

# RRC RESILIENCY TOOLKIT

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communities®



**MICHIGAN ECONOMIC**  
DEVELOPMENT CORPORATION

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# INTRODUCTION TO RESILIENCY

**This document is intended for the use of local officials and staff. It describes the MEDC resiliency toolkit, how to develop a self-assessment survey, and how to integrate into adopted community plans.**

Resilience is broad and our path forward must be collaborative. No one agency, field or program can or should claim ownership of this space.

Fortunately, Michigan communities have a vast set of resources from statewide partners ([Michigan Department of Environment, Great Lakes, and Energy](#), [Land Information Access Association](#), [Michigan Association of Planning](#), etc.). This toolkit is not meant to replace those but to complement them, specific to RRC-engaged or certified communities or any Michigan community seeking improved resilience. This toolkit breaks down resilience across topics so a community can assess and address resiliency respective to their capacity, but also to push communities to think broader and more holistically about their physical, social and natural systems.

This toolkit is grounded in strategies to minimize the effects of negative economic impact through preparation through preparation and easing recovery from the spectrum of shocks and stresses. While climate has been a typical driver of resilience planning guides, this toolkit, especially for RRC communities, is through an economic lens and broadens the types of shocks from natural to man-made or systemic stresses, as was made evident during the 2020 pandemic. We have witnessed our systems disrupted by forces expected or unexpected, and we are seeing with greater clarity how underlying inequities of access, opportunity and security can magnify the effect of those disruptions on our households, businesses and communities as a whole.

Each chapter in this toolkit provides an overview of the theme, then breaks down a set of suggested values, goals, metrics and actions you can use in your master plans, capital improvement plans or resilient climate action plans. Look for when a recommendation ties directly to an RRC Best Practice expectation. These resilient strategies are meant to supplement the RRC Best Practices and provide RRC communities a set of resources that go beyond the RRC expectations.

## RRC RESILIENCE FRAMEWORK THEMES

The RRC Resilience Toolkit is organized using the following framework of place, people, infrastructure and economy. This framework is broad enough to cover the range of topics that define resilience, but also focused on the needs of Michigan

communities. Communities are encouraged to adapt the definitions of these themes to fit the unique context and needs of their community:

### PLACE

- Providing for physical buildings and spaces that enable a thriving community
- Includes: Parks/ open space, housing, affordable housing, schools, community centers, libraries, municipal buildings, basic necessities (grocery stores, health care)

### PEOPLE

- Protecting and strengthening the well-being and health of communities
- Includes: Well-being, equity, leadership, strategy, social cohesion, social capital

### INFRASTRUCTURE

- Strengthening our environment and systems that support society
- Includes: Water (water bodies, stormwater, drinking water, wastewater, snow and ice); energy (electricity, fuels); communications; transportation (bridges, roads, rail, transit, non-motorized paths, transportation access, transportation affordability)

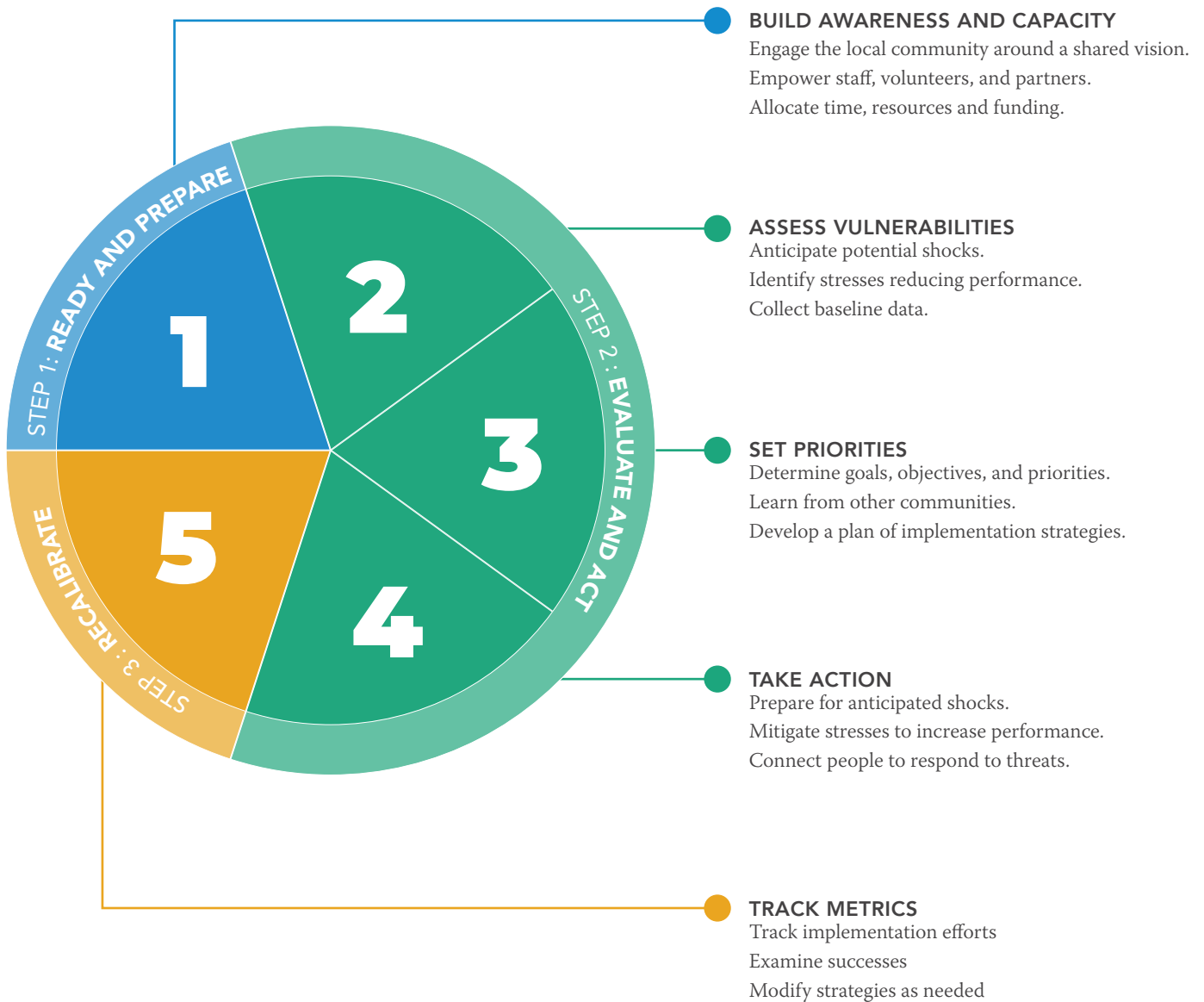
### ECONOMY

- Ensuring equitable capacities for communities to overcome shocks and develop prosperity
- Includes: Jobs, job diversity, industry, income, income inequality, employers

# GETTING STARTED

This toolkit is designed to be responsive to community needs based on capacity, community goals and other local factors. It is to be used to help communities understand where they are in regards to resilience, and what actions to take to increase resilience. While every community is encouraged to start with

Step 1, “Resilience Readiness self assessment” (page 7), some communities may jump quickly to steps 2 and 3. While the toolkit is outlined in linear steps, the phases are intended to be loops that are continuously reassessed and recalibrated as a community makes progress.



# BUILDING RESILIENCE

## WHAT DOES IT MEAN FOR A COMMUNITY TO BE RESILIENT?

A resilient community:

- **Is informed of threats and risks.** The policymakers, planners and citizens have identified the shocks and chronic stresses that threaten their community. Additionally, the community understands the magnitude of each threat's impact on the region.
- **Is organized to address vulnerabilities.** It actively reassesses vulnerabilities, creates plans to reduce negative impacts and executes plans to achieve improvements. Resilience-building responsibilities are clearly assigned to policymakers, planners and organizations.
- **Has connected people and organizations that provide**

**support.** People from different groups and organizations are connected and prepared to work together to respond to a shock or address a chronic stress. Community members understand their roles and ways they can assist in building resilience.

- **Has future-prepared infrastructure and services.** Infrastructure and services are designed to accommodate future needs, remain functional during and after a shock, protect people and resources and support a high quality of life.

- **Supports the unique needs of vulnerable groups.** The community understands it is only as resilient as its most vulnerable population and addresses specific needs for this group.

### A resilient community...



FIGURE 4: SOURCE: INTERNATIONAL FEDERATION OF RED CROSS AND RED CRESCENT SOCIETIES

# RESILIENCE SELF ASSESSMENT

## STEP 1: RESILIENCE READINESS

This survey is intended for communities to self-assess where they are on the continuum of resilience planning and identify appropriate tools to help them along their journey. The magnitude and urgency of these issues can be overwhelming. This assessment provides a baseline of readiness to tackle these large and complex issues of people, place, infrastructure and economic resilience through planning, policy, regulation, incentives and partnerships. The process is anything but linear, and there is an opportunity to advance specific initiatives without having everything “figured out.” There is also a necessity to continually come back to education and capacity-building based on new data and/or the evaluation of implementation strategies.

## STEP 2: EVALUATE AND ACT

The RRC resilience framework of people, place, infrastructure and economy is based on best practice experience and case study review of numerous resilience frameworks, refined

for Michigan communities. Step 2 focuses on identifying indicators, both point in time shocks and ongoing stresses that restrict a community’s performance and long-term resilience. With this baseline, communities can take steps towards measurable improvements. At the local level, every community will have their own values, challenges and drivers for change, but there are county and regional opportunities to address common stresses and protect shared assets. The toolkit provides a number of metrics so that the community can define their own baseline measures. The toolkit also includes a several existing checklists and assessment tools included in resources.

Each themed chapter contains a set of suggested goals and accompanying actions and metrics to help inform your community’s policies and regulations. The Actions are organized in the final chapter in a table that includes more detail, like whether they are implemented as part of a policy, plan, regulation, capital project, etc.

### KEY ORGANIZATIONAL ELEMENTS

Organizing Elements	What does this mean?	Where do I find this?	When do I need this information?	How do I factor in our local capacity?
<b>Themes</b>	People, place, infrastructure and economy	These are the chapters	If resilience is new to your community, start with a high-level conversation	Keep the discussion broad but try to build out your assets and partnerships
<b>Goals (sub-themes)</b>	For each theme, which goals to strive for	Within the chapters	If you are already talking about resilience, use these as a framework launching point	Balance near-term and long-term goals
<b>Objectives</b>	Categories under goals to further define topic-specific strategies	Within the chapters	Strengthen the specificity in policies and plans	Focus on identified priorities first
<b>Measures</b>	In order to understand what success looks like, you need to identify the variables that define your goals	Matrix in appendix	If you have established vision, look here to help make those goals S.M.A.R.T. goals	Work with your county and regional partners to collect and manage data
<b>Resources</b>	Specific assessment tools and case studies	Sidebar and appendix	If you understand your gaps and know where you want to go, but don’t know how to get there look here	Look at your peer communities who are similar in scale or dealing with similar regional stresses
<b>Actions</b>	The implementable strategies	Within the chapters	If you are in the process of writing a plan or policy, look here for example actions	Try to integrate resilience actions with existing processes and programs to the greatest extent possible

## STEP 3: RECALIBRATE

No matter where your community is in the continually evolving process of resilience and adaptation, the toolkit offers resources to help you plan for resilience. The very nature of resilience is striving for continuous improvement,

so these steps and phases are intended to be cyclical. As the community evolves and gains capacity, you will be able to broaden your work.

## UNDERSTANDING THE THREATS

In recent years, the term “resilience” has become an increasingly important part of the community planning process. Originally, resilience as a concept stemmed from *disaster recovery*, referring specifically to the amount of time needed for infrastructures to bounce back after a sudden impact. However, those in the disaster recovery world have recognized that the concept of infrastructures is increasingly much more complicated. For a community to be prepared to literally weather any storm, it is increasingly important to take a broader definition of preparedness. Infrastructures are not the only critical aspects needed to help a community bounce back after a storm. A community’s citizens, buildings, economy and infrastructure all need to be equally prepared to be able to withstand a sudden hit that interrupts business as usual. Today, resilience is more broadly the total capacity of preparedness of a community at any given time.

As the definition of resilience has expanded, so has the geography of those communities who take it into their planning processes. While coastal and environmentally vulnerable communities have been the first adopters of resilience processes, many places around the world have realized that preparedness is directly connected to prosperity. The more prepared any community is for any unexpected event, the faster the recovery process will be. Michigan is not alone in the need to prepare; recent events like COVID-19, the Sanford Dam collapse, and even the Flint water crisis have shown the importance in Michigan communities taking immediate proactive measures to address our social, economic and environmental vulnerabilities.

The positive news is that Michigan is already taking measures to be prepared.

“Resilience for Michigan is the capacity to prepare for disruptions, respond and recover from shocks and stresses, and adapt and grow from a disruptive experience.”

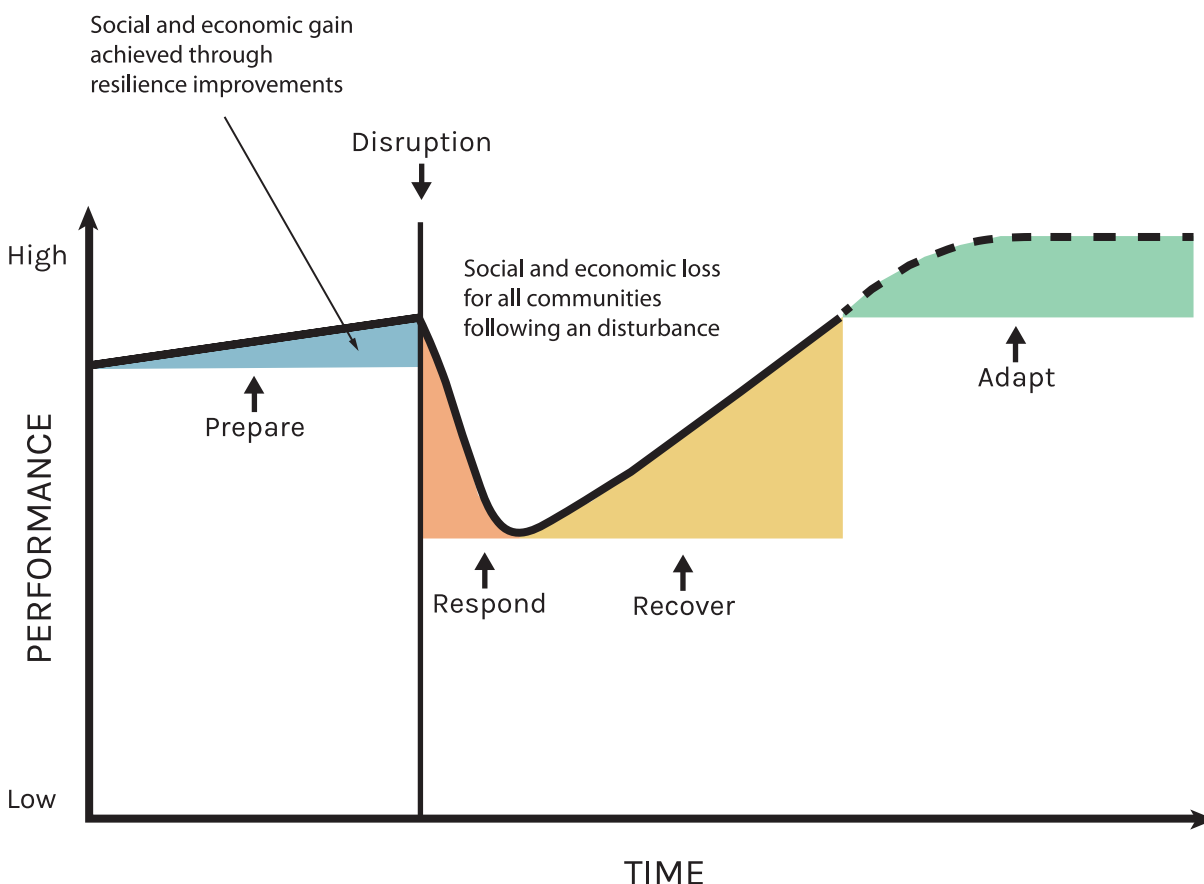


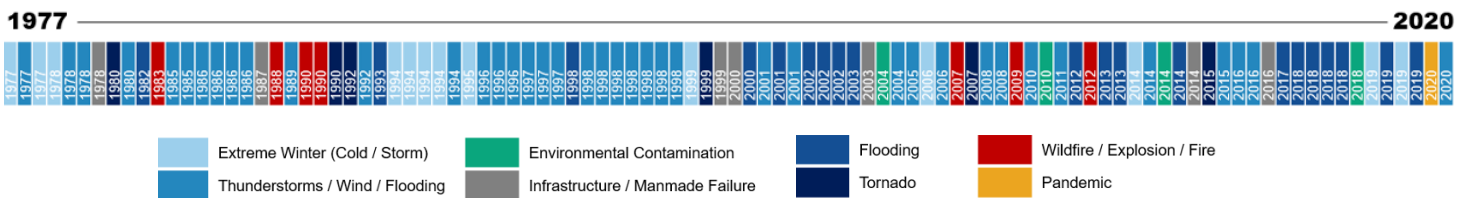
Figure 3: Resilience over time chart. Adapted from M.E. Hynes, B. Ross, and CARRI, 2008



## TIMELINE & INEVITABILITY

The crises that impacted communities in recent years are not a new occurrence. Since 1977, the governor of Michigan has declared an emergency or disaster 83 times. These crises and disasters varied in type, including storms and flooding, economic collapse, infrastructure failures, environmental contamination and deteriorating public health. However, they all had one thing in common: they threatened communities' health, safety and welfare.

