lake-level fluctuations causing increased problems with flooding. These forces informed the creation of multiple climate futures. Each climate future was tested and evaluated for impacts on the environment and land use in the community.

Climate Future Definitions

Rather than presenting a prediction of what the future will bring, each of the following "climate futures" lays out a possible future that might occur. These varying climate futures — all of which are reasonably anticipated possibilities — are arranged from a least impactful to a most impactful condition in terms of the potential for wave damage and flooding hazards they would bring. The following descriptions outline the key assumptions made in defining each of the climate futures as compared to the others. For each community, Map 13 shows the estimated land areas that would be affected by waves and flooding under these three climate futures and Map 14 shows the same information but with building footprints displayed.

"Lucky" Future: Under the Lucky Climate Future scenario, Great Lakes water levels will stay relatively low. Although there will be wave and wind action, major storm events and wave impacts will not encroach on properties landward of current beaches. A Lucky Future projection, indicating the land areas that would be affected by high-energy waves along the shorefront and/or adjacent riverine flooding under these conditions, is shown in green on Maps 13 and 14.

"Expected" Future: Under the Expected Climate Future, Great Lakes water levels will continue to fluctuate according to long-term decadal patterns, including recent extreme storm events incorporated into the ongoing Great Lakes Coast Flood Study by the Federal Emergency Management Agency (FEMA). Given those ongoing fluctuations, this Climate Future accounts for periods when Great Lakes still-water elevations are closer to the long-term average. In addition, this Climate Future anticipates the so-called "100-year storm event" (or 1% storm) becoming more like a 20- or 50-year storm event (i.e., an expected storm within the normal community planning time horizon) because of increased storminess. The Expected Future projection is shown in yellow on Maps 13 and 14.

"Perfect Storm" Future: Under the Perfect Storm Climate Future, Great Lakes water levels will continue to fluctuate according to decadal patterns, consistent with assumptions made for the Expected Future. However, for this Perfect Storm Climate Future, the estimated still-water elevation is set higher than the long-term average and closer to the long-term high (583 feet). In addition, this Climate Future anticipates the occurrence of a so-called "500-year storm event" (or 0.2% storm) occurring within the planning time horizon while lake levels are high. The Perfect Storm Future projection is shown in red on Maps 13 and 14.

Management Scenarios

Under the scenario planning algorithm, one can also analyze the potential for development impacts. The three Climate Futures can be used to create distinct scenarios, which can then be analyzed for selected conditions as noted above. This array of scenarios represents a range of conditions the county could reasonably encounter in the foreseeable future regarding potential wave and flooding impacts, given changing natural conditions and the development management decisions made in response. For analysis here, each scenario focuses on potential impacts to land use and environmental conditions in Clay Township as an example. Land use impacts include the acreage and structures that would be at risk under different futures.

In Tables 4-3, 4-4 and 4-5 below, there are three rows that each describe a different development scenario. The

first row shows the impact on current development in Clay Township. The second row shows the impact if the township experiences a full buildout of residential development according to its existing zoning code. The final row summarizes the impact if the municipalities were to first implement best practices (BMPs) into their land use regulations before full buildout. The BMPs modeled in this management option are:

- 50-foot buffers around any inland water (rivers, lakes and streams).
- 50-foot buffers around any wetland five or more acres in size, as defined by the State of Michigan's Final Wetland Inventory data.
- A complete restriction of any development within a wetland five or more acres in size, as defined by the State of Michigan's Final Wetland Inventory data.

Land Use Results for Clay Township

Total Acres

The total acres of land impacted by flooding increases from the Lucky Climate Future to the Perfect Storm Climate Future. For this analysis, the Lucky and Expected climate futures are the same, due to relatively weak wave run-up along Clay Township's shoreline. Between the Lucky and Perfect Storm scenarios, the total acres impacted increases by about 9%. Table 4-2 shows the total acres of land impacted under each future flood forecast in Clay Township.

Table 4-2. Total Land Acres Impacted by Flooding in Clay Township

	Lucky	Expected	Perfect Storm
Clay Township	30,583	30,583	33,395

Structures

Up to 4,642 existing structures may be impacted in Clay Township depending on the severity of the Climate Future experienced. Table 4-3 summarizes the total number of structures impacted under the varying Climate Futures. One can see that the use of best management practices (BMPs) for future development would have the effect of reducing the proportion of structures that would potentially be affected by a storm event (see Maps 15 and 16 for Clay Township).

Table 4-3. Number of Structures Impacted by Flooding in Clay Township

	Total	Lucky	Expected	Perfect Storm
Current Development	5,806	4,533 (78%)	4,533 (78%)	4,642 (80%)
Buildout According to Current Zoning Ordinance (Additional Structures Impacted)	17,444	12,161 (70%)	12,161 (70%)	12,538 (72%)
Build-out According to Best Management Practices (Additional Structures Impacted)	9,101	4,533 (50%)	4,533 (50%)	4,642 (51%)

Table 4-4 shows the tax revenue of properties affected in each of the climate scenarios. While Clay Township would add much more tax revenue if it were to build out under its current zoning, the potential cost of damages, shown in Table 5, increases drastically as well. The township will have to balance the long-term desire to add revenue with the need to be able to withstand the short-term risks associated with a flood event.

Table 4-4. Tax Revenue of Affected Properties in Clay Township

	Lucky	Expected	Perfect Storm
Current Development	$15,116,612	$15,116,612	$15,454,388
Buildout According to Current Zoning Ordinance (Additional Structures Impacted)	$44,288,452	$44,288,452	$47,294,059
Build-out According to Best Management Practices (Additional Structures Impacted)	$15,116,612	$15,116,612	$15,454,388

Table 4-5 describes the potential damages that may occur in the different climate futures. As previously mentioned, it is worth noting that a buildout according to BMPs would, over time, result in less tax revenue than a full buildout according to the current zoning ordinance. However, as shown in Table 5, the potential cost of damages in Clay Township be around 25 times more costly. In other words, If you allow more development in high hazard zones, you will see greater tax revenue, but also significantly greater potential loss from damages. Many communities, when considering development, only look at the amount of tax revenue the municipality will gain. However, as this analysis shows, potential hazards and their subsequent damages should also play into the siting of new buildings.

Table 4-5. Potential Property Damages for Different Flooding Scenarios in Clay Township

	Lucky	Expected	Perfect Storm
Current Development	$22,287,275	$22,287,275	$23,729,617
Buildout According to Current Zoning Ordinance (Additional Structures Impacted)	$554,162,661	$554,162,661	$563,162,320
Build-out According to Best Management Practices (Additional Structures Impacted)	$22,287,275	$22,287,275	$23,729,617

Coastal Resiliency Goals

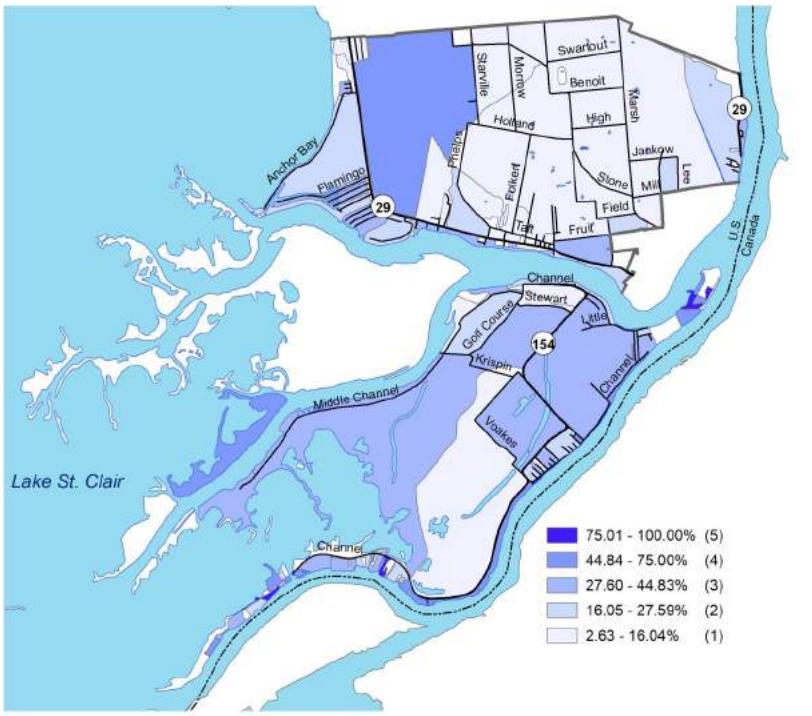
The coastal resiliency goals desired by St. Clair County residents are:

1. Utilize green infrastructure to effectively manage stormwater runoff and mitigate other environmental impacts from climate-related hazards.
2. Continue to participate in regional watershed planning efforts.
3. Invest in and protect critical infrastructure.
4. Work with community partners to implement innovative solutions to reduce the amount of paved, impervious surfaces throughout the county.
5. Implement the St. Clair County Hazard Mitigation Plan.

Clay Township Example

Map 1

Percent of Population 65 Years and Older (male and female)



Data Sources:
St. Clair County,
U.S. Census Bureau (2010), ACS (2013-2017),
Michigan Geographic Data Library.

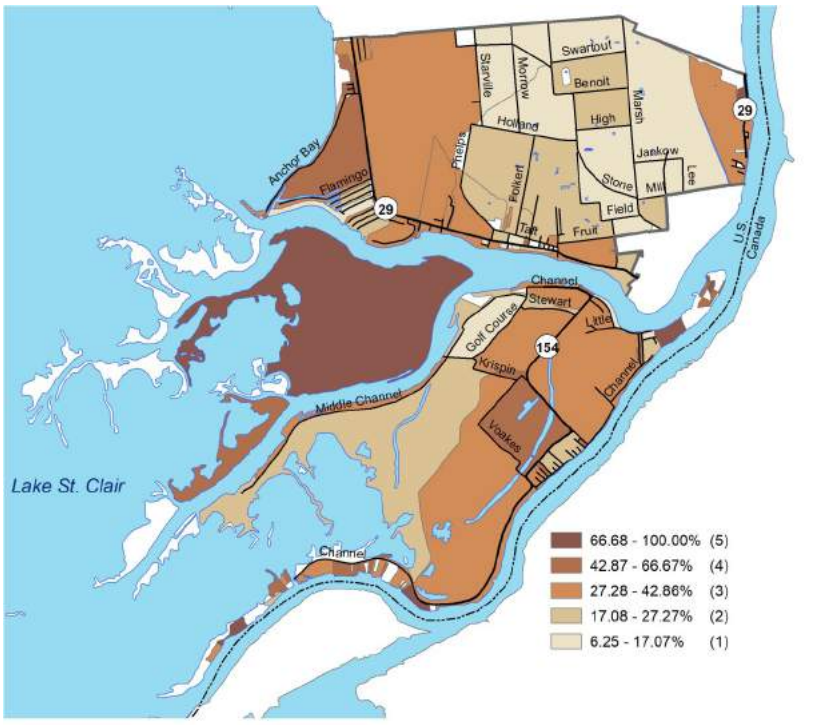
Prepared May 2020 by LIAA for the St. Clair Community.

N

0 0.9 1.8 2.7 3.6 Miles

Map 2

Percent of Households with People Living Alone



Data Sources:
St. Clair County,
U.S. Census Bureau (2010), ACS (2013-2017),
Michigan Geographic Data Library.

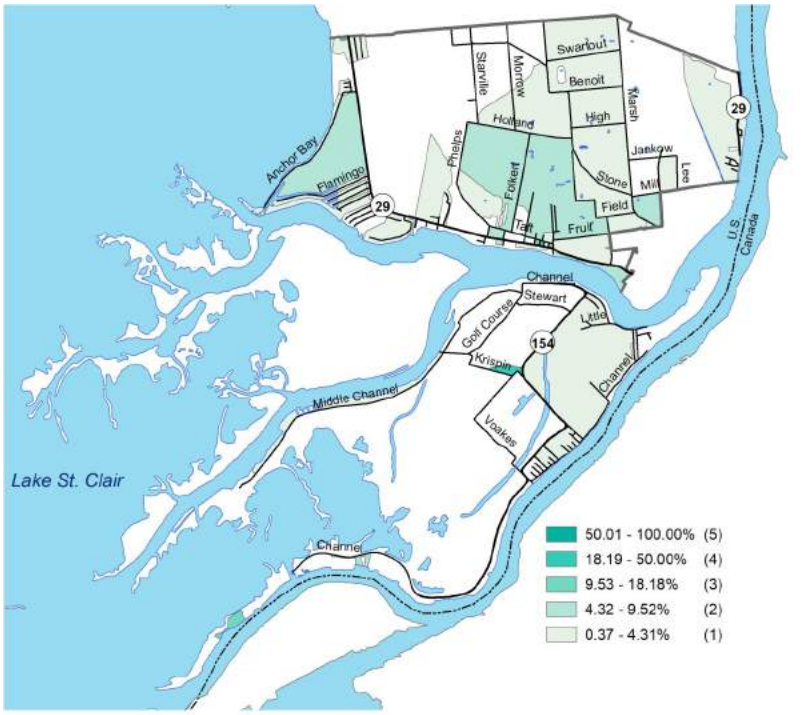
Prepared May 2020 by LIAA for the St. Clair Community.

N

0 0.9 1.8 2.7 3.6 Miles

Map 3

Percent of Non-white Population



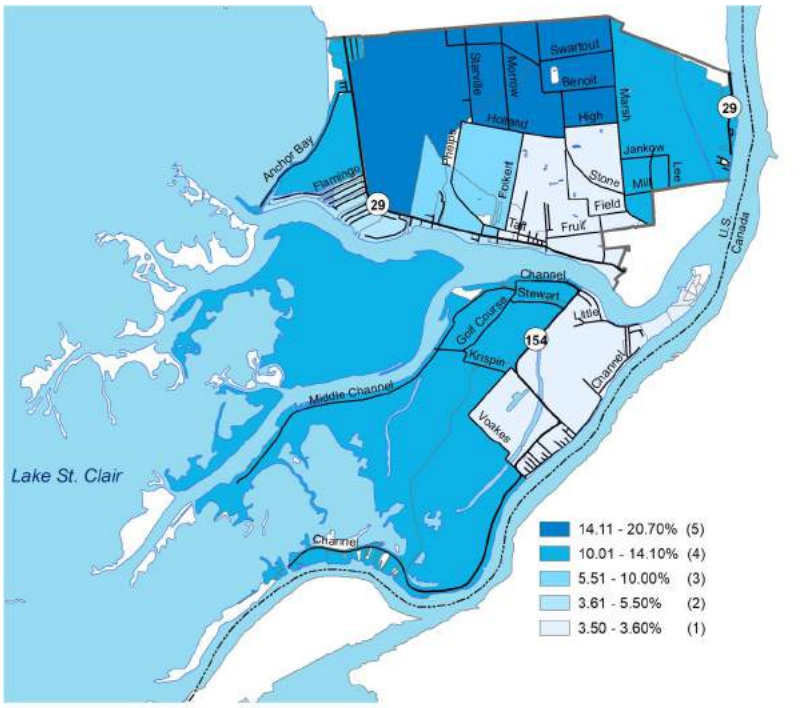
Data Sources:
St. Clair County,
U.S. Census Bureau (2010), ACS (2013-2017),
Michigan Geographic Data Library.

Prepared May 2020 by LIAA for the St. Clair Community. N

0 0.9 1.8 2.7 3.6 Miles

Map 4

Percent of Households Living Below the Poverty Threshold



Data Sources:
St. Clair County,
U.S. Census Bureau (2010), ACS (2013-2017)
Michigan Geographic Data Library

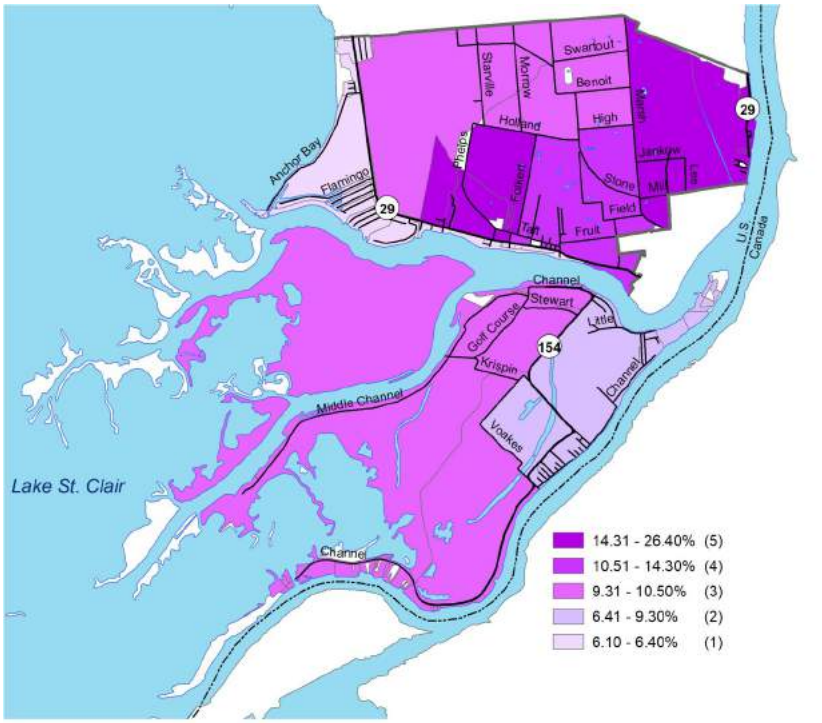
Prepared May 2020 by LIAA for the St. Clair Community. N

0 0.9 1.8 2.7 3.6 Miles

Clay Township Example

Map 5

Percent of Population 25 Years and Older with Less than a High School Education



Data Sources:
St. Clair County,
U.S. Census Bureau (2010), ACS (2013-2017),
Michigan Geographic Data Library.

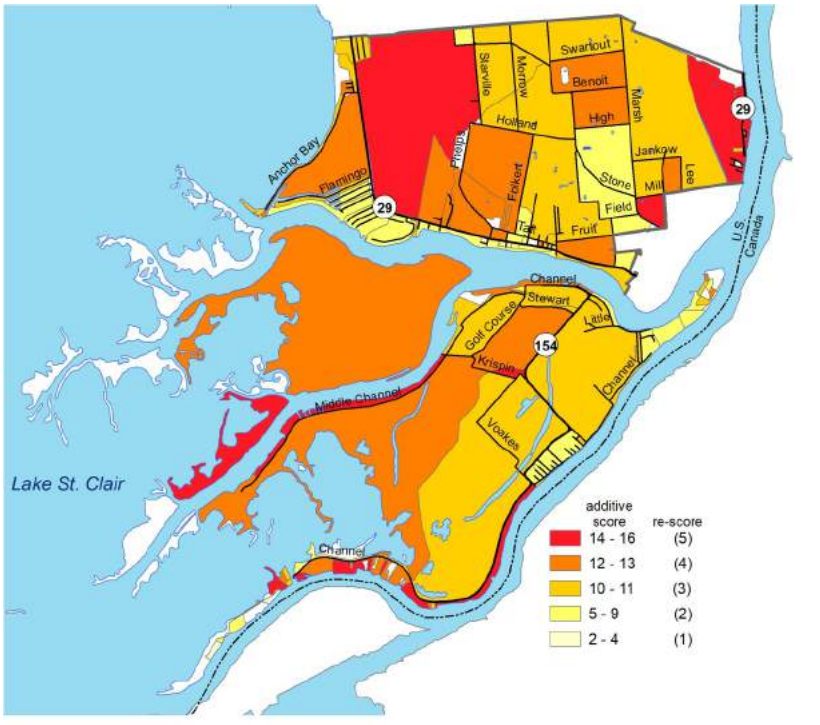
Prepared May 2020 by LIAA for the St. Clair Community.

N

0 0.9 1.8 2.7 3.6 Miles

Map 6

Relative Sensitivity of Populations to Extreme Heat Events



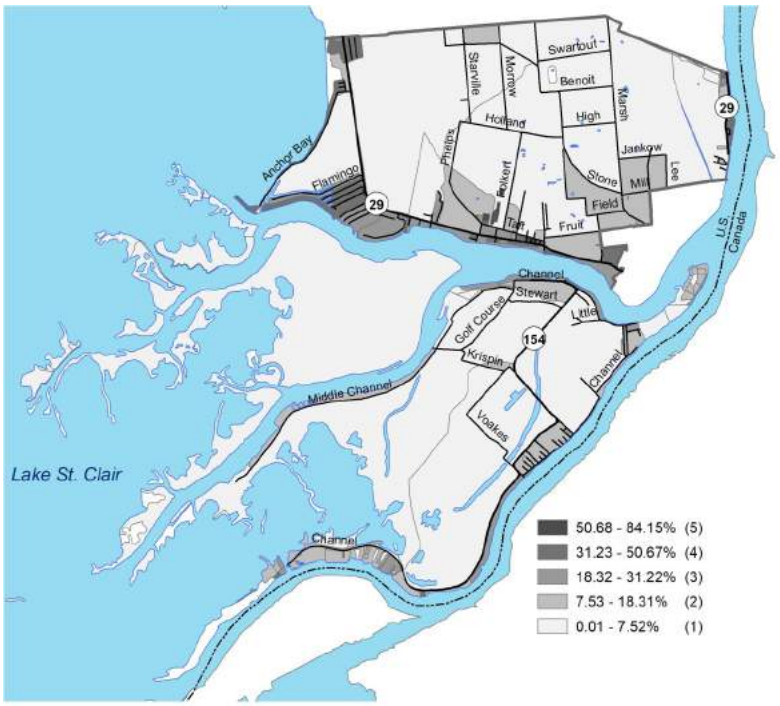
Data Sources:
St. Clair County,
U.S. Census Bureau (2010), ACS (2013-2017),
Michigan Geographic Data Library.

Prepared May 2020 by LIAA for the St. Clair Community.

N

0 0.9 1.8 2.7 3.6 Miles

Map 7
Percent Impervious Surface



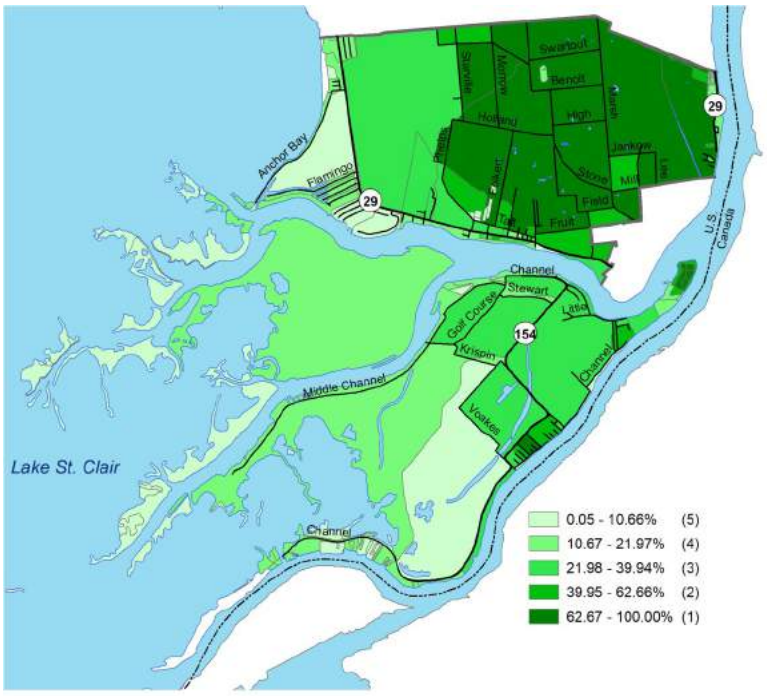
Data Sources:
St. Clair County, SEMCOG,
U.S. Census Bureau (2010), ACS (2013-2017),
Michigan Geographic Data Library.

Prepared May 2020 by LIAA for the St. Clair Community.

Miles
0 0.9 1.8 2.7 3.6

N

Map 8
Percent Tree Canopy



Data Sources:
St. Clair County, SEMCOG,
U.S. Census Bureau (2010), ACS (2013-2017),
Michigan Geographic Data Library.

Prepared May 2020 by LIAA for the St. Clair Community.

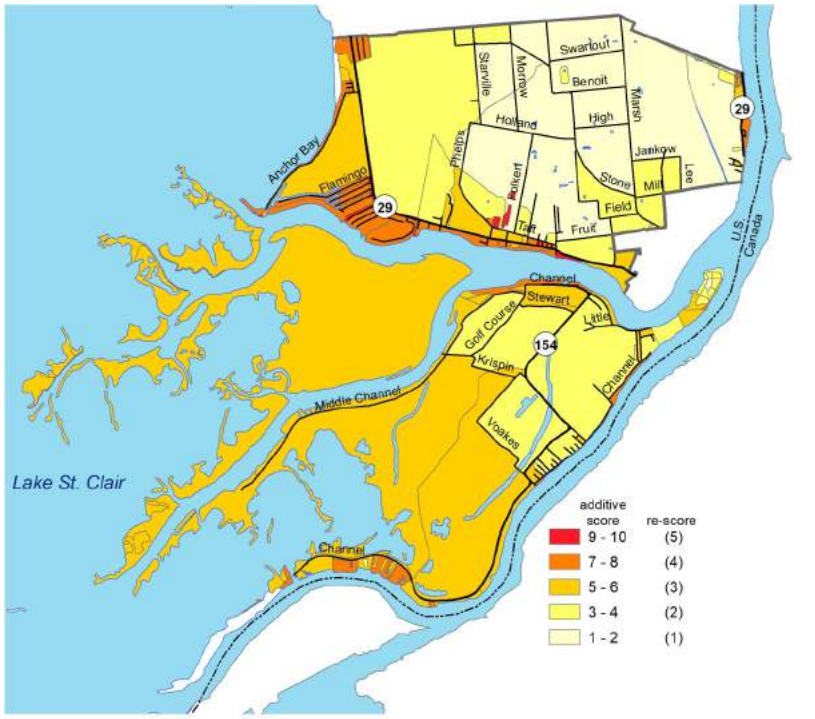
Miles
0 0.9 1.8 2.7 3.6

N

Clay Township Example

Map 9

Relative Exposure of Populations to Extreme Heat Events



Data Sources:
St. Clair County, SEMCOG,
U.S. Census Bureau (2010), ACS (2013-2017),
Michigan Geographic Data Library.

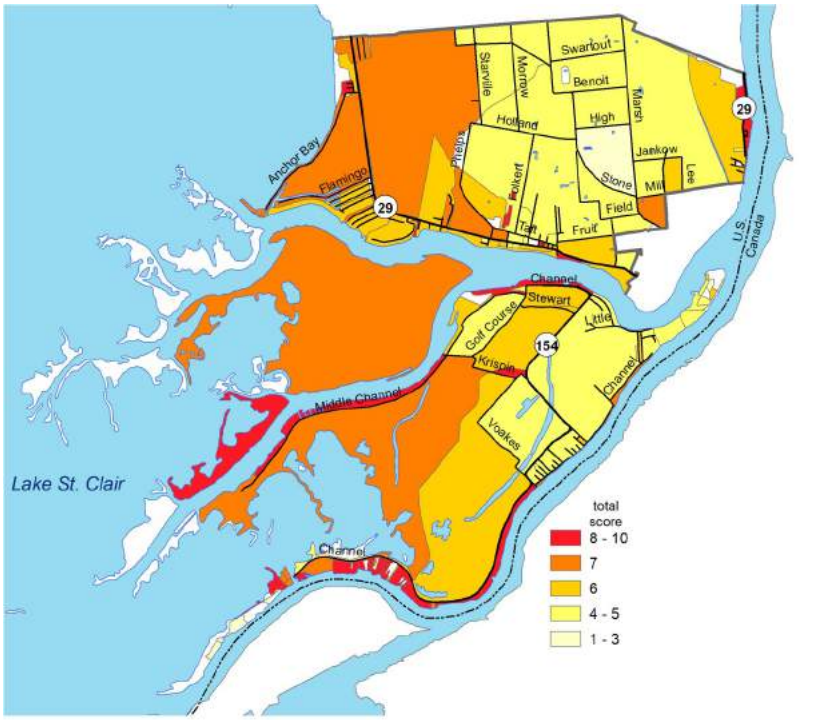
Prepared May 2020 by LIAA for the St. Clair Community.

0 0.9 1.8 2.7 3.6 Miles

N

Map 10

Population Vulnerable to Extreme Heat Events



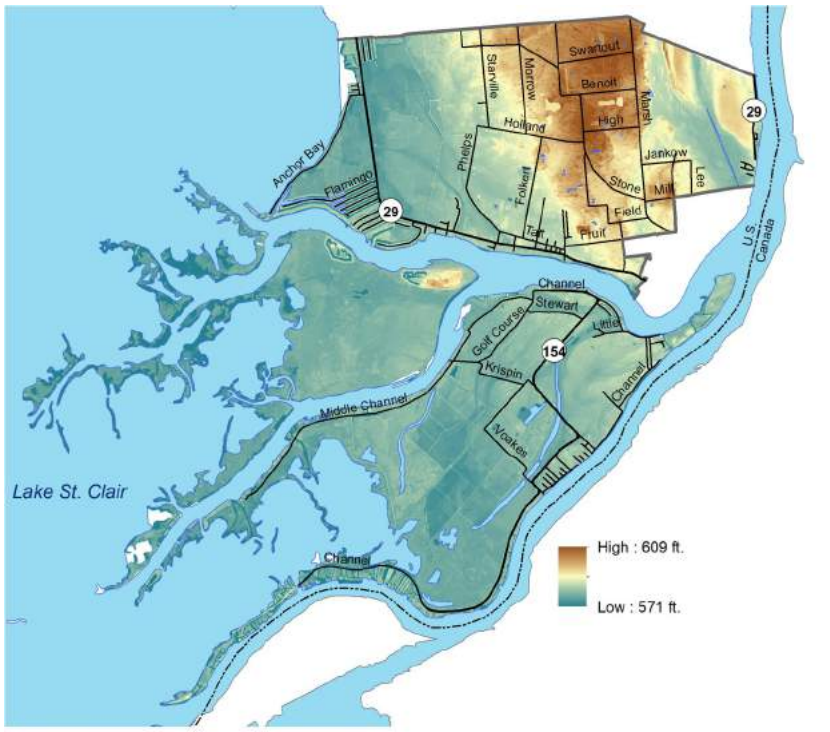
Data Sources:
St. Clair County, SEMCOG,
U.S. Census Bureau (2010), ACS (2013-2017),
Michigan Geographic Data Library.

Prepared May 2020 by LIAA for the St. Clair Community.