Historical trends and future projections show these types of events will continue to impact Michigan communities. It is not a matter of if it will hit, but a matter of when. The inevitable manifestation of a threat means communities need to act now to prevent these events from becoming a crisis. They need to build resilience to protect people.



## STRESSES & SHOCKS

Threats come in the form of both stresses and shocks. Stresses are factors that pressure a community on a daily or reoccurring basis, such as chronic food or water shortage, an overtaxed transportation system, endemic violence or high unemployment. Shocks are typically single-event disasters such as fires, earthquakes and floods. Shocks and stresses are inextricably linked. A stress can lead to and/or exacerbate a shock; for example, rising average energy usage and stagnant supply (a stress) can cause and worsen a blackout (a shock) during a heatwave due to the energy demand for cooling exceeding the supply. Therefore, building resilience requires addressing both the shocks and stresses that threaten communities.

- High energy usage (CO<sub>2</sub>)
- Average temperature increasing
- Average annual precipitation rise
- Shifting plant zones
- Regional fragmentation
- Racial inequality
- Economic inequality
- Aging infrastructure and increased demand

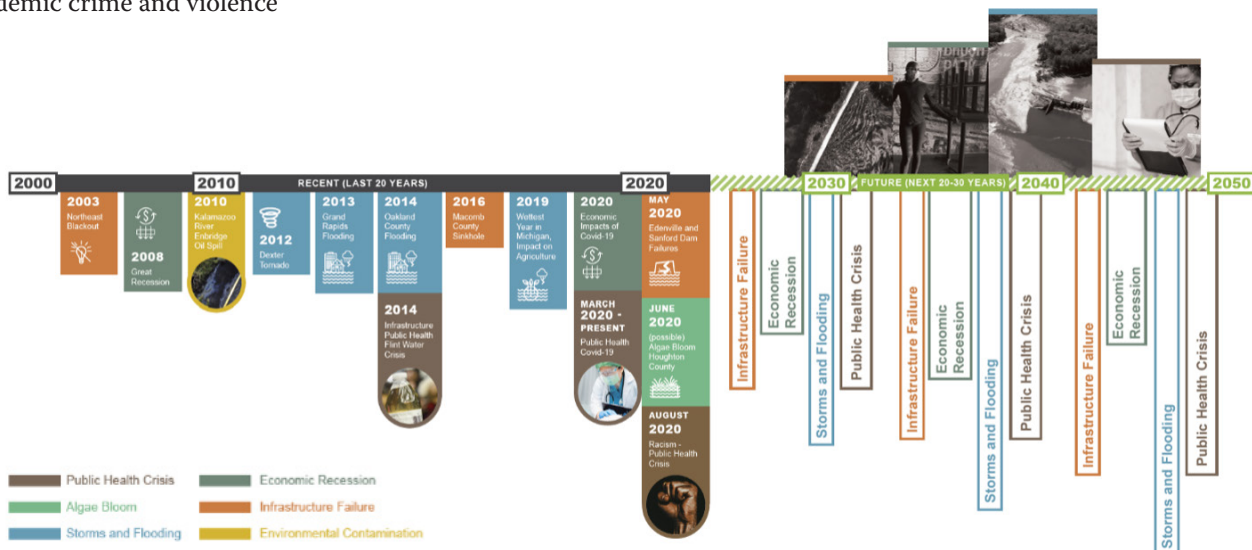
Shocks that threaten Michigan communities include:

- Heatwaves
- Flooding
- Winter storms
- Landslides
- Disease and pest outbreak
- Infrastructure failure
- Economic recession

Stresses that slowly degrade quality of life in Michigan include:

- Water access
- Aging population
- Endemic crime and violence

A good source: [www.michigan.gov/documents/msp/mha\\_2019\\_full\\_update\\_natural\\_hazards\\_653708\\_7.pdf](http://www.michigan.gov/documents/msp/mha_2019_full_update_natural_hazards_653708_7.pdf)



# 1.0

# PLACE

**DEFINITION:** Adapting the physical buildings and spaces, both human-made and environmental, to shocks and stresses to create a thriving, desirable community.

**Includes:**

- Natural systems
- Buildings and structures
- Land use

# 1.0 PLACE

## PLACE IN MICHIGAN

“Resilient Places” include the spaces, structures, systems and environments that our communities occupy. These places are physical parks and open spaces, the cultural and historic buildings, but these are also the underlying natural and man-made systems that support and impact our daily lives. These places are influenced by the land use, development and land management policies and practices of our communities.

## RESILIENCE FOR PLACES INCLUDE:

- **Natural systems:** habitat, stormwater management, air quality, water quality, vegetation, tree canopy, pollution/contamination, erosion, flooding, biodiversity, emissions, invasive species
- **Structures:** historic or cultural structures, building energy efficiency, rehabilitation, code compliance, accessibility, vacant and underutilized structures
- **Land use:** zoning, scale, walkability, agriculture, parks, limiting sprawl, access, density

## BASELINE

The places of our communities include four overarching themes: natural systems, structures, land use, and parks and recreation. Embodied within each of these are the elements that impact our daily lives and the systems that sustain our environments.

Natural systems include Michigan’s environments, ecosystems, resources, flora and fauna. In Michigan and the rest of the United States, human behavior affects these natural systems. Recent policy advancements have been made in the state of Michigan. In 2020, Governor Whitmer set precedent by shutting down Line 5, an international oil pipeline that runs underwater through the Great Lakes, and by signing a resolution to commit Michigan to achieving zero carbon emissions by 2035. These policies and actions, along with an ecotourism industry that continues to thrive in many parts of the state, offer hope for Michigan’s approach to climate change.

Despite these strides, critical issues persist throughout the state. Air, water and soil quality continue to be affected and to impact the health and safety of Michiganders. Michigan standards for air, soil and water quality are of critical

importance, and it is through collaboration and partnership of communities amongst jurisdictions and active groups that change may be affected.

## SHOCKS

- Flooding
- Loss of historic structures
- Droughts
- Heatwaves
- Economic downturn/financing
- Wildfires
- Tornadoes

## STRESSES

- Aging building systems
- Aging population
- High energy usage (CO<sub>2</sub>)
- Pests
- Brownfields/contamination
- Access to fresh food
- Fragmented habitat and systems
- Rising temperatures and heat island
- Shifting planting/habitat zones
- Coastal erosion
- Sprawl

## WHAT CAN YOUR COMMUNITY DO?

- Conduct a self-assessment
- Consider each of the themes from this section that ranked highly in your self-assessment
- Update master plan (**RRC Best Practice 1**)
- Incorporate a climate action plan into master plan and capital improvement plan (**RRC Best Practice 1**)
- Check out the resources for links to more information on the topics of interest to you
- Use the suggested language in each table as a starting point when crafting policies or regulations or action plans

# 1.10

## NATURAL SYSTEMS

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# 1.10 NATURAL SYSTEMS

## OVERVIEW

### GOAL: Protect, enhance, and restore natural ecosystems

Michigan has an abundance of natural and diverse environmental resources. These provide a foundation for our communities and livelihoods, for our local economies and recreation. These spaces, species and systems include:

- **Water:** water quality, flooding, drought, and stormwater management
- **Flora and fauna:** vegetation, biodiversity, pest and invasive species management, habitat creation and preservation and tree canopy
- **Air:** Air quality and emissions regulation
- **Soil:** Soil contamination and pollution, shoreline erosion, soil quality (stabilization, compaction, nutrient load)

**Vulnerabilities:** The vulnerabilities of ecosystems lie in the disruption of natural systems. Where human development and action modifies the environment, ecosystems, species, cycles and systems, the impact must be analyzed, evaluated, and addressed.

Extreme weather events draw awareness to

- Establish strategy for improving metrics
- Create emergency response plan
- Build network

See also: Planning for Resilience in Michigan (LIAA 2017)

## 1.11 AIR QUALITY

### OBJECTIVE: Ensure outdoor air quality is healthy for all segments of the population

#### UNDERSTANDING AIR QUALITY

What to look for	How to measure	Sample sources
What is our local air quality?	Air quality monitoring	EPA, AirNow
Does our air quality impact our citizens?	Asthma rates in population	CDC
What are the sources of emissions in our community?	Point source emissions	EPA

## SUGGESTED ACTIONS

### Information

- Monitor air quality over time, including daily ratings and trends
- Alert residents when air quality does not meet healthy levels
- Educate the public about the impacts of poor air quality on human health and the natural environment and the efforts they can take to reduce air pollution emissions and exposure

### Policy & Regulation

- Identify, enact, and enforce emission regulation
- Conduct a study to evaluate the geographic areas and subpopulations with the highest exposure to outdoor air pollutants, particularly in consideration of environmental justice and equity impacts
- Enforce anti-idling regulations or burning restrictions to prevent the emission of excess pollution, particularly on Air

Quality Action Days

### Physical

- Reduce exposure to toxins and pollutants that increase vulnerability to health impacts from climate change, for example, outdoor and indoor air pollutants that contribute to cardiovascular and respiratory conditions such as asthma. (APA, 2020. P. 33, F.1.1)

### Collaboration

- Collaborate with local industrial operations to reduce and minimize the release of criteria and hazardous air pollutants in the community
- Collaborate with local industrial operations to reduce and minimize the release of noxious odors in the community

# 1.10 NATURAL SYSTEMS

## 1.12 GREEN INFRASTRUCTURE

**OBJECTIVE:** Maintain a network of green infrastructure that integrates with the built environment to maintain natural ecological systems and functions.

### UNDERSTANDING GREEN INFRASTRUCTURE

What to look for	How to measure	Sample sources
What is the presence, condition and quality of green stormwater infrastructure on public and private property and in our community's rights-of-way?	Green infrastructure survey Land cover survey	Land cover data Green infrastructure assessment On-the-ground investigation EPA Stormwater Management Model (SWMM)
What is the extent and condition of tree canopy coverage along streets and paved areas such as parking lots?	Tree canopy survey	Land cover data On-the-ground investigation Multi-Resolution Land Characteristics Consortium (MRLC)

### SUGGESTED ACTIONS

#### Physical

- Provide sufficient street tree planting along urban streets.
- Upgrade public spaces and public buildings based upon locally adopted or recognized best practices in green infrastructure; where possible, create demonstration projects to enhance public support.

#### Policy & Regulation

- Promote inclusion of on-site rainwater capture and water treatment and recycling systems for new and retrofitted construction in low-income communities to reduce the cost of relying on centralized water delivery systems. (APA, 2020. P. 31, E.5.6).
- Develop off-site stormwater regulations allowing site developers to participate in district-scale stormwater management plans (**RRC Best Practice 2.6**).
- Adopt local design criteria and associated codes that require proactive green infrastructure practices for new developments.
- Include evaluation of green infrastructure potential during early site reviews of proposed developments and subdivisions.

#### Planning

- Create a community-wide green infrastructure plan that is integrated with other relevant local plans.
- Assess the state of the jurisdiction's urban forest.
- Develop street tree planting standards (**RRC Best Practice 2.6**).

#### Financing

- Develop a stormwater rebate program for residents who implement GSI on their property. See how this was successfully done as part of the Washtenaw County rain barrel program.
- Encourage the use of xeric landscaping for public projects and private development to decrease water consumption and educate the community about the advantages of xeriscaping.

# 1.10 NATURAL SYSTEMS

## 1.13 BIODIVERSITY

**OBJECTIVE:** Promote biodiversity and manage or prevent the proliferation of invasive species.

UNDERSTANDING BIODIVERSITY		
What to look for	How to measure	Sample sources
What is the presence and condition of native plant and animal species?	Biodiversity survey: Presence and abundance of native and indigenous plant and animal species	Michigan natural features inventory Local observation
Are there protected and endangered species in our community?	Threatened and endangered species survey: Population and location of threatened, endangered, or vulnerable (sensitive or endemic) species	Federal and state locational data Local observation
Are there invasive species in our community?	Presence and concentration of invasive species	Local observation
What is the location and condition of native habitats and systems?	Native habitat survey: Location of wetlands, forested area, water systems, grasslands, and other habitat systems. Disruption, fragmentation, and loss of native habitats and systems.	Local observation Maps of Michigan's natural communities

## SUGGESTED ACTIONS

### Information

- Identify and address threats to existing species, including the displacement or harm of native plants and animals due to invasive species.
- Evaluate the presence and abundance of species—classification from pioneer species to mature community.
- Inform residents and/or plant or animal sellers about the benefits of native species and the hazards of invasive species.

### Policy & Regulation

- Retain biodiversity within natural systems as it is vital to the health and longevity of those systems. Protecting forested areas, wildlife preserves, and the connectivity of wildlife habitat should be prioritized. (APA, 2020. P. 31, E.4.4).
- Adopt or enforce an ordinance requiring control of listed priority invasive species or enact a preferred plant ordinance for private and public landscaping.

### Physical

- Provide a diversity of suitable tree species to decrease vulnerability of tree canopy by reducing susceptibility of disease transmission among trees of the same species.
- Restore and protect biodiversity. Study, restore, and preserve the complex interrelationships between plant and animal

species and their habitats to maintain healthy ecosystems and their carbon sequestration and climate control functions. (APA, 2020. P. 18, C.2.6).

- Utilize native vegetation. Select native vegetation for development and natural area restoration projects and consider species that will be able to adapt to and thrive in changing climate conditions. (APA, 2020. P. 19, C.3.5).
- Eliminate invasives. Identify and control invasive plant and animal species using natural and nonpolluting techniques in order to maximize the health and productivity of forests and ecosystems. (APA, 2020. P. 19, C.3.6).
- Ensure that all local government-owned buildings use native and/or sustainable, site-appropriate species in landscaping.
- Take actions to prevent the spread of invasive species, especially in priority natural systems areas, such as monitoring, eradication, or other control programs.

### Collaboration

- Partner with local volunteer groups to monitor areas at greatest risk of invasion and remove invasive species.
- Partner with local volunteer groups or neighborhood associations to restore priority natural systems areas by planting native plants or improving local wildlife habitat.

# 1.10 NATURAL SYSTEMS

## 1.14 URBAN HEAT ISLAND

OBJECTIVE: Monitor and mitigate the urban heat island effect

### UNDERSTANDING URBAN HEAT ISLAND

What to look for	How to measure	Sample sources
What is the prevalence of impervious surfaces in our community?	Ratio of pervious to impervious surface as landcover	EnviroAtlas Multi-Resolution Land Characteristics Consortium Other landcover data Global Surface UHI Explorer
What is the relative temperature of our community compared to peripheral rural areas?	Temperature sensing	Local observation
How vulnerable is our community to future increases in average temperature and high-heat days?	Average temperature and high-heat day trends and forecasts Vulnerable populations Vulnerable infrastructure	"The Climate Explorer"

### SUGGESTED ACTIONS

#### Policy & Regulation

- Establish policy and regulation to encourage or require planting of tree canopy—for example, along parking lots or as part of new development.
- Incentivize and require green roofs. Encourage and incentivize the use of green roofs through landscaping and building regulations. Plants and other green infrastructure (natural systems) absorb carbon and clean pollutants such as SO<sub>x</sub>, NO<sub>x</sub> and particulate matter from the air. Green roofs are an excellent way for municipalities to simultaneously address stormwater management and quality, reduce air pollutants, increase energy efficiency of buildings, mitigate the urban heat island effect, and provide green space, habitat, and a potential food source. (APA, 2020. P. 27, D.5.4).

#### Program

- Promote natural and nature-based solutions. The promotion of nature-based solutions in plans, programs, and projects involves actions that work with and enhance nature to respond to a changing climate. This could include such things as reclaiming floodplains (to reduce flood impacts), adding open space or planting street trees (to reduce the heat island effect), and using green infrastructure or LID design considerations, among other efforts, to restore degraded natural systems. (APA, 2020. P. 21, C.6.3).
- Utilize high albedo surfaces, such as light-colored paint and pavement to reduce heat island effect

#### Planning & Design

- Develop a tree succession plan to ensure preservation and replacement of tree specimens and overall canopy (RRC Best Practice 2.6).

## 1.15 SOIL & SEDIMENT CONTROL

OBJECTIVE: Incentivize and provide funding for protection and prevention from erosion

### UNDERSTANDING EROSION PREVENTION

What to look for	How to measure	Sample sources
What soil-based factors could threaten the structural integrity of new and existing development? Are there areas that show signs of slumping, soil creep, or other indicators of erosion?	Proximity to shorelines or riparian zones Location within the floodplain Shoreline loss over time Soil quality analysis with core sampling	FEMA Flood Map Service Center Soil Classification Map

### SUGGESTED ACTIONS

#### Funding

- Provide grant opportunities for erosion prevention and structural reinforcement of shorelines, building foundations, and infrastructure.

#### Program

- Create an inventory of publicly owned buildings along water bodies that are greater than 50 years old, and assess level of importance for individual inspection
- Have a structural engineer assess the integrity of foundation and supports of buildings identified as potential risk.



# 1.20

## BUILDINGS & STRUCTURES

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# 1.20 BUILDINGS & STRUCTURES

## OVERVIEW

**GOAL:** Create and maintain buildings with long life-cycles to promote flexible reuse and reduction in construction and maintenance costs/impacts

**Description:** historic or cultural structures; energy efficient, adaptive reuse, weather resistant, placement to maximize solar/wind effects, building energy performance, historic preservation, development practices

## 1.21 BUILDING ENERGY EFFICIENCY

**OBJECTIVE:** Ensure new and existing buildings are energy efficient.

### UNDERSTANDING BUILDING MATERIAL EFFICIENCY

What to look for	How to measure	Sample sources
What is the material impact of our building design decisions?	Embodied carbon/carbon footprint	Carbon calculator

## SUGGESTED ACTIONS

### Financing

- Identify—and increase awareness of—energy efficiency incentive programs at the federal (Sec. 25C tax credit for homeowner investments in energy efficiency improvements), state, regional, utility and local level.
- Identify—and increase awareness of—energy efficiency incentive programs at the federal (Section 179D tax deduction for commercial investments in energy efficiency improvements), state, regional, utility and local level.

### Planning & Design

- Re-use and adapt existing building stock where necessary; identify where materials from recent demolition can be reused in new-builds.
- Encourage the usage of mass timber as a built material; encourage sustainable steel for structures where possible
- Build or renovate locally owned public facilities that will be used as shelters, command centers, and demonstration areas to meet higher building code standards.

## 1.22 HISTORIC & CULTURAL ASSETS

**OBJECTIVE:** Preserve, conserve, renovate, and adapt historic structures and sites to retain local, regional, and national history and heritage, and community culture. Historic preservation should not be a hinderance to needed housing.

### UNDERSTANDING HISTORIC & CULTURAL ASSETS

What to look for	How to measure	Sample sources
Where are historic and cultural assets in our community, and what is their condition and designation status?	Structures and sites with existing historic designation Structures and sites with historic or cultural significance that may or may not be designated as such	State of Michigan Historic Designation Records National Parks Service Historic Register

## SUGGESTED ACTIONS

### Policy & Regulation

- Advocate for historic preservation. Incentivize the conservation and reuse of historic buildings and develop and implement tools (i.e., design guidelines, adaptive reuse incentives, listings of historic buildings, etc.) to encourage conserving and reusing historic buildings. Advocate for greater flexibility in the use of historic tax credit programs to facilitate the adaptive reuse of old and historic structures. Encourage states to match federal tax credits. (APA, 2020. P. 13, B.8.1).
- Identify, record, and develop a preservation, protection,

- restoration or reuse strategy for historic and culturally significant sites and structures in the community.
- Participate in the Michigan Main Street program: Michigan Main Street exists to help communities develop main street districts that attract both residents and businesses, promote commercial investment and spur economic growth by helping to educate and organize local stakeholders and partner organizations. Communities can leverage the benefits generated through RRC certification by participating in the Main Street Program to support overall community prosperity.

# 1.30

## LAND USE

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# 1.30 LAND USE

*This section is especially applicable to reinforce resilient planning into your master plan (RRC Best Practice 1.1)*

## OVERVIEW

**GOAL:** Encourage a mixture of uses in compact, walkable centers to support a dynamic and active community

**Description:** Zoning, scale, walkability, agriculture, parks, limiting sprawl, access, vacancy/occupancy

The land use of a community includes designations, as well as standard development and growth practices, mixed-use designation, scale and access, density and land management.

This includes topics such as:

- **Development/Use:** Promoting zoning, density and mix of uses that results in walkable development. Encouraging infill development and vacant land reuse strategies. Discouraging sprawl and unsustainable development and circulation patterns. Zone for a flexible mixture of uses to accommodate shifts in market

demand, adaptive reuse of land and buildings, and encourage shorter commute times (jobs and services within walking distance)

- **Site Design:** cluster, preserve natural features, minimize impacts of water events,
- **Agriculture and Food Access:** Sustaining local and community gardens and large-scale agricultural practices
- Design and reconstruct each system to:
  - » Mix land use: efficiencies of walking/vibrancy
  - » Combine “human” and “natural” systems
  - » Coordinate solutions across all scales
  - » Integrate numerous systems into solutions

## 1.31 LOCAL AGRICULTURE

**OBJECTIVE:** Encourage private, local and community agriculture at a variety of scales.

### UNDERSTANDING LOCAL AGRICULTURE

What to look for	How to measure	Sample sources
How vulnerable is our local agricultural industry to current and future climate shifts?	Climate trends and forecasts Projected impacts to local agricultural sectors	Climate Toolbox
Are there community farms or shared agricultural plots in our community?	Community farms or shared agricultural plots	Local observation
What are local policies and regulations around the creation of community farms or shared agricultural plots?	Permissive, prohibitory or absent language around community farms or shared agricultural plots	Policy and regulation review

## SUGGESTED ACTIONS

### Policy & Regulation

- Evaluate existing zoning ordinances for local and community agriculture-related policies to ensure they do not create regulatory barriers to self-sufficiency of grown foods.
- Support the preservation of prime agricultural and forest land. Prime land has the potential to sequester significant amounts of carbon and also provides local economic and food security benefits. Assess the suitability of suburban backyards to support home-scale agriculture by reviewing underlying pre-development soils maps and/or reducing manicured lawn area. (APA, 2020. P. 28, D.8.4).
- Support the creation and retention of both local and regional food producers. The consumption of locally or regionally produced food reduces GHG emissions and food waste associated with transporting food, supports biodiversity within the region, and adds to the regional economy. However, zoning ordinances may require revisions to better allow local production, such as via urban gardens or rooftop

gardens. The “upcycling” of food waste to create new food products will also be an emerging theme with high-impact potential. (APA, 2020. P. 28, D.8.5).

- Support sustainable agricultural practices. Support the preservation of prime farmland soils and local food production to protect farmland and reduce food transportation and associated GHG emissions. Encourage agricultural practices that reduce potable water consumption, harmful air emissions, and polluted runoff while increasing the carbon sequestration capacity of soils. These practices include planting cover crops, using no-till farming techniques, adding organic material to soil (crop residues, biosolids, compost), planting more deep-rooted perennial crops, and limiting the use of chemical fertilizers, herbicides, and pesticides which disrupt natural soil processes. (APA, 2020. P. 18, C.1.5).
- Supporting opportunities for sale of local food at farmers markets will further help local food producers economically while keeping the carbon footprint of food acquisition down.

# 1.30 LAND USE

## 1.32 REDEVELOPMENT

**OBJECTIVE:** Focus growth and redevelopment in infill areas, increased density, and mixed-use development to reduce sprawl.

### UNDERSTANDING REDEVELOPMENT

What to look for	How to measure	Sample sources
What are the development patterns of the community?	Housing unit density of recent, current and projected development Areas zoned for mixed-use development Areas developed as mixed-use Number of infill builds	Development and site permits Local land-use data
What are the local land-use policies and regulations for development and development process (reviews, permitting, approvals, variances)?	Local policy and regulation around land use development, such as development density and mixed-use development	Policy and regulation review

### SUGGESTED ACTIONS

#### Policy & Regulation

- Create planned opportunities for compact mixed-use development. Promote and incentivize the development of a mix of land uses and densities in close proximity to transit stations. (APA, 2020. P. 10, B.2.1).
- Provide for a mix of uses in urban areas. Develop comprehensive plans and innovative zoning codes, such as form-based codes, that enable more creativity in providing for a mix of housing types and provide for mixed-use development patterns served by transit and good pedestrian and bike facilities. (APA, 2020. P. 12, B.5.1).
- Encourage mixed-use area development. Provide incentives for developing mixed-use neighborhoods, such as zoning code density bonuses for developments that include good pedestrian and bicycle facilities and access to transit service. Develop zoning codes that allow mixed-use development by-right rather than requiring zoning relief. (APA, 2020. P. 12, B.5.2) (**RRC Best Practice 2.3**).
- Evaluate existing zoning ordinances for acceptance and encouragement of mixed-use development and redevelopment regulations.
- Streamline development review procedures for infill development.
- Create infill development zones where applicable to limit annexation to areas that are supported by existing city infrastructure. Create specific development standards for infill development.
- Quantify the approximate cost of annexation and impacts

on long-term utility maintenance to create better informed decisions about future annexations.

- Ensure zoning code is infill development friendly by taking steps such as allowing mixed-use by right, removing minimum lot sizes, and standardizing setback and impervious cover requirements.
- Create clear criteria for annexation approvals that meets community values, capacity, and quality of life.

#### Financial

- Incentivize mixed-use development. Provide incentives and techniques for development to encourage their location on previously developed or infill sites. Zoning codes that include density bonuses, fee reductions, transfer of development rights, and other incentives to avoid greenfield development are particularly important. (APA, 2020. B.6.1).

#### Education

- Educate residents and community groups about the importance of infill and redevelopment, brownfield assessment findings, and design strategies for compatible neighborhood development.

# 1.30 LAND USE

## 1.33 VACANT LAND

**OBJECTIVE:** Repurpose vacant and underutilized lots into newly productive uses

### UNDERSTANDING VACANT LAND

What to look for	How to measure	Sample sources
Where is vacant land located in our community?	Location and ownership status of vacant parcels	Local parcel or assessor data Landgrid, GIS

### SUGGESTED ACTIONS

#### Policy & Regulation

- Identify existing vacant land.
- Establish strategies for reuse of vacant land.
- Create program for sale of vacant parcels, partnering with the county or state land bank.

#### Physical

- Support temporary, creative neighborhood uses for vacant properties and grayfields.
- Consider the development of green spaces and infrastructure on vacant and underutilized parcels, such as rain gardens, community gardens, pocket parks.
- Target local infrastructure improvements to underserved and blighted areas to revitalize redevelopment and catalyze private investment.

## 1.34 LIMIT ENVIRONMENTAL IMPACTS

**OBJECTIVE:** Minimize human encroachment and impact on natural features and systems.

(See also 2.1, "Natural Features" section)

### UNDERSTANDING NATURAL FEATURES

What to look for	How to measure	Sample sources
Where are we unintentionally encroaching upon or impacting natural features?	Ratio of pervious to impervious surface Development and land area located in floodplains, wetlands, or other sensitive areas	Michigan floodplain data FEMA floodplain data EnviroAtlas impervious surface data
What are the soil types in our community, and how prone to flooding are they?	Soil Hydrological Group	USDA Soil Hydrological Group data

### SUGGESTED ACTIONS

#### Policy & Regulation

- Revise parking requirements. Eliminate parking minimum requirements and consider options for parking maximums and parking pricing options to reduce reliance on single-occupancy vehicles and help facilitate a switch to climate-friendly travel options. (APA, 2020. P. 10, B.1.11).
- Prioritize low-impact stormwater management to filter water on site, shared stormwater systems to minimize runoff (**RRC Best Practice 2**).
- Set waterfront setbacks that shift building line further from high water mark.
- Prioritize cluster development to promote natural features preservation.
- Adopt a policy commitment to limited or no expansion

of physical jurisdiction boundaries or extension of urban services.

- Adopt land use regulations that limit development in areas of high hazard vulnerability.
- Adopt local building codes or enforce state building codes with heightened standards for buildings in areas of high hazard vulnerability.
- Engage in restoring and maintaining critical water bodies and the buffer zones that protect those water bodies
- Provide incentives to residents and developers to protect and restore critical watershed protection areas.
- Adopt a watershed management plan that integrates natural water bodies with human water use and addresses inputs and outputs of the water systems.

# 1.30 LAND USE

## 1.35 PARKS & OPEN SPACE

**OBJECTIVE:** Provide a system of accessible and quality parks, recreation, and open space that meet the needs of the community.

### UNDERSTANDING PARKS & OPEN SPACE

What to look for	How to measure	Sample sources
Where are parks located in relationship to residential areas, and what is the programming, condition, and perception of these green spaces?	Ratio of dedicated parks and open spaces (in acres) per 1,000 residents Residential areas not served by a park or open space within a 10-minute walking distance Distance to parks from residential areas	ESRI and/or Google Observation Local community survey Local observation

### SUGGESTED ACTIONS

#### Planning & Design

- Evaluate availability, accessibility and quality of existing parks and open spaces to residents of the community.
- Survey residents to understand preferences for park and recreation programming.
- Conduct a study regarding the economic impact of public parklands on the local economy to understand their contributions to community satisfaction and tourism.
- Adopt regulatory strategies or development incentives to create, maintain, and connect public parkland.

- Adopt site design guidelines for new public parklands and improvements to existing facilities to strengthen environmental benefits and provide visitor amenities.

#### Collaboration

- Participate in a local or regional alliance working to improve and expand the community-wide or regional park system.
- Host or partner with a volunteer program to support public parkland maintenance.

### ENVIRONMENTAL ASSESSMENTS

**Remediation Process:** Response activity to address sites of environmental contamination generally proceeds in a sequence of steps, which can include initial evaluation, interim response, remedial investigation, remedial action, operation and maintenance, and monitoring.

**ResAP:** A response activity plan, or ResAP, is a plan which may include one or more of the following: (i) A plan to undertake interim response activities; (ii) A plan for evaluation activities; (iii) A feasibility study; or (iv) A remedial action plan.

**BEA:** Also known as a baseline environmental assessment, demonstrates that the new owner or operator has performed

due diligence in evaluating if the site has environmental contamination. Liability protection under many state laws can be provided if the BEA is disclosed to EGLE.

**Due Care:** Actions required by the owners and operators of property that is contaminated to ensure that the contamination does not cause unacceptable exposures, and the contamination is not exacerbated or worsened. All terms are illustrated as defined by EGLE. Learn more on EGLE's [website](#).

# 1.0

## METRIC RESOURCE TABLE

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# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS
<b>1.10 NATURAL SYSTEMS: Protect, enhance, and restore natural ecosystems</b>						<b>RRC Best Practices: 2.6 Green Infrastructure</b>
<b>1.11 Air quality</b> Ensure outdoor air quality is healthy for all segments of the population	What is our local air quality?	Air quality monitoring	EPA AirNow	<a href="#">EPA AirData Air Quality Monitors</a>		
	Does our air quality impact our citizens?	Asthma rates in population	CDC	CDC places mapping tool		
	What are the sources of emissions in our community?	Point source emissions	EPA	<a href="#">EPA/NEI 2014 point source emission map</a>		
<b>1.12 Green infrastructure</b> Maintain a network of green infrastructure that integrates with the built environment to maintain natural ecological systems and functions	What is the presence, condition and quality of green stormwater infrastructure on public and private property and in our community's rights-of-way?	Green infrastructure survey Land cover survey	Land cover data Green Infrastructure Assessment On-the-ground investigation EPA Stormwater Management Model (SWMM)	<a href="#">EPA Stormwater Management Model (SWMM)</a> EnviroAtlas data, <a href="#">Percent Impervious Surface Layer</a>		<a href="#">Climate Adaptation Workbook</a> <a href="#">A Guide to Assessing Green Infrastructure Costs and Benefits for Flood Reduction</a> <a href="#">Tackling Barriers to Green Infrastructure: An Audit of Municipal Codes and Ordinances Workbook</a>
	What is the extent and condition of tree canopy coverage along streets and paved areas such as parking lots?	Tree canopy survey	Land cover data On-the-ground investigation Multi-Resolution Land Characteristics Consortium (MRLC)	<a href="#">MRLC</a>		
<b>1.13 Biodiversity</b> Promote biodiversity and manage or prevent the proliferation of invasive species	What is the presence and condition of native plant and animal species?	Biodiversity survey: Presence and abundance of native and indigenous plant and animal species	Michigan Natural Features Inventory Local observation	<a href="#">Michigan natural features inventory</a>	<a href="#">Native species in Michigan</a>	Management plans (lakeside, forest, urban canopy, etc.)
	Are there protected and endangered species in our community?	Threatened and endangered species survey: Population and location of threatened, endangered, or vulnerable (sensitive or endemic) species	Federal and state locational data Local observation	<a href="#">Endangered species by county</a>	<a href="#">Threatened and endangered species program in Michigan</a>	Michigan's Wildlife Action Plan (MDNR)
	Are there invasive species in our community?	Presence and concentration of invasive species	Local observation	Local observation	<a href="#">What are invasive species?</a> <a href="#">Invasive species Michigan watch list</a> <a href="#">Invasive species resources and funding</a>	
	What is the location and condition of ecosystems and native habitats and systems?	Ecosystem and native habitat survey: Location of wetlands, forested area, water systems, grasslands, and other habitat systems. Disruption, fragmentation, and loss of native habitats and systems.	Local observation Maps of Michigan's natural communities	<a href="#">Distribution maps of Michigan's natural communities</a>	<a href="#">Maintaining Biodiversity: Resources and Grants and Funding Opportunities</a>	<a href="#">Climate Change Response Framework Fishwerks</a>
<b>1.14 Urban Heat Island</b> Monitor and mitigate the urban heat island effect	What is the prevalence of impervious surfaces in our community?	Ratio of pervious to impervious surface as landcover	EnviroAtlas Multi-resolution Land Characteristics Consortium Other landcover data	EnviroAtlas data, <a href="#">Percent Impervious Surface Layer</a> <a href="#">Multi-resolution Land Characteristics Consortium</a>		
	What is the relative temperature of our community compared to peripheral rural areas?	Temperature sensing	Local observation	Local observation	<a href="#">EPA Urban Heat Island Effect Information and Impacts</a>	
	How vulnerable is our community to future increases in average temperature and high-heat days?	Average temperature and high-heat day trends and forecasts Vulnerable populations Vulnerable infrastructure	The Climate Explorer	<a href="#">The Climate Explorer</a>	<a href="#">EPA Urban Heat Island Effect Information and Impacts</a>	

# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS
<b>1.15 Soil and Sediment Control</b> Incentivize and provide grant funding for commercial and residential protection and prevention from erosion.	What soil-based factors could threaten the structural integrity of new and existing development?  Identify areas that show signs of slumping, soil creep, or other indicators of erosion	Proximity to shorelines or riparian zones Location within the floodplain Shoreline loss over time Soil quality analysis with core sampling	USDA USGS	<a href="#">FEMA Flood Map Service Center</a> <a href="#">Soil Classification Map</a>		
<b>1.20: BUILDINGS &amp; STRUCTURES: Create and maintain buildings with long life-cycles to promote flexible reuse and reduction in construction and maintenance costs/impacts</b>						RRC Best Practices: 1.1.3 Capital improvements planning
<b>1.21 Building material efficiency</b> Ensure buildings do not increase embodied carbon	What is the material impact of our building design decisions?	Embodied carbon/carbon footprint	Embodied carbon in construction calculator	<a href="#">Carbon Leadership Forum</a>	<a href="#">Building transparency</a>	<a href="#">Architecture 2030</a>
<b>1.22 Historic and cultural assets</b> Preserve, conserve, renovate, and adapt historic structures and sites to retain local, regional, and national history and heritage, and community culture.	Where are historic and cultural assets in our community, and what is their condition and designation status?	Structures and sites with existing historic designation—and structures and sites with historic or cultural significance that may not be designated as such	State of Michigan Historic Designation records National Parks Service Historic Register	<a href="#">Local historic districts in Michigan</a> <a href="#">National Parks Service database</a>	<a href="#">Michigan Main Street program</a>	
<b>1.30 LAND USE: Encourage a mixture of uses in compact, walkable centers to support a dynamic and active community</b>						RRC Best Practices: 2.3 Concentrated Development + 1.1 Master Plan ( Complete streets) ?
<b>1.31 Local agriculture</b> Encourage private, local and community agriculture at a variety of scales.	How vulnerable is our local agricultural industry to current and future climate shifts?	Climate trends and forecasts Projected impacts to local agricultural sectors	Climate Toolbox	<a href="#">Climate Toolbox</a> <a href="#">Climate Explorer</a>		<a href="#">Agricultural Conservation Planning Framework (ACPF) Toolbox</a> <a href="#">Useful to Usable Agriculture Climate Tools</a>
	Are there community farms or shared agricultural plots in our community?	Community farms or shared agricultural plots	Local observation	Local observation		
	What are local policies and regulations around the creation of community farms or shared agricultural plots?	Permissive, prohibitory or absent language around community farms or shared agricultural plots	Policy and regulation review	Policy and regulation review		
<b>1.32 Redevelopment</b> Focus growth and redevelopment in infill areas, increased density, and mixed-use development to reduce sprawl.	What are the development patterns of the community?	Housing unit density of recent, current and projected development Areas zoned for mixed-use development Areas developed as mixed-use Number of infill builds	Development and site permits Local land use data	Local observation	<a href="#">Illustrative: Street Network Sprawl Map</a> (Zoom in for county, grid and street-level data. Updated 2014)	
	What are the local land use policies and regulations for development and development process (reviews, permitting, approvals, variances)?	Local policy and regulation around land use development, such as development density and mixed-use development	Policy and regulation review	Policy and regulation review	<a href="#">Michigan Variances Fact Sheet</a> Michigan Township Association, <a href="#">Land Use Regulation</a>	
<b>1.33 Vacant land</b> Repurpose vacant and underutilized lots into newly productive uses	Where is vacant land located in our community?	Location and ownership status of vacant parcels	Local parcel or assessor data Landgrid, GIS	<a href="#">LandGrid</a>		USGS <a href="#">GIS Web Tools</a>

# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS
<b>1.34 Limit environmental impacts</b> Minimize human encroachment and impact on natural features and systems.	Where are we unintentionally encroaching upon or impacting natural features?	Ratio of pervious to impervious surface Development and land area located in floodplains, wetlands, or other sensitive areas	Michigan floodplain data FEMA floodplain data EnviroAtlas impervious surface data	<a href="#">Michigan Department of Environment, Great Lakes, and Energy floodplain mapping</a> FEMA floodplain mapping EnviroAtlas Data, <a href="#">Percent Impervious Surface Layer</a>	<a href="#">ESRI methodology for SEMCOG area</a>	
	What are the soil types in our community, and how prone to flooding are they?	Soil Hydrological Group	USDA Soil Hydrological Group data	USDA web soil survey		
<b>1.35 Parks and open spaces</b> Provide a system of accessible and quality parks, recreation, and open space that meet the needs of the community	Where are parks located in relationship to residential areas, and what is the programming, condition, and perception of these green spaces?	Ratio of dedicated parks and open spaces (in acres) per 1,000 residents Residential areas not served by a park or open space within a 10-minute walking distance Distance to parks from residential areas	ESRI and/or Google observation Local community survey Local observation		<a href="#">ESRI guide for evaluating access to parks (advanced GIS)</a> <a href="#">Guide for measuring the walking or biking distance along a specific route in Google Maps</a>	

# 2.0

# PEOPLE

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**DEFINITION:** The ability of a community's residents to prepare, respond, recover and adapt when faced with changing social, environmental and economic conditions. Includes:

- Health and well-being
- Housing
- Safety and security
- Equity and inclusion

## 2.0 PEOPLE

### PEOPLE IN MICHIGAN

The year 2020 served as a test of this resilience. With the spread of COVID-19, the health and well-being of Michiganders was threatened. This disaster required strategy and response at all levels—from a statewide declaration of emergency and county and city response to coordination of health care facilities and dedication of essential workers. All levels of health care and response were critical to the recovery of Michigan residents. The lessons gleaned from these experiences may inform and better guide response in the future.

The long-term impacts of COVID-19 will persist in years and decades to come. This pandemic disproportionately affected communities of color, bringing inequities in health care access and quality to the national conversation. Additionally, clear discrepancies in preventative health care practices and health insurance coverage continue to surface. As Michigan and the United States works to address these issues, a widespread health care reform may occur.

As such, a focus on citizens and what they need to be prepared is of the utmost importance. People are the foundation of a community. As individuals, residents exercise their voices, actions and rights in diverse ways, while collectively, the cultures, social groups and organizations they form provide support and momentum for the lives of Michiganders. There are several themes around which communities can evaluate and plan for a population of resilient people, including health, wealth, housing, education and training, safety and security and culture. Resilience here depends on providing people with fair access to the resources needed to ensure a stable and well-rounded quality of life. This means providing residents with equal opportunities across age, race, gender, language and culture.

Resilience for people includes:

- **Health and well-being:** Free from risk of infectious and long-term diseases; protected from air and water quality shocks; reduced exposure to things that increase health stresses like diabetes and chronic respiratory disease or decrease/lower life expectancy.
- **Housing:** Access to diverse and affordable housing options, access to home repair financing and training, access to home ownership, temporary housing, shelters, long-term care facilities, reducing housing cost burden.
- **Safety and security:** A safe and secure community is one that is inclusive, welcoming and comfortable. These qualities that make a place “safe” rely on the physical environment,

policies and operational strategies.

- **Equity and inclusion:** Civic participation and engagement, equitable access to resources, arts and culture, public events, history, emergency response, racial equity and communication. By valuing both the collective social condition and equitable rights of diverse or at-risk individuals, communities grow stronger and more resilient.

### BASELINE

Michigan is home to nearly 9.99 million people today. Between 2018 and 2019 the population of Michigan declined slightly, although household income grew. Over 74% of people own homes in Michigan as of 2020, with nearly 1% of homes and 6% of rentals vacant. Recognizing that housing access and affordability is a critical aspect of wealth-building, it is important for towns and cities to ensure that housing stock is affordable and accessible for all. Every person deserves the right to a home.

The past year has shown even greater awareness of the inequality that exists across several communities. Social and racial inequities were brought to the forefront in 2020. As systemic issues and injustices persist, the movement for dialogue and reform is far from over. In order for citizens to want to call Michigan a home, it is important to ensure citizens feel safe and secure in their communities. This begins with strong civic engagement programs supported through strong legal human rights. Yet community safety, even in places like our streets and in parks, has oftentimes been disproportionately allocated. Home ownership can help to build the equity gap but creating ease of transportation to critical services can help Michigan residents to not only live but thrive within their communities. Safe streets, ease of pedestrian routes and equal access to healthy, fresh food are important factors to consider when developing and sustaining community resilience.

Healthy people are at the core of community resilience. The pandemic has shown how important it is to have well-functioning hospitals and care facilities, but also the importance of creating active and healthy citizens to remove long-term stress on health care citizens. The healthier an individual is, the less chance there is of them being vulnerable to unanticipated events. It's important to ensure healthy conditions, like access to fresh food and places for exercise and other healthy lifestyle-building activities. It also includes focusing on things like improving access to hospitals and ensuring that there are resources for mental and physical well-being.

## 2.0 PEOPLE

### SHOCKS

- Novel infectious disease outbreak (COVID-19)
- Health emergencies
- Loss of employment
- Terrorism
- Financial
- Educational
- Resource crisis
- Communication failure
- Unreliable transportation/evacuation routes

### STRESSES

- Housing cost burden (access to affordable housing, gentrification)
- Access to health care (physical and mental)
- Poor diet and exercise/food insecurity (access to healthy affordable food)
- Less education + training/unemployment
- Lack of wealth (the accumulation of savings and assets)
- Lack of family and social support/isolation
- Violence/community safety
- Structural racism

### WHAT CAN YOUR COMMUNITY DO?

The most vulnerable residents are those with the most shocks and stresses. The community must seek equity—the targeted and disproportionate directing of resources to the most vulnerable residents (as identified by Michigan Department of Health and Human Services,<sup>1</sup> FEMA National Integration Center and CDC Health Workbook;<sup>2</sup> all lists adapted).

The CDC offers a checklist to evaluate vulnerable populations and available resources.<sup>3</sup>

- Elderly persons: Age over 65 years
- Children: Age under 18 years
- No health insurance: People with no health insurance
- Asthma rates: Persons with asthma
- Those in poverty: Reduced access to health care, transportation or other social services
- Disabled persons: People with mental or physical disability
- Racial and ethnic minorities
- Those who are unemployed
- Those with less than a high school diploma
- Single parent households
- No vehicle: Households without a vehicle

Identify the specific needs of vulnerable populations in the community. Partner with local community organizations to identify social resilience needs at the neighborhood level.

<sup>1</sup> 2019 Michigan Health Equity Report. [https://www.michigan.gov/documents/mdhhs/pa653-health\\_equity\\_report\\_full\\_document-allcomponents\\_5.13.20\\_final\\_690987\\_7.pdf](https://www.michigan.gov/documents/mdhhs/pa653-health_equity_report_full_document-allcomponents_5.13.20_final_690987_7.pdf)

<sup>2</sup> The CDC provides guidelines for community preparedness and emergency response, including an expanded list of potential vulnerable and at-risk populations. CDC Public Health

Workbook: To Define, Locate and Reach Special, Vulnerable, and At-risk Populations in an Emergency (list on page 31). [https://emergency.cdc.gov/workbook/pdf/ph\\_workbookfinal.pdf](https://emergency.cdc.gov/workbook/pdf/ph_workbookfinal.pdf)

<sup>3</sup> [https://www.cdc.gov/climateandhealth/pubs/cdc\\_planningworksheet-508.pdf](https://www.cdc.gov/climateandhealth/pubs/cdc_planningworksheet-508.pdf)

# 2.10

## HEALTH & WELL-BEING

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## 2.10 HEALTH & WELL-BEING

### OVERVIEW

**GOAL:** Achieve positive health outcomes and minimize health risk factors.

**Health care:** This includes the physical proximity and accessibility of clinics, emergency facilities, physicians, counseling, preventative health, treatment, specialists, dental and vision care and pharmacies. This also includes availability of health insurance and care coverage.

Mental and physical health, recreation and fitness, preventative health practices and screenings, chronic and acute condition rates, community health preparedness and response, clinic, therapy, treatment, pharmacy and emergency availability, access to healthy food, nutrition education.

**Fitness and recreation:** The availability of—and access to—recreation and fitness facilities such as parks, trails, exercise equipment, tracks, sports fields, pools, beaches and recreation centers.

**Food and nutrition:** The availability and accessibility of fresh and nutritious grocery and food options.

### 2.11 HEALTH CARE ACCESS

**OBJECTIVE:** Provide high quality local health systems that are accessible and responsive to community needs.

#### UNDERSTANDING HEALTH CARE ACCESS

What to look for	How to measure	Sample sources
How healthy is our community?	<ul style="list-style-type: none"> <li>Doctor visits</li> <li>Preventative health care</li> <li>Health spending</li> <li>Health condition prevalence</li> <li>Health insurance coverage</li> <li>Health provider availability</li> </ul>	<ul style="list-style-type: none"> <li>CDC data</li> <li>Headwaters “Economics Populations at Risk” tool</li> </ul>
Do our residents have access to health care resources?	<ul style="list-style-type: none"> <li>Ratio of health providers to population</li> <li>Rates of health insurance coverage</li> </ul>	<ul style="list-style-type: none"> <li>Federal health care locations</li> <li>CDC data</li> </ul>

### SUGGESTED ACTIONS

#### Policy & Regulation

- Partner with local hospitals and clinics to provide education, referral and follow-up, case management, home visiting and telecare consultation for at-risk and vulnerable populations.
- Lobby to increase support for non-profit health care organizations that receive federal funding and deliver comprehensive care to uninsured, under-insured and vulnerable patients regardless of ability to pay.
- Provide medical, dental and/or mental health services to the community through income-based clinics or community health workers.
- Implement strategies to recruit medical professionals to the community or to areas of need in the community.
- Use a performance management system to monitor and improve health services and programs that promote positive health outcomes and expand access to health care.

#### Physical

- Identify and address existing disparities in access to health care and health opportunities, including healthy foods, green spaces, opportunities for exercise and active transportation. (APA, 2020. P. 32, E.7.3).

#### Informational

- Educate the public about eligibility and enrollment barriers to obtaining health insurance.

#### Cooperative

- Establish a governance model between the health department, local health care providers and community health organizations that supports local and regional collaboration for improving community health.



## 2.10 HEALTH & WELL-BEING

### 2.12 ACTIVE LIVING

**OBJECTIVE:** Promote active lifestyles for adults and children to integrate physical activity into their daily routines.

UNDERSTANDING ACTIVE LIVING		
What to look for	How to measure	Sample sources
Is it easy for people to walk and bike to where they need to go?	Walkability and bikeability: Proximity of resources and availability of sidewalks and bike infrastructure for recreation and to access local amenities, resources, jobs and schools	WalkScore AARP walk audit
Do our residents have access to fitness and recreational amenities?	Availability, location and affordability of fitness and recreational resources such as rec centers, parks, sports fields, trails	County health rankings and road maps
What is the condition of our bike and pedestrian infrastructure?	Local observation of bike and pedestrian infrastructure gaps, access, and infrastructure condition	Local observation

### SUGGESTED ACTIONS

#### Planning & Design

- Provide parks and recreation opportunities for all ages, abilities and seasons. These include sports fields and courts, walking and hiking trails and paths, open, unprogrammed space, exercise and fitness facilities, beaches and pools, etc.

#### Programs

- Provide programming to increase community recreation options at rec centers and public parks. Increase public awareness of parks and amenities.
- Create a lending library of seasonal recreational equipment, such as cross-country skis, pickleball or croquet sets, alpine ski poles and walking sticks (AARP “Livability Roadmap: Health”).
- Host an annual wellness walk for people of all ages (AARP “Livability Roadmap: Health”).
- Develop and expand a community center with programs for people of all ages—from toddlers to centenarians (AARP “Livability Roadmap: Health”).

- Provide assistance for low-income users to access and use public parklands and programming through subsidy, scholarships and discounts.
- Host programs and events in public parkland that bring the community together and encourage physical activity.
- Enable joint use of school-based recreation facilities during non-school hours.

#### Policy & Regulation

- Create guidelines to encourage the incorporation of active building design features in new public, commercial, office or multi-family residential buildings.
- Establish school siting guidelines that give preferential considerations to locations that maximize the number of students who can walk or bike safely to school.