0 0.9 1.8 2.7 3.6 Miles

N

Map 11
Digital Elevation Model



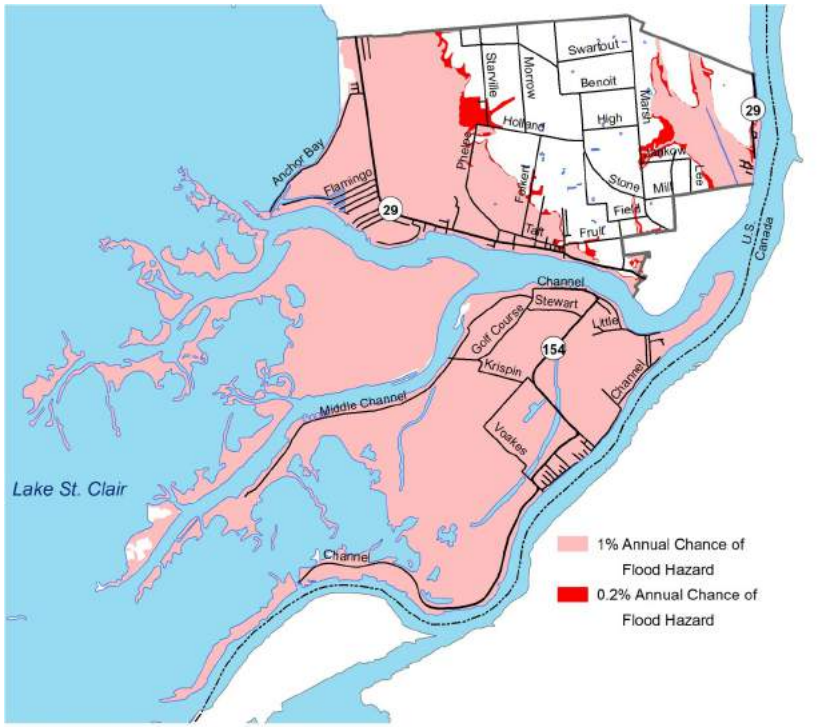
Data Sources:
St. Clair County, USDA Geospatial Data Gateway,
Michigan Geographic Data Library.

Prepared May 2020 by LIAA for the St. Clair Community.

N

Miles
0 0.9 1.8 2.7 3.6

Map 12
FEMA Flood Zones



Data Sources:
St. Clair County, FEMA,
Michigan Geographic Data Library.

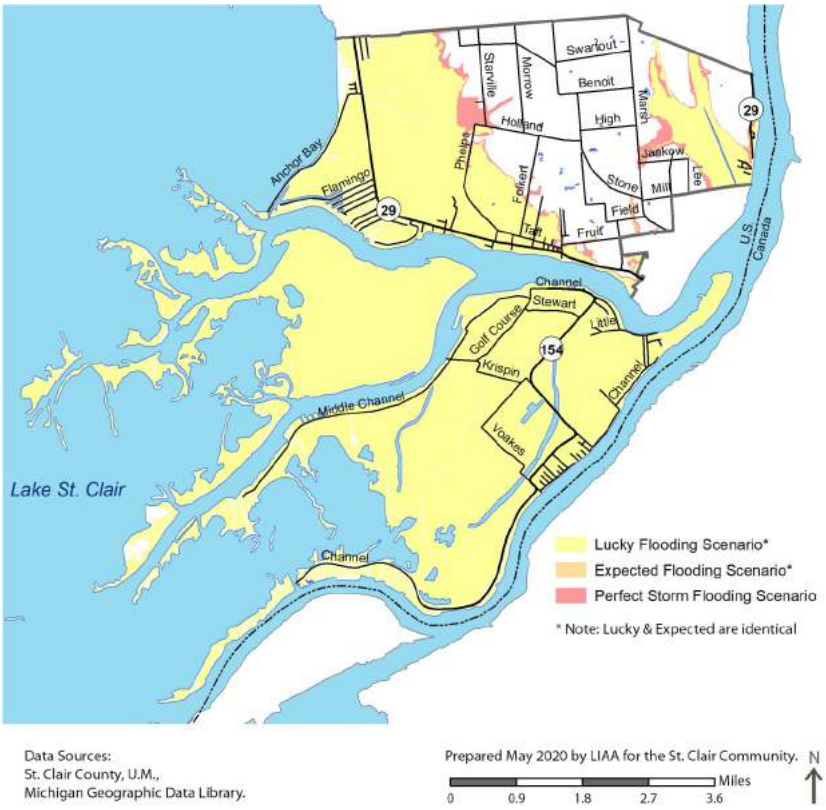
Prepared May 2020 by LIAA for the St. Clair Community.

N

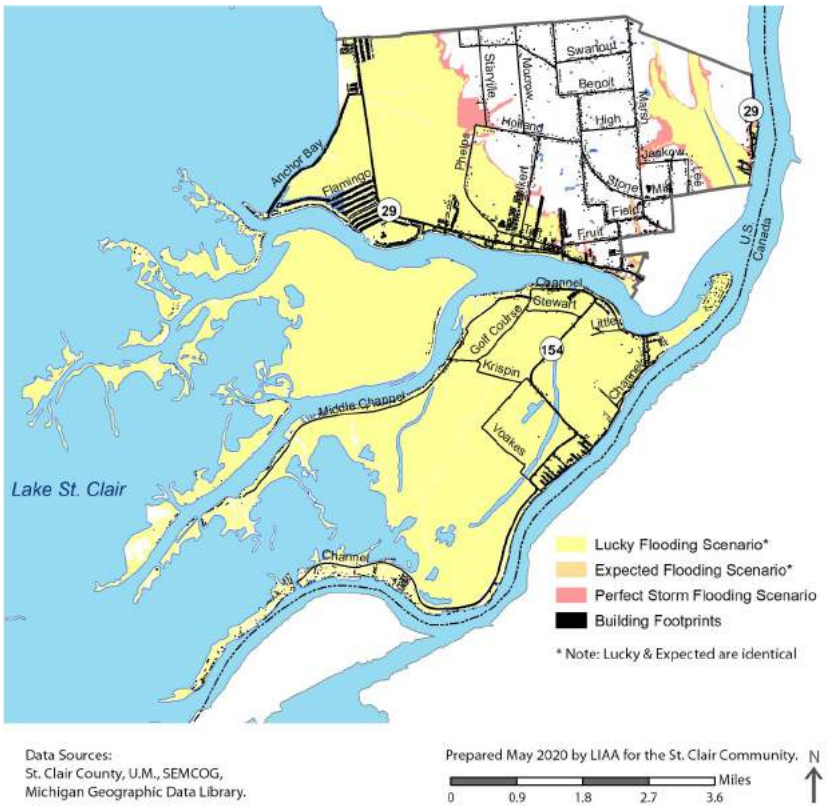
Miles
0 0.9 1.8 2.7 3.6

Clay Township Example

Map 13
Future Climate Scenarios

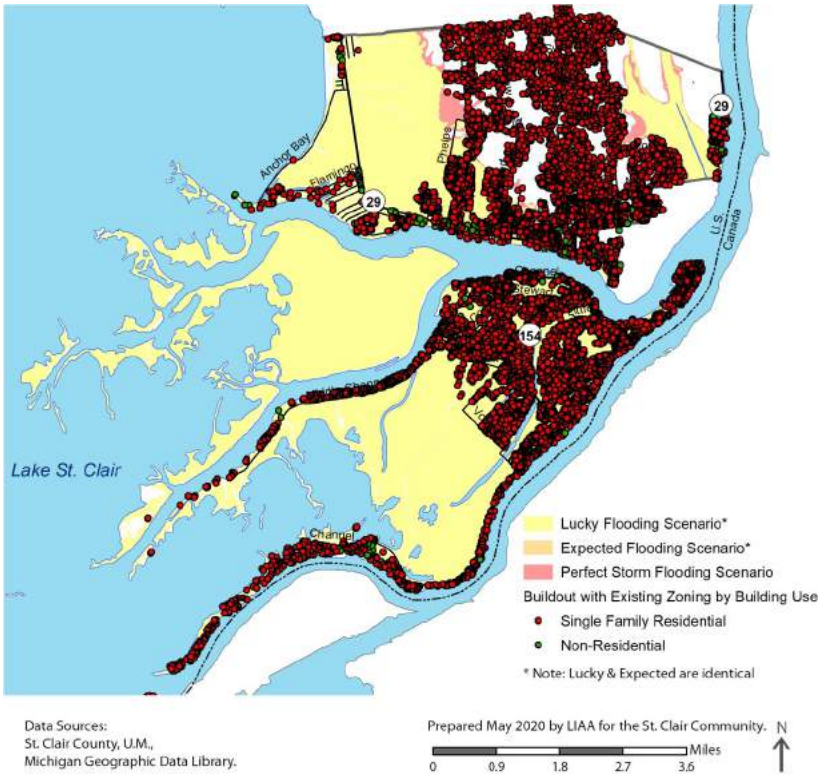


Map 14
Future Climate Scenarios with Building Footprints



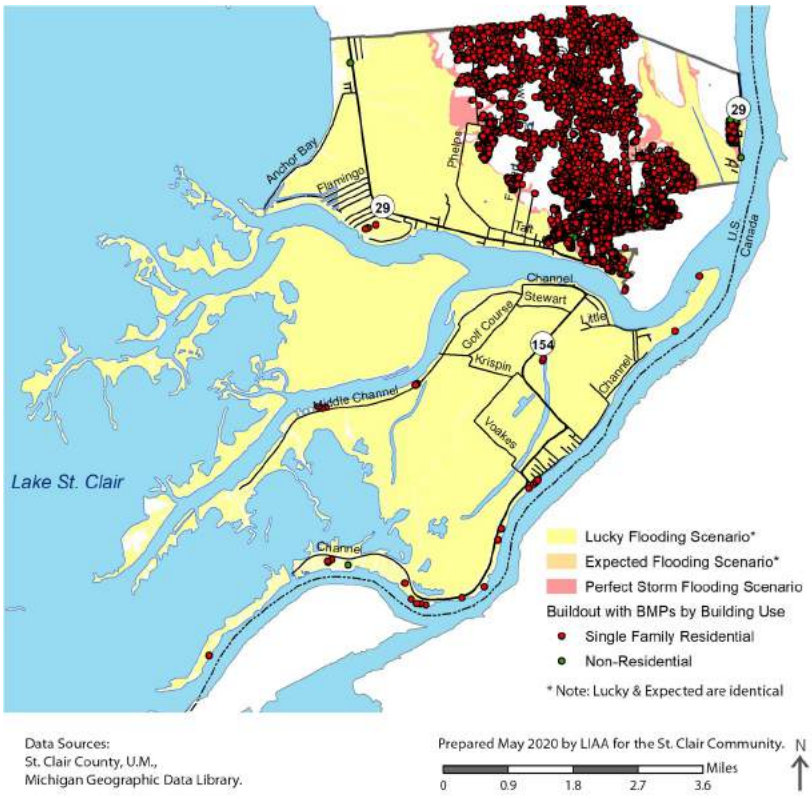
Map 15

Future Climate Scenarios with Buildout According to Current Zoning



Map 16

Future Climate Scenarios with Buildout According to Best Management Practices



Master Plan Guiding Principles
Coastal Resiliency

ECONOMIC PROSPERITY

Climate and environmental impacts present a range of risks and problems that can negatively impact the economy, including property loss and damage, increased infrastructure and service costs, and risks to financial stability. According to the Nature Conservancy, weather related disasters cost the global economy $250 billion every year.

SUSTAINABILITY AND RESILIENCY

The way we build our communities can help us better manage the impacts of extreme temperatures, flooding, Promoting the shifting of climate-friendly behaviors, practices and actions among natural resource consumers and users will reduce their climate impact and protect our natural resources.

QUALITY OF LIFE

Environmental hazards and climate events create disruptions in people's lives and often debilitate the communities in which they live and work. School and business closures, infrastructure failures, road closures, and public facilities being used as warming or cooling centers are just a few examples of how the quality of life can be disrupted in a community.

GREAT PLACES

Urban and suburban areas are particularly at-risk during heatwaves as increasing temperatures are made worse by the urban heat island effect. Urban greening is a placemaking strategy that promotes an integrated network of planned and unplanned green spaces in urban areas. Urban greening strategies such as stormwater infrastructure, green roofs, parks, and greenways can greatly benefit places and the people who live there.

HEALTHY COMMUNITIES

Changes in weather and climate patterns can put lives at risk. Heat is one of the most deadly weather phenomena. Higher incidences of flooding can lead to the spread of waterborne diseases, injuries, and chemical hazards. When considering the full range of threats from climate and other environmental exposures, vulnerable populations are among the most exposed, most sensitive, and have the least individual and community resources to prepare for and respond to health threats.

COLLABORATION

Because natural disasters affect different governmental entities in different ways, emergency response requires cooperation from all levels of community and governmental support. St. Clair County has a long history of coordination and cooperation in dealing with natural and man-made hazards, through the St. Clair County Emergency Management department.

Transportation and Mobility 5

Algonac Walpole Island Ferry. Photo courtesy of Katie Stepp, Blue Water Convention and Visitors Bureau

Introduction

Transportation refers to the various ways – navigable rivers, roads, railroads, airways, pathways, and trails that people transport themselves and their supplies and products from one place or community to another. Streets and roads are used for vehicles. Vehicles are the primary means of transportation in St. Clair County.

Transportation planning requires a comprehensive study of existing and anticipated traffic volumes; safety, roadway improvements, and non-motorized means of transportation. The public's accessibility to transportation systems and mobility within those transportation systems are key considerations.

Transportation planning must consider how, when and where people travel; and potential impacts of this travel on community character, the environment, air quality, noise pollution, taxation and fiscal expenditures. The biggest transportation impact is on land use and community development.

History of Transportation and Community Development

Traditionally, transportation planners have said that communities develop first and that roads must be built to help people get from place to place.

While, community planners have said that transportation routes come first and are the means by which people arrive in and develop a community.

In St. Clair County, we see evidence of these patterns, using both land and water resources:

- Gratiot Avenue linked Port Huron with Detroit, but also spawned many small communities along the corridor (Smiths Creek, Rattle Run, Snyderville, and Belle River).
- Lapeer Road was the link between Port Huron and Lapeer. Wadhams, Goodells, Emmett, and Capac grew because of this road.

- The coastal communities of Fort Gratiot, Port Huron, Marysville, St. Clair, Marine City, and Algonac, which make up most of the Urbanized Area, were originally linked by a water route—the St. Clair River, next by a muddy path, then plank roads, and inter-urban rail, and eventually M-25 and M-29.

Today, the major corridors in St. Clair County are I-94 and I-69, which parallel Gratiot Avenue and Lapeer Road. Although these highways do not create new formally-organized communities, the interstates do attract development in the form of motorist service facilities, such as gas stations, fast food restaurants, just-in-time delivery suppliers, and overnight accommodations.

Transportation Issues

Starting in 1913, when the first St. Clair County Road Commission came into existence, transportation planning in the County focused on building new roads.

Transportation engineers and planners were trained to accommodate rising traffic demands and to prevent congestion. New and wider roads were built to support suburban development patterns because of the County's rivers, bridges, and ferries were, and continue to be, transportation issues.

In the 1940's and 1950's, transportation planning began to incorporate a wider range of issues and strategies that, in general terms, included safety and convenience. Carpooling facilities were constructed to reduce gas consumption and air pollution in the 1970's and 1980's.

Automobiles remain, by far, the primary mode of transportation within St. Clair County. However, transportation planning today also includes inter-modal connections to facilitate travel by bus, bicycle, and on foot.

Transportation and Land Use

Since transportation and land use are so closely linked, it is vital that transportation improvements be coordinated with St. Clair County's overall land use plan. The County Master Plan suggests that residential and commercial development be directed toward settlement, especially those already providing public services, including public water and sewer lines. Conversely, the Master Plan suggests that residential development be limited in rural areas and that farming and agricultural preservation be promoted as the primary land use within areas with quality agricultural soils.

As developed areas continue to grow, roadways as well as utility and public service improvements would continue to support that growth, within those developed areas.

Natural Features and Environmental Impacts

Natural features such as lakes, rivers, and hills define and potentially constrain the land space available for road development, transportation networks, and community structure.

Water bodies are the most notable natural features in St. Clair County. Because water bodies are both conveyances for transportation by boat and a hindrance for ground transportation, they are key factors in establishment of settlement patterns within the county.

Likewise, transportation facilities and vehicles affect land, air, and water resources. Roads and their rights-of-way require land space. And automotive exhaust can impact air quality, even though many changes are occurring to improve this through Federal Transportation Programs and even Electric Vehicle technology.

Roads and Automobiles

Roads are classified according to purpose. A good road network provides mobility, functionality, efficiency, and safety as well as access regardless to purpose or vehicle type.
St. Clair County contains roads that are classified by the government as:

- Interstate highways and state arterials
- Principle arterials
- Minor arterials
- Major collectors
- Minor collectors
- Local (public and private)

Roadways planners and engineers use these classifications to determine a road's required physical design features, such as width, right-of-way, and surface materials. These design features give the road the proper combination of mobility and accessibility for its intended use.

Major Highways, connecting to other regions

- I-94
- I-69
- Pine Grove Ave (M-25)
- M-19
- M-29

Collectors connect arterials with local roads and residential streets and provide access to abutting properties. Collectors are divided into three categories: major collectors in rural areas, minor collectors in rural areas, and urban collectors. Many individual subdivisions or neighborhoods contain one or more collectors that funnel traffic between neighborhoods.

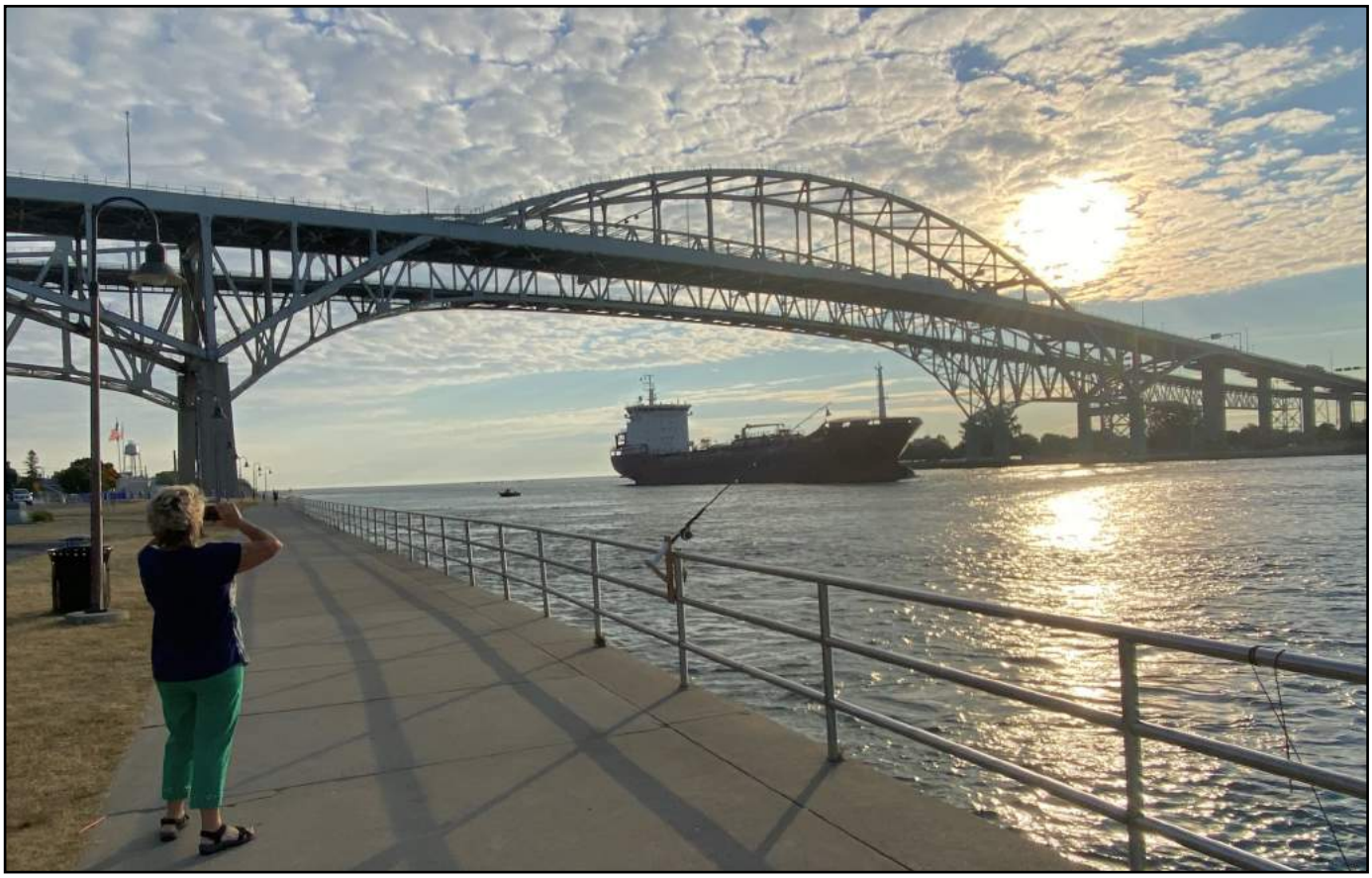
Local streets provide access to property and homes. These streets are generally short and discontinuous, often running not farther than to the nearest collectors.

Blue Water Bridge Traffic

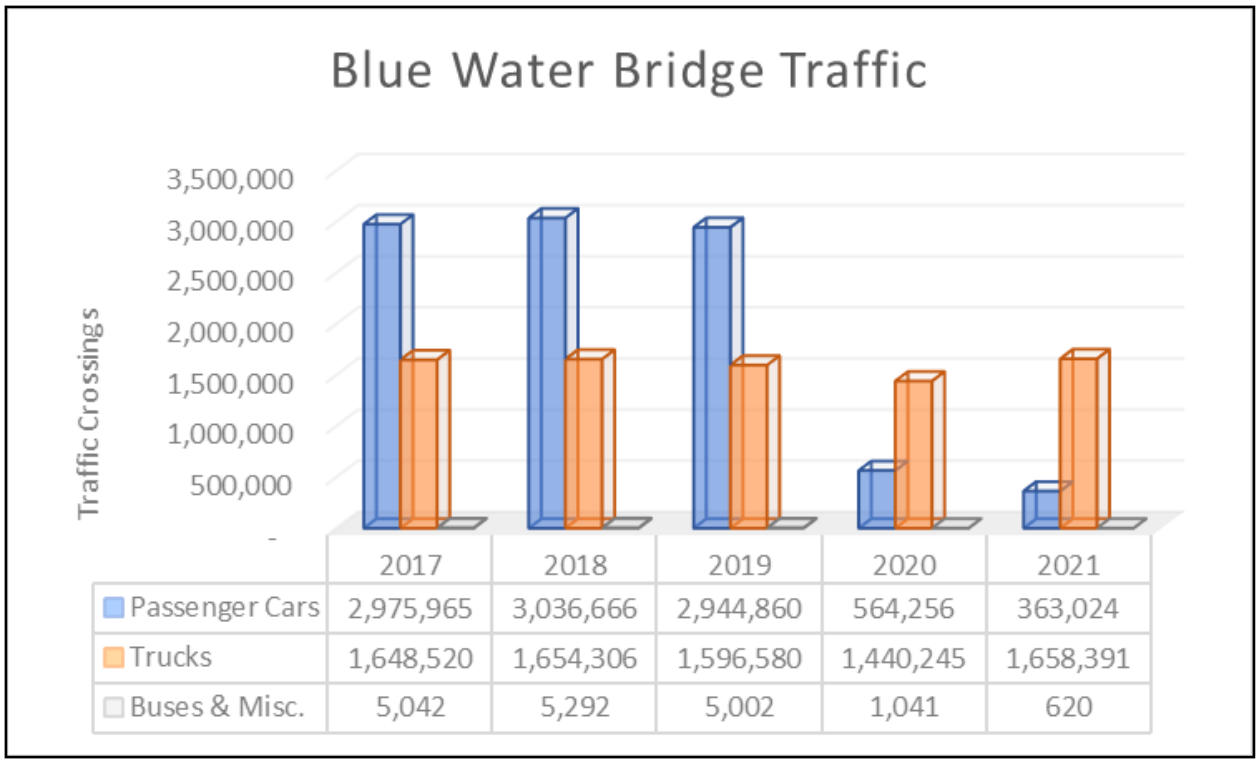
The Blue Water Bridge is a unique and key element in St. Clair County's transportation network because it links, not only this area, but much of the United States and Mexico with Ontario, Canada. The initial span was completed in 1938; and additional span was completed in 1997.

A little over 300,000 vehicles crossed the bridge in 1939, its first full year of operation. The volume grew steadily from 3 million in 1985 to over 6 million in 1991 through 1993. The volume dropped to 5 million in the mid-1990s and remained at that level through 1998.

Since 2006, the average number of commercial trucks has been about 1.5 million each year with a slight dip in 2009 due to the recession and then again in 2020 due to the pandemic. Passenger car, bus, and other vehicle traffic dropped significantly in 2020 due to the pandemic as well.



Blue Water Bridge in Port Huron. Photo courtesy of Katie Stepp, Blue Water Convention and Visitors Bureau



	2017	2018	2019	2020	2021
Passenger Cars	2,975,965	3,036,666	2,944,860	564,256	363,024
Trucks	1,648,520	1,654,306	1,596,580	1,440,245	1,658,391
Buses & Misc.	5,042	5,292	5,002	1,041	620

Source: Michigan Department of Transportation, Blue Water Bridge, 2022.

Blue Water Bridge Plaza Expansion Project

The Blue Water Bridge Plaza Expansion Project is the completion of a larger corridor and expansion project that received a Record of Decision in 2009. Funding shortfalls for the plaza facilities put the plaza work on hold, while other phases, including freeway rebuilding, replacement of the Black River bridge, and a new welcome center were completed.

MDOT received a $25 million *Infrastructure for Rebuilding America* (INFRA) grant in 2020 to proceed with a plaza expansion alternative, reduced in size, that will minimize impacts on Pine Grove Avenue in Port Huron and still address the original project's purpose and need.

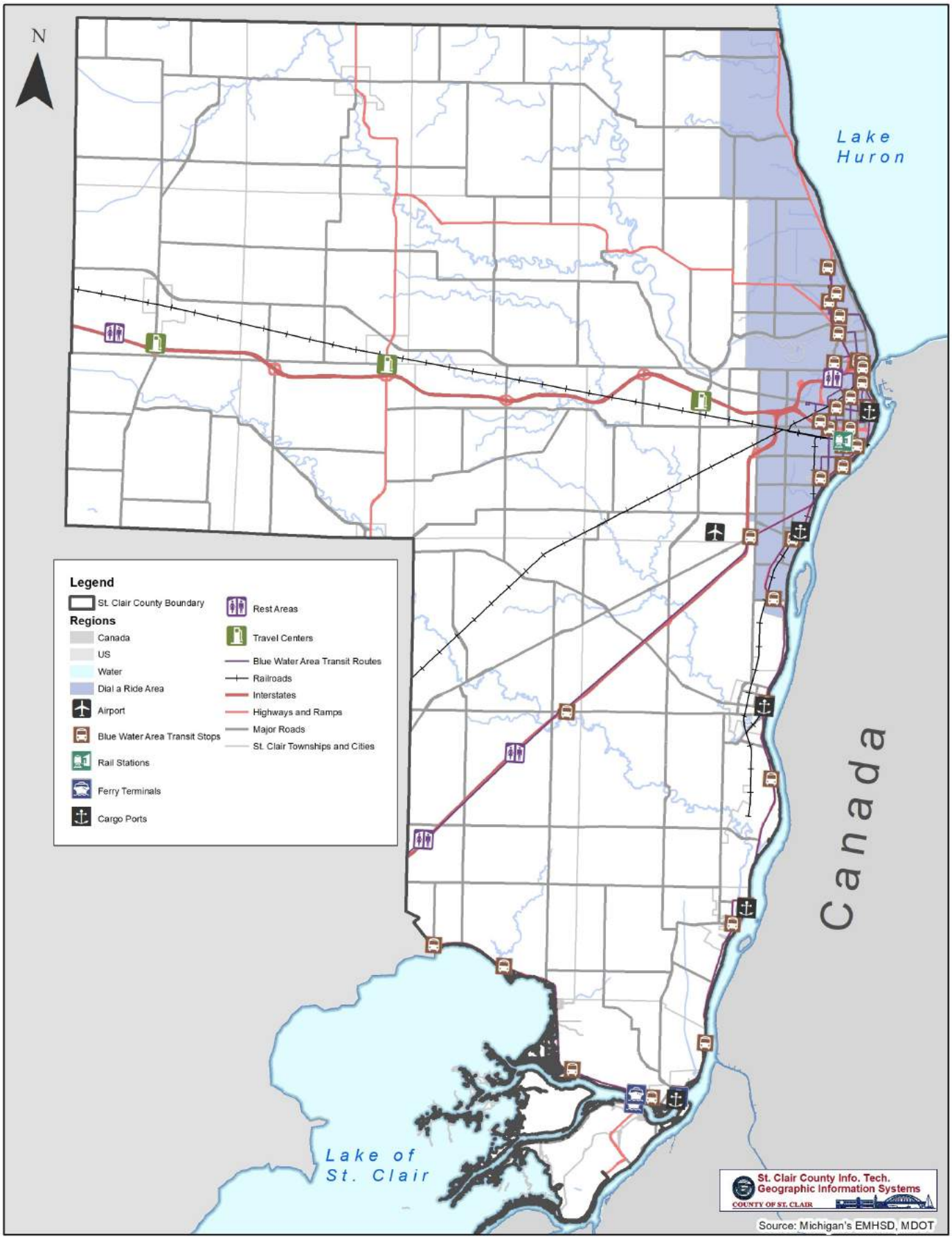
The project is intended to provide for the safe, efficient, and secure movement of people and goods across the Canadian-U.S. border in the Port Huron area to support the economies of Michigan, Ontario, Canada, and the United States. It will also support the mobility and security needs associated with national and civil defense.

What to expect…

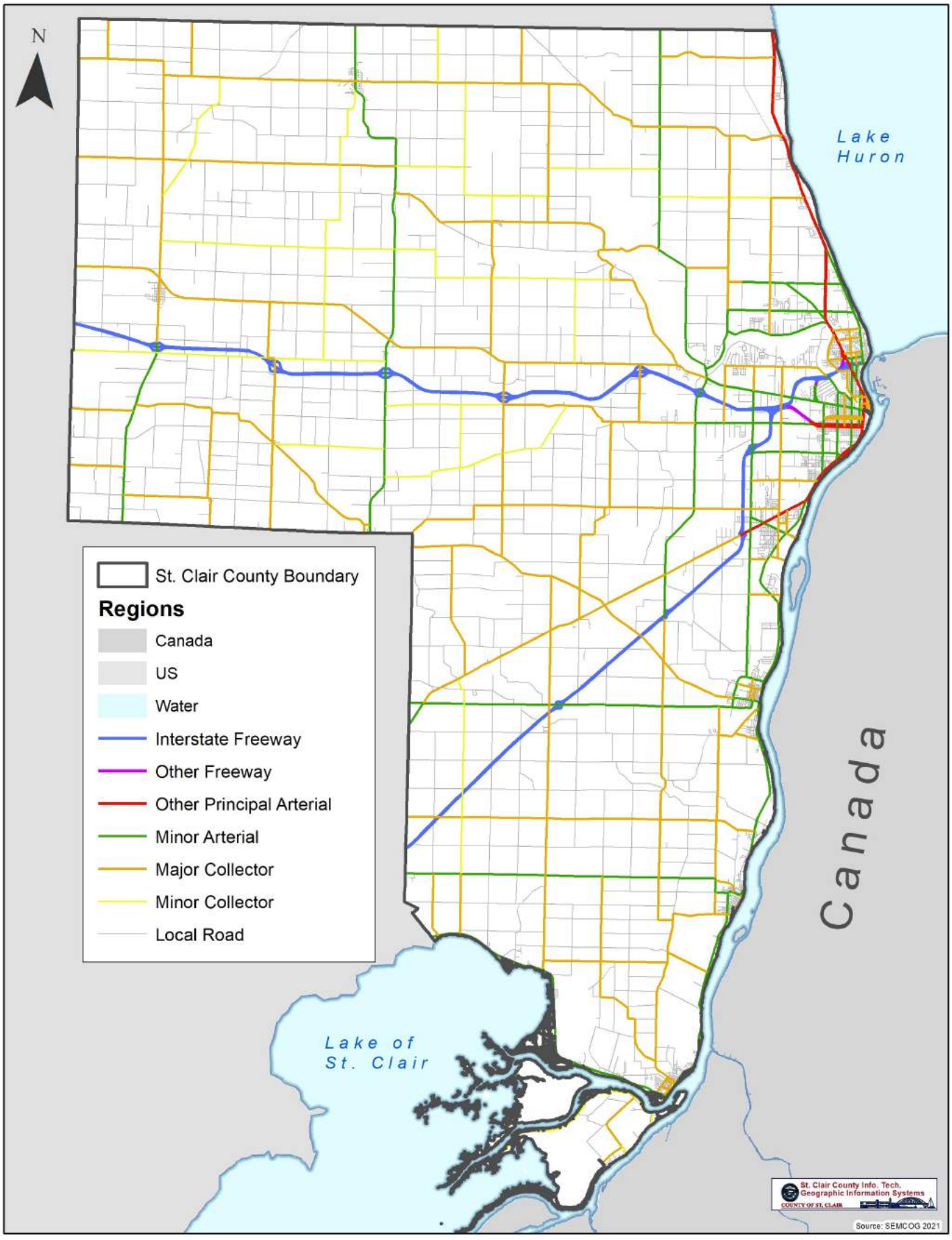
2022: Blue Water Bridge Land Port of Entry Feasibility Study completed by MDOT, Customs and Border Patrol, and General Services Administration.

2023: Complete Environmental Review, 30% Engineering Design, and Utility Coordination.

MAP 5-1: ST. CLAIR COUNTY TRANSPORTATION NETWORK



MAP 5-2: NATIONAL FUNCTIONAL CLASSIFICATION, ST. CLAIR COUNTY



Road Maintenance and Responsibility

The St. Clair County Road Commission is responsible for maintaining most of the roads within the county, including interstate highways, Michigan highways, and township section-mile roads. Cities and villages are responsible for roads within their respective jurisdiction. Townships are generally not responsible for road maintenance.

Roadway Capacity and Volume

Roadway capacity refers to the number of vehicles that can travel through an intersection or roadway segment during a specified period of time. Generally, roadway capacity is measured at peak hours of travel. Roadway capacity is dependent on a number of factors, including pavement condition, width, number of lanes, intersection design (including turning radius), speed limits, nearby driveways and access points, and sight distance due to hills or curves.

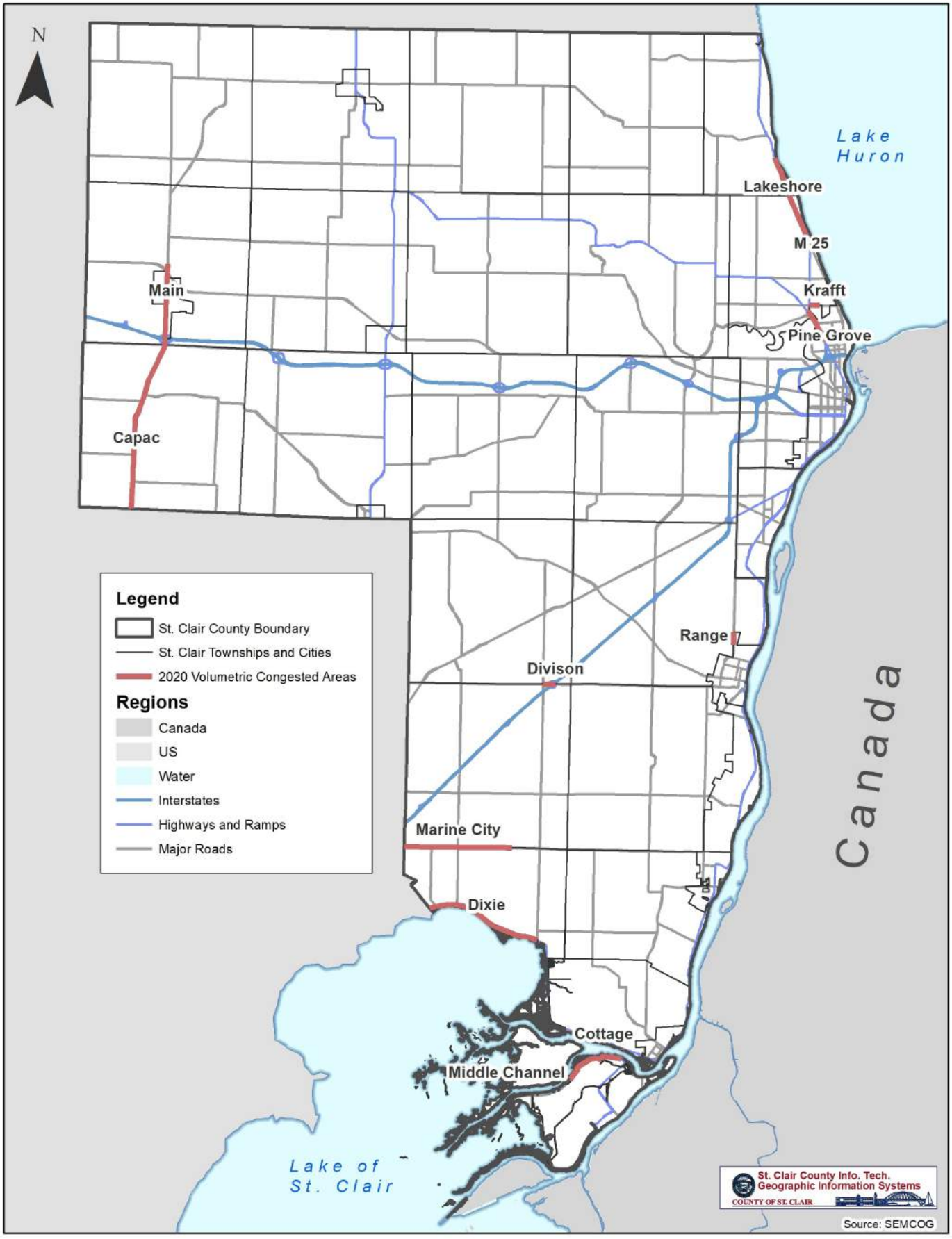
Roadway volume refers to the number of vehicles that travel a roadway, regardless of its capacity. Congestion refers to the situation that occurs when a road's volume exceeds its capacity.

Under optimum conditions, a two lane road has a capacity for up to 12,000 vehicles per day. The majority of roads in St. Clair County have two lanes and carry less than 10,000 vehicles per day.

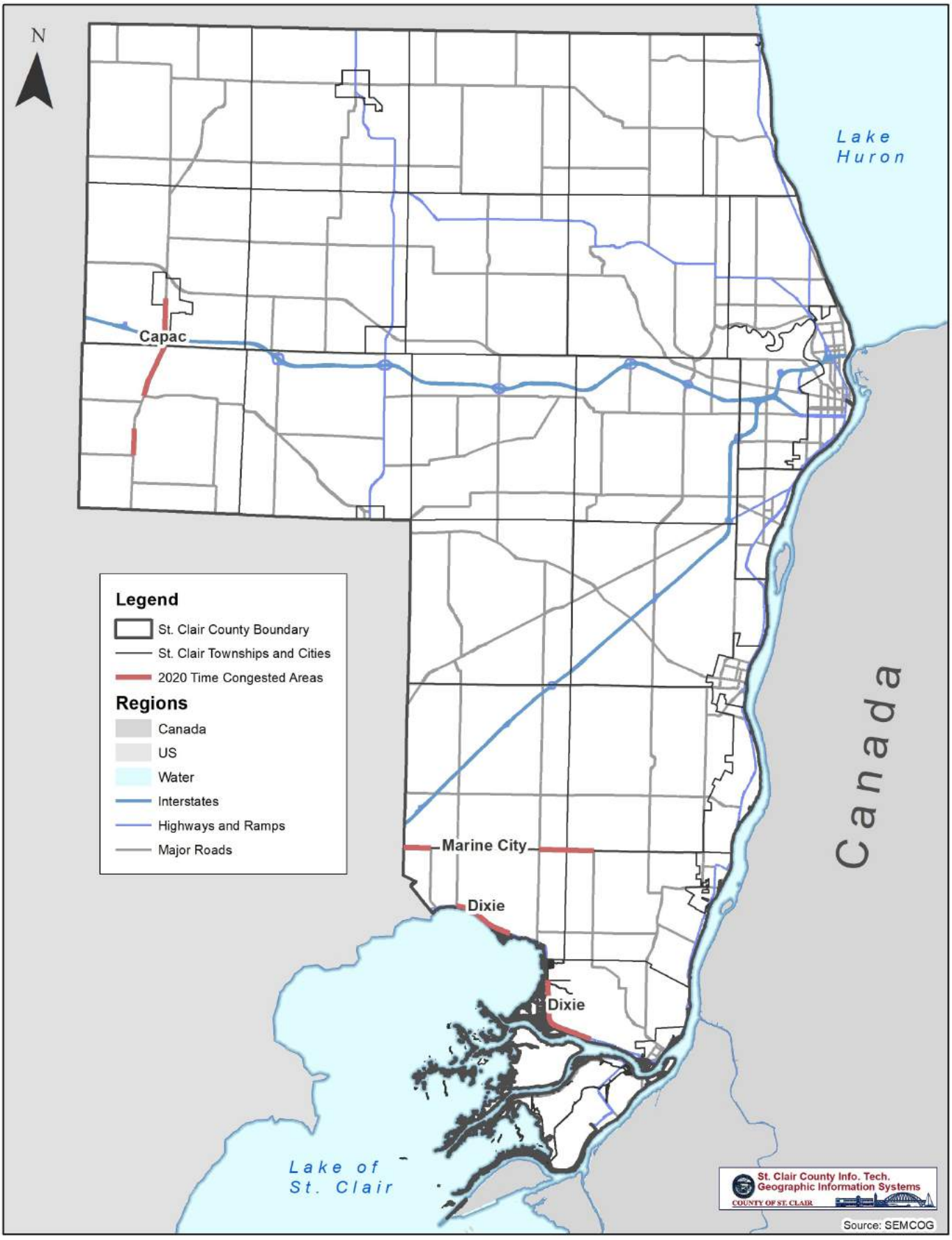
The County's only four and five-lane roads are within the urbanized areas of Port Huron, Marysville, Marine City, and St. Clair. Most of these carry 10,000-20,000 vehicles per day. The heaviest volume road in the county (other than 1-94 and 1-69) is Pine Grove Ave (M-25 in northern Port Huron) which carries roughly 24,000+ vehicles per day in some segments.

Projections through 2045 show an increase in traffic in and around Port Huron and on some roads in the southern part of the county due to increased development there.

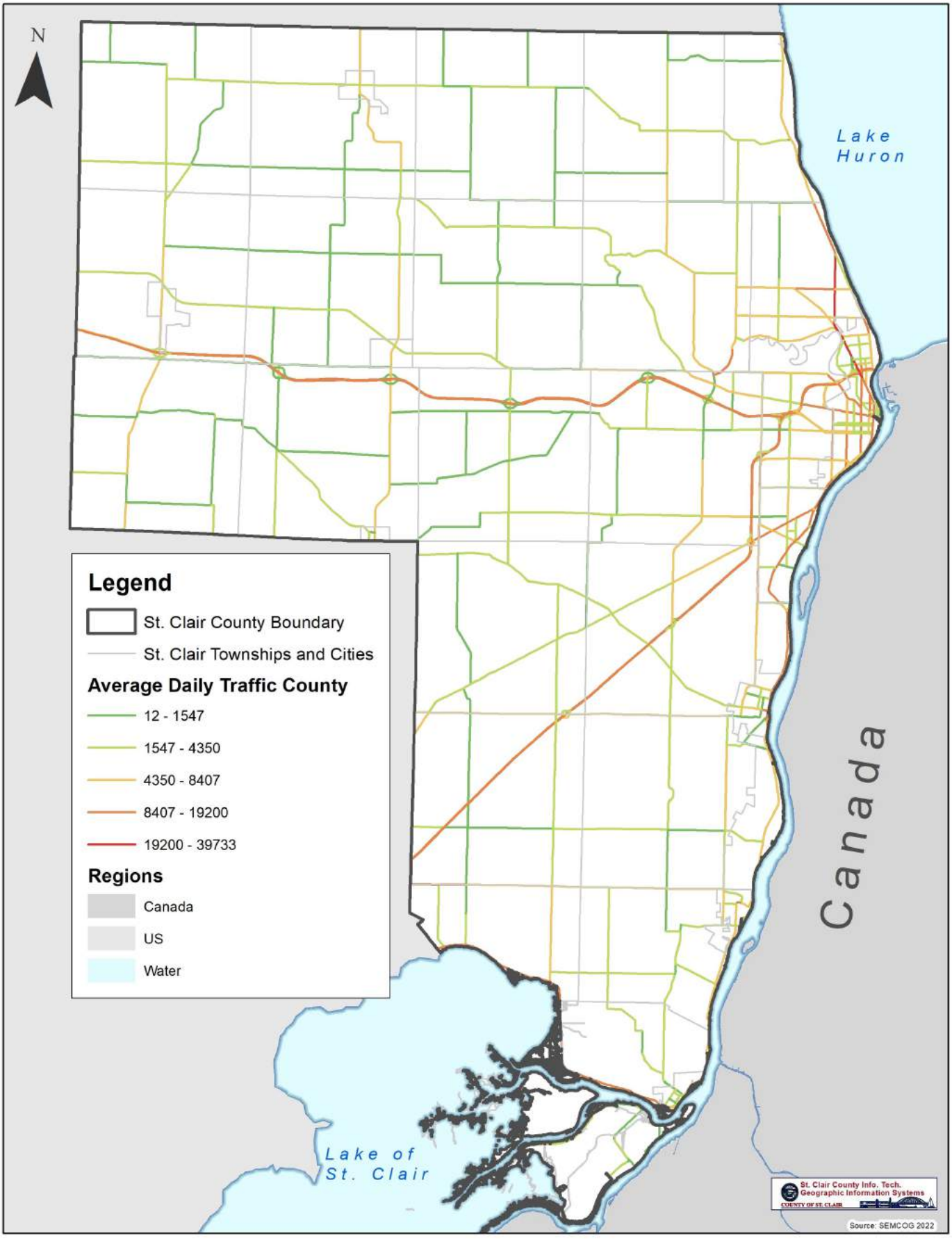
MAP 5-3: ST. CLAIR COUNTY CONGESTION BY VOLUME, 2020



MAP 5-4: ST. CLAIR COUNTY CONGESTION BY TIME, 2020



MAP 5-5: ANNUAL AVERAGE DAILY TRAFFIC (AADT) COUNTS, 2020



Safety

Safety is a top priority of the U.S. Department of Transportation and the Federal Highways Administration, which remain committed to reducing fatalities and serious injuries. Locally, transportation stakeholders will continue to make safety a priority by ensuring there is a larger consideration of safety aspects associated with transportation projects when they are programmed in the Transportation Improvement Program (TIP).

As might be expected, more accidents occur on major roads and intersections. Therefore, how an intersection is designed and how well traffic move through it are major safety considerations. As unobstructed sight distance is an important consideration.

In St. Clair County, the majority of intersections with the highest occurrence of crashes are located within the City of Port Huron or just north of the city along M-25. See Tables 5-1 and 5-2.

Table 5-1: High Crash Intersections in St. Clair County, 2017-2021

County Rank	Region Rank	Intersection	Jurisdiction	2017	2018	2019	2020	2021	Average Number (2017-2021)
1	123	M-25 @ Krafft Rd	State/County	32	25	24	32	32	29
2	367	Pine Grove Ave @ Holland Ave	State/City	22	18	23	16	21	20
3	536	Pine Grove Ave @ Sanborn St	State/City	27	23	14	7	12	16.6
4	580	Hancock @ Pine Grove Ave	State City	27	12	14	9	18	16
5	852	M-25 @ Keewahdin Rd	State/County	10	13	10	18	16	13.4
5	852	E I-94/Pine Grove Ramp @ Pine Grove Ave	State	29	9	9	6	14	13.4
7	873	Pine Grove Ave @ 10th Ave	State/City	20	12	10	12	12	13.2
8	1047	Lapeer Rd @ Wadhams Rd	County	14	11	11	11	13	12
9	1150	Gratiot Blvd @ Range Rd	State/County	12	11	14	9	11	11.4
10	1223	26 Mile Rd @ Marine City Highway	County	15	18	10	6	6	11

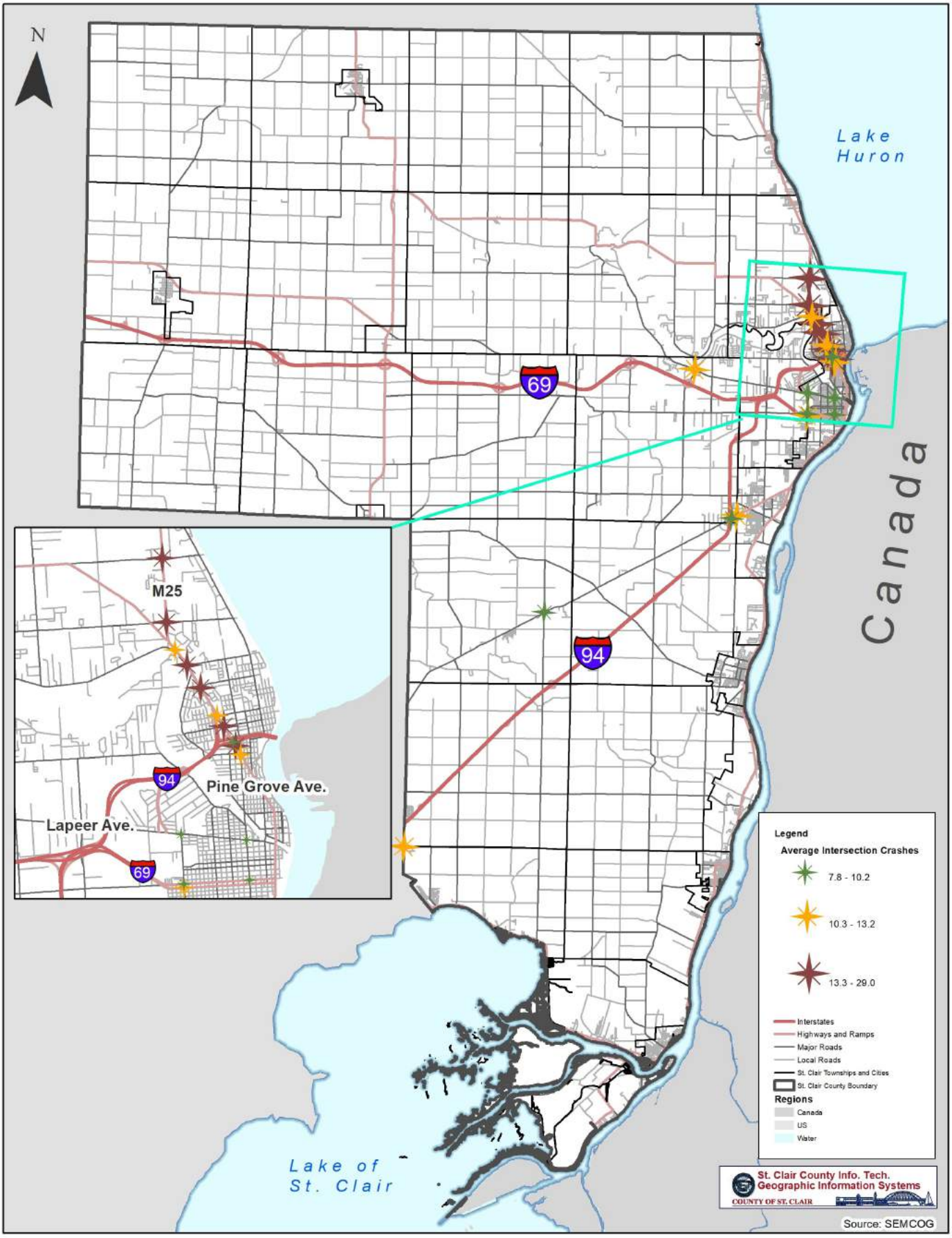
Source: SEMCOG Community Profiles, January 2023

Table 5-2: Crash Severity, 2017-2021

Year	Fatal	Serious Injury	Other Injury	Property Damage Only	Total Crashes
2017	13	82	641	2,969	3,705
2018	16	63	594	3,053	3,726
2019	19	69	557	3,083	3,728
2020	20	72	551	2,667	3,310
2021	17	75	548	2,986	3,626

Source: SEMCOG Community Profiles, January 2023

MAP 5-6: HIGH CRASH INTERSECTIONS, ST. CLAIR COUNTY 2021



Pavement Surface Evaluation and Rating (PASER)

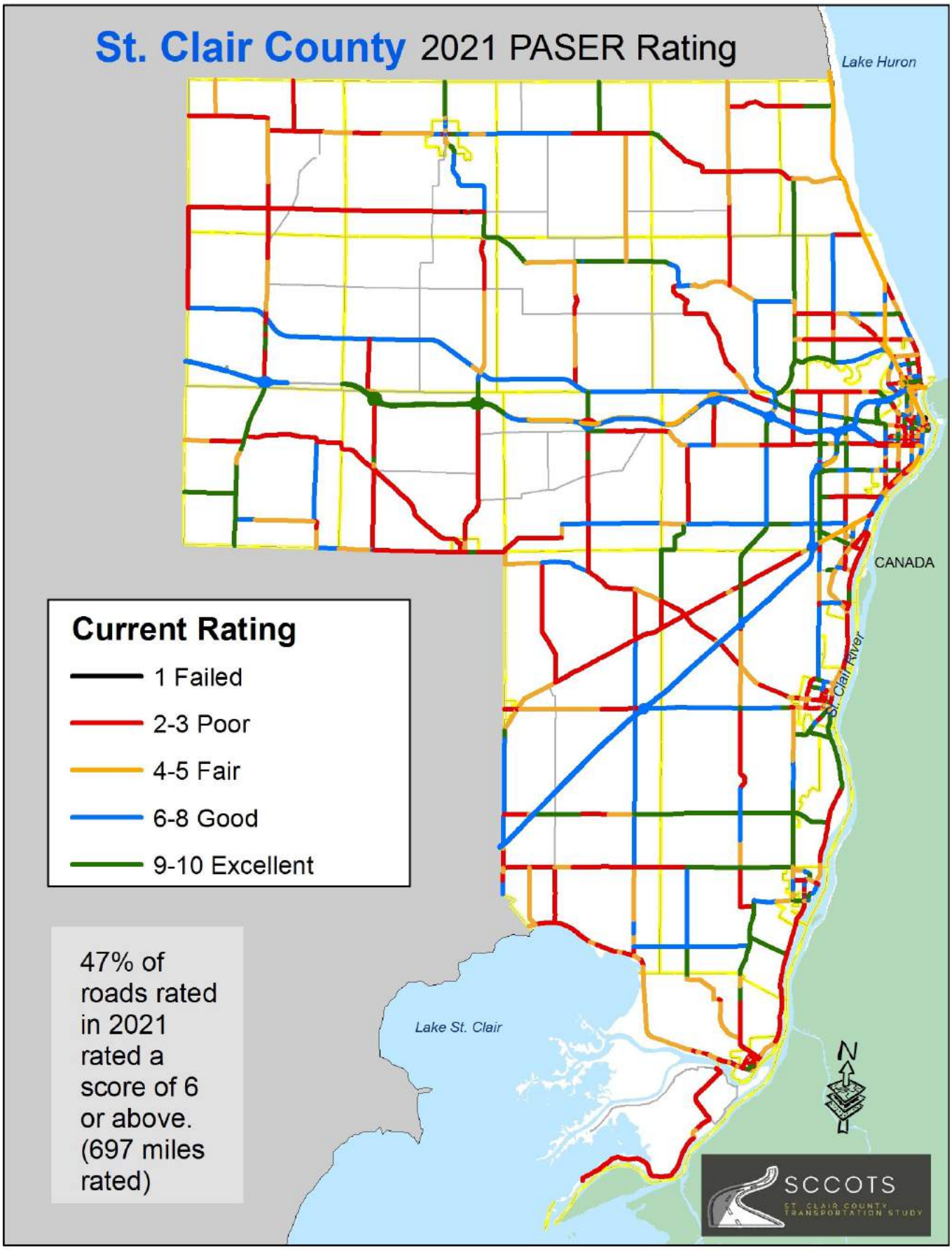
Each year, the St. Clair County Metropolitan Planning Commission (MPC) performs a visual inspection to evaluate pavement surface conditions on 50% of the federal-aid roads in St. Clair County. The next year, the same pavement evaluation is performed for the other 50% of the county that was not done the previous year. However, due to the COVID-19 pandemic, the roads were not rated in 2020 and then the entire network was rated in 2021. In 2022, staff went back to rating half of the network and did the eastern portion, which included 322 miles.

Typically, PASER evaluates pavement distress in asphalt and concrete roads. For asphalt roads, the rating team looks at surface defects, surface deformation, cracks, patches, and potholes. For concrete roads, the rating team evaluates joints, pavement cracks, pavement deformation (such as settlement or heave, utility repairs, patching, etc.), and surface defects (such as polishing, spalling, shallow reinforcing, etc.). In reviewing various defects, it is important to consider both the severity and extent. Typically, a defect will begin slowly and gradually become more severe. Rating the roads helps communities and road agencies manage road maintenance in an effective and fiscally responsible manner.

The PASER scale is a 1-10 rating system for road pavement condition developed by the University of Wisconsin-Madison Transportation Information Center. PASER uses visual inspection to evaluate pavement surface conditions. When assessed correctly, PASER ratings provide a basis for comparing the quality of roadway segments. The PASER assessment method does not require measurements of individual distresses, and thus PASER ratings cannot be disaggregated into measurements of specific distress types. The advantage to this method is that roads may be assessed quickly, possibly even by "windshield survey." A primary disadvantage is that because PASER ratings cannot be disaggregated into component distress data, the metric cannot be used in mechanistic-empirical transportation asset management programs.

In 2021, MPC staff rated the entire federal aid road network, which included 1,435.1 lane miles. Of that total, 23.7% of the roads were rated as being in ‘Good’ condition, 33.1% were rated as ‘Fair,’ and 43.1% were considered to be in ‘Poor’ condition.

MAP 5-7: PAVEMENT SURFACE EVALUATION AND RATING (PASER), 2021



Blue Water Area Transit operates the majority of its fleet on compressed natural gas (CNG), which greatly reduces pollution and saves about a dollar per gallon on the cost of fuel. During the summer months, BWATC operates a trolley route that highlights historic and scenic sites in downtown Port Huron. Photos courtesy of Blue Water Area Transit Commission.

Public Transportation

Transit facility refers to public modes if transportation, such as buses, special vans, taxicabs, shuttle services, trolleys, and ferries.

Public transportation is critical to the County's productivity and economic development. It can reduce congestion, improve environmental quality, and encourage a more sustainable environment for development.
Today, the County has several challenges to its public transportation, including:

- Increasing costs which strain existing public transportation resources.
- Jurisdictional and service boundaries as well as funding barriers which increase cost and complexity of coordination and leave some communities with limited or no service, and;
- The lack of a predictable amount of annual State funding makes budgeting for current and future service very challenging.

The Blue Water Area Transportation Commission (BWATC) is the only bus company operating within St. Clair County and is a member of the St. Clair County Transportation Study (SCCOTS).

BWATC provides transit services to several communities within St. Clair County including the cities of Port Huron and Marysville and the townships of Port Huron, Fort Gratiot and Burtchville. BWATC operates a combination of fixed route, demand response and contract services.

Downtown Transfer Center

In December 2015, a new transfer center opened in downtown Port Huron. The center is located south of McMorran Place, between McMorran Blvd and Grand River Ave. This center provides more than 2,000 daily passengers who come downtown a safe and efficient means to transfer buses. Buses enter and depart in different directions and wait for passengers in two sheltered parallel lanes.

Blue Water Area Transit's bus transit center project included more than $2.5 million in improvements to the surrounding downtown area. BWATC improved landscaping, lighting, parking, walkways, outdoor seating, and roads, which makes the area more appealing for all downtown visitors.

In addition to BWATC funds, the $9.8 Million bus transit center project was made possible by support from federal funds (70%) and state funding (17.5%).

Passenger trips were greatly affected by the pandemic. Blue Water Transit's fixed route services are about 50% of pre-pandemic levels. They are increasing every month, but they are still down. SMR ended Marysville service during this time period (2017-2021) so service in Marysville also went to Monday, Wednesday, and Friday only.

Commuter Routes

Two commuter routes run between Port Huron and Chesterfield Township, a community in northern Macomb County that is home to many suburban office parks, twice a day Monday through Friday. This service links up with the Suburban Mobility Authority for Regional Transportation (SMART) buses so commuters can make a connection to their final destination in Southeast Michigan and/or downtown Detroit. One route is called the I-94 Express Route. It has 4 stops in St. Clair County before reaching its final destination at 23 Mile Rd. and Gratiot. Commuters can also take the M-29 commuter route. This route services communities along the St. Clair River via M-29 and also connects to SMART at 23 Mile Rd. and Gratiot.

Shopper Shuttle

Shuttle service to major shopping centers in the northern end of the community is available to customers Monday through Friday beginning at 8:05 a.m. and Saturday beginning at 10:20 a.m. The shuttle provides door-to-door service to the shops along the route. Transfers between the shuttle and other BWATC buses are free. Shopper shuttle service ends at 8:50 p.m.

Trolleys

Motorized trolleys, owned by BWATC, operate within the Port Huron area, taking residents and sightseers on tours of historical and cultural sites within the city. These trolleys are also available for exclusive rental for private use.

Special Vans

The BWATC also provides "Dial-A-Ride" service. This demand/response service is available for residents living in Burtchville, Port Huron, and Fort Gratiot Townships and the City of Marysville. The St Clair County Council on Aging "Dial-A-Ride" program is available to senior citizens throughout the county. The Council on Aging, Blue Water Center for Independent Living, and other similar agencies offer transportation for individuals who require special attention. Demand/response buses are available for physical challenged individuals.

Taxi, Shuttle and Ride Share Services

Two private taxicab companies operate within St. Clair County, mostly within Port Huron, Marysville, and Fort Gratiot Township. Three shuttle services provide transit to airports in the Detroit and Flint areas.