## 2.10 HEALTH & WELL-BEING

### 2.13 HEALTHY ENVIRONMENTS

**OBJECTIVE:** Reduce and eliminate the exposure of residents to unhealthy environments.

#### UNDERSTANDING HEALTHY ENVIRONMENTS

What to look for	How to measure	Sample sources
Are our residents being exposed to unhealthy or hazardous quality conditions?	Point source and non-point source pollution Asthma rates Sudden disease or outbreak	EPA

#### SUGGESTED ACTIONS

##### Planning & Design

- Reduce exposure to particulate matter 2.5; identify and understand where air source pollution comes from.
- Reduce transportation pollution in local community by diversifying transportation options.
- Establish a local warming or cooling shelter.

##### Programs

- Rebates for efficient home devices; where possible, encourage the reduction of fuel combustion from inside homes (electric heating where possible).
- Tree planting and green space programs specific to your community's native species can help remove pollution and encourage higher air quality.
- Lead abatement and remediation.

### 2.14 HEALTHY FOODS

**OBJECTIVE:** Ensure that adults and children of all income levels have physical and economic access to fresh and healthy food and have opportunities to learn about nutritious eating and food safety.

#### UNDERSTANDING HEALTHY FOODS

What to look for	How to measure	Sample sources
Do adults and children in our community have access to healthy, affordable food options?	Food access data	USDA Economic Research Service

#### SUGGESTED ACTIONS

##### Planning & Design

- Community gardens for urban locations; grocery stores should be located in areas with food deserts.

##### Programs

- Food assistance programs and emergency food programs can help communities prepare for unanticipated pandemics, but also increase food accessibility.
- Food rescue programs, as in public/private partnerships between restaurants, hotels and other venues of large food production, can partner with local food halls to make good food more widely available.

##### Physical

- Ensure urban and rural agriculture conditions are ready for food production. Focus on water-holding capacity of soil, the ability to drain excess rainfall from agricultural land and even buffers from erosion.
- The reduction of containments like pesticides in the food production system can reduce water run-off pollution and decrease exposure to chemical substances. Moving towards more organic farming methods can help to create healthy supply chains of food.

# 2.20

## HOUSING

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## 2.20 HOUSING

### OVERVIEW

**GOAL:** Construct, preserve and maintain an adequate and diverse supply of housing type and affordability options for all residents.

**Description:** Access to diverse and affordable housing options, access to home repair financing and training, access to home ownership, temporary housing, shelters, long-term care facilities, housing cost burden.

### 2.21 HOUSING ACCESS

**OBJECTIVE:** Provide a diversity of housing type and affordability options.

#### UNDERSTANDING HOUSING ACCESS

What to look for	How to measure	Sample sources
Is there an adequate availability of diverse and affordable housing options?	<p>Excessive housing cost burden (households spending greater than 30% of income on housing costs)</p> <p>Displacement rates by income level, race, age and gender</p> <p>Residential occupancy by race</p> <p>Preservation, creation, availability, location, accessibility, quantity and quality of affordable housing options</p>	<p>Envision, Balanced Housing Model</p> <p>Headwaters "Economics Populations at Risk" tool</p>

### SUGGESTED ACTIONS

#### Planning & Design

- Maintain the quantity and quality of existing subsidized housing.
- Analyze public transit access and transportation costs for neighborhoods with housing affordable to low- and moderate-income households.
- Encourage construction of a variety of housing typologies
- Incentivize developers to build increased density housing with greater than the minimum requirement of subsidized housing.

#### Policy & Regulation

- Adjust the zoning ordinance to enable the construction or redevelopment of smaller homes. Lower the minimum building size through proactive zoning to allow for alternative home model construction.
- Change zoning to allow for a range of housing types to provide residents the opportunity to progress through various life stages while maintaining their attachment to a particular neighborhood.
- Adopt policies to permit the adoption of accessory dwelling units (ADUs). This may include the permitting of all types

of ADUs (detached, attached, interior), as well as the simplification of the permitting process for ADUs and waiving of permit or impact fees. This may also include the adoption of simple, flexible but nondiscretionary ADU rules about setbacks, square footage and design compatibility with the primary dwelling—and limitations on off-street parking requirements (AARP, ABCs of ADUs).

#### Cooperative

- Identify partners for incentivizing the construction of ADUs and increasing awareness of their benefits. For example, lenders can work with homeowners to finance the construction of ADUs by using renovation loans, advocates can organize tours of completed ADUs in order to inform and inspire the community; educate homeowners, real estate agents, architects and builders about local zoning regulations and the permit process, real estate agenda can educate themselves and their clients about rules for the construction of ADUs, and local media can report on how and why homeowners build ADUs (AARP, ABCs of ADUs).
- Work with private employers to provide live-near-your-work or employer-assisted housing financial incentives.

## 2.20 HOUSING

### 2.22 HOMEOWNER SUPPORT

**OBJECTIVE:** Help homeowners maintain and remain in their homes.

#### UNDERSTANDING HOMEOWNER SUPPORT

What to look for	How to measure	Sample sources
Are homeowners having difficulty staying in their homes?	Housing condition statistics Foreclosure rates Displacement rates and out-migration trends by race, income, etc. Repair grants and/or training	Local and regional data (as available) LandGrid data

#### SUGGESTED ACTIONS

##### Program

- Provide grant funding to bring homes up to building code, make basic repairs and energy efficiency improvements.
- Partner with non-profit organization(s) to provide education, counseling and financial assistance to homebuyers or renters.

##### Policy & Regulation

- Create Neighborhood Enterprise Zones where applicable to leverage funding for housing rehabilitation.
- Incentivize a weatherization assistance program.

### 2.23 HOMEOWNERSHIP

**OBJECTIVE:** Provide homebuyer assistance to encourage homeownership and wealth building.

#### UNDERSTANDING HOMEOWNERSHIP

What to look for	How to measure	Sample sources
Are homebuyer assistance programs adequately serving local residents who wish to purchase a home?	Homeownership rates (ratio of renter-occupied housing units to owner-occupied units—and by race and income level) Assessment of existing homebuyer assistance programs (public, non-profit, or lender-driven) Home value trends	Local program evaluation HUD Community Assessment Reporting Tool (CART)

#### SUGGESTED ACTIONS

##### Funding

- Provide or tap into grant funding or homeowner tax credits to residents for home purchase, home improvement, energy efficiency upgrades and associated initiatives to improve housing affordability.

##### Policy & Regulation

- Provide and tap into homebuyer guidance programs.

##### Program

- Create a pathway to homeownership program by partnering with Habitat for Humanity and Mid-Michigan Community Action for financial and homebuyer education.

## 2.20 HOUSING

### 2.24 AFFORDABLE HOUSING

**OBJECTIVE:** Ensure adequate supply of affordable housing options to meet the needs of all residents.

#### UNDERSTANDING AFFORDABLE HOUSING

What to look for	How to measure	Sample sources
Is the affordable housing supply sufficient to serve local need at a variety of income levels?	Housing affordability and income statistics	Local program evaluation HUD Community Assessment Reporting Tool (CART) Envision, "Balanced Housing Model" Headwaters "Economics Populations at Risk" tool

#### SUGGESTED ACTIONS

##### Policy & Regulation

- Remove regulatory barriers to affordable housing in zoning and subdivision regulations (APA, 2020. P. 30, E.3.1).
- Prioritize development of affordable housing in transit and active transportation-rich locations and targeted growth areas (APA, 2020. P. 30, E.3.2).
- Assure that affordable housing is built or renovated to be energy efficient, climate ready, and minimally carbon emitting. Improve home weatherization through programs such as the Federal Low-Income Home Energy Assistance Program. Require heating and cooling appropriate to the climate (APA, 2020. P. 30, E.3.3).
- Identify appropriate locations for buyouts or development rights transfers of low-income housing units in floodplains or other locations at risk due to climate change. Eliminate barriers that would prevent low-income residents in such locations from relocating (APA, 2020. P. 30, E.3.5).
- Protect disadvantaged residents. Ensure that, through land banking, housing preservation and other intentional means of providing affordable housing assistance, investments made in underserved areas do not disadvantage or displace existing community residents (APA, 2020. P. 30, E.3.6).
- Implement programs to preserve and maintain existing subsidized and unsubsidized affordable rental housing in transit-served areas, compact and mixed-use areas and areas with rapidly rising housing costs.

##### Information

- Engage housing advocates, builders, developers, lenders, building ownership groups and policy makers in creating affordable housing retention programs and in maintaining community cohesiveness where climate-motivated redevelopment pressure on low-income communities exists or may occur (APA, 2020. P. 30, E.3.4).

##### Planning & Design

- Prioritize affordable housing in low flood risk areas (lower income households often forego flood insurance and are disproportionately affected by the cost of recovery post-disaster).

##### Funding

- Provide grant funding for duplexes, triplexes, townhomes, and small apartment buildings.

# 2.30

## SAFETY & SECURITY

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## 2.30 SAFETY & SECURITY

### OVERVIEW

**GOAL:** Ensure a safe, comfortable and equitable community.

**Description:** Traffic crash rates, pedestrian infrastructure, ADA accessibility, lighting, crime rates, police expenditure, emergency response.

### 2.31 CRIME & COMMUNITY SAFETY

**OBJECTIVE:** Maintain an environment where people feel safe and welcomed in their communities.

#### UNDERSTANDING CRIME & COMMUNITY SAFETY

What to look for	How to measure	Sample sources
What populations or neighborhoods may be disproportionately impacted by crime or police activity in our community?	Violent and non-violent crime rates Racial disparities in arrests and incarceration Injury and death rates	Local law enforcement data

### SUGGESTED ACTIONS

#### Cooperative

- Partner with a local organization to provide mental health and dementia awareness training for first responders and municipal employees (AARP “Roadmap to Livability: Health”).
- Develop partnerships with local agencies, nonprofit organizations, schools and residents to implement public safety strategies, enforcement programs and trust-building initiatives.
- Conduct a survey of community perceptions of safety, recognizing that some crimes are not reported and to illuminate safety issues that need to be addressed.

#### Policy & Regulation

- Conduct a survey of community perceptions of safety recognizing that some crimes are not reported and to illuminate safety issues that need to be addressed.
- Adopt a safe communities strategic plan with a comprehensive, balanced approach that includes violence prevention, intervention, suppression and enforcement, community policing and reentry strategies.
- Perform ongoing data collection, evaluation and monitoring from multiple agencies to track trends and identify emerging community needs.

- Integrate community policing and procedural justice into police department operations to support and build trust within the community.
- Implement violence prevention programs and strategies to address community-identified risks and protective factors
- Implement school-based violence prevention programs and strategies, particularly in highly impacted, urban and at-risk neighborhoods.
- Develop violence intervention programs and strategies to support at-risk families and youth and to prevent the escalation of violence.
- Create or support a multi-faceted, monitored reentry program for ex-offenders that includes training, education, mentoring, employment opportunities and other support services to reduce recidivism.

#### Program

- Provide informational materials covering topics such as how to recognize and report domestic violence, elder or child abuse, and other hidden criminal activity.



## 2.30 SAFETY & SECURITY

### 2.32 PEDESTRIAN & BICYCLE COMFORT

**OBJECTIVE:** Facilitate walkable and bikeable communities by providing safe, accessible and enjoyable pedestrian and bike infrastructure.

#### UNDERSTANDING PEDESTRIAN AND BICYCLE COMFORT

What to look for	How to measure	Sample sources
Is pedestrian and bicycle infrastructure clearly established, comfortable and safe?	<ul style="list-style-type: none"> <li>Vehicular crash rates, pedestrian or bicycle incidents</li> <li>Compliance with ADA requirements for all pedestrian infrastructure</li> <li>Safe pedestrian and bicycle infrastructure (crosswalks, crossing signals, etc.)</li> <li>Light levels along circulation routes</li> <li>Availability of signage and wayfinding</li> </ul>	<ul style="list-style-type: none"> <li>Michigan traffic crash data</li> <li>Local and regional data</li> <li>Survey of local infrastructure location, compliance, and condition</li> </ul>

#### SUGGESTED ACTIONS

##### Program

- Adopt a complete streets policy, making roads safe for all users (AARP “Roadmap to Livability: Transportation”).
- Implement a program to encourage businesses and property owners to keep sidewalks clear of snow and safe for pedestrians (AARP “Roadmap to Livability: Transportation”).
- Create safer pedestrian crossings.
- Install reflective signs and pavement markings to make it easier and safer for people to travel by foot, bicycle or motorized wheelchair at night (AARP “Roadmap to Livability: Transportation”).

##### Policy & Regulation

- Create an incentive program for businesses to install bike racks so people can securely leave their bicycles while visiting stores.
- Coordinate with a local bike group to gather additional cycling data at assumed high-use corridors and intersections.
- Incorporate mobility assistance in public spaces (ramps, hand railings, contrasting colors at boundaries, tactile paving), shaded places to rest, water fountains, emergency call stations, wayfinding with larger fonts and audio signals.

### 2.33 TRANSPORTATION SAFETY

**OBJECTIVE:** Ensure safe and efficient vehicular circulation.

#### UNDERSTANDING TRANSPORTATION SAFETY

What to look for	How to measure	Sample sources
Are there areas of concentrated crash rates or speeding reports in our community?	<ul style="list-style-type: none"> <li>Vehicular crash rates</li> <li>Traffic signage, striping and safety infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Michigan traffic crash data</li> <li>Local observation</li> </ul>

#### SUGGESTED ACTIONS

##### Program

- Adopt a Vision Zero initiative to eliminate vehicle-inflicted pedestrian injuries and death.

# 2.40

## EQUITY & INCLUSION

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## 2.40 EQUITY & INCLUSION

### OVERVIEW

**GOAL:** Ensure equity, inclusion, and access to opportunity for all residents

**Description:** Civic participation and engagement, equitable access to resources, low rates of disparities in income, health, etc., arts and culture, public events, cultural and historic resources, immigrant resources, multilingual resources.

### 2.41 CIVIC ENGAGEMENT

**OBJECTIVE:** Facilitate inclusive civic engagement and empower all community members to participate in local decision-making.

#### UNDERSTANDING CIVIC ENGAGEMENT

What to look for	How to measure	Sample sources
Do residents and local stakeholders have adequate opportunity to engage with public proceedings, economic development and other local decisions?	<ul style="list-style-type: none"> <li>Number of engagement events</li> <li>Number, geographic distribution and demographics of participants in engagement events</li> <li>Number of public events</li> <li>Number of attendees</li> <li>Homes with someone who doesn't speak English, compared to multilingual public resources</li> <li>Resources adapted for those hard of hearing (such as closed captioning for television broadcasts) or visually impaired</li> <li>Accommodations for cultural practices that may inhibit participation in public realm</li> <li>Accommodations for those who may lack access to technology or may be unable to participate in in-person engagement sessions</li> </ul>	<ul style="list-style-type: none"> <li>Media and communication outlets</li> <li>Zoom or online meetings</li> <li>Public television and radio stations</li> <li>Website resource</li> <li>Social media</li> <li>News resources</li> <li>Headwaters "Economics Populations at Risk" tool</li> </ul>

### SUGGESTED ACTIONS

#### Informational

- Create opportunities for community authorship and participation in planning, design and response.
- Build a network of communication and media outlets to ensure communication and dissemination of information at all times and in response to emergency events.
- Build community cohesion through public events such as cultural celebrations, concerts and festivals.
- Use a range of communication types in order to reach at-risk populations, such as those who are not literate, speak a language other than English, are deaf or hard of hearing, blind or visually impaired or have mobility impairments.
- **RRC Best Practice 1.2.1–1.2.3**
- Use meaningful and inclusive public involvement processes. Utilize collaborative problem solving and participatory planning, working with community partners to put community-based climate action, recovery and resiliency plans into effect (APA, 2020. P. 29, E.1.2).
- Ensure an inclusive, fair and two-way information exchange. When analyzing community risk and needs in the process of developing climate plans and actions, ensure that

traditionally underrepresented communities have a strong voice in their development (APA, 2020. P. 29, E.1.3).

- Conduct a survey or evaluation to demonstrate existing levels of social capital and community cohesion throughout the community.

#### Program

- Maintain a publicly accessible inventory of social networks and groups (e.g., block captains, civic organizations, trusted elders) organized by geography or neighborhood.
- Collaborate with neighborhood associations, civic groups and local service providers to identify and address neighborhood-specific needs.
- Establish and support neighborhood advisory councils to build the social capital of neighborhoods and bring issues to the attention of the local government.
- Provide programs that support the development of positive, strong youth leaders, particularly in low-income and/or minority neighborhoods.
- Create a volunteer program for residents to assist the local government and community with special events, services and operations.

## 2.40 EQUITY & INCLUSION

- Adopt a policy to encourage diversity in local government appointments to advisory boards and commissions that includes requirements for tracking and reporting composition by gender, race and ethnicity.
- Conduct adult education campaigns about the electoral process and voter participation targeted at geographic areas or populations with low voter participation.
- Partner with business, civic, non-profit and neighborhood organizations to increase and promote community engagement in local decision-making.
- High schools and colleges to offer hands-on classes for childcare services. This can provide learning opportunities about how to care for and teach young children while providing the community with a much-needed affordable and trusted service.
- Offer virtual interviewing and remote work opportunities (relieves the burden of transportation and creates greater opportunity for people with disabilities).