Ferry Service

There are three ferry services in southern St. Clair County that provide service to Canada or to Harsens Island. Auto ferry service across the St. Clair River is available from the Walpole Algonac Ferry, which connects Algonac to Walpole Island in Ontario, Canada - the closest route between the Detroit area and the Chatham/Wallaceburg/London/Toronto region in Ontario. United States Customs officials greet and control passengers who arrive in St. Clair County via the ferry from Walpole Island.

There is also passenger (but not automobile) ferry service from Algonac to Russell Island via the Russell Island Ferry. There is a large parking lot for Russell Island Ferry passengers located near where M-29 bends through the Algonac central business district on the east side of the road. This lot is immediately south of the Seafarers International Union headquarters.

Ferry to Harsens Island. Photo courtesy of Katie Stepp, Blue Water Convention and Visitors Bureau

Just west of the Algonac city limits on M-29 in Clay Township is Champions Auto Ferry, which connects mainland Clay Township to Harsens Island.

Harsens Island Transportation Options

The Harsens Island Transportation Authority (HITA) was established to "plan, promote, purchase, acquire, establish, own, operate, or cause to be operated, maintain, improve, enlarge and modernize an intra-waterway transit waterway system serving the Harsens Island area" and was re-activated in 2019. The board was reinstated in response to residents who wanted to explore different potential options for transportation to the Island.

Constructing a vehicular bridge from M-29 on the mainland of Clay Township to M-154 on Harsens Island has been a topic of discussion for many years, with several proposals submitted by the Detroit International Bridge Company since 2001. Those proposals were denied for various reasons, most recently in 2016 when MDOT and EGLE both denied the respective permit applications. Though the permits were denied, reviewing the application provides some guidance for what specific information the reviewing agencies are considering and what criteria must be met in order to receive regulatory approval. Additionally, the Clay Township Planning Commission finds that a bridge to Harsens Island is consistent with promoting the health, safety, and welfare of the community.

Any new ferry service, bridge, or other alternative transportation option to Harsens Island will require local, state, and federal approvals and cooperation. Additionally, Clay Township will need to address planning and zoning issues to ensure adequate safety, access, vehicle queuing, signage, lighting, landscaping, and other site design elements.

Commercial Water Ports, Railroads, Tunnels, and Airports

The number of people associated with boat, rail, and air transportation systems is, by far, less than the number of people who drive and use automobiles. Nevertheless, these other methods of transportation, primarily for hauling freight, are significant because of their economic and land use implications.

Ports

Freighters travel through the St. Clair River and Lake Huron, the midpoint of the St. Lawrence Seaway system. Deep water ports along the shoreline can accommodate Great Lakes and ocean-going freighters.

There are 38 deep-water ports in the state of Michigan, four of which are in St. Clair County.

- Port Huron, Seaway Terminal: Commercial Port
- Marysville, former DTE power plant site: US Customs Service Port
- St. Clair, DTE Site: US Customs Service Port
- Marine City, St. Clair Aggregates Port

Freight Rail Service

CSX Transportation and CN North America Railroad provide Class I rail service to the County. The Class I rail routes in St. Clair County provide U.S. freight connections to Canada through the International Railroad Tunnel in Port Huron, as well as service to industrial sites throughout Michigan. In 2017, nearly 239,000 loaded containers and nearly 169,000 empty containers were shipped across the United States-Canadian border.

The CN North America's primary line runs east to west through the communities of Port Huron, Emmett, and Capac. CN North America also has a route through the communities of Columbus Township and Smiths Creek on a SW-NE Detroit line. The CSC line runs from Marine City through St. Clair, Marysville, and Port Huron.

Passenger Rail Service

In addition to freight, the CN east-west route provides passage for Amtrak passenger rail service. The Port Huron depot station is the only scheduled stop in the county for daily round trip service between Port Huron and Chicago. And as this service continues to grow, more trips are likely to be added. In 2017, the Blue Water Transportation Commission (BWATC) initiated a pre-feasibility study focusing on upgrading/replacing the existing Port Huron Amtrak Station located on 16th Street in the City of Port Huron. Input was sought from a steering committee, as well as through two public meetings. A report was produced outlining the findings and published in 2018. The report summarizes numerous sites that could be considered (including the existing site), established siting criteria, and weighed input from the public and various stakeholders to narrow down the list of options in preparation for continued study of viable replacement options.

In 2021, continuation of this study was initiated by BWATC in partnership with MDOT through a Federal Transit Administration (FTA) grant. This continuation study seeks to further refine the options identified earlier as well as entertain any newly discovered sites that may meet the needs of the community as well as the various stakeholders. Nine possible site locations for a new station have been identified in the study, including the existing site in the city and sites located outside of the City of Port Huron.

Railroad Tunnel

Canadian National Railroad owns the tunnel under the St. Clair River that connects Port Huron with Sarnia, Ontario. The tunnel opened in April 1995, and is a major link in the most direct route between Halifax, Nova Scotia, Montreal and Toronto, Ontario, and Chicago, Illinois. Trains passing through the tunnel transport high-priced manufactured goods and prepackaged food items from Europe to the United States industrial heartland.

The tunnel accommodates high-clearance, multilevel auto carriers and double-stacked containers that can be carried on either train cars or semi-trucks.

Airports

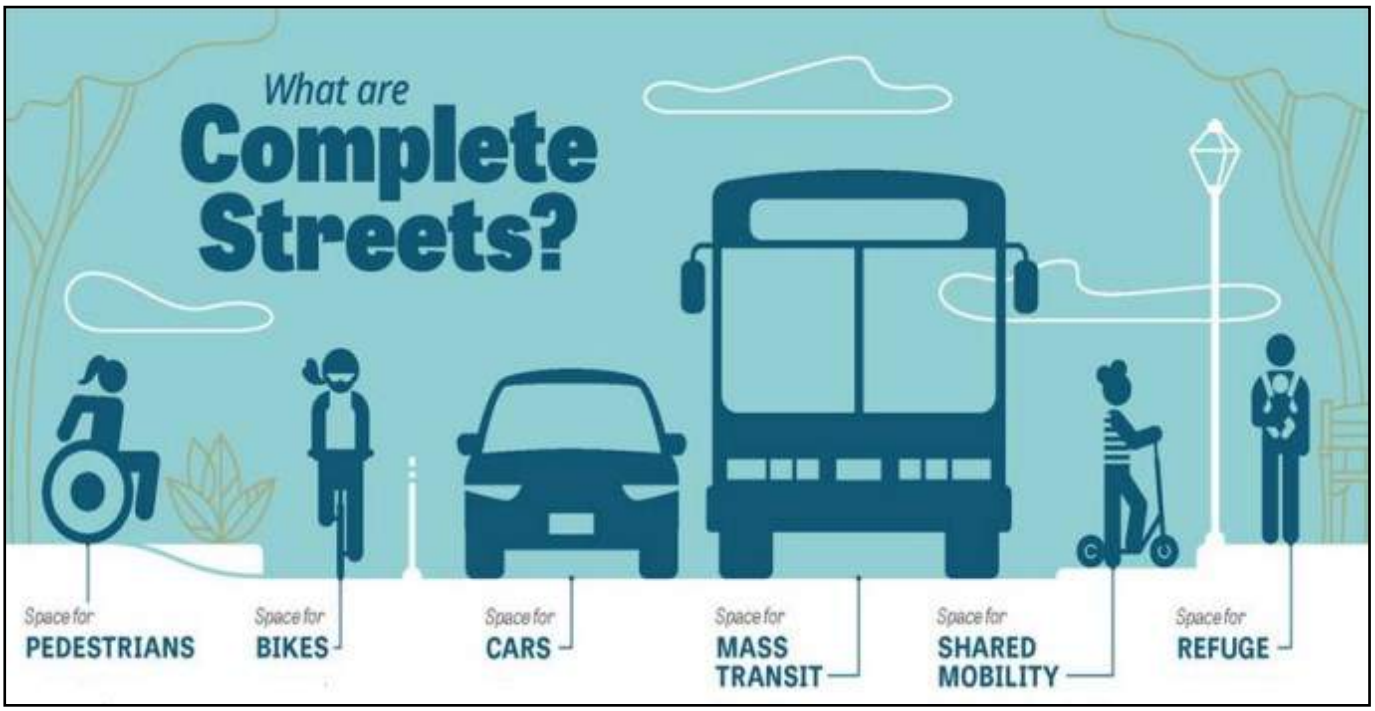
The St. Clair County International Airport (SCCIA) primarily functions as a cargo airport providing 24-hour customs/immigration services. The SCCIA is equipped with Pilot Controlled Lighting, an Automated Weather Observations System and an Instrument Landing System. The SCIAA's primary runway is 5,103 feet long by 100 feet wide and the secondary runway is 4,100 feet long by 75 feet wide. Major roadways that serve the airport include I-94, I-69, and Gratiot Avenue.

Directly adjacent to the airport is the 80-acre St. Clair County Airport Industrial Park. This industrial park is geared towards attracting applied research and technology with 12,000-20,000 square foot facilities available. This location is considered ideal for corporate research and development, rapid prototyping, or related industrial activity due to the convenience of airport facilities for corporate and time sensitive logistics.

The Marine City Airport is also located in St. Clair County but is privately owned and classified as a general-utility airport. The I-94 and 26 Mile Road interchange is the closest major access point to serve this airport.

COMPLETE STREETS

Complete Streets are streets designed and operated to enable safe use and support mobility for all users. Those include people of all ages and abilities, regardless of whether they are travelling as drivers, pedestrians, bicyclists, or public transportation riders. The concept of Complete Streets encompasses many approaches to planning, designing, and operating roadways and rights of way with all users in mind to make the transportation network safer and more efficient. Complete Street policies are set at the state, regional, and local levels and are frequently supported by roadway design guidelines.



Source: Fairfax County, Virginia. https://www.fairfaxcounty.gov/tysons/transportation-transforming-existing-system

Complete Streets approaches vary based on community context. They may address a wide range of elements, such as sidewalks, bicycle lanes, bus lanes, public transportation stops, crossing opportunities, median islands, accessible pedestrian signals, curb extensions, modified vehicle travel lanes, streetscape, and landscape treatments. Complete Streets reduce motor vehicle-related crashes and pedestrian risk, as well as bicyclist risk when well-designed bicycle-specific infrastructure is included. They can promote walking and bicycling by providing safer places to achieve physical activity through transportation. One study found that 43% of people reporting a place to walk were significantly more likely to meet current recommendations for regular physical activity than were those reporting no place to walk (Powell, Martin, Chowdhury, 2003).

There is no singular design prescription for Complete Streets. Each one is unique and should respond to the individual community's population and needs. A Complete Street may include sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible public transportation stops, frequent and safe crossing opportunities, median islands, accessible pedestrian signals, curb extensions, narrower travel lanes, roundabouts, and more. A complete street in a rural area will look quite different from a complete street in a highly urban area, but both are designed to balance safety and convenience for everyone using the road.

Implementing a Complete Streets Policy

A Complete Streets policy has the potential to end the project-to-project struggle to design better facilities by requiring all road and transportation improvement projects to begin with evaluating how the street serves all users– pedestrians, bicyclists, public transportation vehicles and passengers, trucks, and automobiles. Adopting a Complete Streets policy may require changing existing policies and practices of local communities and/or transportation agencies. In some cases it may be difficult to adopt a new procedure or to modify design guidelines. Furthermore, adopting a Complete Streets policy may require additional training for planning and engineering staff which will take time and cost money.

Ultimately, the desired outcome of a Complete Streets policy is one in which a multi-modal street becomes the default design and only after a formal exception process is a non-compliant design allowed. The U.S. Department of Transportation's design guidance for *Accommodating Bicycle and Pedestrian Travel: A Recommended Approach,* names three exceptions where roadways can lack facilities for all users:

- Excessive Cost
- Absence of need
- Roads where bicyclist and pedestrians are prohibited

Some additional challenges for implementing a Complete Streets policy may include:

- Lack of right-of-way in cramped thoroughfares may make multi-modal improvements difficult, costly, or impossible
- Overcoming the misconception that Complete Streets cost more to build than traditional streets when in fact Complete Streets often cost less to construct. By fully considering the needs of all non-motorized travelers (pedestrians, bicyclists, and persons with disabilities) early in the life of a project, the costs associated with including non-motorized facilities are minimized
- Ensuring accurate transportation analysis as current methodologies for studying traffic may result in misleading results. For example, some current traffic methodologies may fail to consider how the presence of transit in a mixed-use corridor could potentially lower trip generation rates and thus reduce traffic volumes and congestion.

An Ideal Complete Streets Policy

Regardless of a policy's form, the National Complete Streets Coalition has identified important elements of a comprehensive Complete Streets policy. These elements could potentially be used in evaluating transportation projects within St. Clair County. A Complete Streets policy should include the following:

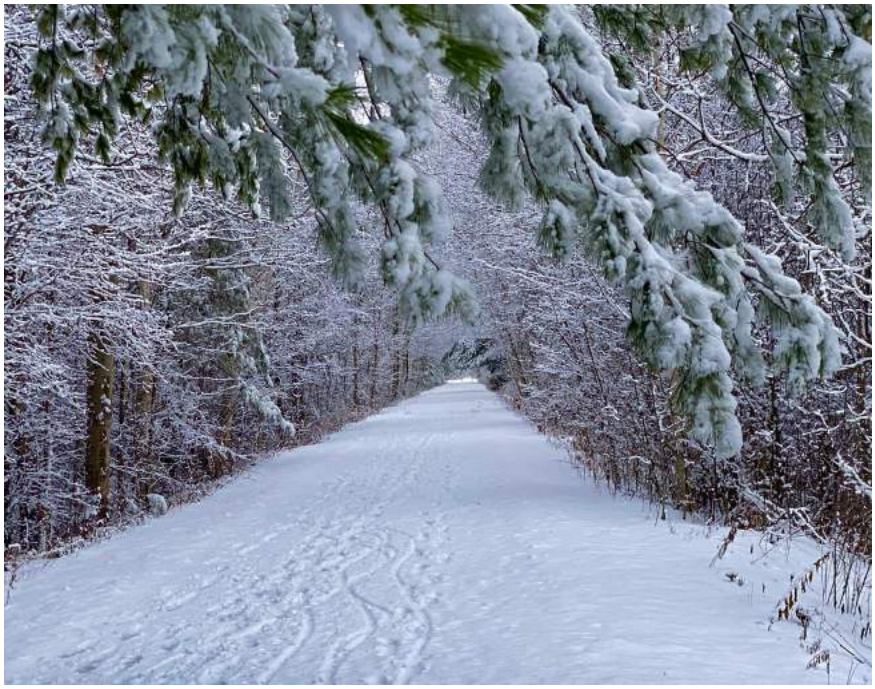
1. Includes a vision for how and why the community wants to complete its streets. Specifies that 'all users' includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, buses and automobiles. Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes.
2. Is adoptable by all agencies to cover all roads.
3. Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way.
4. Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions.
5. Directs the use of the latest and best design standards while recognizing the need for flexibility in balancing user needs.
6. Directs that Complete Streets solutions will complement the context of the community.
7. Establishes performance standards with measurable outcomes.
8. Includes specific next steps for implementation of the policy.

Trails and Greenways

Greenways are corridors of land recognized for their ability to connect people and places together. According to the EPA, greenways promote outdoor recreation, catalyze economic development, increase adjacent property values, celebrate historical and cultural assets, promote conservation and environmental education and improve qualify of life.

Greenways have multiple purposes, but from a recreation perspective they have two major functions:

- To link and facilitate hiking and biking access between residential areas and parks.
- To provide opportunities for the linear forms of outdoor recreation (i.e. hiking, jogging, bicycling, equestrian riding, and walking) in which many St. Clair County residents engage today. These recreation activities require the development of trails along the greenways.



There are two primary trail systems within St. Clair County: the Wadhams to Avoca Trail and the Bridge to Bay Trail.

Wadhams to Avoca Trail

In 1999, PARC purchased the surface rights to 9.82 miles (100 acres) of right-of-way from CSX Railroad and began developing it as the Wadhams to Avoca Trail. In 2001 and 2004, PARC purchased two additional properties totaling 17.65 acres adjacent to the trail north of Imlay City Road for a trailhead and parking. In 2003, PARC purchased the surface rights to an additional two and a half miles of CSX Railroad right-of-way totaling 17.66 acres from Wadhams Road to Griswold Road. The trail is over 12.4 miles long and contains 160 acres.

To date, the 640-foot Mill Creek Trestle has been decked and railed for pedestrians and bike riders. Three acres of land southeast of the Trestle was purchased to create a horse crossing at Mill Creek.

At the south end of the trail in Kimball Township, over five miles of trail have been paved starting at McLain Road running southeast to Griswold Road. The paved section of the trail passes through a developing residential area and is heavily used by residents.

In a joint effort with the St. Clair County Road Commission, a hybrid pedestrian signal was installed in 2010 where the trail crosses Wadhams Road. It was the first time this type of signal has been used for a trail crossing in Michigan. The signal prompts flashing lights to stop traffic when a pedestrian wishes to cross the road.

Designated parking areas are located at the Wadhams Road, Imlay City Road, Lapeer Road and Avoca Road trailheads. The non-motorized trail is open to walkers, bicyclists and equestrians.

It is a priority of PARC and its community partners to extend the Wadhams to Avoca Trail to the City of Yale, as well as exploring opportunities to extend the trail beyond St. Clair County into Sanilac County.

Bridge to Bay Trail

The St. Clair County Parks and Recreation Commission (PARC) is working in conjunction with 13 local units of government, Friends of the St. Clair River, the Metropolitan Planning Commission and the St. Clair County Community Foundation to develop a 54-mile paved trail from Lakeport State Park to New Baltimore. A regional trails governing board helps to plan and promote the trail, while each local unit of government is responsible for constructing their section of the trail. Even though PARC plays an instrumental coordinating role in the development of the Bridge to Bay Trail, the property that makes up that trail is owned by various municipalities and townships. Most trail construction projects are funded by grants. PARC usually helps to fund the local match required for trail construction grants.

The Bridge to Bay Trail extends from St. Clair County's northern border, under the Blue Water Bridges; through Port Huron, Marysville, St. Clair, Marine City, and Algonac; and past state and municipal parks, museums, gazebos, and lighthouses. Sometimes the trail is within reach of the water's edge and sometimes a few miles inland. It connects communities together for walkers, joggers, strollers, and bicyclists of all ages. The trail varies from a ten-foot wide separated paved pathway in the right of way along a road, or a five-foot wide dedicated bike lane.

Community partners have a primary goal of connecting the Bridge to Bay Trail to the Wadhams to Avoca Trail within St. Clair County, the Macomb Orchard Trail in Richmond (Macomb County), and the St. Clair Parkway Trail in Lambton, Ontario, Canada via ferry. As of 2021, roughly 26 miles of the 54-mile Bridge to Bay Trail is complete.

Funding for the Bridge to Bay Trail comes from the St. Clair County Parks and Recreation Millage, local government funds, and state and federal grants, and philanthropic grants. Grant money for the trail has been provided by the United States government through federal transportation grants, and by the Michigan Department of Transportation (MDOT), the Michigan Department of Natural Resources (MDNR), and the Michigan Natural Resources Trust Fund (MNRTF).

Bridge to Bay Trail in Port Huron. Photo courtesy of the St. Clair County Parks and Recreation Commission.

MAP 5-8: BRIDGE TO BAY TRAIL

Blue Water River Walk and Blue Water River Walk County Park

Blue Water River Walk County Park is a former railroad switch yard that has been partially restored to a coastal wetland. The wetlands feature three ponds, marshland and native plants. The habitat is home to amphibians, such as frogs and toads, and is a popular nesting and feeding spot for migratory birds. A boardwalk allows park visitors to get close to the wetland habitat without disturbing the natural features and interpretive signs help explain how the wetlands work. Just north of the wetlands is a picnic pavilion, a shade trellis, walkways, landscaping, an artificial lawn activity area, picnic tables, grills and benches. Future developments will include a children's playground, restrooms and a second pavilion.

Traveling through the park is the Blue Water River Walk. The River Walk is a paved pathway that begins at Desmond Landing to the north and travels southwest to 10th Street. The Blue Water River Walk is part of the Bridge to Bay Trail System. The Blue Water River Walk is owned by the Community Foundation of St. Clair County. St. Clair County Parks leases and maintains the grounds.

The St. Clair County Parks and Recreation Commission purchased 4.85 acres of land using two MNRTF grants and received a $1,039,500 grant from the National Fish and Wildlife Foundation to develop a 2.75-acre wetland on the very southern end of the river walk.

US Bike Route 20

US Bike Route 20 is an established bicycle route in Michigan from the Walpole Island/Algonac Ferry in Downtown Algonac, where it connects to local trails in Canada, to Ludington, Michigan, where the route continues across the car ferry S. S. Badger to Manitowoc, Wisconsin. The Michigan segment operates on bicycle paths, county roads and state roads, favoring paved roads that have either low to moderate traffic or paved shoulders. Bicyclists on the route will encounter historic small towns like Marine City and Vassar, the old-world Bavarian charm of Frankenmuth, and the Manistee National Forest.

The Great Lake-to-Lake Trail, Route #1

The Great Lake-to-Lake Trails Route #1 is a 275-mile shared use trail across Michigan's southern Lower Peninsula that links Lakes Michigan and Huron while featuring pastoral farms and woodlots mingled with small towns and major cities. The linear destination trail connects visitors to nature while fostering healthy, sustainable and prosperous communities from South Haven to Port Huron. Route #1 is one of five Great Lake-to-Lake Trails that the Michigan Trails and Greenways Alliance (MTGA) intends to develop.

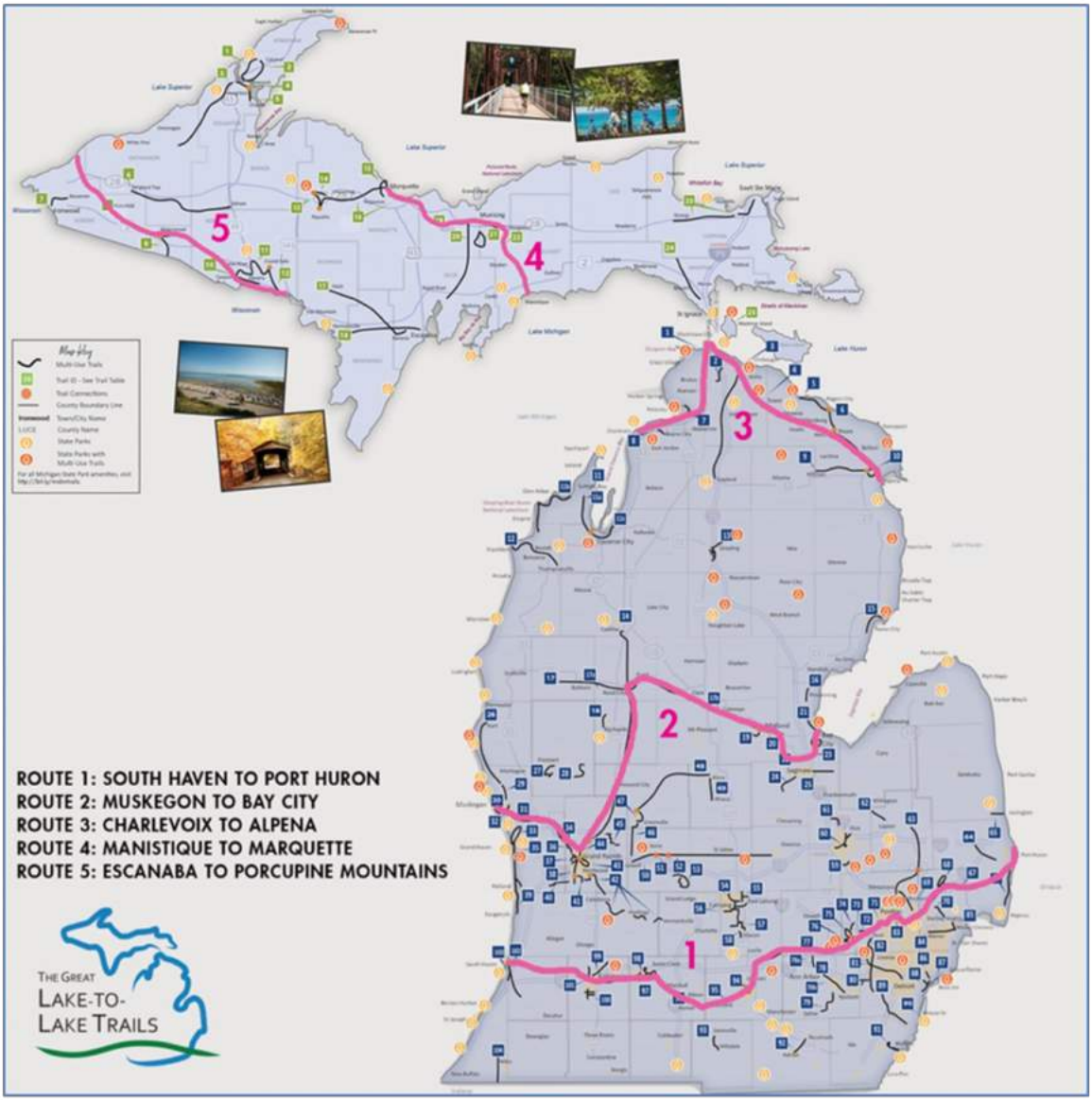
The Great Lake-to-Lake Trail offers Michigan's trail users a unique opportunity to experience quiet rural pathways and urban excursions as it winds its way across the southern lower portion of Michigan from shore to shore. The MTGA began the Great Lake-to-Lake Trails Project in 2009 with a grant from the Kresge Foundation to accelerate the development of cross-state trails while enhancing tourism and economic development opportunities.

Great Lakes Way

The purpose of the Great Lakes Way is to build upon the groundwork laid by so many others to strengthen and define the greenways and blueways of the Huron-Erie corridor and ensure that people of all ages, backgrounds, ethnicities and interests feel welcomed and share in its benefits. The Great Lakes Way is a regional trail that builds upon existing assets and mapping and ensuring broad equity.

Creation of the Great Lakes Way brings together the collective assets of Monroe, Wayne, Macomb, and St. Clair counties. By designating these greenways and blueways as the Great Lakes Way, the region can focus on the important linkages still to be developed, while delivering a clear brand and message that will be recognizable to

MAP 5-9: GREAT LAKE-TO-LAKE TRAIL, ROUTE #1



its residents. The goal is to link residents and visitors to the impressive collective of natural, educational, and recreational assets throughout the region. More information about the Great Lakes Way can be found online at https://cfsem.org/initiative/greatlakesway/.

St. Clair County Trails Plan

In 2019, St. Clair County, along with the Community Foundation of St. Clair County and numerous local and regional partners, developed an updated countywide trails plan in 2019 that identifies existing gaps in countywide non-motorized trail networks, identifies preferred alternatives to eliminate those gaps, and prioritizes the timing and sequencing for completing needed connections. The overarching goal is to complete the Bridge to Bay Trail and Wadhams to Avoca trail networks, which includes connecting to the Macomb Orchard Trail and the Great Lake-to-Lake Trail Route #1, described on the previous page. These activities supported the adoption of an implementation-focused plan that clearly identifies opportunities, needs, and priorities for future trail and bikeway projects.

Ultimately, the planning process was a chance to step back and take stock of current facilities and position county government, local municipal partners, and other agencies to pursue and implement the next wave of trail projects across St. Clair County. A major goal of the plan is to connect community assets, downtowns, and recreation facilities.

The Blueways of St. Clair

Blueways of St. Clair

One of the goals included in the 2007-2011 Master Recreation Plan was to explore developing a system of water trails in St. Clair County. The St. Clair County Metropolitan Planning Commission, in partnership with PARC, applied for and was granted a Michigan Coastal Management Grant to create *The Blueways of St. Clair* water trail system for St. Clair County.

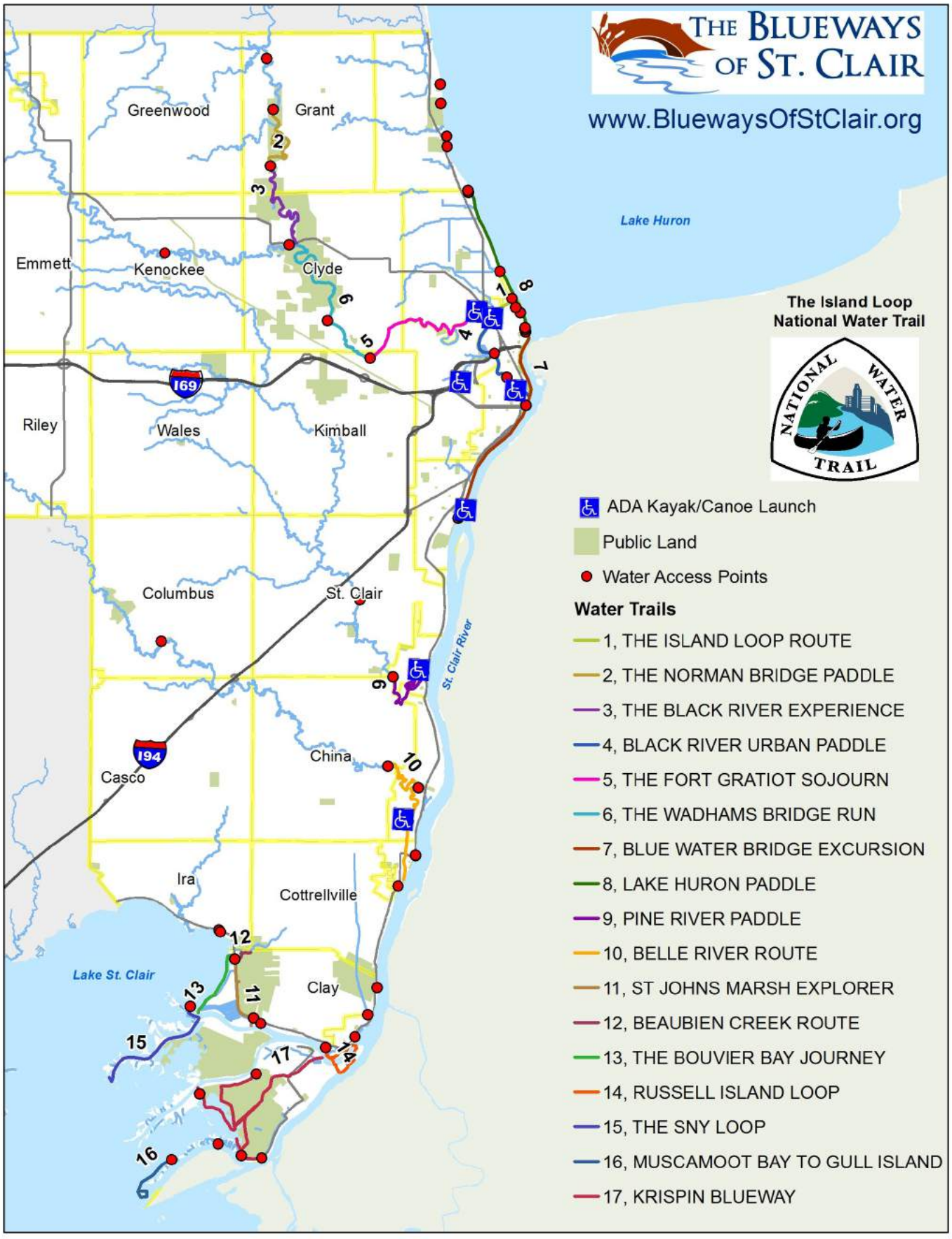
Research began in 2009 to find all the public access points along waterways in the county. Next, public input was gathered for popular paddling routes and put-ins. An interactive website was built up with paddling routes, access pictures, information on restaurants, motels, museums and other points of interest. The website provides information on the major rivers in the County, including the Black River, Belle River, Pine River, Lake Huron, St. Clair River, and the St. Clair River delta, which is the largest freshwater delta in North America.