### Policy & Regulatory

- Establish regular, ongoing opportunities for elected officials and/or senior government staff to meet with residents to answer questions and listen to concerns.
- Provide young people with opportunities to participate in civic activities.
- Provide civic education programs that support the development of positive, strong youth leaders, with a particular focus on engaging individuals from low-income and/or minority neighborhoods.
- Provide capacity building and leadership programs to cultivate and support community leaders and groups.

## 2.42 CIVIL & HUMAN RIGHTS

**OBJECTIVE:** Respect and protect the civil and human rights of all members of the community.

### UNDERSTANDING CIVIL & HUMAN RIGHTS

What to look for	How to measure	Sample sources
Are all citizens fairly treated and respected by public actors (law enforcement, departments, etc.) and private parties (landlords, lenders, etc.)?	<ul style="list-style-type: none"> <li>Number of engagement events</li> <li>Public policies and procedures with discriminatory language</li> <li>Diversity and representation of leadership and committees when compared to community population</li> <li>Immigrant and refugee statistics</li> <li>Survey of communications materials (media, virtual and in-person meeting conduct, public television, websites, social media, news resources, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Survey of existing local government policy</li> <li>Identification of at-risk populations</li> <li>Headwaters "Economics Populations at Risk" tool</li> </ul>

### SUGGESTED ACTIONS

#### Policy & Regulation

- Adopt policies or amend the jurisdiction's charter to specifically protect the civil and human rights of all.
- Ensure that public policy and procedural language is equitable and inclusive.
- Ensure community leadership and committees reflect the racial, gender, age, income, ethnic and other diversity of the community's population. Adopt guidelines that ensure diversity and inclusion in hiring practices.

#### Informational

- Provide information about community issues, programs, services and activities that is accessible to limited English proficiency residents.
- Provide diversity or cultural competence training for local government staff.
- Collect, analyze and publish data on racial or ethnic disparities in judicial and law enforcement activities to proactively promote the respect of all community members' civil and human rights.

- Establish an office within the jurisdiction with the authority and capacity to investigate civil and human rights complaints.

#### Program

- Establish an independent civil and/or human rights commission to ensure equity and inclusion for all.
- Provide training for police officers focused on implicit bias, cultural responsiveness and nondiscrimination.
- Operationalize the local government's civil and human rights policies in programs, services and operations.
- Provide language translation or interpretation services to ensure that residents have access to information about their civil and human rights and local government services.

## 2.0 PEOPLE

### 2.43 SOCIAL CAPITAL

**OBJECTIVE:** Foster bonds, links, and bridges to strengthen social capital.

UNDERSTANDING CIVIL & HUMAN RIGHTS		
What to look for	How to measure	Sample sources
Are there existing relationships that can be relied on for assistance in times of need?	Number of third party organizations contributing to your city Number of resource groups for organizational leadership to connect with City staff	Economic Development collaboratives Michigan Community Resources
What does governance look like during and after a disaster event?	Response time for aid immediately following an event Complaint resolution Access to services	Unicef datasets CDC datasets
What tools could the City provide existing organizations to strengthen their measurable impact on the community?	Resources and assistance available Community surveys	Collaborative platforms like Mural

### SUGGESTED ACTIONS

#### Cooperative

- Deepen existing relationships within the community, nearby communities, and local and regional governments (bonding) by creating action-oriented task groups.

#### Program

- Develop opportunities to connect community members, businesses, and local leadership with new partners and friends outside of their current network (bridging).

- Reach out to local leaders and government officials to create a presence within each other's community. Coordinate regional activities, find ways to create interconnection (linking).
- Create assistance programming within existing network to ensure needs are met in an emergency.

### ADDITIONAL RESOURCES

- U.S. Census data
- Information provided by state/local health departments
- SNAPs
- Chambers of Commerce
- United Way
- Public Health Foundation's database on counties, the National Public Health Performance Standards Program (NPHPSP)

# 2.0

## METRIC RESOURCE TABLE

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# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS
<b>2.10 HEALTH &amp; WELL-BEING: Achieve positive health outcomes and minimize health risk factors</b>						
<b>2.11 Health care access</b> Provide high quality local health systems that are accessible and responsive to community needs	How healthy is our community?	Doctor visits Preventative health care Health spending Health condition prevalence Health insurance coverage Health provider availability	CDC data Headwaters Economics, "Populations at Risk" tool	<a href="#">CDC interactive data</a> Headwaters Economics, <a href="#">Populations at Risk Tool</a>		
	Do our residents have access to health care resources?	Ratio of health providers to population Rates of health insurance coverage	Federal health care location data CDC data	<a href="#">Hospitals</a> <a href="#">CDC interactive data</a>	<a href="#">How do you measure access?</a>	
<b>2.12 Active living</b> Promote active lifestyles for adults and children to integrate physical activity into their daily routines.	Is it easy for people to walk and bike to where they need to go?	Walkability and bikeability: proximity of resources and availability of sidewalks and bike infrastructure. Used for recreation and to access local amenities, resources, jobs and schools.	WalkScore	<a href="#">WalkScore</a>	<a href="#">CDC interactive data</a> <a href="#">EPA Walkability Index</a>	<a href="#">Active Communities Tool Action Planning Guide</a> <a href="#">Conducting a walk audit</a>
	Do our residents have access to fitness and recreational amenities?	Availability, location and affordability of fitness and recreational resources such as recreation centers, parks, sports fields, trails	County health rankings and roadmaps	County Health Rankings and Roadmaps, <a href="#">Access to Exercise Opportunities</a>		
	What is the condition of our bike and pedestrian infrastructure?	Local observation of bike and pedestrian infrastructure gaps and access Local observation of bike and pedestrian infrastructure condition	Local observation	Local observation		
<b>2.13 Healthy environments</b> Reduce and eliminate the exposure of residents to unhealthy environments.	Are our residents being exposed to unhealthy or hazardous environmental conditions?	Point source and non-point source pollution Asthma rates Diabetes rates Sudden disease or outbreak	Center for Disease Control	<a href="#">CDC data and statistics</a>	<a href="#">EPA/NEI 2014 point source emission map</a>	<a href="#">National Environmental Public Health Tracking Network</a> <a href="#">Diabetes Burden toolkit</a> <a href="#">National asthma maps</a>
<b>2.14 Healthy foods</b> Ensure that adults and children of all income levels have physical and economic access to fresh and healthful food and have opportunities to learn about nutritious eating and food safety	Do adults and children in our community have access to healthy, affordable food options?	Food access data	USDA Economic Research Service	<a href="#">USDA Food Environment Atlas</a> <a href="#">USDA Food Access Research Atlas</a>	<a href="#">About the atlas</a>	
<b>2.20 HOUSING: Construct, preserve, and maintain an adequate and diverse supply of housing types and affordability options for all residents</b>						
<b>RRC Best Practices: 2.4 Housing Diversity</b>						
<b>2.21 Housing access</b> Provide a diversity of housing type and affordability options	Is there an adequate availability of diverse and affordable housing options?	Excessive housing cost burden (households spending greater than 30% of income on housing costs) Displacement rates by income level, race, age and gender Residential occupancy by race Preservation, creation, availability, location, accessibility, quantity and quality of affordable housing options	Envision Tomorrow, "Balanced Housing Model" Headwaters Economics, "Populations at Risk" tool	Envision Tomorrow, <a href="#">Balanced Housing Model</a> Headwaters Economics, <a href="#">Populations at Risk Tool</a>	<a href="#">MSHDA</a>	

# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS
<b>2.22 Homeowner support</b> Help homeowners maintain and remain in their homes.	Are homeowners having difficulty staying in—or maintaining—their homes?	Housing condition statistics Foreclosure rates Displacement rates and out-migration trends by race, income, etc. Repair grants and/or training	Local and regional data (as available) LandGrid data	<a href="#">LandGrid</a> <a href="#">U.S. Census flows mapper</a> (note: minimum value must be greater than 0 in order for tool to work)		
<b>2.23 Homeownership</b> Provide homebuyer assistance to encourage homeownership and wealth building.	Are homebuyer assistance programs adequately serving local residents who wish to purchase a home?	Homeownership rates (ratio of renter-occupied housing units to owner-occupied units—and by race and income level) Assessment of existing homebuyer assistance programs (public, non-profit, or lender-driven) Home value trends	Local program evaluation HUD Community Assessment Reporting Tool (CART)	<a href="#">HUD community assessment reporting tool</a> <a href="#">Michigan housing data</a>	<a href="#">Illustrative: Housing boom and bust</a>	
<b>2.24 Affordable housing</b> Ensure adequate supply of affordable housing options to meet the needs of low income residents.	Is the affordable housing supply sufficient to serve local need at a variety of income levels?	Housing affordability and income statistics	Local program evaluation HUD community assessment reporting tool (CART) Envision Tomorrow, “Balanced Housing Model” Headwaters Economics, “Populations at Risk” tool	Envision Tomorrow, <a href="#">Balanced Housing Model</a> Headwaters Economics, <a href="#">Populations at Risk Tool</a>		
<b>2.30 SAFETY &amp; SECURITY: Ensure a safe, comfortable, and equitable community</b>					RRC Best Practices: Tying this in with BP 1.1 Master Plan and 1.3 CIP	
<b>2.31 Crime and Community Safety</b> Maintain an environment where people feel safe and welcomed in their communities.	What populations or neighborhoods may be disproportionately impacted by crime or police activity in our community?	Violent and non-violent crime rates Racial disparities in arrests and incarceration Injury and death rates	Local law enforcement data	Local law enforcement data		
<b>2.32 Pedestrian and Bicycle Comfort</b> Facilitate walkable and bikeable communities by providing safe, accessible and enjoyable pedestrian and bike infrastructure.	Is pedestrian and bicycle infrastructure clearly established, comfortable, and safe?	Vehicular crash rates, pedestrian or bicycle incidents Compliance with ADA requirements for all pedestrian infrastructure Safe pedestrian and bicycle infrastructure (crosswalks, crossing signals, etc) Light levels along circulation routes Availability of signage and wayfinding	Michigan traffic crash data Local and regional data Survey of local infrastructure location, compliance, and condition	<a href="#">Michigan Traffic Crash Reporting System</a> (request access required)		
<b>2.33 Transportation Safety</b> Ensure safe and efficient vehicular circulation.	Are there areas of concentrated crash rates or speeding reports in our community?	Vehicular crash rates Traffic signage, striping and safety infrastructure	Michigan traffic crash data Local observation	Michigan Crash Data, <a href="#">Aggregated Michigan Traffic Crash Reporting System</a> (request access required)		



# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS
<b>2.40 EQUITY &amp; INCLUSION: Ensure equity, inclusion, and access to opportunity for all residents</b>				<b>RRC Best Practices: Could tie this to public participation and outreach BP 1.1.4?</b>		
<b>2.41 Civic Engagement</b> Facilitate inclusive civic engagement and empower all community members to participate in local decision-making	Do residents and local stakeholders have adequate opportunity to engage with public proceedings, economic development, and other local decisions?	Number of engagement events Number, geographic distribution and demographics of participants in engagement events Number of public events Number of attendees Homes with someone who doesn't speak English, compared to multilingual public resources Resources adapted for those hard of hearing (such as closed captioning for television broadcasts) or visually impaired Accommodations for cultural practices that may inhibit participation in public realm Accommodations for those who may lack access to technology or may be unable to participate in in-person engagement sessions	Media and communication outlets Zoom or online meetings Public television and radio stations Website resource Social media News resources Headwaters Economics "Populations at Risk" tool	Local departmental and project-specific data Local policies and ordinances Headwaters Economics, <a href="#">Populations at Risk Tool</a>		<a href="#">FEMA hazard mitigation planning</a>
<b>2.42 Civil and Human Rights</b> Respect and protect the civil and human rights of all members of the community	Are all citizens fairly treated and respected by public actors (law enforcement, departments, etc) and private parties (landlords, lenders, etc)?	Number of engagement events Public policies and procedures with discriminatory language Diversity and representation of leadership and committees when compared to community population Immigrant and refugee statistics	Survey of communications materials (media, virtual and in-person meeting conduct, public television, websites, social media, news resources, etc) Survey of existing local government policy Identification of at-risk populations Headwaters Economics Populations at Risk Tool	Local observation and data collection Michigan Labor Market Report, <a href="#">Foreign-born Population (pages 15-25)</a> Headwaters Economics, <a href="#">Populations at Risk Tool</a> <a href="#">Arrested Mobility Report</a> on discriminatory transportation policies and interventions <a href="#">Redlining &amp; Exposure to Urban Heat Islands</a>		
<b>2.43 Social Capital</b> Foster bonds, links, and bridges to strengthen social capital	Are there existing relationships that can be relied on for assistance in times of need? What does governance look like during and after a disaster event? What tools could the City provide existing organizations to strengthen their measurable impact on the community?	Response time for aid immediately following an event Resources and assistance available Number of third party organizations contributing to your city Number of resource groups for organizational leadership to connect with City staff	United Way and other philanthropic partner web pages Lists of non-profits in neighborhood block groups Council and commission members	<a href="#">Unicef</a> datasets <a href="#">CDC</a> datasets EMS response time (hospital, fire department, or third-party EMS service)	<a href="#">DisasterAssistance.gov</a> <a href="#">Michigan Community Resources</a>	<a href="#">Mural</a> <a href="#">State Preparedness Planning resources</a> <a href="#">Economic Development collaboratives</a>

# 3.0

# INFRASTRUCTURE

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**DEFINITION:** The ability for infrastructure systems to tolerate and adjust to shocks and stresses such as environmental changes and increasing demand.

**Includes:**

- Transportation (bridges, roads, rail, transit, nonmotorized paths, transportation access, transportation affordability)
- Water (stormwater, drinking water, wastewater, snow and ice)
- Energy (electricity, fuels)
- Waste
- Water

## 3.0 INFRASTRUCTURE

### INFRASTRUCTURE IN MICHIGAN

Our infrastructure needs are continually evolving. To meet the demands of our regional stakeholders, we must work together to promote a diversified, state-of-the-art infrastructure and energy network. A region with these resources, particularly in the era of this pandemic, is better positioned to confront the future that lies ahead. We must maximize our current assets and explore, develop and integrate new technologies across Michigan. This includes maintaining and upgrading the infrastructures.

Resilient infrastructure includes:

- Water reliable and safe freshwater supply; (water bodies including Lake Michigan, lakes, streams, aquifers); potable water distribution; sewage and wastewater removal system maintenance; prepared stormwater management and removal infrastructure)
- Energy: decarbonized energy supply of electricity generation (gas and coal-fired power plants, nuclear and solar, wind and hydropower); reliable energy transport (power distribution lines, natural gas distribution lines)
- Communications (cell towers and distribution infrastructure like 5G, fiberoptic wires and/or hotspot access)
- Transportation (bridges, roads, rail, transit, non-motorized paths, aviation, navigation)
- Solid waste (collection and storage)

Aviation, bridges, dams and navigation are important infrastructure systems, but they have state/regional/cross-jurisdictional operation and ownership, and thus not included in this resiliency planning focused on cities and villages.

### BASELINE

Energy infrastructures with the achievement of long-term climate goals; energy infrastructures include things like the actual generation assets of power and heating supplies, but also the distribution of these supplies via power lines. From a resilient perspective, the actual supplies are important for Michiganders to achieve their long-term carbon reduction goals, but also for maintaining reliable power and heating supplies. Ensuring that our lights are kept on is increasingly difficult in the face of challenging demand coordination; winds and convective storms are making the maintenance of power lines more frequent, and the increasing average temperature and daily weather fluctuations mean that it is increasingly difficult for utilities across Michigan to predict and maintain reliable, affordable and accessible clean energy supplies. At the same time, due to the original heavy industrial nature of Michigan, most of its actual energy supplies were made

to support the large power demands of the manufacturing industry. Today, while it is important to support industry, the demand on electricity generation is nowhere where it used to be. As such, for energy, Michigan must look to transition its electricity generation supplies in a way that meet its long-term sustainability goals. This includes strategically thinking about how to retire power plants beyond their life assets, but also, ensuring that a strong base-load power supply exists to support any fluctuation in sun and/or wind that might increase the intermittency of renewables. While it is important to identify a reliable and diverse generation supply mix, Michigan cities must also work with local utility providers to ensure electricity distribution lines (especially in dense urban centers) are upgraded to provide a reliable network for development.

Water faces a similar level of complexity; the supplies of the actual water system which provide Michigan with drinking, cleaning and operating water are increasingly vulnerable due to temperature fluctuation. Hot summers are increasing snow melt, but also annual evaporation rates. At the same time, unexpected flooding events associated with heavy rainfall mean that Michigan is dealing with the need to moderate a higher volume of water inflow than did previous generations of Michiganders. That, coupled with the age of existing water distribution and sewage lines, means pipe replacements and pipe conditions are extremely important for ensuring resilient water supplies. Towns and cities should be thinking about the infrastructures that provide and deliver their water, as well as re-envisioning appropriate water management techniques. This might mean paying stricter attention to the water flows that go through wastewater and/or sewage management systems, or even contemplating how stormwater infrastructure can help to mitigate any unanticipated water flows.