The Blueways website lists 17 different paddling routes, totaling 151 miles, in nine unique bodies of water and lots of valuable information related to paddling and shoreline recreation. Check out St. Clair County's Blueways website at www.BluewaysOfStClair.org.

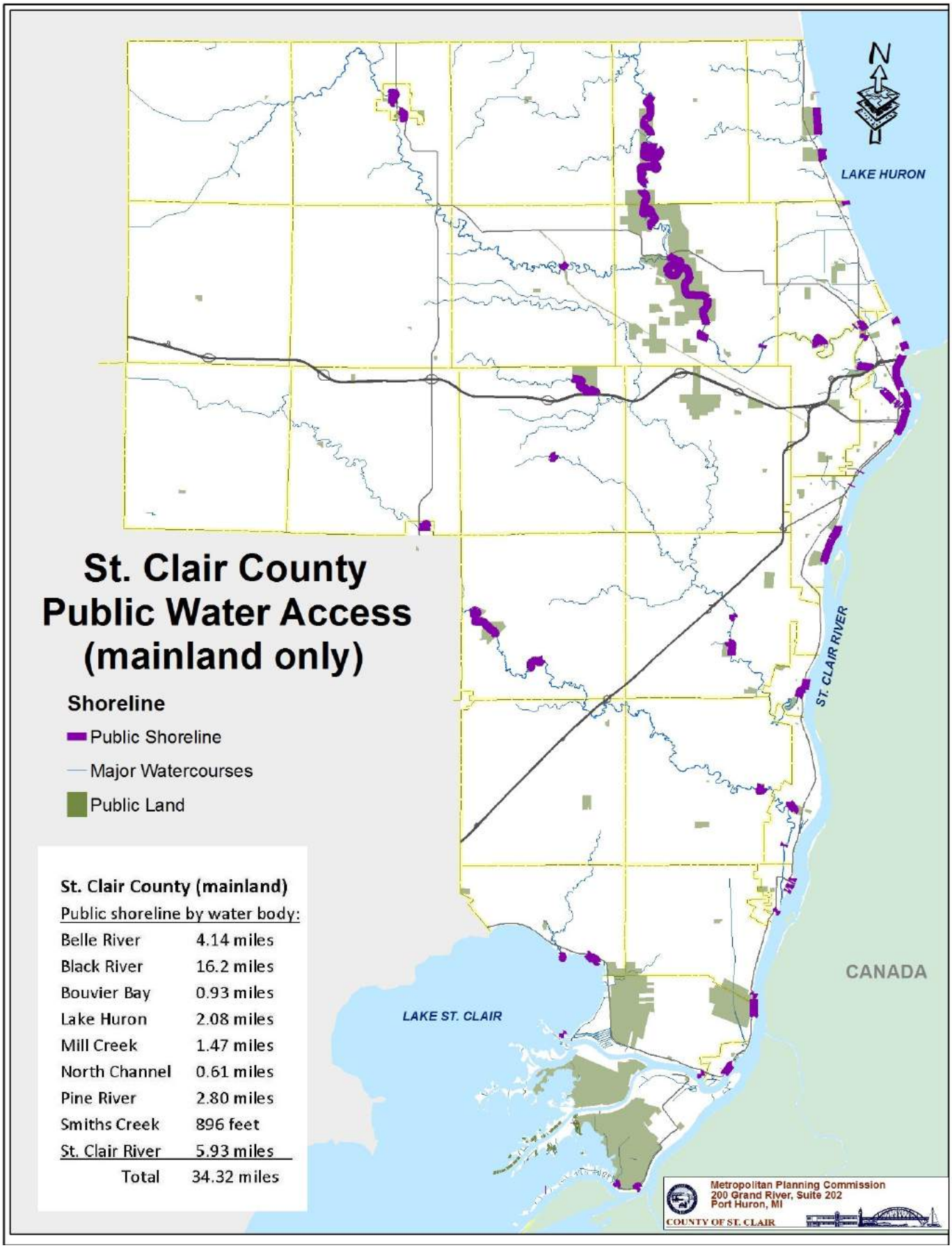
Island Loop National Water Trail

The 10.2-mile Island Loop National Water Trail was the first national water trail to be designated in Michigan and the 14th in the United States. The trail makes a loop from the Black River, to the Black River Canal, to Lake Huron, into the St. Clair River and back to the Black River. It also passes the oldest lighthouse in Michigan, the Thomas Edison Museum, the Huron Lightship Museum, and the Acheson Maritime Center. It also navigates between the United States and Canada for 2.5 miles and meanders through Fort Gratiot Township, Port Huron Township, and the City of Port Huron.

MAP 6-10: BLUEWAYS OF ST. CLAIR



MAP 6-11: PUBLIC WATER ACCESS, ST. CLAIR COUNTY MAINLAND



St. Clair County (mainland)

Public shoreline by water body:

Belle River	4.14 miles
Black River	16.2 miles
Bouvier Bay	0.93 miles
Lake Huron	2.08 miles
Mill Creek	1.47 miles
North Channel	0.61 miles
Pine River	2.80 miles
Smiths Creek	896 feet
St. Clair River	5.93 miles
Total	34.32 miles

Transportation Planning Process

Various federal, state, county, and local governmental agencies legislate or participate in transportation decisions. Each Transportation Agency has its own goals and responsibilities.

When federal agencies financially support a transportation project, those agencies provide input into the planning process. Transportation projects are also subject to review under the National Environmental Policy Act (NEPA), which requires compliance with environmental regulations.

Every urbanized area of more than 50,000 people must be part of a Metropolitan Planning Organization (MPO) that coordinates regional transportation plans (RTP). St. Clair County nests within the seven-county Southeast Michigan Council of Governments (SEMCOG) serves as the MPO.

The Metropolitan Planning Commission has established the St. Clair County Transportation Study (SCCOTS) to aid the development of a coordinated transportation system for the county. SCCOTS maintains an advisory committee that provides recommendations to the Metropolitan Planning Commission and to SEMCOG.

In addition to the various specific policy and program issues already presented in this chapter, the federal government and the county government provide program guidelines.

Federal Government

The federal government has had several transportation funding programs in the past and will likely have more in the future. The current program is Bipartisan Infrastructure Law, as enacted in the Infrastructure Investment and Jobs Act. A $1.2 trillion act, which governs all federal transportation policy and funding through 2026. But of the $645 billion total for transportation, about $300 billion is for a new five-year reauthorization to replace the expiring FAST Act (See chart below). The additional ~$345 billion consists of annual appropriations of various kinds which are not guaranteed or sourced from gas taxes via the highway trust fund.

The President's Bipartisan Infrastructure Law makes historic investments in the transportation sector: improving public safety and climate resilience, creating jobs across the country, and delivering a more equitable future. And it is the largest long-term investment in our infrastructure and economy in our Nation’s history.

County Government

Through SCCOTS, the St. Clair County Metropolitan Planning Commission has participated in the development of a 20-year Regional Transportation Plan (RTP), a 25- year Long Range Transportation Plan (LRTP), and a four-year Transportation Improvement Program (TIP) for St. Clair County and the other communities and agencies that SCCOTS serves. These plan list projects and funding priorities based in part on:

- Analysis of current travel conditions, transportation facilities, and systems management
- Protection of economic, demographic, and land use activities and transportation demands
- Evaluation of short-term improvements and long-term, area-wide transportation alternatives

Through provisions of the Regional Transportation Plan and Long-Range Transportation Plan, the Metropolitan Planning Commission hopes to reduce congestion and improve safety factors, road surfaces, and overall highway and bridge standards throughout the county.

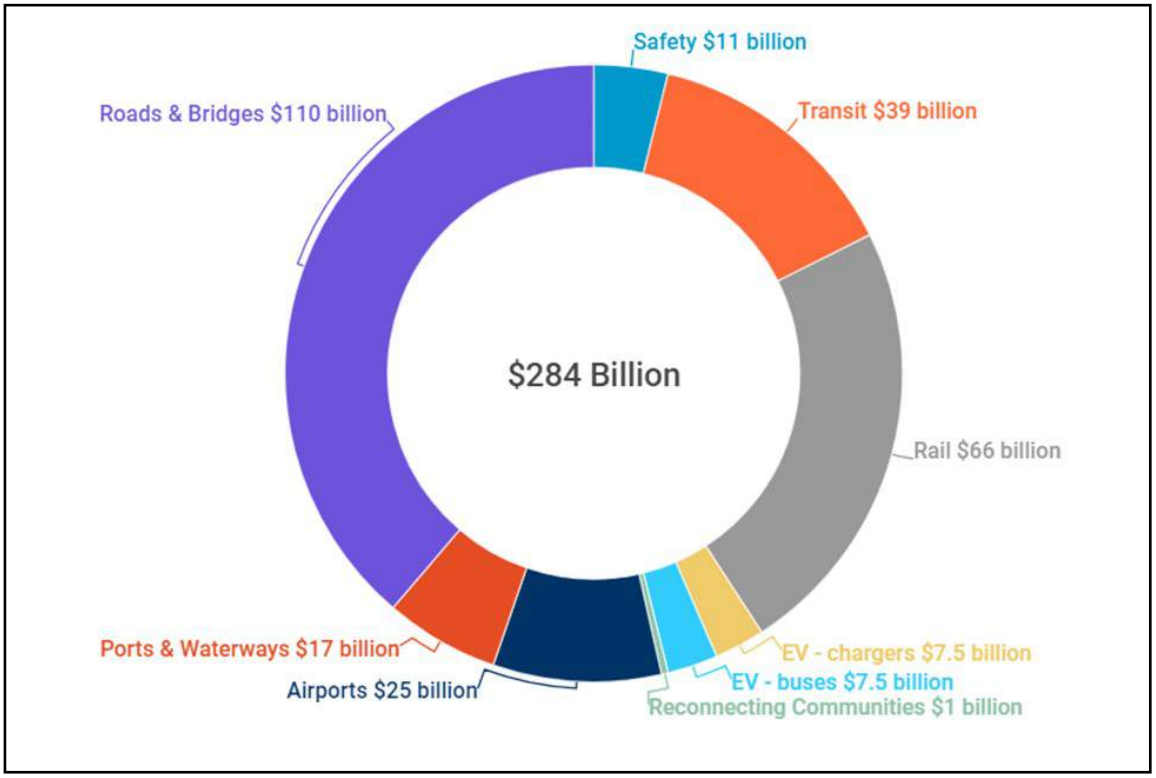
Transportation Funding

Funding for road improvements is available from federal, state, and local sources. This money is generally applied to new road development and improvements of maintenance of existing roads.

Federal Funding

Federal transportation funding priorities change as transportation legislation is established and amended. The Federal Highway Trust Fund is the source of federal surface transportation funds. The fund contains two accounts: the highway account and the Mass Transit account.

Bipartisan Infrastructure Law, 2021



Currently, the Bipartisan Infrastructure Law, which was signed into law by the President on November 15, 2021. BIL directs spending on Bridges, Climate/Resilience, Electric Vehicles, Safety, and Equity.

Invests $350 billion in highway programs over 5 years
The Bipartisan Infrastructure Law provides the basis for FHWA programs and activities through September 30, 2026. It makes a once-in-a-generation investment of $350 billion in highway programs. This includes the largest dedicated bridge investment since the construction of the Interstate Highway System.

Creates more than a dozen new highway programs
New programs under the Bipartisan Infrastructure Law focus on key infrastructure priorities including rehabilitating bridges in critical need of repair, reducing carbon emissions, increasing system resilience, removing barriers to connecting communities, and improving mobility and access to economic opportunity.

Creates more opportunities for local governments and other entities
Many of the new programs include eligibility for local governments, Metropolitan Planning Organizations (MPOs), Tribes, and other public authorities, allowing them to compete directly for funding.

State funding
The Michigan Department of Transportation (MDOT) is the overseeing state agency for road improvement projects and funding in Michigan. Many program priorities change annually and as they related to relate to federal program priorities. In St. Clair County the County Road Commission and SCCOTS develop and prioritize annual and long-range expenditure priorities.

Local funding
Local funds may come from general obligation bonds, revenue bonds, special assessments, or special millages. Funding from local source can often be matched with monies available from federal and state agencies. Some local governments are also asking private developers to pay for road installation or repair when the road serves a specific private use.

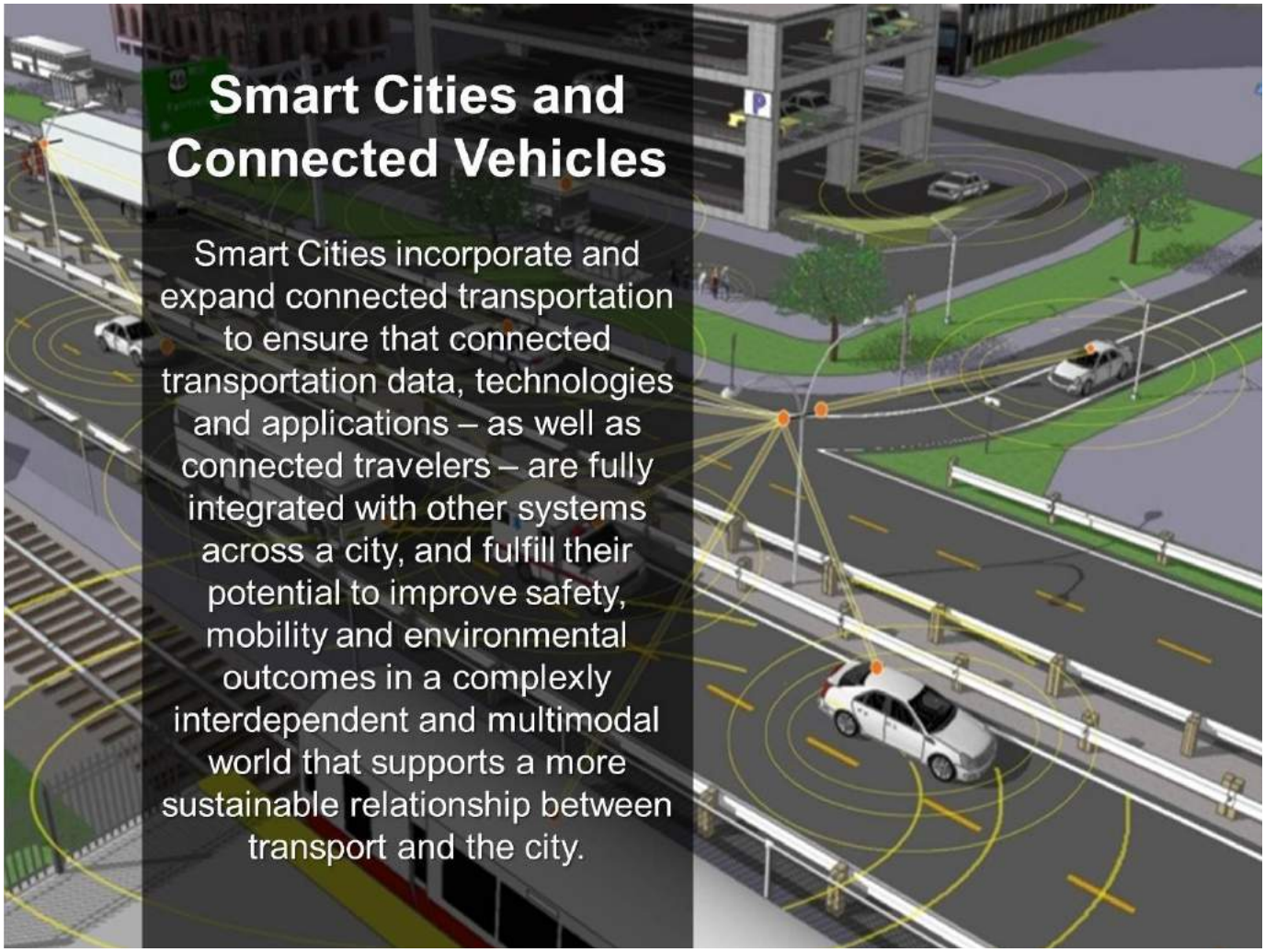
Future Transportation Needs and Trends

Parking

As cities look to plan for rapid population expansion or commercial redevelopment, and to make the most out of their infrastructure, one of the first places they might focus on is parking. An increasing number of cities have started to eliminate minimum parking requirements for developers, aiming to increase walkability and decrease car dependency.

This trend brings to light the problems with existing infrastructure. The need is to establish a highly functional and efficient parking management solution that ensures resident satisfaction and utilizes the existing parking lots and on-street parking throughout the city. Some examples of parking management strategies which influence travel demand include:

- Creating a greater opportunity for shared parking by encouraging compact mixed-use development and improving walking and cycling conditions.
- Pricing parking to reflect the cost of providing parking.
- Providing a parking “cash out” or other financial incentive to employees to use alternative modes.
- Renting or selling parking facilities separate from building space.
- Providing better user information and marketing relating to parking availability and price.



Source: US Department of Transportation, 2016.

Connected and Autonomous Vehicles

Connected and autonomous vehicle technology will transform transportation systems over the coming decades, with major implications for the planning and design of communities. Autonomous vehicles, also known as driverless or self-driving cars, have been sharing streets and roads for years.

According to the American Planning Association:

> *"The widespread deployment of autonomous vehicles for cities and metropolitan regions will change the way we design our public rights-of-way. Sensors will allow autonomous vehicles to travel closer together than human-controlled vehicles, reducing the necessary pavement width and freeing up space for wider sidewalks, bike lanes, and other amenities. Local zoning codes will need to address requirements for passenger loading and unloading, and parking needs will change drastically if a shared use model is employed. As cities transition away from ordinances that now require large amounts of land to be used for parking and circulation, they will need to determine how best to make use of that "extra" land through new approaches to land use and zoning. "*

Connected and autonomous vehicles will require new infrastructure that will rely on sensors to be located on structures and other infrastructure. Sensors will allow vehicles to "talk" to one another, as well as to the

surrounding infrastructure. This technology will feed into a larger ecosystem known as a "Smart City." Large amounts of data will be transferred between vehicles and infrastructure and this data will be able to provide planners, engineers, and decision makers with new insight as to how a transportation network, and the overall community, is functioning.

From safety, cost, energy/fuel conservation, advancement of technology, and traffic efficiency to drivers who are informed of weather, road conditions, construction, and emergencies. Connectivity provides many opportunities to improve on-road, roadside, and planning activities that are all connected by the ability to collect, process, and manage big data. Using Dedicated Short Range Communication, Wi-Fi, and satellite connections to connect vehicles to infrastructure, vehicles, and pedestrians will provide numerous opportunities for economic development and transportation improvements.

Shared-Use Mobility Services

The Shared-Use Mobility Center defines shared-use mobility as transportation services and resources that are shared among users, either concurrently or one after another. This includes public transit; taxis and limos; bike sharing; car sharing; ride sharing; ride sourcing or ride-hailing; ride-splitting; scooter sharing (now often grouped with bike sharing under the heading of "micromobility"); shuttle services and "microtransit;" as well as other options. This includes services such as Lyft and Uber that can be accessed via smartphone. Advances in technology have made sharing transportation options efficient and easy. Automobile manufacturers, rental car companies, and transit agencies have developed new solutions and mobile applications designed to alter routes, fill empty seats, collect fares and share real-time arrival and departure information. These types of services provide people with additional transportation options, reduce traffic congestion, and provide first and last mile options.

Mobile ride sharing services such as Uber and Lyft are available in the county; however, anecdotal evidence suggests those services are inconsistent and not readily available all the time.

Land Use and Infrastructure

Intelligent, sensor-based infrastructure will ultimately be deployed over time to collect data that will be used to improve system efficiencies, public safety, and overall mobility. Connected and autonomous vehicles and shared-mobility services will have a profound impact on how we plan our communities. According to Professor Jonathan Levine at the University of Michigan:

> *"if we do not address land use, there will be an ultimate impediment to access to transportation for consumers and constituents. Two examples of this impediment include parking and zoning. In many cities, when a new residential or commercial building is constructed, there must be a minimum number of parking spots attached. This requirement of parking increases housing costs in the area. Furthermore, when zoning laws encourage low density development, that density is eventually capped and cannot increase."*
>
> *"What autonomous vehicles (AVs) could potentially do is encourage infill development in the cities, reducing their outward expansion making their per-capita environmental footprints smaller. The benefits are not restricted to cities; employing AVs to operate in coordination with public transit to encourage transit-oriented development can make suburbs more attractive to live in."*

According to a Florida State University Study (*"Envisioning Florida's Future: Transportation and Land Use in an Automated Vehicle World"*) there are strong indicators that AVs will require narrower ROWs and travel lanes, influence the location, form, and amount of parking, impact the mobility of bicyclists and pedestrians, declutter

urban environments through reduced signalization and signage, and provide redevelopment opportunities on now unnecessary parking lots and excess ROW.

Electric Vehicles

According to the American Planning Association (APA), the electric vehicle market has implications for communities and for local governments, including land-use and development changes that need to be addressed in policy, programs, and regulation. In particular, planners and local government decision makers need to consider the land-use implications of the extensive build-out of EV charging infrastructure that is a necessary part of this new technology.

Many major automakers have plans to stop selling gasoline-powered cars and trucks by 2040. The October 2022 issue of *Zoning Practice* from the APA by Brian Ross, AICP, Jessica Hyink, and Rebecca Heisel suggest four important factors to consider when evaluating EV chargers from a land-use perspective:

- Are the chargers designed to be used for hours or minutes at a time?
- How many chargers are there in a single location?
- Are the chargers accessible to anyone or only to specific customers, employees, or residents?
- Does the user or the site owner or operator pay for the charge?

Additionally, the report notes that communities cannot rely exclusively on new installations associated with private development projects to create an equitable charging network. The Metropolitan Planning Commission should develop model zoning regulations to accommodate EV charging infrastructure.

Electric vehicle charging stations outside the DoubleTree Hotel/Blue Water Convention Center in Port Huron.

Transportation and Mobility Goals

The transportation and mobility goals desired by St. Clair County residents are:

1. Plan for and promote complete streets and walkability throughout communities.
2. Work with communities to improve and increase safe, functional bicycle infrastructure throughout the county.
3. Promote and connect regional trails and greenways systems.
4. Revise thoroughfare plans to coincide with anticipated growth.
5. Develop detailed small area plans for key roadways and growth corridors.
6. Develop and implement access management standards.
7. Reserve sufficient rights-of-way for future roads and related improvements.
8. Provide facilities for carpooling, Park and Ride, and other transportation demand programs.
9. Expand existing public transportation systems to connect residential areas with core services and employment centers.
10. Establish a countywide multi-modal transportation system.
11. Implement transportation safety and security measures.
12. Continue to enhance the Blueways of St. Clair water trail network.

Master Plan Guiding Principles
Transportation and Mobility

ECONOMIC PROSPERITY
Planning for the safety, accessibility and availability of transportation influences the availability and accessibility of employment. Transportation is linked to producer, consumer and distribution costs. Planning for efficient transportation helps reduces costs in all sectors of the economy.

SUSTAINABILITY AND RESILIENCY
Investing in sustainable transportation and promoting other, more environmentally-friendly modes of transportation makes it easier for people to drive less and contributes to a reduction in greenhouse gas emissions, and in all other pollutants emitted by motor vehicles. Planning for a resilient transportation system will prevent critical assets from exposure to hazards and allow for sufficient capacity to mitigate impacts of a shock if exposed.

QUALITY OF LIFE
Well-planned communities encouraging active living and transportation have the ability to improve the daily living of its residents by improving accessibility to employment, education, recreation, food and health and social services. The ease of travel is also a factor impacting quality of life, therefore; transit quality, road conditions and walkability all factor into the wellbeing of a community.

GREAT PLACES
St. Clair County will create great places by capitalizing on unique assets, have safe, stable, and walkable neighborhoods, and have desirable communities that provide residents with quality public services and great schools. Connecting people to healthy food, parks, shops, transportation options and other amenities.

HEALTHY COMMUNITIES
Planning for improved roadway facilities and increased accessibility to a well-connected, multi-modal transportation network, communities can improve the health of people by improving safety, encouraging more active lifestyles through the availability of non-motorized transportation options

COLLABORATION
The St. Clair County Transportation Study (SCCOTS) is responsible for coordinating state and federal transportation funding and the transportation improvement program for St. Clair County. SCCOTS is a shining example of countywide collaboration amongst road and transit agencies, SEMCOG and MDOT to ensure the county uses its resources effectively and efficiently in creating a multi-modal transportation network.

Public Facilities and Services

6

Photo courtesy of the St. Clair County Parks and Recreation Commission

Bridge to Bay Trail, Mark Brochu, PARC, (L); McLaren Port Huron Hospital (R)

Introduction

Public facilities and services refer to the established governmental systems that operate and maintain public operations as well as the government personnel and private employers and employees who perform daily public service jobs. Specifically, public services refer to services provided by agencies, such as schools, community water supplies, sewage disposal, roadway systems, electric and gas utilities, and police and fire protection. While, public facilities refer to the structures, equipment, or improvements needed to support delivery of public services, such as buildings, roads, bridges, water and sewer pipes, water filtration plants, wastewater treatment plants, utility poles and lines, communication towers, and emergency service stations. The County's Long-Range Capital Improvement Program (CIP), Annual Operating Budget, and Master Plan assist in addressing the County's public facilities and services to improve quality of life for the residents as well as support local businesses.

Land Use and the Environment

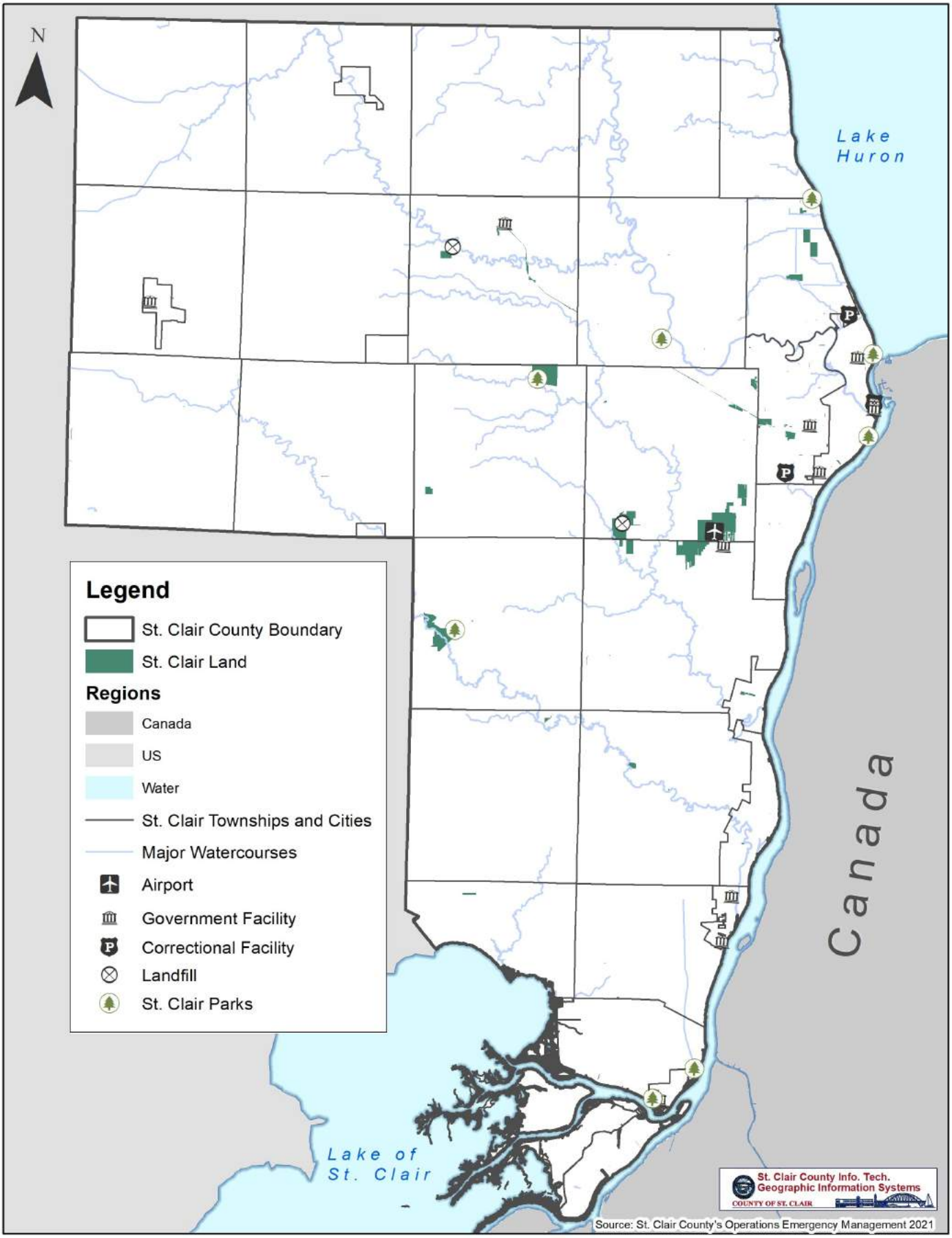
Planned communities provide public facilities and services more efficiently than unplanned communities. Government buildings, schools, utilities, water and sewer lines, etc. take up space. When communities determine how and where these facilities and services should be located based on what types of public facilities and services are requested by citizens and business owners, what the community can afford, and what the government can provide, development patterns and population growth are impacted. Generally, residents in planned communities are more appreciative of government officials and the public facilities and services they provide. In addition, the quality of facility and service construction may impact the environment. For example, the construction of power lines affect visual scenery depending on whether they are placed on utility poles or buried.

History of Public Facilities and Services in St. Clair County

Public facilities and services occur in little pockets throughout the county when the citizens have demanded it. Unfortunately, very little comprehensive planning for future public facilities and services has occurred in the county, raising the issue of whether or not public facilities and services should follow development and only be provided where people settle, or should be used to guide growth to the most suitable and appropriate locations.

In the past, public facilities and services were constructed based on where people settled. This type of planning led to inefficiencies, artificially high costs when facilities and services were provided, pollution, lost open space and farmland, lost recreational opportunities, and a decrease in quality of life. Communities are more successful in the long-term when provisioning public facilities and services to guide growth to appropriate locations.

MAP 6-1: COUNTY FACILITIES



Algonac Water Filtration Plant

In addition, another concern is whether or not public facilities and services should be paid only by the local communities themselves, or should be shared amongst local communities when and where practical. In the past, local communities provided facilities and services on their own, leading to higher costs and duplication of facilities and services. As budgets continue to become constrained, local and county leaders are working together to oversee some public services and create needed infrastructure systems.

Water, Sewer, and Solid Waste Systems

Governments, businesses, and citizens are responsible for ensuring drinking water quality, proper disposal of sewage and solid waste, and environmentally-friendly stormwater drainage.

Water Systems

Within St. Clair County, the water systems consist of private wells that pump water directly from groundwater sources, and public lines that convey water from public water treatment and purifying facilities. Water treatment and purifying facilities refer to a community structure that filters and chemically treats water, and tests it for harmful biological organisms before pumping it to residences and businesses. There are ten public water treatment systems that serve 20 distribution systems within the county. Eight of these systems draw water from Lake Huron, the St. Clair River, or Lake St. Clair. Some of the water pumped from Lake Huron passes through county-owned water distribution pipes, and is pumped to Detroit, Flint, and other metropolitan centers outside of St. Clair County. Three inland communities rely on large public wells. Residents on the islands at the southern end of the county have very limited access to public water and make special provisions to attain potable water.

A lack of safe, potable water and adequate water supplies are growing problems in the county. Many wells in St. Clair County are either unproductive due to insufficient groundwater supplies or have poor quality due to salty taste, sporadically dry or low-pressure yield, and brine or methane gas contamination. There is little well water contamination from nitrates or bacteria since clay soils inhibit leaching into well heads. Alternative approaches to either development trends or water supplies is necessary to meet the needs of future populations.

Generally, demand for water is low relative to capacity in all systems. Many communities have significant unused water capacity, including Yale, Memphis, and Clyde, Burtchville, and East China Townships.

The St. Clair County Health Department issues all well permits and monitors well permits for schools, restaurants, churches, and similar establishments.

Sanitary Sewer Systems

Sewage refers to unwanted liquid waste, either human waste ("black water"), household drain water ("gray water"), industrial sludge, or stormwater runoff. Sanitary sewer systems refer to the method of disposing of sewage. The sanitary sewer systems consist of either private on-site septic systems or public facilities that include drainage tubes and a wastewater treatment plant or open pit lagoon.

Septic Systems

Private homes and small businesses in much of St. Clair County are served by in-ground systems or mound systems. In-ground systems are placed below the ground's natural existing grade and do not work well in much of St. Clair County due to the inability of clay-based soils to quickly absorb liquids. Mound systems, on the other hand, are placed on a bed of sand on top of the existing grade and covered with additional fill. These systems require more space than in-ground systems, including space for additional mounds after the first mound becomes full and loses its functionality. Mound systems usually have a life span of five to 30 years, depending on the volume of wastewater fed into them.

Municipal Systems

Commercial and industrial centers and medium to high-density residential developments require an alternative method of disposing of liquid waste. The most common methods are:

- Passive treatment methods, usually lagoons, that feature an "open pond" of sewage and biological treatment
- Active treatment methods that feature more complicated mechanical, chemical, and biological treatment

Lagoon systems are more common in small communities, mobile home parks, and a few larger communities. They require a large amount of space and have low capital outlays and operational costs. However, they are often objectionable due to the unpleasant odors and eventual discharge of the treated liquid.

There are ten municipal wastewater treatment systems in St. Clair County serving 16 collection systems. Most of these are in the more highly developed area along the eastern and southern coast.

Demand for sanitary sewers vary widely across St. Clair County with demand being higher for sanitary sewers than water in most communities. Several communities are experiencing sewer demands greater than 75% of their capacities.

Sewage Problems

St. Clair County's soils, groundwater, and surface water are not capable of handling large volumes of sewage. Yet, in the past, many people and businesses dumped sewage into the nearest stream and created an environmental problem. Point source pollution refers to pollution that flows into a watercourse from an identifiable source, such as a drainpipe from an industrial complex or a sewage system. Direct discharge pipes from businesses and most residences have since been disconnected in favor of more sanitary and healthy means of disposing of sewage.

Nonpoint source pollution refers to pollution that flows into a watercourse from a number of sources that are not easily identifiable. These points may be hidden by natural surroundings or visible only during certain times of the year or under certain conditions. Examples of nonpoint source pollution include sewage leaching from underground septic systems, fertilizers and pesticides running off agricultural fields and lawns, E. coli contamination of streams from livestock manure or wild animal feces, and oil from roadways. There is an immediate need for improved treatment of wastes in several of the communities within the county as they continue to experience health and environmental problems due to surface water contamination from untreated sewage running directly into county drains, and septic systems that leach sewage into the soils that eventually seep into county streams and drains. The Village of Emmett is in the process of constructing a lagoon system to address this issue. The health department is concerned about the islands at the south end of the county since the water table is high and they do not have public sewer facilities.

Permits and Inspections

The St. Clair County Health Department is responsible for septic system permit review. On average, the office receives about 271 permit applications per year dating back to 2015. In 2018, 352 septic permits were issued, while, 340 permits were issued in 2021.

As mentioned earlier, most of St. Clair County is unsuitable for in-ground drain fields since the soils or high water table cannot handle the quantity of wastewater typical of a single-family home. There are many old systems already in place, which raises concern about the potential for surface water contamination. Permit applications for new, in-ground drain fields cannot be approved for most areas.

Storm Water Systems

Stormwater refers to liquid runoff from rain and snowmelt. Stormwater systems refer to a series of connected drains and streams that facilitate appropriate movement of stormwater from fields, lowlands, and roadways in rural and urban areas. Without proper drainage, most agricultural fields could not be successfully farmed and many of the houses and businesses in the county could not be built without suffering water damage. Construction development, especially of impervious parking lots, has contributed to flood issues.

Drain refers to a dredged ditch. In some cases, these ditches have been dug along the edges of farm fields, while in other cases, natural meandering streams have been channelized and straightened to create a drain. Most drains are a recognized entity, designated by public vote and maintained by county government at taxpayer expense. Within villages and rural areas, open ditches run parallel to roadways along the front of residential property. Controversy exists within the county regarding whether full-scale dredging or natural stream restoration is the proper method for achieving drain improvements.

The St. Clair County Drain Commissioner is responsible for maintaining the 373 county drains and 28 inter-county drains that extend for 842 miles within St. Clair County in order to adequately drain land for productive use and to prevent flooding. Drain improvement projects are contracted out based on the high number of drainage project requests and the lack of available staff.

About two-thirds of St. Clair County has designated drainage districts, which means they have a formal mechanism for funding drain maintenance. Natural drains that are undesignated have no mechanism for drain maintenance.

Photo Credits: Jon Clark, SEMCOG (L); SEMCOG (R)

Combined Sewer Systems and Illegal Hookups

Combined sewer systems refer to municipal sewer systems that are designed to carry both wastewater and stormwater in the same pipes. This is an archaic system that easily overfills after large or moderate amounts of precipitation, thus causing untreated raw sewage to overwhelm treatment facilities and be discharged into streams and rivers. Historically, many communities in St. Clair County had combined sewer systems that have since been constructed into separate systems, so stormwater and wastewater are not mixed. For example, Port Huron worked for 20+ years to separate its combined sewer systems, completing the project in 2019.

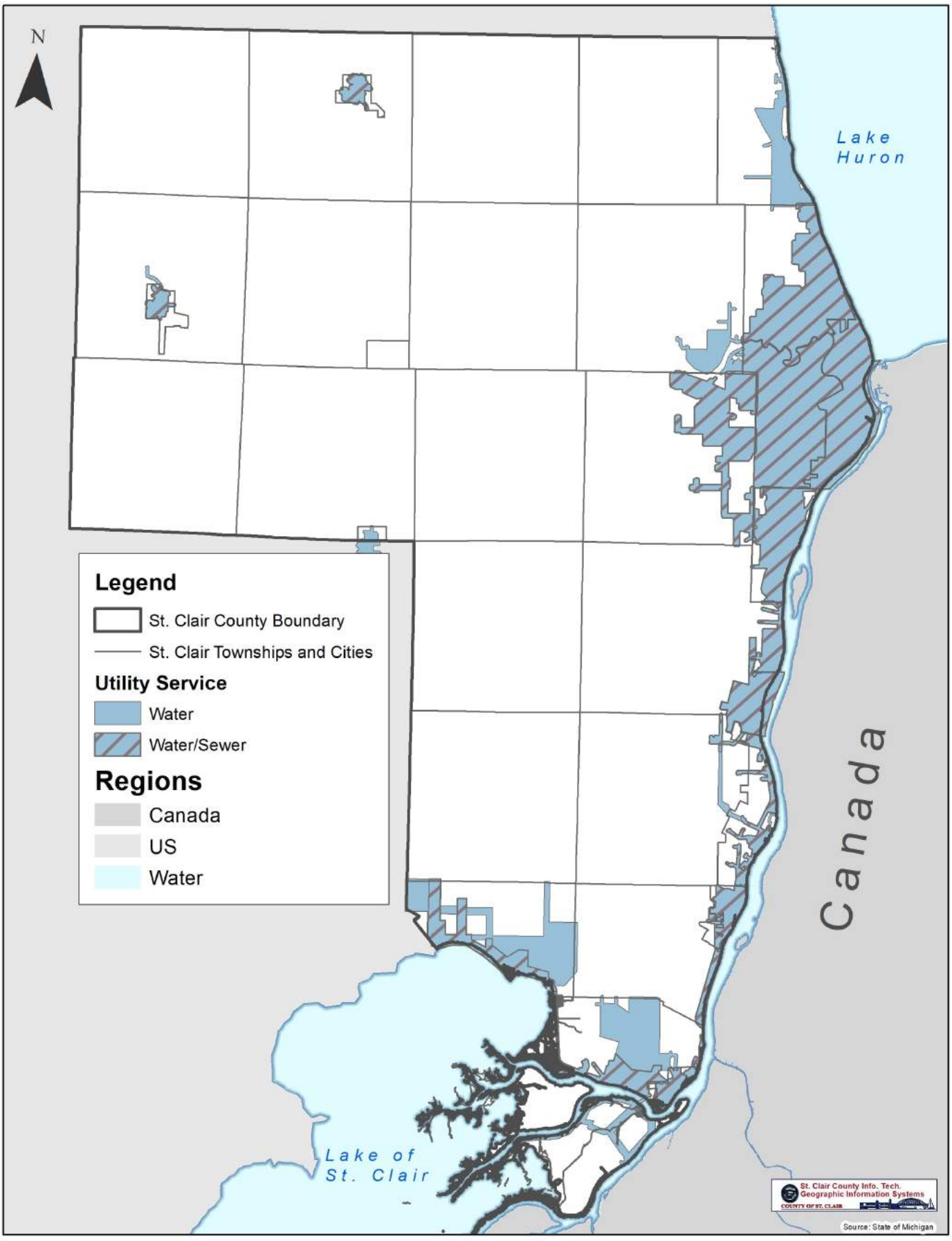
There are an indeterminate number of illegal hookups from private homes and businesses to stormwater systems, resulting in raw sewage being discharged into drains, lakes, and streams that can be detected by dyes and infrared aerial photography. Enforcement occurs as staff time permits.

Landfills and Materials Management Facilities

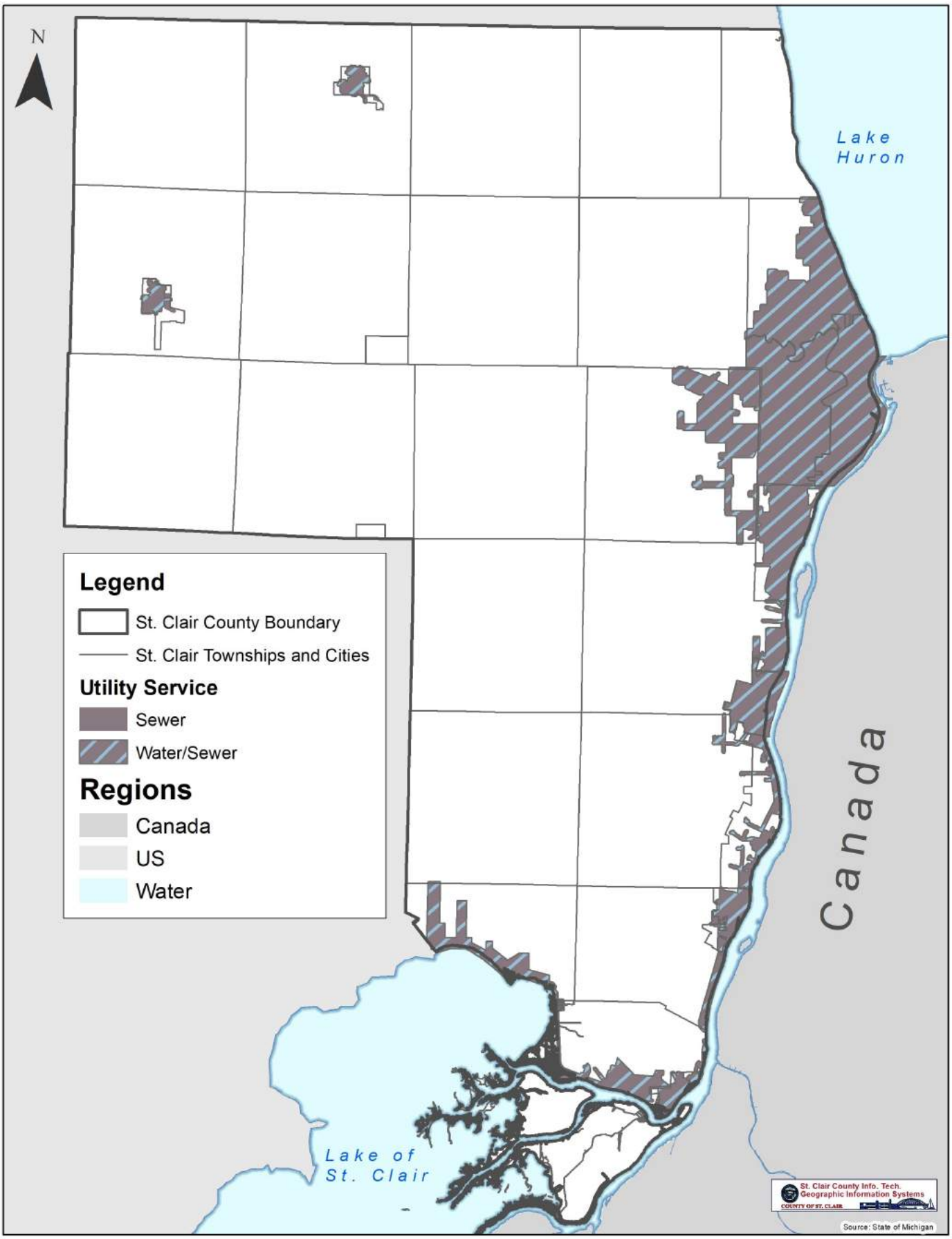
St. Clair County owns and operates one active landfill, two household hazardous waste collection centers, and one recycling drop off center. The County also maintains one closed landfill. The management of these facilities and the programs they support are the responsibility of the Environmental Services Department located in Smiths Creek. To provide solid waste disposal services, the department supervises the design, construction, operation, closure, and post-closure maintenance of the Smiths Creek Landfill, as well as post closure maintenance activities at the Thomas Road site in Kenockee Township. The department also facilitates the implementation of the St. Clair County Solid Waste Management Plan through the promotion of source reduction, recycling, materials recovery, composting, and licensing of waste transport vehicles.

A solid waste landfill is a public service facility. The first and most important function of a properly run landfill is to provide safe containment for waste. Historically, communities hauled trash to the "dump", buried it in a hole in the ground, covered it up, and forgot about it. In order to protect our environment, today's landfills are subject to federal, state, and various local regulations. Regulations require the Environmental Services Department to control landfill gas, protect ground and surface water from contamination, prevent hazardous waste from entering the landfills, and assure that any hazardous waste that is discovered on site is properly handled, stored, and disposed of at a permitted facility designed to accept hazardous material.

MAP 6-2: WATER SERVICE IN ST. CLAIR COUNTY



MAP 6-3: SEWER SERVICE IN ST. CLAIR COUNTY



Each day, waste is delivered to the landfill in a variety of hauling vehicles. Once at the landfill, hauling vehicles are directed to designated unloading areas in the licensed disposal area. The waste is dumped from the vehicle and checked for hazardous waste or other unacceptable material. The waste is then pushed into place and compacted by waste compactors. The active face of the waste disposal area is covered each day by an approved cover material (e.g. soil, paper pulp, or tarps). Waste is placed in the active face until an approved final elevation is reached. Once the final elevation is reached in the entire licensed disposal area, the landfill is capped and closed. After the landfill closes, landfill gas and groundwater at the landfill continues to be monitored for a minimum of 30 years. During that time, the landfill site can be developed for use as a golf course, park, open space, or other recreational activity.

There are two landfills currently licensed in St. Clair County: the Smiths Creek Landfill and the Range Road Detroit Edison Property. The Smiths Creek Landfill is a Type II landfill, which is a municipal solid waste landfill. The Range Road Detroit Edison Property is a Type III landfill, which accepts fly ash from power generating plants operated by Detroit Edison. The Emterra Environmental USA Recycling and Waste Center transfer facility is the only other currently licensed solid waste facility.

The conventional “dry tomb” approach to landfills – sealing away garbage from all air and water – takes decades, if not centuries to decompose waste to the point where it no longer threatens safe drinking water. Therefore, conventional landfills require extensive monitoring and maintenance long after the last truck unloads its trash to make sure pollution does not escape. This liability is a concern to today’s landfill operators and an unnecessary

burden to future generations.

Fortunately, St. Clair County's recent bioreactor landfill technology development addresses this concern by optimizing the conditions for biological decomposition of municipal solid waste via:

- moisture addition
- chemistry regulation (e.g., pH-level)
- microbial seed addition
- a new bioreactor technology that uses domestic septage to increase the rate of MSW decomposition and, consequently, produce larger amounts of methane. With the construction of a landfill gas-to-energy facility, the collected methane is being converted into renewable clean energy.

Solid Waste Management Planning

Each county in the State of Michigan has a Solid Waste Management Plan that ensures adequate disposal capacity and assures all non-hazardous solid waste generated in the county is collected and recovered, processed, or disposed at facilities that comply with state laws and rules. As previously referenced, the State of Michigan is shifting its focus from disposal to materials management. Since Solid Waste Management Plans are outdated, St. Clair County will be transitioning to a plan with a materials management focus in the future. This shift will increase recycling access, infrastructure, and market development.

Counties will be encouraged, but *NOT* required, to look at and integrate other sustainable practices, such as:

- Energy Recovery and Savings
- Pollution Prevention
- Social Equity
- Decarbonization, Sustainability, and Climate Resiliency

Currently mandated Solid Waste Management Plans focus primarily on landfilling and incineration of waste. The materials management/circular economy transition focuses on reuse, recycling, food rescue, composting, and other sustainable practices. Recirculating materials in the economy through these sustainable practices will develop and increase Michigan's materials management infrastructure, create new and additional supply chains, spawn new markets, keep revenue in the region, and promote economic growth. Materials management includes managing recyclables, organics, tires, wood, concrete, and other materials traditionally considered trash and landfilled.

A sustainable materials management hierarchy has been identified by Michigan's Department of Environment, Great Lakes, and Energy (EGLE) that prioritizes actions to take to prevent and divert unwanted materials from being landfilled. Each level in the hierarchy focuses on different management strategies for recovering value from unwanted materials. The top levels share the best ways to prevent and divert materials from being landfilled. They provide the most benefits for the environment, society, and the economy, while the bottom levels represent the worst options.

Electric Power and Gas

DTE broke ground on its $1 billion, state-of-the-art, 1,150 megawatt Blue Water Energy Center on existing company property in East China Township in August 2019. It will provide affordable and reliable power for 850,000 homes beginning in 2022. According to DTE, the new plant is expected to be the most fuel-efficient power plant in Michigan. It will run on natural gas and use combined-cycle technology that captures waste heat to produce additional electricity. The plant will be 70% cleaner and 40% more efficient than the three coal-fired plants it replaces - one of which was the St. Clair Power Plant, which closed in 2018.

In St. Clair County, DTE Energy also operates the Greenwood Energy Center, a 15-acre solar farm in Avoca, the coal-powered Belle River Power Plant, the solar array at St. Clair County RESA in Marysville, and the landfill gas project at Smiths Creek Landfill in Kimball Township. The Belle River Power Plant is planned for closure in 2028.

SEMCO Energy Gas Company, headquartered in Port Huron, is a regulated public utility that delivers natural gas to approximately 300,000 residential, commercial, and industrial customers in service territories in the southern half of the State's Lower Peninsula (including in and around the cities of Albion, Battle Creek, Holland, Niles, Port Huron, and Three Rivers) and in the central, eastern, and western parts of the State's Upper Peninsula.

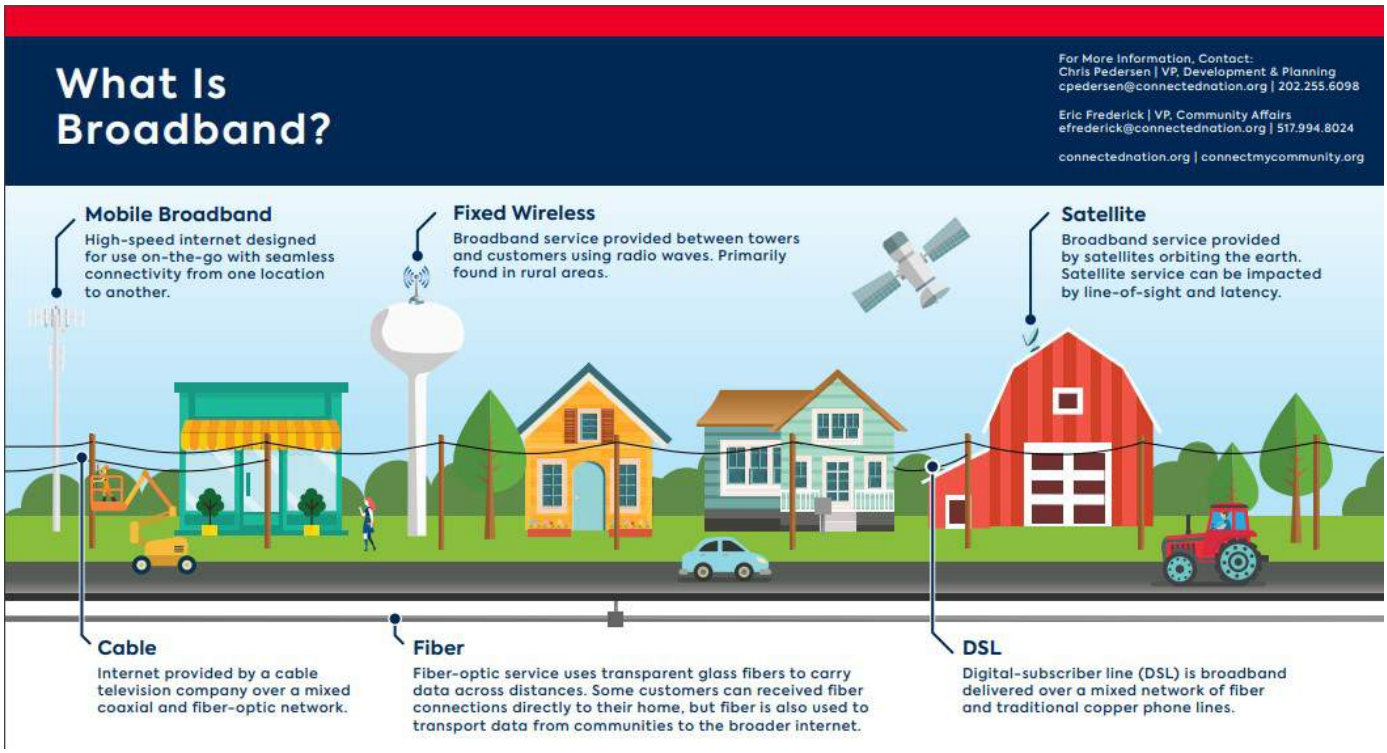
Natural gas is available via underground pipes in the more developed areas. Propane gas tanks also are readily available.

Broadband Coverage and Access

St. Clair County leaders and stakeholders recognize broadband as the economic development driver that supports many of the region's primary industries including, but not limited to manufacturing, healthcare, education, agriculture, public safety, private businesses, and public agencies. Broadband access can empower disenfranchised communities by connecting unserved residents to the internet and providing them the opportunity to telecommute and have access to distance learning. Broadband access also acts as an economic growth driver, which provides opportunities to attract new business investment, while at the same time allowing existing businesses and anchor institutions to further innovate and expand through technology adoption.

Broadband is an essential infrastructure investment that our residents and businesses must have to thrive in today's connected world. So much of our everyday life is dependent upon robust and reliable communication networks. The traditional model of broadband development has seen the general public rely on private sector investments within their communities and, unfortunately, many areas within St. Clair County lack the required coverage and performance of optimal broadband infrastructure.

Photo Credits: www.newlook.dteenergy.com, 2023



Overview of Broadband Technologies. Source: Connected Nation Michigan, April 2022.

As technological advancements strive to create a fully connected and streamlined world, the success of communities and businesses will depend on how they adopt reliable, high-speed, and secure broadband solutions. Broadband refers to high-speed internet that is delivered to households and businesses via a variety of wired and wireless networks. It can be broken down into two types of service: fixed and non-fixed.

Connection speed refers to the download and upload speeds. It is the most common measurement of internet service. Adequate connection speeds depend on the type of user, amount of data consumed, and future technological advancements. In 1996, the FCC broadband definition was 200 Kbps download and 20 Kbps upload (200/20 Kbps). The FCC updated the definition to 4 Mbps download and 1 Mbps upload (4/1 Mbps) in 2010, and to 25 Mbps download and 3 Mbps upload (25/3 Mbps) in 2015. In 2022, there has been growing consensus that broadband should be defined as 100 Mbps download and 100 Mbps upload to meet increasing demand for connectivity and speed (100/100 Mbps).

The COVID-19 pandemic highlighted the need for reliable and affordable broadband service as businesses, educational institutions, and governments moved their operations to online platforms. The pandemic raised awareness about the digital divide as many households struggled with a lack of access to internet service, the availability of devices to connect to service, and/or the skills to use the internet. Existing inequities for rural populations, low income populations, students, seniors, and Black and Hispanic households were exacerbated. In addition, family members competed with one another for broadband bandwidth during remote work and learning. Some communities without high-speed internet saw residents leaving since they needed high-speed internet to participate in teleworking, virtual/distance learning, telehealth, and government services.

Why is Broadband Important?

According to the Michigan High-Speed Internet (MIHI) office, more than 212,000 households in Michigan lack the opportunity to access a high-speed internet connection and another additional 865,000 households face barriers related to affordability, adoption, or digital literacy. In sum, this means that approximately 31% of Michigan households do not have an affordable, reliable high-speed internet connection that meets their needs.

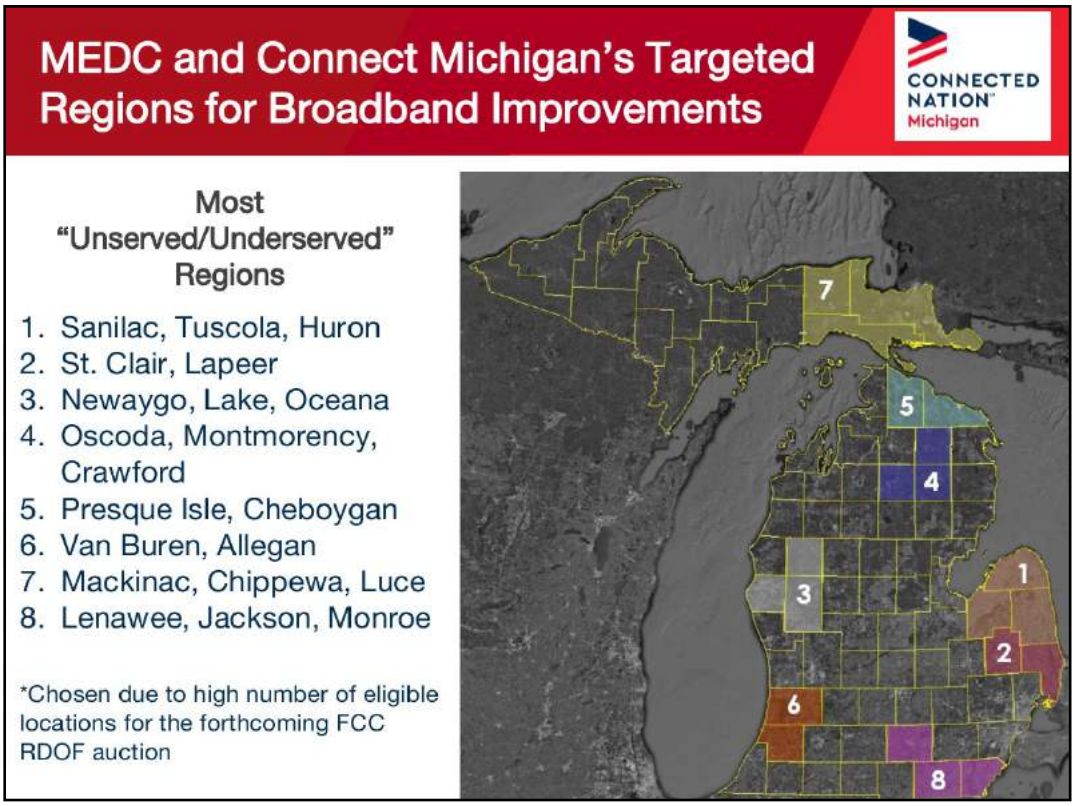
Furthermore, MIHI lists the following consequences of having limited or no access to fast broadband service:

- Students with high-speed, home internet access have an overall grade point average (GPA) of 3.18. This is significantly higher than the average 2.81 GPA for students with no home access and 2.75 average for student with only cell phone access.
- Increased access to the internet can help address issues of isolation among older adults. Studies have shown that isolation is associated with worse health outcomes and even premature death among adults age 50 and over.
- Effective use of telemedicine can reduce hospitalizations of nursing home patients and reduce healthcare costs.
- Small businesses with websites have higher annual revenues and are more likely to have recently hired one or more employees than similar businesses that are not online. Those that use social media weekly are three times more likely to have hired recently than those that do not.
- A study of manufacturers found that 40% were able to add new customers and 57% saved money because of their high-speed internet connection.
- Farmers who gain high-speed internet access experience an average 6% increase in farm revenue.
- Having a home broadband connection gives households an estimated economic impact of $1,850 per year.

In July 2021, Connect Michigan surveyed St. Clair County residents and businesses to get a better understanding of broadband adoption, coverage areas, and community needs. In total, there were 869 residential respondents, 32 business respondents, 13 government respondents, as well as additional respondents in other sectors. Some key takeaways from that survey include:

- 58% of households stated their internet service does not meet their needs.
- 77% of businesses are unsatisfied with their broadband service due to slow connection speeds, unreliable service, and poor customer service.
- The average monthly cost for service among households is $94.92. This is 33.6% more per month than other communities.
- The average monthly cost for service among businesses is $110.91, or 17% more than other communities.
- 80% of respondents stated their connection speeds were too slow.
- 69% of workers in St. Clair County telework at least one day per week.
- The average household in St. Clair County has twelve internet-enabled devices.
- 61.2% of households use a fixed service (fiber, cable, DSL, fixed wireless).
- 19.4% use a non-fixed service (mobile, satellite).
- 19.3% do not subscribe to a service.
- 13.1% of households use mobile internet as their primary home internet service.