Transportation and mobility offer some of the most impactful and exciting solutions surrounding resilience and sustainability in the region. Michigan's legacy as an automotive and industrial giant also means that Michigan has a robust network of transportation distribution. Roads, railways, bridges and even dams are built-out across Michigan's expansive landmass. While other infrastructure areas require more straightforward contemplation of upgrades, thinking of the best upkeep and maintenance of these mobility ways offers exciting opportunities to support robust placemaking in Michigan. Mobility infrastructures offer increasingly important opportunities to contemplate economic mobility opportunities; cars are a critical way for Michiganders to get to work, but opportunities for ensuring a timely commute can now include cheaper and healthier alternatives, like biking and walking. It

## 3.0 INFRASTRUCTURE

is important to ensure communities have fair and equal access to transportation, and when thinking of alternate methods of commuting, this places greater emphasis on coordinating parks, sidewalks and community services alongside any transportation upgrades. Projects like “rails to trails” hinder opportunities to re-contemplate connectivity; whereas rethinking modular hydropower opportunities in an aging dam might be an interesting way of both protecting a community against flooding, while also ensuring roadways remain safe during storms. Overall, transportation resilience should target accessibility (ensuring all Michiganders have safe means to get to work, home, school and play), but also sustainability (ensuring that all Michiganders are not negatively impacted by the environmental, social or economic displacement of transportation infrastructures).

Michigan’s infrastructure resilience sits at a critical juncture. Although vulnerabilities are plentiful, mainly surrounding the age of pipes and wires, there is significant opportunity to reinforce these infrastructures to prepare Michigan residents now and in the long term. However, an increasingly important part of this is informational and educational, ensuring Michigan residents understand things like how their energy consumption can impact the environment in the long term, or simply understanding how things like saving on flushing can reduce stress on wastewater systems.

### SHOCKS

- Heatwaves
- Flooding
- Wind damage
- Winter storms
- Cyber attacks

### STRESSES

- Age of infrastructure (pipes, wires)
- Deferred maintenance
- Emerging technologies integration (tech synchronization)
- Increasing demand
- Annual average precipitation rise
- Drinking water access

### WHAT CAN YOUR COMMUNITY DO?

The most vulnerable infrastructures are those with the most shocks and stresses. All Michigan infrastructure systems are in mediocre condition, and many are at risk according to the American Society of Civil Engineers’ report card. Every four years, the American Society of Civil Engineers’ report card for America’s infrastructure depicts the condition and performance of American infrastructure in the familiar form of a school report card—assigning letter grades based on the physical condition and needed investments for improvement. Poor overall condition puts lives, communities and businesses at risk; as such, the report card was created to bring attention to the infrastructures that need attention the most.<sup>1</sup> The community should seek to prevent system failure—the targeted and disproportionate directing of resources to the most vulnerable infrastructures.

- Roads (D-) in economic manufacturing and distribution areas
- Roads (D-) near medical and food distribution facilities
- Stormwater (D-) in urban areas with combined stormwater/wastewater systems
- Stormwater (D-) in lakefront/riverfront areas
- Drinking water (D) in urban polluted areas
- Drinking water (D) in urban areas with poor water distribution lines
- Schools (D+)

<sup>1</sup> Annual report card can be found at <https://infrastructurereportcard.org>

# 3.10

## TRANSPORTATION

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## 3.10 TRANSPORTATION

### OVERVIEW

**GOAL:** Promote diverse transportation modes that are safe, low-cost and reduce vehicle miles traveled to connect people to jobs, education, amenities and housing.

### 3.11 SAFE ROADS

**OBJECTIVE:** Provide safe, well-maintained roads for all modes of transportation.

UNDERSTANDING SAFE ROADS		
What to look for	How to measure	Sample sources
How effective and accommodating are our roads for cars, bicyclists, pedestrians and transit riders?	Crash data Road and bridge condition data	National Highway Traffic Safety Administration safety information Michigan TAMC

### SUGGESTED ACTIONS

#### Cooperative

- Partner with the county and state to develop and maintain multimodal, interconnected trade, logistics and transportation systems to enhance freight mobility.
- Encourage public/private partnerships in neighborhood road condition upgrades to reduce municipal costs. Seek equity by subsidizing lower income neighborhoods.
- Consider adopting a [Vision Zero](#) action plan to eliminate traffic fatalities and injuries.

#### Physical

- Develop a schedule to bring all streets, curbs and sidewalks up to good condition.

#### Policy & Regulation

- Create an incentive program for businesses to install bike racks so people can securely leave their bicycles while visiting stores.
- Coordinate with a local bike group to gather additional cycling data at assumed high-use corridors and intersections.

### 3.12 ACCESSIBILITY

**OBJECTIVE:** Provide diverse, convenient, affordable, safe and accessible transportation choices and modes with a priority on pedestrian, bicycle and transit infrastructure.

UNDERSTANDING ACCESSIBILITY		
What to look for	How to measure	Sample sources
Can everyone get to work, school and their homes within a fair amount of time?	Residential proximity and accessibility to: <ul style="list-style-type: none"> <li>• Schools</li> <li>• Employment centers</li> <li>• Commercial centers</li> <li>• Health care</li> <li>• Food and grocery</li> <li>• Other resources and amenities</li> </ul>	NREL WalkScore Local observation
Are transit options convenient, reliable and affordable to meet the needs of residents?	Ridership rates (local or regional system data): <ul style="list-style-type: none"> <li>• Ridership trends overall</li> <li>• Ridership by stop, time of day, boarding/alighting, etc.</li> <li>• Assessment of ridership by neighborhood, income, economic center, amenities (health care, education, grocery, etc.)</li> <li>• Survey of residents and existing transit users</li> </ul>	Local or regional system data Local survey
Are mobility options affordable to residents of the area?	Transportation cost and percentage of income spent on transportation	Center for Neighborhood Technology's Housing & Transportation (H+T) affordability index

## 3.10 TRANSPORTATION

### SUGGESTED ACTIONS

#### Regulatory

- Revise parking requirements. Eliminate parking minimum requirements and consider options for parking maximums and parking pricing options to reduce reliance on single-occupancy vehicles and help facilitate a switch to climate-friendly travel options (APA, 2020. P. 10, B.1.11).
- Subdivision and other development regulations require walkability standards that encourage walking and enhance safety.

#### Physical

- Identify areas of the community that are not conducive to safe bicycling, running and walking due to a lack of lighting or poor surface conditions. Develop a plan to improve these routes.
- Ensure that all city/village streets are well-maintained and safe for all forms of transportation. Integrate complete streets guidelines to accommodate all users.
- Install sidewalks and/or pathways throughout the city/village and fill in missing sidewalk infrastructure, where feasible.
- Integrate alternative modes into existing rights-of-way. Retrofit existing streets to include enhanced bicycle and pedestrian facilities, bus lanes and other transit improvements where appropriate (APA, 2020. P. 11, B.4.2).
- Implement “last-mile” transportation options to bridge gaps between existing transit nodes and destinations within a community (APA, 2020. P. 36, G.3.2).
- Plan for first/last mile connectivity. Promote first/last mile travel options that do not require automobiles, such as walking, bikes, scooters and other micro-mobility options (APA, 2020. P. 9, B.1.4).
- Include emerging technologies as part of transit system design. Develop transit stations that include facilities that incorporate the use of emerging transportation technologies such as autonomous vehicles, electrified rail, and micro-mobility options (APA, 2020. P. 9, B.1.5).

#### Cooperative

- Continue to participate in county and regional intra- and inter-county trailway planning to offer trail connectivity among residents, employment and shopping destinations.
- Advocate in the region for increased frequency of public bus service throughout the city/village.
- Partner with the county and state to develop and maintain multimodal, interconnected transit and roads transportation systems to enhance personal mobility. Types of rural public transportation include demand-response public transportation (dial-a-ride), traditional and deviated fixed route services (e.g., shuttles, circulators), vanpool or reimbursement programs.
- To encourage the use of public transportation, work with employers to offer incentives to help reduce the cost to the user, including free or discounted bus passes, employer-provided subsidies, reimbursements, partial payments or pre-tax payroll reductions.
- Work with employers to increase opportunities for telecommuting.

#### Information

- Provide residents with clear understanding of how to navigate bus, bike and automobile routes.

#### Policy & Regulation

- Revise future land-use and zoning maps to encourage personal services such as pharmacies, groceries and hardware stores in localized areas.
- Revise future land use and zoning maps to encourage higher-density, mixed-use nodes along major roads that will promote use of existing transit service or support future transit service.

# 3.20

## WATER

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## 3.20 WATER

### OVERVIEW

**GOAL:** Monitor water risks and quality in the community to provide safe, accessible drinking water and appropriate storm and wastewater management systems.

### 3.21 WATER CONSUMPTION

**Objective:** Minimize water use and demand while providing safe, accessible drinking water to all residents.

#### UNDERSTANDING DRINKING WATER

What to look for	How to measure	Sample sources
Is our water supply clean and safe for our citizens to drink?	Potential sources of contamination Water quality reports	EPA drinking water assessment EPA My Waterway EPA water quality and surveillance and response USGS National Water Information System Michigan wellhead protection areas
Do all occupied homes in our community have reliable running water?	Local water supply reports Water quality reports Utility shut offs	EPA drinking water data

### SUGGESTED ACTIONS

#### Information

- Monitor the gallons pumped from groundwater, Great Lakes and inland surfaces to determine total gallons from all sources.
- Monitor drinking water consumption by sector (commercial, institutional, industrial, manufacturing, irrigation, livestock, public).

#### Planning

- Adopt a community-wide water management plan to improve water efficiency and reductions by residential and commercial sectors.
- Develop and provide water conservation programs to residents and businesses to reduce domestic water usage.

#### Market-based

- Coordinate with utility providers to ensure utility pricing overall matches the infrastructure needs of replacement infrastructure.
- Create incentives to encourage the new construction of water-efficient buildings and landscaping.

#### Physical

- Replace drinking water distribution lines, especially lead lines.
- Manage and upgrade infrastructure to reduce leaks in the drinking water system, eliminate contaminants and achieve other local conservation goals.

#### Policy & Regulation

- Consider implementing a well head protection ordinance to protect the city/village's drinking water supply from degradation or contamination.
- Establish water quality monitoring and public reporting systems. Require that the water utility report drinking water quality tests and increase testing. Local water utilities should follow federal guidelines for municipal excellence on environment (available through the EPA) and should follow state-level DEP guidelines for environmental management.
- Establish protocols in the case of insufficient clean water supply to meet the needs of low-income and other vulnerable populations.
- Adopt plumbing, building and/or zoning codes that promote water efficient practices and products.
- Train inspectors to enforce water efficiency standards in adopted plumbing, building and zoning codes.

#### Voluntary/Cooperative

- Encourage public/private partnerships in neighborhood water utility upgrades to reduce municipal costs. Seek equity by subsidizing lower income neighborhoods.
- Create a comprehensive education and outreach campaign to engage residents and businesses in water efficiency efforts.
- Work with the local utilities to increase smart meters for water use throughout the community.

## 3.20 WATER

### 3.22 WASTEWATER SYSTEMS

**OBJECTIVE:** Ensure regular sewer system and septic maintenance.

#### UNDERSTANDING WASTEWATER SYSTEMS

What to look for	How to measure	Sample sources
Are we experiencing sewer system overflows or non-point source groundwater pollution?	Sewer overflow data Local reports Percentage of population served by centralized wastewater management (v. on-site septic systems)	EPA conduct a drinking water or wastewater utility risk assessment National Infrastructure Advisory Council Water Sector Resilience

#### SUGGESTED ACTIONS

##### Cooperative

- Investigate the potential for the creation of a septic system maintenance program for properties not served by municipal sewer services.

##### Information

- Monitor the age and condition of sewer infrastructure.
- Monitor the days per year that the sanitary sewer system overflows.

##### Market-based

- Coordinate with utility providers to ensure utility pricing overall matches the infrastructure replacement needs.

##### Physical

- Expand the capacity of the city/village's wastewater treatment facilities to accommodate current needs and enable future growth.
- Investigate the potential for providing public sewer to properties without sewer service that are near sensitive water bodies.
- Separate combined stormwater and wastewater systems.
- Upgrade and improve stormwater and wastewater treatment facilities to meet current and foreseeable needs.

### 3.23 STORMWATER MANAGEMENT

**OBJECTIVE:** Minimize runoff into stormwater infrastructure and reduce flooding.

#### UNDERSTANDING STORMWATER MANAGEMENT

What to look for	How to measure	Sample sources
Is the existing stormwater system condition and capacity adequate to support current needs and projected needs for significant (100-year) storm events?	Stormwater system condition and capacity	Local municipality, county, and regional records and data EPA national stormwater calculator From LIAA (p. 78): Local municipalities and their engineering/building departments <ul style="list-style-type: none"> <li>County drain commissioners and road commissions</li> <li>County/local GIS departments</li> <li>Regional councils of governments</li> </ul>
Where do we have flooding, ponding, surface erosion or sewer overflow issues?	Local reports Sewer overflow data (frequency, location, volume, impacts and event) Floodplain data Local observations	Local observation Local reports FEMA

## 3.20 WATER

### SUGGESTED ACTIONS

#### Information

- Assess age and condition of stormwater infrastructure.
- Assess ratio of pervious to impervious surface and impacts to stormwater runoff.
- Inventory the location, service area, capacity, type and condition of existing green stormwater infrastructure. Assess and address gaps in stormwater management.
- Educate the public on the many benefits of green infrastructure by using public properties as demonstration projects.
- Monitor increase in water levels and flooding.
- Monitor water level rising and surface temperature at the edges of water bodies.
- Monitor yearly land recession rate.
- Study the capacity of the stormwater sewer system to better understand if it can handle heavy precipitation events.

#### Physical

- Utilize green infrastructure best practices. Retrofit existing streets to incorporate green infrastructure elements that address stormwater management, wildlife passage and urban heat island impacts, and improve air quality and incorporate other natural system best practices (APA, 2020. P. 11, B.4.3).
- Conduct street vacuuming or street sweeping on a regular basis.
- Investigate the feasibility of installing pervious pavement in city/village-owned parking lots, in new sidewalk projects and on low-traffic roadways.
- Reduce over time the critical stormwater infrastructure below code standards that is in designated high-risk flooding areas.
- Undertake an evaluation of city/village buildings and facilities to identify improvements to reduce stormwater runoff and implement those that prove feasible.

#### Policy & Regulation

- Reduce over time the percentage of residents living in designated high-risk flooding areas.
- Enact zoning ordinance regulations that prohibit the clearing or grading of land without proper zoning approvals and erosion control permits.
- Establish stormwater management standards that prevent direct discharge of storm or melt water into surface water.
- Review current zoning standards for lots near sensitive water bodies to ensure that they include items such as: maximum allowable impervious surface coverage levels; setbacks for structures, driveways and parking areas; greenbelts/vegetative buffers and greenbelt design standards; and prohibition of the use of herbicides, pesticides and fertilizers within greenbelts/vegetative buffers.

#### Voluntary

- Encourage residential and commercial rainwater capture and reuse.
- Encourage the use of low impact development (LID) stormwater control techniques like rain gardens, bio-retention areas and bioswales in private developments.
- Provide incentives for on-site stormwater treatment to reduce standing water.

*See also: "Planning for Resilience in Michigan" (LIAA 2017)*

# 3.30

## ENERGY

## 3.30 ENERGY

### OVERVIEW

**GOAL:** Increase energy security, accessibility and sustainability and promote long-term decarbonization.

### 3.31 SUSTAINABLE ENERGY

**OBJECTIVE:** Reduce the energy use intensities of the built environment.

#### UNDERSTANDING SUSTAINABLE ENERGY

What to look for	How to measure	Sample sources
Do our buildings have an energy use intensity in line with DOE recommendations?	Energy use intensity	Zero-tool

### SUGGESTED ACTIONS

#### Policy & Regulation

- Require that Demand Response be permitted for energy consumers. Demand response provides an opportunity for consumers to play a significant role in the operation of the electric grid by encouraging them to reduce or shift their electricity usage during peak periods in response to time-based rates or other forms of financial incentives.
- Require alternative energy facilities. Require the installation of electric charging stations and/or alternative fueling stations and its infrastructure in both publicly accessible locations and new development projects that require additional off-site parking or additional on-street parking on public streets (APA, 2020. P. 9, B.1.3).
- Evaluate the local ordinance to support renewable energy and adjust as needed to improve feasibility and encourage use.
- Decommission power plants beyond end of life and high in coal intensity.

#### Physical

- Undertake an evaluation of city/village buildings and facilities to identify improvements to reduce energy consumption and implement those that prove feasible.
- Install or continue to retrofit existing streetlight fixtures with energy-efficient light fixtures.
- Reduce transit emissions. Transition public transit systems to electricity rather than fossil fuels to reduce carbon emissions (APA, 2020. P. 10, B.1.9).
- Replace power and natural gas distribution lines.
- Promote microgrids as a strategy for community energy independence.

#### Program

- Implement solar and other on-site energy capture programs. Create programs to provide alternative energy sources (e.g., solar panels) that support lower utility bills for low-income communities, while also providing jobs to those communities and achieving a smaller overall energy footprint. Support development of community-located solar arrays where rooftop resources are limited (APA, 2020. P. 31, E.5.1).