The Metropolitan Planning Commission completed a Broadband Strategic Plan in 2023, which provides a set of recommendations for expanding broadband access and coverage in St. Clair County.



There are an increasing number of state and federal grant funding programs that are providing assistance to local communities and internet service providers to build broadband infrastructure. County officials will need to seek out public-private partnerships to go after grant funding to eliminate gaps in service areas.

Health Care Facilities and Educational Systems

Health care facilities and educational systems are related because they both:

- Help measure quality of life
- Affect population growth and where people live
- Have significant land use and traffic impacts

One measurement of quality of life is accessibility to a wide-range of healthcare facilities and services. Generally, people want to live near hospitals, clinics, and doctors' offices- but not too close because of the noise and traffic volume associated with those facilities.

Education is another measurement of quality of life because good educational programs help young people become knowledgeable participants in society and better able to compete for jobs. Good educational programs also help adults continue with education and enrichment courses.

Health Care

St. Clair County appears to have sufficient doctors, clinics, and other healthcare facilities to serve its population. More advanced hospital care is available in the Detroit metropolitan area.

St. Clair County is served by three medical hospitals:

- McLaren Port Huron Hospital (Port Huron)
- Lake Huron Medical Center (Port Huron)
- Ascension River District Hospital (East China Township)

All three hospitals participate in joint Tri-Hospital services and provide healthcare at satellite facilities. Combined, they have roughly 398 beds and provide a range of services, including emergency and wound treatment, cardiac care, sports medicine, business health services, cancer and obstetrics care, pediatrics, various therapies, orthopedic and various medical surgeries, and senior programs. Ascension River District Hospital also offers substance abuse and psychiatric services.

St. Clair County Community Mental Health provides program services for children and adults at locations in Port Huron, Algonac, Capac, Fort Gratiot, and Marine City. McLaren Port Huron Hospital also offers outpatient and inpatient mental health care.

Education

Just under 22,500 persons go to school in St. Clair County with approximately 18,575 students attending primary and secondary schools. Educational facilities include the St. Clair County Regional Educational Service Agency (RESA), public school systems, private and parochial schools, and St. Clair County Community College (SC4). The St. Clair County Library System is also included as an educational institution.

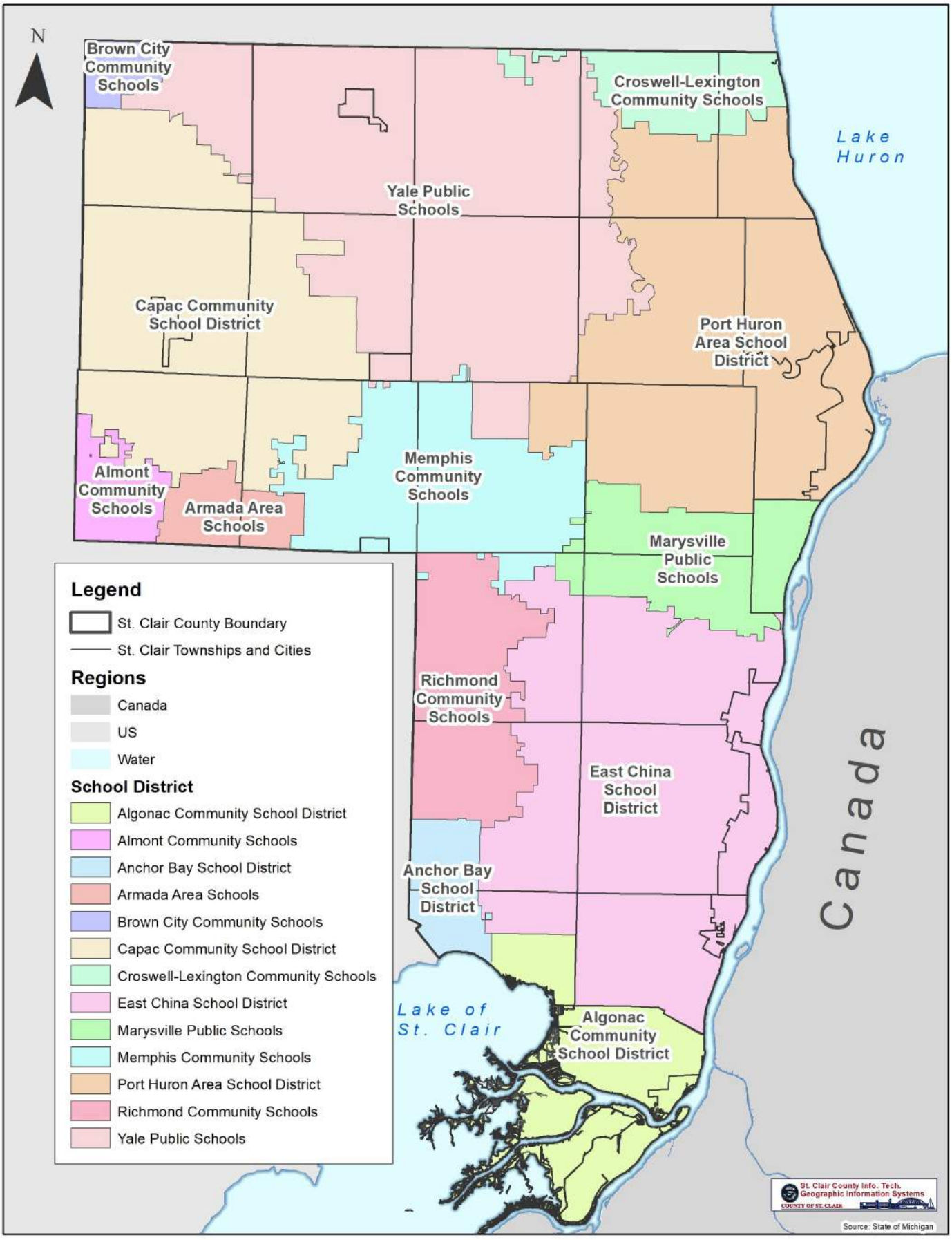
Seven public school districts located within the RESA District have at least two school buildings within St. Clair County. Another five school districts extend into St. Clair County from neighboring communities, drawing students to where their school buildings are located (Map 7-4). RESA provides training for students and teachers.

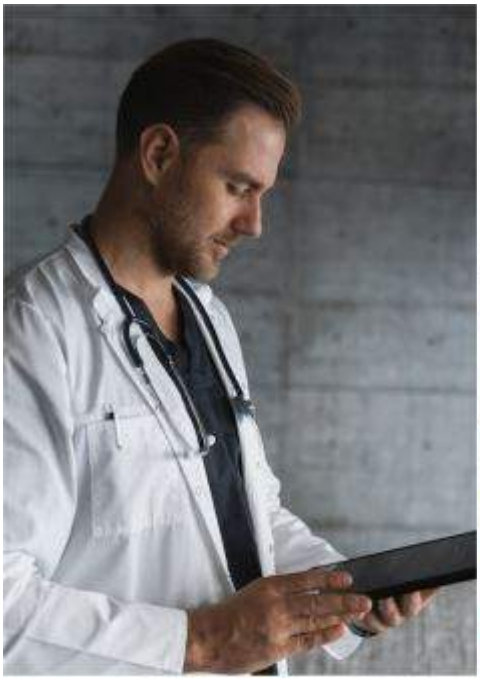
Enrollment in St. Clair County public schools has declined exponentially from 2005 to 2020 for a total loss of over 8,500 persons, nearly one third of their student population according to the 2005-2009 and 2016-2020 American Community Survey's Education Tabulations (ACS-ED). SEMCOG forecasts the county to continue to experience declining enrollment, but at a slower pace.

St. Clair County Community College (SC4) is a member of the American Association of Community Colleges and provides opportunities for higher education to area residents. Enrollment at SC4 can be a first step in transferring to a four-year college or university, or participation in a complete education/training program. The main SC4 campus is an 11-building campus located on 29 acres in Port Huron. The college has extended learning centers at Algonac, Croswell-Lexington, and Yale High Schools, as well as at the Sanilac Career Center in Sanilac County. Total enrollment of all undergraduates in the fall semester of 2021 was 3,231. Approximately 140 of these students were enrolled as transfer-ins from another institution.

The SC4 University Center on the Port Huron campus features partnerships with 15 four-year colleges and universities. The University Center offers bachelor's and master's degrees in academic fields, including business and information technologies, health and human services, humanities, science, technology, engineering and math, social science, and general academics.

MAP 6-4: PUBLIC SCHOOL DISTRICTS IN ST. CLAIR COUNTY





Police, Fire, and Emergency Medical Services

Police, fire, and emergency medical services are provided by a number of sources throughout St. Clair County:

- St. Clair County government offers sheriff deputy and corrections service
- Seven communities have a local police force
- Twenty-one townships, cities, and villages offer fire service, either individually or in agreement with a neighboring community
- Emergency medical systems (EMS) are associated with community fire departments, local hospitals, or one of two private companies
- Each of the three hospitals in St. Clair County has emergency rooms

While there are many fire departments in the county, higher fire insurance ratings have been deemed for a large segment of the population who live some distance from the nearest fire station as well as for those who live in rural areas with a lack of fire hydrants.

The County Sheriff's Office is located at the St. Clair County Intervention Center at 1170 Michigan Road in Port Huron Township. This center includes offices, a jail with 448 beds for adults and 70 beds for juveniles, the Central Dispatch center, classrooms and other related facilities. The Sheriff's Office provides police service to St. Clair County communities without their own police force.

The St. Clair County Marine Patrol – a division of the County Sheriff's Office – is headquartered in Algonac. Marine Patrol is staffed by 50 marine deputies under the command of the division lieutenant, a sergeant and five corporals serving as platoon leaders. An administrative assistant is assigned secretarial and clerical duties.

The dive rescue/recovery unit is a branch of the marine patrol. This unit is staffed by 20 dive/rescue specialists who are on 24-hour call - available for immediate response to any situation requiring the need for underwater/ sub-surface rescue, ice rescue and/or recovery of persons and/or property. Most of the division personnel are seasonal employees and have other positions within the community - many in the public service sector and serving in other areas of law enforcement, such as firefighters and emergency medical personnel.

The Marine Patrol fleet consists of 11 patrol craft equipped with law enforcement, firefighting, electronic navigation, electronic surveillance, and search and rescue equipment.

St. Clair County Central Dispatch is a separate, individual department within the county government. Operations are overseen by the Central Dispatch Director and all shifts have an assigned senior dispatcher. The director takes direction regarding policy and operations from the Central Dispatch Authority/Advisory Board comprised of 11 members. Each member represents a larger organization within the county, such as police, fire, townships and cities. The director is also under the authority of the County Administrator.

Central Dispatch is staffed by 20 full-time dispatchers, two part-time call takers, two full-time supervisors, a full-time deputy director and a full-time director. At any given time, there are at least two dispatchers on duty; optimal staffing is four and special events typically require six dispatchers. Central Dispatch provides dispatch services for over 25 agencies.

In 2019, Central Dispatch took in 56,936 emergency 911 calls and 129,620 calls for service from a computer-aided dispatch database. That is following 70,962 emergency calls in 2018 and 58,965 emergency calls in 2017.

The United States Coast Guard provides emergency service to boaters in distress and participates in search and rescue operations.

There are three ambulance services that provide emergency services in St. Clair County:

- Tri-Hospital EMS
- Marysville Fire Department
- Richmond-Lenox EMS Ambulance Authority

Tri-Hospital EMS covers 26 of the 31 municipalities in St. Clair County. In addition to those providers directly serving St. Clair County, there are a number of other ambulance providers in the Blue Water Area, including Marlette EMS, Croswell EMS, Med-Star Ambulance, and Sanilac Ambulance Service.

In 2022, a countywide millage to support ambulance services was approved by voters. The 0.5 mill tax is estimated to generate about $3.3 million per year, which will be used for general operating costs. The funding goes directly to local ambulance agencies for staffing and operation needs.

Changing population centers will require new regional facilities, including new fire stations, ambulance barns, and satellite police stations. Communities should set aside land in order to avoid higher land prices in the future. Plans should also be made to create standards for land development and roadway construction, especially private roads, to efficiently handle emergency service vehicles, especially fire engines and ladder trucks.

Municipal, State, and Federal Services and Facilities

In addition to St. Clair County government, there are 32 other local jurisdictional units - cities, villages, and townships - within the county. Each of these local units has at least a municipal building or hall. Some have fire halls, police stations, parks, and a department of public works. The State of Michigan and the United States governments also have a variety of public service offices throughout the county.

Municipal Governments

There has been very poor coordination of public facility planning between governmental units partly due to a lack of planning and opinions that cooperation is of little value, except when required. This attitude must change for sensible land use planning to occur, for appropriate land use patterns to be implemented, for inappropriate or conflicting land use patterns to be avoided, and for taxpayers to realize efficiencies from their tax dollars.

State of Michigan Government

The following State of Michigan offices are located within St. Clair County:

- Secretary of State in Port Huron and Marine City
- Michigan Department of Transportation, which maintains the Blue Water Bridge, a Welcome Center in Port Huron, and a field office in Capac
- Michigan Employment and Security Administration in Port Huron
- Michigan Department of Health and Human Services in Port Huron
- Michigan Department of Natural Resources in Port Huron State Game Area and on Harsens Island

The county does not have a state police post; however, there is a substation in the City of Port Huron and one just outside the county's border in Richmond.

United States Government

The following United States government offices are located within St. Clair County:

- Customs and Immigration at the Blue Water Bridge and in Algonac, plus a Border Patrol in Marysville
- Justice Department, Immigration and Naturalization Service at the Blue Water Bridge and in Algonac
- Military recruiting offices (Air Force, Army, Marines, and Navy) in Port Huron
- A federal District Court in Port Huron
- U.S. Marshall in Port Huron
- Social Security Administration in Fort Gratiot
- Army Corps of Engineers in Marine City
- Coast Guard station in Port Huron
- Post Offices in 20 communities

Recreational Facilities

Recreational facilities within St. Clair County are operated by the State of Michigan, the county, municipalities, school districts, and private organizations. These facilities provide a variety of recreational opportunities.

State of Michigan Recreational Facilities

The State of Michigan owns 22,178 acres of resource-based facilities in St. Clair County, including:

GOODELLS COUNTY PARK

- Algonac State Park is a 1,450-acre park on the St. Clair River with over 3,200 feet of river frontage, camping, picnicking, nature study, and other activities.
- Lakeport State Park is a 1,215-acre park split into two sites that has almost a mile of Lake Huron Beach in Burtchville Township. It offers camping, picnicking, hiking trails, and playground areas.

The state also operates or provides funding for eleven public boat launch sites with nearly 500 parking spaces and three wildlife and game areas.

St. Clair County Recreational Facilities

St. Clair County currently owns nine properties devoted to parks and recreation activities that total 1,060.5 acres:

- Goodells County Park 405 acres
- Columbus County Park 411 acres
- Fort Gratiot County Park 30 acres
- Woodsong County Park 33 acres
- Fort Gratiot Light Station 5 acres
- Blue Water River Walk County Park 6.5 acres
- North Channel County Park 10 acres
- Marine City Dredge Cut Access . 34 acres
- Wadhams to Avoca Trail 160 acres (12 miles long)

It is also important to note the St. Clair County Regional Educational Service Agency's 111-acre Pine River Nature Center, which is adjacent to Goodells County Park. By adding that acreage to the parks and trails inventory above, PARC property totals 1,171.5 acres.

MAP 6-5: ST. CLAIR COUNTY PARKS AND RECREATION FACILITIES

Public Facilities and Services Goals

The public facilities and services goals desired by St. Clair County residents are:

1. Plan public facilities and services to direct growth toward areas suitable for higher-density development.
2. Provide public services either at the same time as development occurs or in an orderly, phased manner consistent with local community plans.
3. Provide public facilities and services efficiently and cost-effectively.
4. Cooperate and partner with other agencies and governmental units to gain common benefits.
5. Eliminate gaps and expand access to affordable broadband countywide.
6. Support the development of alternative energy infrastructure.
7. Improve community resiliency and sustainability for essential utilities and services.
8. Update the capital improvement program annually.

Woodsong County Park

Master Plan Guiding Principles
Public Facilities and Services

ECONOMIC PROSPERITY
A strong economy creates wealth to allow St. Clair County and local governments to fund and support the demand for public services and essential services at their needed capacity. Additionally, business owners desire excellent public facilities and services to support their operations as well as attract customers.

SUSTAINABILITY AND RESILIENCY
Local governments are increasingly turning to green infrastructure, energy efficient equipment and facilities, alternative energy sources, and low-impact forms of development when building or upgrading public facilities. These efforts assist in preserving our environmental resources and reducing operational costs for the municipality.

QUALITY OF LIFE
A community's quality of life is directly correlated to the quality of its public facilities and services since public facilities and services impact whether or not current residents continue to live in the county, if new residents and businesses are attracted to and move into the county, and if tourists visit and have subsequent return visits.

GREAT PLACES
High quality public facilities and services create desirable communities that contribute to high levels of resident contentment with the facilities and services received. Many public services, such as sewer, water, and utilities, are constructed within road or railroad rights-of-way. Emergency services rely on high quality roads to reach their destinations quickly.

HEALTHY COMMUNITIES
Protecting and improving the health of people and their communities is achieved by promoting community health programs and improving access to health and human services, healthy food options, a quality education, safe and healthy homes, adequate employment, and transportation.

COLLABORATION
Over the past decade, local governments in St. Clair County have faced tough fiscal challenges and have learned to be innovative and more cost effective through intergovernmental cooperation, which often leads to the formation of joint services or regional authorities that can help communities realize economies of scale.

Land Use and Change Management

7

Alternative 1: Use Generalized Future Land Use Plans

This alternative makes the assumption that it will be possible for all of St. Clair County's 32 local units of government to actually pursue their individual master plans as they are currently written and approved.

The local master plans have many good features. Master plans for the townships and much of the county encourage farmland preservation. Most master plans provide ample land for industrial, commercial, and residential use. And the master plans state a desire to preserve open space and create recreational areas.

The local master plans also have some negative features. Master plans for the townships in the northwest part of the county allow residential homes to be built in fields along rural roads adjacent to farmland without an adequate buffer or provisions for these disparate uses. Local master plans also designate more land than is necessary for industrial, commercial, and residential use. And few contain mechanisms to protect water quality or rural character.

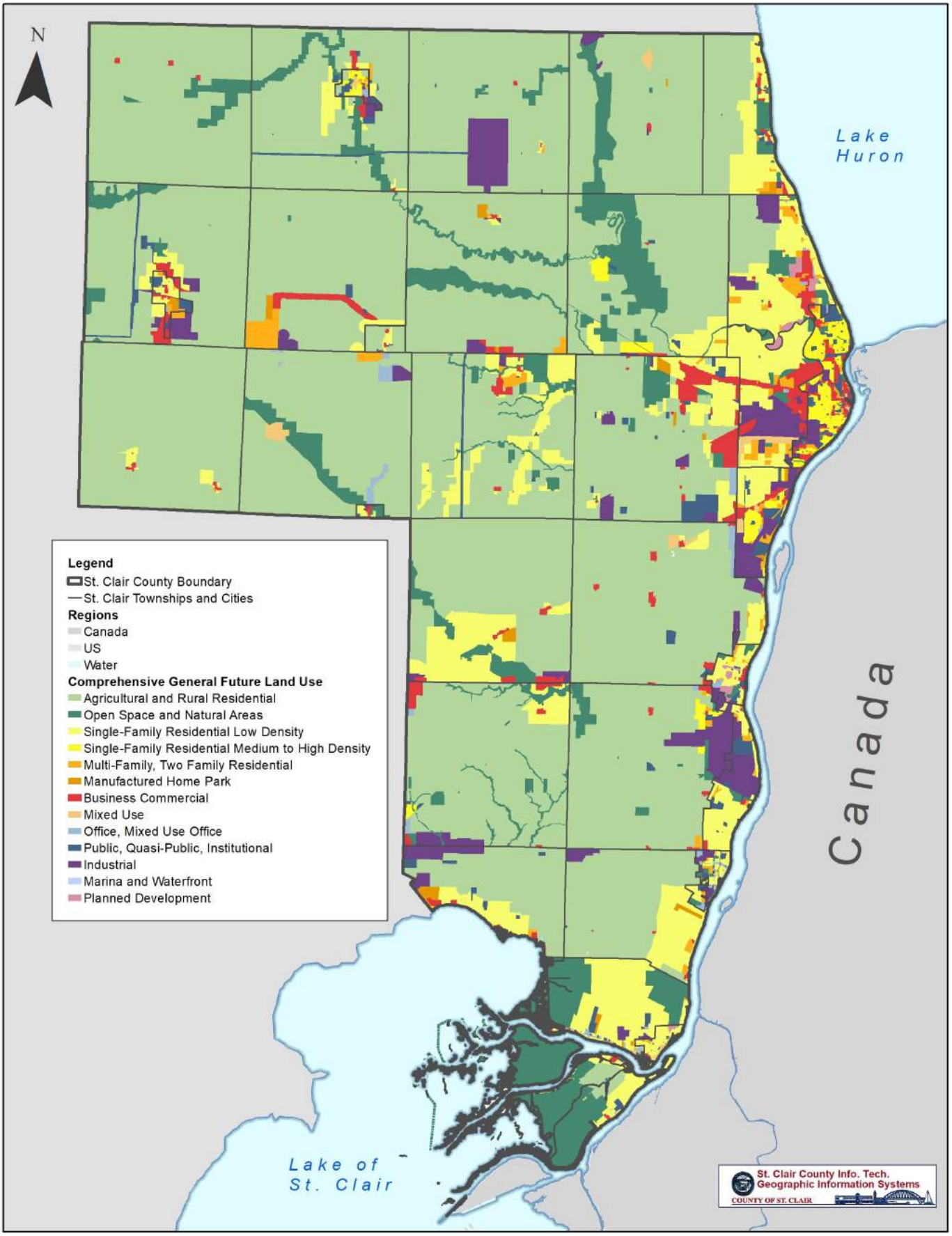
Individual local master plans also do not necessarily relate to land use planning in adjacent communities. For example, the area next to a stream may be protected as open space in one community, not protected in the next community, and protected in a third downstream community. This lack of coordination creates a checkerboard pattern that endangers the integrity of the entire corridor and negates the possibility of a trail or natural habitat that would benefit all communities along the corridor.

Generalized Master Plans

The map associated with this alternative represents the intention of all township and municipal generalized master plans as of 2022.

- The majority of most townships are designated as agriculture/rural residential (off-white). Municipalities and townships along the eastern shore are designated as low-density residential (light yellow) and high-density residential (dark yellow).
- There are scattered pockets for industry and manufacturing (purple), business and commercial use (red), and office complexes (orange).
- Recreation and open space (green) is planned in unconnected strips from community to community, as is the case with sections of Pine River, Belle River, and Mill Creek.

MAP 7-1: GENERALIZED FUTURE LAND USE PLANS IN ST. CLAIR COUNTY



Alternative 2: Use Generalized Zoning Ordinances

Many Local zoning ordinances, as currently written, often contradict the intentions of local master plans.

Local zoning ordinances preserve only small amounts of land for agricultural purposes and contain few provisions for protecting natural resources and open space. In fact, local zoning ordinances allow for residential development that would house over 1 million people, which is 5.4 times more than the county's population in 2000.

Local zoning ordinances allow for low-density residential development on lots of two to five acres. That population density will be too low to economically provide public water and sewer lines, but too high for adequate on-site septic systems and for groundwater supplies from wells.

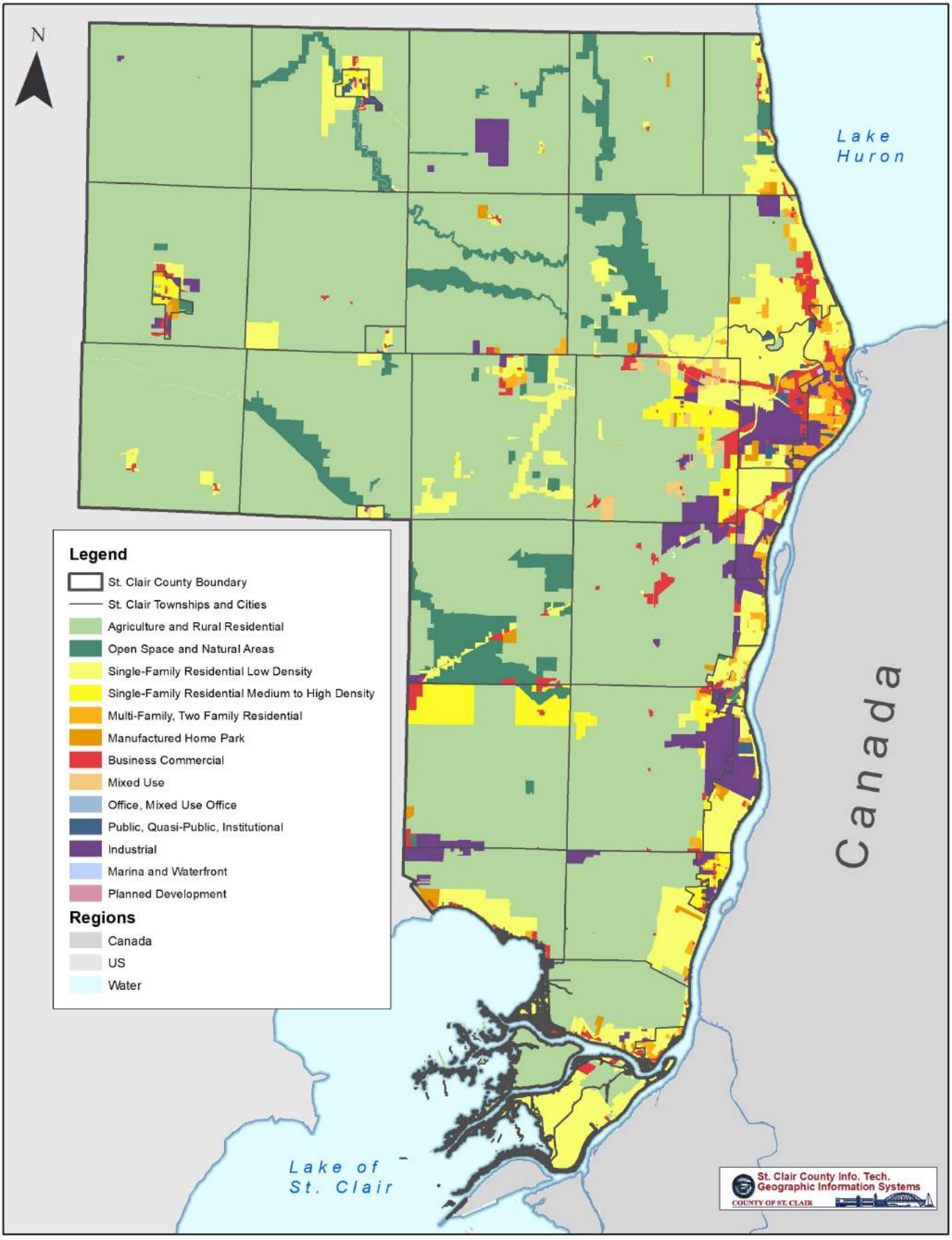
Thus, local zoning ordinances would result in inordinate taxation as well as the potential for health and environmental problems caused by insufficient sewage disposal and insufficient water supplies.

Generalized Zoning Ordinances

The map associated with this alternative represents land use zoning allowed by township and municipal zoning ordinances as of 2022.

- The striking feature of this map is the differences between the intention of township master plans and the practices allowed by zoning ordinances within those same townships.
- Most township ordinances allow predominantly low-density rural residential (grayish-green). Some areas intended for low-density residential development on the master plans are actually zoned for higher-density residential (yellow).
- Zoning ordinances permit less land for industry and manufacturing (purple), business and commercial use (red), and office complexes (orange) than designated in the master plans.
- Zoning ordinances would allow for almost all the recreation and open space (green) to be consumed by residential development.

MAP 7-2: GENERALIZED ZONING IN ST. CLAIR COUNTY



Alternative 3: The St. Clair County Master Plan Vision

The Master Plan for St. Clair County continues to be a visionary document. There are disadvantages to having and using a countywide Master Plan. It requires an investment of time and energy. It involves public education and technical assistance. It necessitates proactive and coordinated cooperation among people and government officials throughout the county.

In spite of these immediate disadvantages, there are many long-term advantages that make the Master Plan a desirable tool to manage growth and change within St. Clair County. The Master Plan contains the means through which citizens and government can:

- Preserve and enhance the county's rural character.
- Protect water and air quality.
- Set aside sufficient land for commercial and industrial growth.
- Direct growth to areas best suited to provide public facilities and services.
- Mitigate the need for increased taxes to pay for urban services and utilities.
- Protect the environment for both animal habitat and human enjoyment.
- Create public transit systems to improve mobility.
- Foster a diverse, healthy, and sustainable economy.
- Make the county an attractive location for tourists and tourist dollars.
- Make the county a more desirable place to live and thus create more jobs.

How can all of these advantages be accomplished?

First, recognize that St. Clair County has many strengths, then take steps to preserve those strengths. We have space for homes, farms, industrial and commercial centers, education institutions, waterways and recreational areas, public facilities, small towns and big cities, urban scenes and country vistas, cultural and tourist attractions and historical resources and modern structures. We have sand and gravel, uplands and wetlands, woodlands and roadways.

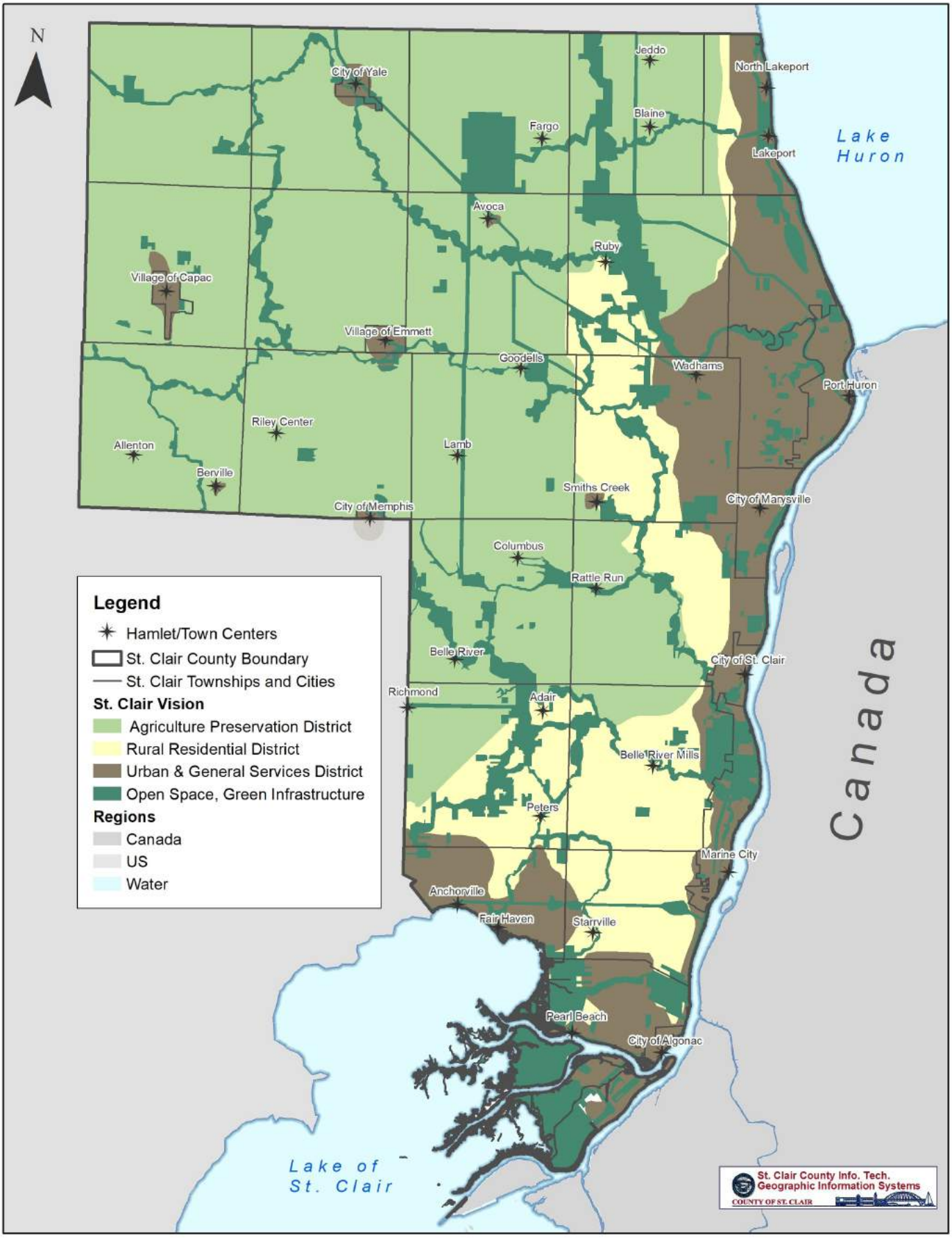
Master Plan for St. Clair County

The map associated with this alternative contains many colors and land use designations. It depicts a composite of where we can best protect, preserve, or provide:

- Rural, agricultural, residential, commercial, industrial, or institutional land
- Public facilities
- Utilities and transportation systems
- Recreational areas, open space, and environmental and natural resources

The Urban and General Services District (shown in grey) is the proposed area that should be considered for extension of public sewer, water, stormwater, police, fire, and other urban services through the year 2050. The western edge of the UGS District is constrained, in some areas, by physical limitations. The UGS District will help ensure fiscal responsibility and the wise use of land resources.

MAP 7-3: ST. CLAIR COUNTY MASTER PLAN VISION



Analysis and Recommended Alternative

The following evaluates the alternatives and makes a recommendation on a preferred alternative.

Criteria to Evaluate Alternatives

Following are criteria against which the four St. Clair County future land use alternatives were evaluated. They represent characteristics valued by citizens in St. Clair County as represented at visioning workshops and in community surveys. They are also characteristics of sustainable communities with a high quality of life. As was done by the Metropolitan Planning Commission in previous master plans, staff used an objective analysis procedure to relate the future land use alternatives with quality of life factors identified by St. Clair County residents and community stakeholders.

Planning staff reviewed each of the alternatives and scored them as positive, negative or neutral according to the criteria. These are subjective determinations based on relative assessments of each alternative against all the other alternatives on each criterion. The results of this analysis can be seen in Table 8-1.

Fiscal

Land use plans represent a future development pattern, which can affect the financial health of both the public and private sectors. A plan can increase costs to the public sector by promoting thinly spread development that is costly to service and often generates low tax revenues. A plan can save taxpayer money by promoting growth that provides a mix of revenue types balanced to the services needed. A plan can be costly to the private sector by promoting land use conflicts that reduce property values or that leads to eventual property damage. A plan can enhance private property by, among many benefits, providing for amenity and recreation open space nearby, thus increasing property values.

Water and Air Quality

A plan can promote water and air quality by encouraging development patterns that are the least harmful. Development patterns are harmful to water quality when they concentrate impervious area, increasing stormwater runoff to drains and streams and limiting the potential for filtering and infiltrating stormwater. Development patterns are potentially harmful to water quality when they encourage a density that cannot be safely handled by sewage disposal systems or place hazardous land uses near groundwater recharge areas. Plans are harmful to air quality that promote excessive automobile traffic and limit opportunities for mass transit and non-motorized forms of transportation. Plans are harmful to human health when they place land uses, such as dense residential and institutional uses near other land uses that produce airborne toxins, such as gas wells and processing plants, some industrial facilities and some types of agriculture.

Agriculture

A plan promotes the retention of viable agriculture businesses and the local production of food by reducing incentives to develop agricultural land by:

- limiting costly services to, and the extension of sewer and water into agricultural areas,
- by limiting land uses conflicting with agriculture, and
- by concentrating development in areas that are not well suited for agriculture.

Open Space

A plan should provide for adequate, future public open space that can provide a variety of open space benefits, such as passive and active recreation, natural scenery and wildlife habitat. Public open space should be distributed where it will be accessible to the greatest number of residents. Critical natural features, such as

Table 7-1: St. Clair County Land Use Alternatives - Comparison of Quality of Life Factors			
Quality of Life Factors	**Generalized Master Plans**	**Generalized Zoning**	**Master Plan for St. Clair County**
Land and Development Value	Neutral	Negative	Positive
Water & Air Quality	Negative	Negative	Positive
Agriculture	Negative	Negative	Positive
Open Space	Negative	Negative	Positive
Sewer & Water	Negative	Negative	Positive
Jobs	Neutral	Neutral	Positive
Affordable Housing	Neutral	Negative	Positive
Education, Health & Safety	Negative	Negative	Positive
Recreation	Neutral	Negative	Positive
Driving Time	Negative	Negative	Positive
Level of Taxation	Negative	Negative	Positive
Sustainability	Negative	Negative	Positive
Cultural/Historic/ Community Character	Neutral	Negative	Positive
TOTALS	**0 Positive 5 Neutral**	**0 Positive 1 Neutral**	**13 Positive**

floodplains, wetlands, streams and drains should be included in protected open space. The plan should encourage the preservation of open space on private lands to have the greatest scenic and environmental benefits. Open space should be in large, interconnected blocks, not only scattered in large yards.

Sewer and Water

The plan should expand or extend these utilities only to areas that are otherwise suitable to development and in support of a sufficient amount of development to pay for their extension. At the same time, the plan should help ensure the highest quality of public health.

Jobs

A plan promotes jobs by allocating sufficient land to job producing land uses and by locating that land where there is adequate access for employees and materials. A plan reduces jobs by allocating insufficient land for job creation or locates that land inappropriately. New jobs should be located near residential areas, or easily accessible to residential areas by a variety of transportation modes.

Affordable Housing

A plan promotes affordable housing by directing the conservation, rehabilitation and/or redevelopment of old

housing stock, by promoting significant new residential development at a density that can be built and serviced at an affordable rate, and by concentrating jobs near existing and proposed population centers.

Education, Health, and Safety

A plan fosters education by phasing growth so that communities can plan for and afford new schools only as needed and by planning for the land needs of educational facilities in the future. A good plan does not "rob" students from schools in existing, urbanized areas, forcing school closures. A plan provides for health and safety by insuring that new development is not harmful to air and water and that sanitary sewer needs can be adequately met. A plan promotes safety by phasing development so that emergency and public safety services can keep up with the need and the funds to pay for them. A plan promotes safety by concentrating development near population centers to limit emergency response times. A plan promotes safety by encouraging safe access to the transportation system.

Recreation

A plan can provide for recreation by adequately providing public open space to serve the future population and preserving unique natural and cultural resources. A plan can also enhance recreation by encouraging development patterns that provide for large private open spaces.

Driving Time

Excessive driving times (to work, shopping or school) reduces the quality time families can spend together, increases the wear on roads and cars, and contributes to the reliance on fossil fuels from other parts of the world. The plan should reduce or at least not contribute to an expansion of citizen driving times.

Level of Taxation

The level of taxation is influenced by a plan that phases growth so the community has the necessary revenues to pay for the increased level of service. A plan also affects the level of taxation by how efficiently the pattern of development can be serviced. Typically, sprawl patterns of development are more costly to service and promote higher levels of taxation.

Sustainability

Sustainability means that the future generations will have the same access to resources as the present generation. A plan contributes to sustainability by ensuring that both renewable and nonrenewable resources are not exhausted nor dedicated to another, unrelated use. Examples of important natural resources in St. Clair County include sand and gravel, wetlands, woodlands, groundwater, and farmland.

Culture/Historic/Community Character

These resources foster community identity and the sense of place that makes a community, home. A plan can encourage retention of these resources by encouraging development patterns that reflect or extend historic patterns, by preserving important natural and cultural features, and by fostering the creation of development centers rather than a thinly spread unidentifiable growth pattern.

Total

Each of the future land use alternatives was rated either a positive, negative, or neutral on the above criteria. The number of positives, negatives or neutrals for each plan was totaled.

St. Clair County Master Plan Vision Alternative

Table 8-1 applies the evaluation criteria described above to each alternative. The existing composite zoning map and the generalized future land use-based alternatives both ranked lower when each alternative was ranked against the quality of life factors on a relative basis. Each of these alternatives has benefits as identified earlier, but they are far less than those of the Master Plan Vision alternative.

The Master Plan Vision alternative has many elements that are consistent with adopted local master plans in the county, but it has two very different elements as well:

- It has a consistent countywide view; and
- It has a link to a set of vision-based policies that incorporate the long term, inter-governmental considerations, a countywide perspective, timing and other managed, phased-growth considerations.

Thus, the Master Plan Vision Alternative not only depicts a consistent future land use alternative, it also sets forth a set of policies that are necessary to be implemented in order for it to become a reality. It sets basic public priorities on where and when to grow, not simply on what land use should take place where. It focuses on ensuring basic compatibility between land uses in adjoining jurisdictions. It proposes 'Smart Growth' that will not outrun the ability of local governments to pay for needed services. It provides incentives to preserve renewable land resources like farmland, while stimulating urban redevelopment. It promotes sustainable growth, not just growth anywhere, anytime.

As a result, the Master Plan Vision Alternative ranks much higher compared to the other alternatives against this basic set of quality of life factors. The consistent incorporation of the open space corridors (green) category along streams and creeks (which is partly reflected on the composite plan maps) and the much different approach to rural residential development account for the bulk of differences between the generalized master plans map and the Master Plan Vision map. Clearly the detail on the local master plans (with regard to the location and type of commercial and industrial development and the highest density residential development) should be observed if the updated Master Plan Vision is readopted by the Metropolitan Planning Commission (as long as such decisions are otherwise consistent with the policies in the St. Clair County Master Plan and such land uses are within the Urban General Services Districts).

Key Characteristics

- The highest density development within the next 20 or so years occurs within a proposed Urban and General Services Districts (UGSDs). This district is located primarily along the shoreline in a band of about one to three miles wide. Sewer, water and other services are not extended beyond the district boundary, except in or adjacent to small cities and villages.
- The Urban and General Service District represents target areas for directing new short and long term growth needing a full range of public services in a managed, phased, incremental manner.
- A network of open space corridors, trails and parks serves all areas of the county and are connected to major parks, recreation areas, residential areas and the shoreline both within and outside the county.
- The area of the northwest portion of the county, (about six whole townships and portions of others), are designated as Agriculture/Rural Preservation. The intent is to preserve agriculture businesses and rural character through an average density of one dwelling unit per 40 acres and implementation of various tools to purchase or transfer development rights or otherwise protect agriculture for long-term use.
- A large area encompassing four of the southern (but not shoreline) townships, as well as some of the townships bordering the Port Huron Urbanized Area, is designated as Rural Residential. This area includes some protection agriculture in the long term for tracts with prime farmland soils. This district is

primarily intended to provide a low-density residential option in a rural setting without the high cost of providing urban services.

- Small, existing settlements within the Agriculture/Rural Preservation and Rural Residential areas are encouraged to develop at higher densities to protect cultural heritage of historic places and to provide for local community centers. These areas will need new or expanded public water and sewer systems in order to develop this way.
- Redevelopment and renewal in targeted areas will be facilitated by careful public facility spending within the UGSD and on identified corridors in other parts of the county.

Implementing the Master Plan Vision Alternative

The initiatives put forward in this Master Plan will not implement themselves. It will take continued commitment and support for many years. Cooperation and planning will be critical in order to achieve the goals desired by St. Clair County residents and maintain the high quality of life that we currently enjoy and crave in the future.

Change is inevitable. The challenge is to anticipate change, plan for it, and thus benefit from it. For St. Clair County, the challenges between now and 2045 will be managing changes in our economy, effectively planning for changing demographics, maintaining aging infrastructure, and ensuring our communities remain desirable and livable.

Therefore, there is one overriding recommendation within the St. Clair County Master Plan: Proactively plan for the future and be well-equipped to adapt to changes. To do this, we must have a plan and we must make decisions consistent with that plan. However, we also need to ensure that our planning mechanisms are not so rigid that county and local governments cannot effectively and efficiently respond and adapt to sudden changes or disruptions.

The following pages contain recommendations supported by the details and data found within the Master Plan. These recommendations are in regard to:

- Urban and General Services District
- Rural Residential District
- Agricultural/Rural Preservation District
- Open Space Corridors, Trails and Parks

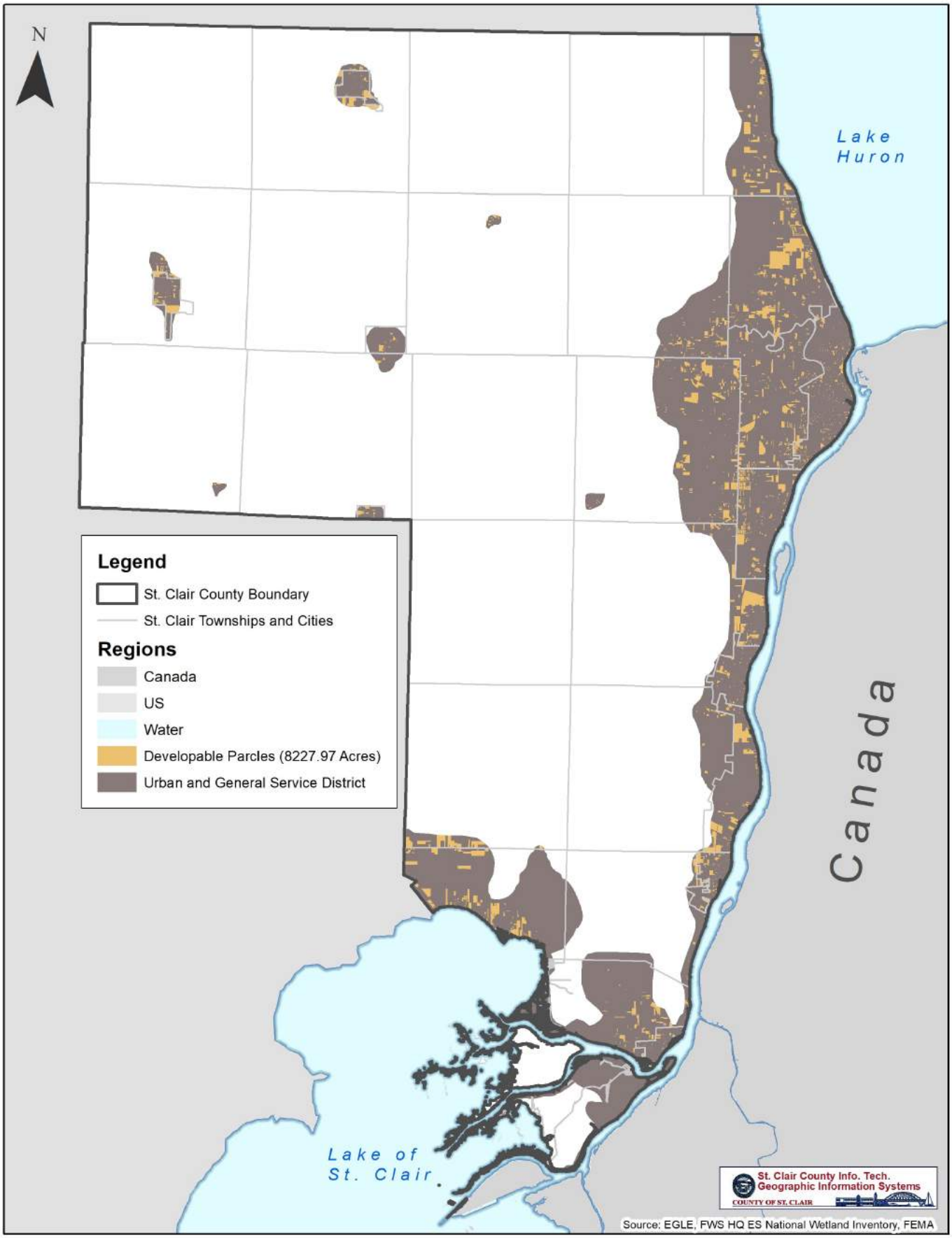
Urban and General Services District (UGSD)

The Urban and General Services District (UGSD) is along the eastern and southern shore and in inland communities of Adair, Allenton, Avoca, Berville, Capac, Goodells, Memphis, Rattle Run, and Yale. These are areas of existing higher residential, commercial, and – in several cases – industrial use densities. Investing in public infrastructure will lead to even higher densities which are capable of supporting infrastructure and a full-range of public services.

With planned developments and proper provision of public services, the UGS District has more than sufficient land area to accommodate all of the residential, commercial, and industrial growth expected within St. Clair County between now and 2050. As shown on Map 8-4, there are over 8,200 acres of developable land in the Urban and General Services District.

By directing growth toward this district, we can preserve the rural character and agricultural quality that exists in the northwest part of the county.

MAP 7-4: DEVELOPABLE LAND, URBAN AND GENERAL SERVICES DISTRICT



Recommendations:

- *Direct residential, commercial, and industrial growth to the Urban and General Services District.*
- *Provide and extend a full-range of public services, including water and sewer lines, in a managed, phased, and incremental manner as populations increase in the Urban and General Services District.*

Rural Residential

The Rural Residential District is in the south-central part of St. Clair County. It serves as a transitional zone between the Urban and General Services District along the coast to the east and south and the Rural and Agricultural Conservation District to the west.

The Rural Residential District provides for rural, low-density home construction. While farm operations would be preserved in the short term, fewer resources would be devoted to farmland protection as in the central and western portions of the county.

Soils in this area can accommodate a relatively few or lower density of septic systems.

Recommendations:

- *Allow rural residential structures at a density of one unit per five acres.*
- *Discourage strip residential development.*
- *Do not extend public sewer and water lines into this district.*
- *Encourage farming – but not concentrated animal feeding operations – as long as it remains viable.*

Agricultural/Rural Preservation

The Agricultural/Rural Preservation (ARP) District occupies the central and northwest part of St. Clair County. Residences in this district would primarily be farm families and their employees.

Density would be one residence per 40 acres, which is not the same as 40 acre lots. Rather, residences would be clustered in lot sizes of one-half to three acres, leaving larger tracts of land for viable agricultural and farming purposes.

New residents to these areas would be encouraged to move into existing villages, cities, or commercial and community centers (this is an opportunity not available to most people moving into this area of the county).

Recommendations:

- *Preserve the Agricultural/Rural Preservation District for agricultural purposes.*
- *Direct new residential development toward existing cities and villages, in a manner recommended in the Urban and General Services District.*
- *Prohibit extension of sewer and water lines into the ARP District.*
- *Promote farmland preservation programs within the ARP District*
- *Establish programs to purchase development rights.*
- *Revitalize cities and villages, making them an attractive alternative to development on farmland.*

Open Space Corridors, Trails and Parks

The optimum location for open space corridors, environmental areas, trails and parks is along natural watercourses, of which there are many in St. Clair County, and their attractive natural land formations.

These corridors, areas, trails, and parks help define rural character, provide recreation opportunities, enhance water quality and wildlife habitat, and invite tourist. They are places where residents can play, work, relax and enjoy the quality of life,

Recommendations:

- *Acquire land that can be used for future public Open Space Corridors, Environmental Areas, Trails, and Parks.*
- *Create Open Space Corridors, Environmental Areas, Trails, and Parks according to the St. Clair County Trails Plan, the St. Clair County Master Recreation Plan, and local master plans and recreation plans.*
- *Develop these corridors and trails as alternative transit routs to connect various parts of the county.*
- *Ensure that trails connect hubs of activity, including downtowns, natural resource areas, and parks.*

Farmland Preservation

Prime farmland is defined by the U.S. Department of Agriculture (USDA) as land with soils best suited to produce food, feed, forage, fiber, and oilseed crops. Prime farmland differs from unique farmland, which refers to land used to grow high-valued vegetables and specialty crops. The USDA defines cropland as pasture, woodland, or other land that is not urban, built upon, or water. Appropriate farmland refers to land that has soil quality, growing season, and moisture supply necessary to economically produce a sustained high yield of crops if acceptable farming methods are used.

Although over one-third of the total land area in St. Clair County is used for farming, agriculture-related employment is estimated to have accounted for 1.1% of total 2021 employment.

In 2017, the market value of agricultural products sold in St. Clair County was $80.9 million. That is double the market value of agricultural products sold in 2002 ($40.2 million). The County ranks 34 out of 83 counties in terms of market value of agricultural products sold. Farm-related income in 2017 was $3.6 million, which was a 28% increase from 2012.

Within St. Clair County, the number of farms increased 3% from 2012 to 2017, from 1,044 farms to 1,077 farms. Total acreage in farms increased to 182,185 acres from 2012 to 2017, a gain of 1%.

The top three agricultural products (in terms of acreage) in St. Clair County in 2017 were soybeans, corn for grain, and forage (hay/haylage).

See the tables on the next pages for a summary of the 2017 Census of Agriculture in St. Clair County.

Other Recommendations

Selection of the Master Plan Vision Alternative to guide future development in the county will best succeed if the following changes were made to local master plans:

- Local policies were consistent or compatible with a set of countywide goals and policies.
- Where relevant, policies were adopted that effectively protect community character, such as conservation subdivisions, cluster development, design guidelines and agricultural land preservation programs.
- Density requirements were adopted that fit the capability of the land, infrastructure and the community vision to support a reasonable population at buildout.
- Development regulations were updated to ensure that coordination and review of proposed

2017 Census of Agriculture: St. Clair County Snapshot

2017 CENSUS OF AGRICULTURE *County Profile*

St. Clair County
Michigan

Total and Per Farm Overview, 2017 and change since 2012

	2017	% change since 2012
Number of farms	1,077	+3
Land in farms (acres)	182,185	+1
Average size of farm (acres)	169	-1
Total	**($)**	
Market value of products sold	80,888,000	-25
Government payments	2,041,000	+19
Farm-related income	3,529,000	+28
Total farm production expenses	66,381,000	-10
Net cash farm income	20,077,000	-48
Per farm average	**($)**	
Market value of products sold	75,105	-27
Government payments (average per farm receiving)	8,574	+71
Farm-related income	9,696	+19
Total farm production expenses	61,635	-13
Net cash farm income	18,642	-49

1 Percent of state agriculture sales

Share of Sales by Type (%)

Crops	89
Livestock, poultry, and products	11

Land in Farms by Use (%) *

Cropland	88
Pastureland	3
Woodland	6
Other	3

Acres irrigated: 966
1% of land in farms

Land Use Practices (% of farms)

No till	20
Reduced till	15
Intensive till	30
Cover crop	7

Farms by Value of Sales

	Number	Percent of Total *
Less than $2,500	429	40
$2,500 to $4,999	82	8
$5,000 to $9,999	98	9
$10,000 to $24,999	120	11
$25,000 to $49,999	107	10
$50,000 to $99,999	69	6
$100,000 or more	172	16

Farms by Size

	Number	Percent of Total *
1 to 9 acres	120	11
10 to 49 acres	446	41
50 to 179 acres	266	25
180 to 499 acres	141	13
500 to 999 acres	72	7
1,000 + acres	32	3

USDA United States Department of Agriculture
National Agricultural Statistics Service
www.nass.usda.gov/AgCensus

2017 CENSUS OF AGRICULTURE *County Profile*

Market Value of Agricultural Products Sold

	Sales ($1,000)	Rank in State [b]	Counties Producing Item	Rank in U.S. [b]	Counties Producing Item
Total	**80,888**	**34**	**83**	**1,349**	**3,077**
Crops	**71,704**	**25**	**83**	**818**	**3,073**
Grains, oilseeds, dry beans, dry peas	50,494	23	81	763	2,916
Tobacco	-	-	-	-	323
Cotton and cottonseed	-	-	-	-	647
Vegetables, melons, potatoes, sweet potatoes	3,856	26	82	396	2,821
Fruits, tree nuts, berries	96	51	81	1,311	2,748
Nursery, greenhouse, floriculture, sod	12,398	12	80	215	2,601
Cultivated Christmas trees, short rotation woody crops	1,038	9	76	39	1,384
Other crops and hay	3,822	13	82	671	3,040
Livestock, poultry, and products	**9,184**	**47**	**82**	**2,157**	**3,073**
Poultry and eggs	114	29	82	1,014	3,007
Cattle and calves	3,957	32	82	1,817	3,055
Milk from cows	4,329	48	72	648	1,892
Hogs and pigs	(D)	(D)	82	(D)	2,856
Sheep, goats, wool, mohair, milk	212	20	81	753	2,984
Horses, ponies, mules, burros, donkeys	335	15	78	648	2,970
Aquaculture	(D)	14	30	(D)	1,251
Other animals and animal products	91	45	81	781	2,878

Total Producers [c]	**1,810**
Sex	
Male	1,150
Female	660
Age	
<35	124
35 – 64	1,119
65 and older	567
Race	
American Indian/Alaska Native	8
Asian	2
Black or African American	4
Native Hawaiian/Pacific Islander	-
White	1,794
More than one race	2
Other characteristics	
Hispanic, Latino, Spanish origin	20
With military service	176
New and beginning farmers	445

Percent of farms that:

Have internet access	73
Farm organically	1
Sell directly to consumers	12
Hire farm labor	19
Are family farms	97

Top Crops in Acres [d]

Soybeans for beans	93,558
Corn for grain	26,077
Forage (hay/haylage), all	14,783
Wheat for grain, all	8,445
Sugarbeets for sugar	1,652

Livestock Inventory (Dec 31, 2017)

Broilers and other meat-type chickens	(D)
Cattle and calves	7,996
Goats	501
Hogs and pigs	109
Horses and ponies	1,477
Layers	5,271
Pullets	294
Sheep and lambs	1,753
Turkeys	265

See 2017 Census of Agriculture, U.S. Summary and State Data, for complete footnotes, explanations, definitions, commodity descriptions, and methodology.

[a] May not add to 100% due to rounding. [b] Among counties whose rank can be displayed. [c] Data collected for a maximum of four producers per farm. [d] Crop commodity names may be shortened; see full names at www.nass.usda.gov/go/cropnames.pdf. [e] Position below the line does not indicate rank. (D) Withheld to avoid disclosing data for individual operations. (NA) Not available. (Z) Less than half of the unit shown. (-) Represents zero.

development with standards of appropriate county agencies, such as the Road Commission, Drain Commissioner, and Health Department occurred in ways consistent with the Master Plan Vision Alternative.

- Adoption of policies and procedures that result in the timed, incremental expansion of public services and facilities consistent with the County Master Plan, local master plans, and local capital improvement programs.
- Establishment of a density that is appropriate for safe septic waste disposal. This may require a lower density than currently is typical in a few places.
- Create an inventory of properties that can accommodate infill development within each community, particularly as it relates to the construction of additional affordable housing stock.

Implementation would also be facilitated if the County undertook the following initiatives:

- Conduct better inventories of natural resources and provisions to protect them, including programs to purchase or otherwise permanently protect the most sensitive lands.
- Continued support of policies by the St. Clair County Metropolitan Planning Commission to oppose local rezonings inconsistent with the local master plan, unless the local master plan is first amended to reflect updated community goals, changing land use patterns, and citizen desires.
- Continued support of policies by the St. Clair County Metropolitan Planning Commission to oppose local rezonings that are inconsistent with the County Master Plan.
- An education program to introduce and increase understanding of:
  - Community character.
  - Rural character.
  - Smart Growth .
  - Safe septic disposal alternatives.
  - Transfer of Development Rights (TDR) and Purchase of Development Rights (PDR).
  - Alternative agriculture activities and uses.
  - Overlay districts.
  - Source Water Protection.
  - Cluster development and planned unit development (PUD).
- Phasing Development.
- Actively promoting the County Master Plan among local governments.
- Continued county-level capital improvements planning.

Land Use and Change Management Goals

The land use and change management goals desired by St. Clair County residents are:

1. Preserve rural character.
2. Protect farmland.
3. Grow our neighborhoods and downtowns.
4. Provide housing to suit various lifestyles and economic needs.
5. Develop nonresidential land in appropriate locations to serve visitors and tourists, create jobs, and increase economic vitality.
6. Manage land development to minimize the impact on natural and existing drains.
7. Coordinate land use planning and transportation improvements to minimize traffic congestion.
8. Consider health impacts when planning for the built and natural environments.
9. Create and maintain parks for present and future needs.
10. Coordinate land use change throughout the county.
11. Improve quality of life.

Master Plan Guiding Principles
Land Use and Change Management

ECONOMIC PROSPERITY
Cities, villages, and townships can encourage economic growth with land use policies that retain and expand existing businesses and promote the emergence of new businesses in locations that provide optimal benefit to the community. Communities can identify and promote specific areas for redevelopment as part of a land use policy that can help guide private sector development.

SUSTAINABILITY AND RESILIENCY
Managing current and future land uses enables communities to address existing and potential land use conflicts and assess natural limitations for future development or redevelopment opportunities in relation to floodplains, wetlands and other environmentally sensitive lands.

QUALITY OF LIFE
Land use changes affect air and water quality, how a watershed functions, how much waste is generated, the extent and quality of wildlife habitat, where traffic congestion occurs, and how and where people feel safe. Land use is significantly interrelated to all other aspects of daily life.

GREAT PLACES
Through strategic policies and incentives, brownfields - sites that are unused or underutilized because of contamination or the reasonable perception of contamination - can be revitalized to create economic opportunities for a community, minimize urban sprawl, and reduce environmental and human health hazards.

HEALTHY COMMUNITIES
Effective land use planning leads to the preservation of natural areas and parks, more transportation choices, complete neighborhoods with access to core services, a wider range of housing options, and more opportunities for walking or biking. Land use planning influences the conditions in which people live and work.

COLLABORATION
Land use, growth and development issues often do not stop at community boundaries. It is increasingly important that local units of government begin to coordinate and collaborate on land use planning. For example, the collaborative planning effort on the Marine City Highway Corridor Study should continue into the future. The communities along the corridor can collectively take a proactive approach to ensure the corridor develops and functions to the desires of the residents and businesses along the corridor.