- Provide accessible programs and tools to support residential facility energy tracking, audits and benchmarking (APA, 2020. P. 31, E.5.5).
- Provide job transition programs for those in closed utility facilities.

#### Information

- Identify energy conservation systems and programs in municipal operations and in local businesses and residences, educate business owners and residents, and encourage reductions in energy consumption.
- Create a task force of diverse stakeholders (city staff, HVAC and energy efficiency experts, passionate residents) to research alternate residential and commercial energy systems, and then educate the community on those systems.
- Create and promote apps and portals that inform the public on air quality levels.
- Encourage the development of energy-efficient buildings and sites, such as an energy audit program.
- Monitor average temperature and average precipitation each year.
- Monitor energy consumption by source (coal, ethanol, natural gas etc.) and consumption by sector (residential, commercial, industrial, transportation).
- Monitor the existing installed solar panels (Kw or Mw) and identify areas qualified for solar panels (both within Google Project Sunroof dataset).
- Work with local builders to host energy efficiency training programs such as LEED and encourage builders to seek professional certifications in these programs.

#### Market-based

- Coordinate with utility providers to ensure utility pricing overall matches the infrastructure needs of replacement infrastructures.

## 3.30 ENERGY

### 3.32 ENERGY AFFORDABILITY

**OBJECTIVE:** Ensure adequate availability of affordable energy utility options.

#### UNDERSTANDING AFFORDABLE UTILITIES

What to look for	How to measure	Sample sources
What is the cost burden of energy utility payments in our neighborhood; what percentage of their income do our residents spend on energy utilities?	Utility bills as a percentage of income Energy system dependencies	EPA EJ Atlas NIST, "Assessing Energy System Dependencies"

#### SUGGESTED ACTIONS

##### Information

- Monitor the cost and cost burden of energy utility per household.

##### Market-based

- Use power-purchase agreements to increase the opportunity and incentives for increased residential solar installation.

##### Physical

- Increase the community's overall electric utility-generating capacity that comes from renewable energy sources.

### 3.33 CARBON FOOTPRINT

**OBJECTIVE:** Lower the carbon footprint of the built environment.

#### UNDERSTANDING CARBON FOOTPRINT

What to look for	How to measure	Sample sources
What is the carbon footprint of the buildings in our community?	Metric tons of CO <sub>2</sub> equivalent per zip code and by land-use sector	Cool Climate maps

#### SUGGESTED ACTIONS

##### Market-based

- Support federal efforts to create a carbon tax and/or carbon pricing.
- Use PACE financing mechanisms to solve financial gaps for commercial energy upgrades.

##### Policy & Regulation

- Promote local building insulation and weatherization programs to reduce heating and cooling costs while lowering the carbon footprint of buildings. These programs are an opportunity for a significant number of new jobs that can be prioritized for local residents (APA, 2020. E.5.4).

# 3.40

## WASTE

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## 3.40 WASTE

### OVERVIEW

**GOAL:** Ensure comprehensive waste and recycling operations, policies and adoption in our community.

### 3.41 WASTE MANAGEMENT

**OBJECTIVE:** Strengthen public emergency communication channels.

#### UNDERSTANDING WASTE MANAGEMENT

What to look for	How to measure	Sample sources
What are the waste and recycling practices and policies in our community?	Waste and recycling program and policy evaluation Ratio of landfill, diverted waste and recycled content	U.S. Waste Reduction Model (WARM)

### SUGGESTED ACTIONS

#### Information

- Increase awareness of recycling services and support efforts to create a city composting program for residents.

#### Program

- Promote the expansion of recycling. In most cases, recycling reduces GHG emissions because it takes less energy to manufacture a recycled product than it does from virgin materials. The expansion of recycling will require both support for more recycling programs and opportunities and significant support for identifying cost-effective uses for recycled products. This may include stricter requirements on solid waste and incentives for the use of recycled products. Regional composting and recycling solutions offer opportunities to make them more commercially viable (APA, 2020. P. 21, C.7.4).
- Create a public education campaign or a focused outreach effort to inform residents and businesses of their roles in achieving waste reduction targets.
- Promote the expansion of composting and waste-to-energy generation. Composting, when reapplied as part of a soil or fertilizer replenishment program, results in fewer emissions of GHGs and small amounts of carbon storage. Waste-to-energy generation, when it displaces fossil-fuel derived generation, results in a reduction of GHG emissions (APA, 2020. P. 21, C.7.5).
- Collaboratively create and run targeted recycling programs at key locations throughout the community.
- Operate specific waste management programs for critical

waste stream types found in the community, such as organic waste, hazardous waste, electronic waste and construction and demolition waste.

- Incentivize circular practices (rebates for equipment used in rainwater harvesting, renewable energy, composting programs, WTE systems, etc).
- Incentivize businesses that encourage returnable and reusable bags and containers, bulk refill stations, and compost/recycling.

#### Policy & Regulation

- Adopt a waste management plan.
- Promote the reuse of materials. Less energy is needed to extract, transport and process raw materials and to manufacture products when people reuse already made products and materials. Examples that support reuse include removing regulatory barriers to facilities or programs that focus on reuse (e.g., donation stores, neighborhood and garage sales, etc.) (APA, 2020. P. 21, C.7.3).
- Adopt specific product bans that will significantly advance progress towards waste reduction goals.

#### Physical

- Support changes in the design, retrofitting, operation and management of waste disposal sites. Advances in the design, operation and management of landfills (both existing and closed) and sewer treatment plants will be needed so that methane emissions are controlled and, where feasible, reused for energy production (APA, 2020. P. 21, C.7.6).



# 3.50

## COMMUNICATIONS

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## 3.50 COMMUNICATIONS

### OVERVIEW

**GOAL:** Ensure equitable access to information technology and create redundancy in telecommunications and broadband networks to protect commerce and public safety in the event of natural or man-made disasters.

### 3.51 EMERGENCY COMMUNICATIONS

**OBJECTIVE:** Strengthen public emergency communication channels.

#### UNDERSTANDING EMERGENCY COMMUNICATIONS

What to look for	How to measure	Sample sources
In the case of an emergency, do people know best procedures (e.g., how to evacuate and where to go, when to shelter in place, etc.)?	Local radio channels and TV stations Local emergency broadcast systems Local sirens and community alerts Evacuation plans and protocols	Michigan statewide communication planning NIST, "Communication Service Provider Coordination Guide"

### SUGGESTED ACTIONS

#### Information

- Provide business owners and residents with clear understanding of how to navigate evacuation routes.
- Monitor the total amount of customers out of power per census tract after a mass power outage.
- Publish information to encourage residents to develop emergency kits and evacuation plans, and encourage businesses to develop emergency procedures and shelter-in-place plans.

#### Program

- Develop emergency management and evacuation strategies that prioritize vulnerable populations, including designing warning systems to reach those with limited English proficiency and persons with disabilities, and evacuation

strategies that focus on persons with disabilities, the transportation-disadvantaged and those living in flood- or fire-prone areas (APA, 2020. P. 32, E.7.1).

- Improve digital access to information in underserved communities through programs that bring current technology and connectivity to those residents, especially critical health and safety information, including advance warning and notification systems (APA, 2020. P. 32, E.7.5).
- Participate in cross-department/agency interstate, statewide, regional or inter-jurisdictional mutual aid response systems.
- Post/publish/broadcast information across television, social media, news sources, radio, etc. to reach as many community members as possible without excluding populations without access to internet.

### 3.52 FIBER & BROADBAND

**OBJECTIVE:** Strengthen and increase communications networks.

#### UNDERSTANDING FIBER & BROADBAND

What to look for	How to measure	Sample sources
Do people have access to reliable Internet?	Broadband availability Provider availability Download/upload speeds	FCC Connected Nation

### SUGGESTED ACTIONS

#### Information

- Design a comprehensive broadband adoption and digital literacy initiative targeting residential, institutional and commercial users.

#### Market-based

- Partner with broadband providers to improve access to high-speed and reliable wireless broadband service

throughout the community.

#### Cooperative

- Work with private communication providers to ensure that all residents and businesses have fiber optic broadband access.

## 3.50 COMMUNICATIONS

### 3.53 WI-FI

**OBJECTIVE:** Offer free public access to Wi-Fi in easily accessible locations.

UNDERSTANDING WI-FI		
What to look for	How to measure	Sample sources
Is public Wi-Fi available in key locations (schools, downtowns, parking lots) in cases of emergency?	Public Wi-Fi hotspots	Connected Nation

### SUGGESTED ACTIONS

#### Physical

- Create Wi-Fi zones in strategic areas of the city.
- Upgrade telecommunications networks to 4G, 5G.

#### Program

- Technology and communications. Support technology and business practices that encourage telecommuting and enable people to reduce vehicle miles traveled from home to work.

These include the use of home offices and technology such as wireless communications and videoconferencing, and the expansion of high-speed, affordable broadband to all communities (APA, 2020. P. 27, D.6.1).

See also [Connected Nation Michigan](#)

# 3.0

## METRIC RESOURCE TABLE

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# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS
<b>3.10 TRANSPORTATION: Promote diverse transportation modes that are safe, low-cost and reduce vehicle miles traveled to connect people to jobs, education, amenities, and housing</b> RRC Best Practices: 1.2 Downtown or Corridor Plan, 2.5 Parking Flexibility						
<b>3.11 Safe roads</b> Provide safe, well-maintained roads for all modes of transportation	How effective and accommodating are our roads for cars, bicyclists, pedestrians, and transit riders?	Crash data Road and bridge condition data	National Highway Traffic Safety Administration Safety Information Michigan TAMC	<a href="#">National Highway Traffic Safety Administration</a> <a href="#">Michigan TAMC interactive road, bridge and culvert condition map</a>	<a href="#">Fatality Analysis Reporting Systems (FARS) encyclopedia</a> MDOT Complete Streets	<a href="#">Complete Streets Michigan communications toolkit</a>
	Can everyone get to work, school, and their homes within a fair amount of time?	Residential proximity and accessibility to: <ul style="list-style-type: none"> <li>• Schools</li> <li>• Employment centers</li> <li>• Commercial centers</li> <li>• Health care</li> <li>• Food and grocery</li> <li>• Other resources and amenities</li> </ul>	NREL Walkscore Local observation	<a href="#">NREL</a>	<a href="#">NREL transportation and mobility research</a>	<a href="#">Walkscore methodology</a> <a href="#">National household travel survey</a> <a href="#">Mobility affordability calculator</a>
	Are transit options convenient, reliable and affordable to meet the needs of residents?	Ridership rates (local or regional system data) <ul style="list-style-type: none"> <li>• Ridership trends overall</li> <li>• Ridership by stop by time of day, boarding/alighting, etc</li> <li>• Assessment of ridership by neighborhood, income, economic center, amenities (health care, education, grocery, etc)</li> </ul> Survey of residents and existing transit users	Local or regional system data Local survey	Local or regional system data Local survey	<a href="#">IJA Notice of Funding Opportunity (NOFO) Tracker</a>	
<b>3.12 Accessibility</b> Provide diverse, convenient, affordable, reliable, safe and accessible transportation options and modes with a priority on pedestrian, bicycle and transit infrastructure.	Are mobility options affordable to residents of the area?	Transportation costs and percentage of income spent on transportation	Center for Neighborhood Technology's Housing & Transportation (H+T) affordability index	<a href="#">H+T Index</a>	<a href="#">Department of Energy Office of Energy Efficiency and Renewable Energy Mobility</a>	<a href="#">DOT, Proximity to major roadways calculator</a> <a href="#">Transportation ROI calculator</a> <a href="#">Personal transportation calculator</a> <a href="#">Mobility Lab transportation cost-savings calculator</a>
<b>3.20 WATER: Monitor water risks and quality in the community in order to provide safe, accessible drinking water and appropriate storm and wastewater management systems.</b> RRC Best Practices: 2.6 Green Infrastructure + 1.3 CIP						
<b>3.21 Water consumption</b> Minimize water use and demand while providing safe, accessible drinking water to all residents	Is our water supply clean and safe for our citizens to drink?	Potential sources of contamination Water quality reports	EPA Drinking Water Assessment EPA My Waterway EPA Water Quality and Surveillance and Response USGS National Water Information System Michigan wellhead protection areas	EPA, <a href="#">Conduct a Drinking Water or Wastewater Utility Risk Assessment</a> EPA, <a href="#">My Waterway</a> EPA, <a href="#">Water quality and surveillance and response</a> <a href="#">USGS National Water Information System</a> <a href="#">Michigan Wellhead Protection Areas</a> EPA, <a href="#">Drinking Water Mapping Application to Protect Source Waters (DWMAPS)</a>	<a href="#">DEHBio Biomonitoring and PFAs Health Studies</a>	<a href="#">Michigan Department of Environment, Great Lakes, and Energy Drinking Water Concern System</a> <a href="#">Resources for communities located near dams</a>
	Do all occupied homes in our community have reliable running water?	Local water supply reports; Water quality reports Utility shut-offs	EPA drinking water data	EPA, <a href="#">Drinking Water Mapping Application to Protect Source Waters (DWMAPS)</a>	<a href="#">Michigan Office of the Clean Water Public Advocate</a>	<a href="#">Department of Environment, Great lakes, and Energy Office of the Clean Water Public Advocate</a> <a href="#">Business Leaders for Michigan, Michigan's business roundtable</a>
<b>3.22 Wastewater systems</b> Ensure regular sewer system and septic maintenance	Are we experiencing sewer system overflows or non-point source groundwater pollution?	Sewer overflow data Local reports Percentage of population served by centralized wastewater management (v. on-site septic systems)	EPA, "Conduct a Drinking Water or Wastewater Utility Risk Assessment" National Infrastructure Advisory Council Water Sector Resilience	EPA, <a href="#">Conduct a Drinking Water or Wastewater Utility Risk Assessment</a> <a href="#">National Infrastructure Advisory Council Water Sector Resilience</a>	<a href="#">MSU septic systems report</a>	<a href="#">Flood guide for water and wastewater utilities</a>

# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS
<b>3.23 Erosion and flooding</b> Minimize runoff into stormwater infrastructure and reduce flooding	Is the existing stormwater system condition and capacity adequate to support current needs and projected needs for significant (100-year) storm events?	Stormwater system condition and capacity	Local municipality, county, and regional records and data EPA National Stormwater calculator From LIAA (p. 78)—Local municipalities and their engineering/building departments: <ul style="list-style-type: none"> <li>County drain commissioners and road commissions</li> <li>County/local GIS departments</li> <li>Regional councils of governments</li> </ul>	<a href="#">EPA National Stormwater Calculator</a>	<a href="#">Basics of water resilience</a> <a href="#">Michigan Water Environment Association</a>	<a href="#">U.S. EPA Tabletop Exercise Tool for Water Systems</a>
	Where do we have flooding, ponding, surface erosion, or sewer overflow issues?	Local reports Sewer overflow data Floodplain data Local observations	Local observation Local reports FEMA	<a href="#">FEMA flood maps</a> <a href="#">NOAA Great Lakes level viewer</a>	<a href="#">FEMA floodplain mapping</a> Michigan Prepares, " <a href="#">Michigan criteria for on-site wastewater treatment</a> "	<a href="#">Household emergency planning tool</a>
<b>3.30 ENERGY: Increase energy security, accessibility, and sustainability and promote long-term decarbonization</b>						
<b>3.31 Sustainable energy demand</b> Reduce the energy use intensities of the built environment	Do our buildings have an energy use intensity in line with 2030 goals?	Energy Use Intensity (total energy divided by total building square footage)	Zero-tool	<a href="#">Zero Tool for Portfolios</a>	<a href="#">Michigan Office of Climate and Energy</a>	Zero-tool; <a href="#">Arch Tool Box</a>
<b>3.32 Energy affordability</b> Ensure adequate availability of affordable energy utility options.	What is the cost burden of energy utility payments in our neighborhood; what percentage of their income do our residents spend on energy utilities?	Utility bills as a percentage of income Energy System Dependencies	EPA EJ Atlas NIST, "Assessing Energy System Dependencies"	<a href="#">EPA EJ Atlas</a> NIST, " <a href="#">Assessing Energy System Dependencies</a> "	ACEEE, " <a href="#">How High are Household Energy Burdens?</a> "	<a href="#">EPA EJ Screen</a> NIST, " <a href="#">Assessing Energy System Dependencies</a> "
<b>3.33 Low-carbon energy supplies</b> Reduce the carbon footprint of energy generation sources	What is the carbon impact of the fuel sources supplying our buildings and transport?	Metric tons of CO <sub>2</sub> equivalent per kWh, kbtu, or per square foot of land	EPA Emissions and Generation Resource Integrated Database	<a href="#">Egrid database</a>	<a href="#">EIA State Generation Profiles</a>	<a href="#">Carbon footprinting calculators for businesses and homes</a>
<b>3.40 WASTE: Adopt resilient and effective waste management and recycling program strategies in our community.</b>						
<b>3.41 Waste management</b> Ensure comprehensive waste and recycling operations, policies, and adoption in our community.	What are the waste and recycling practices and policies in our community?	Waste and recycling program and policy evaluation Ratio of landfill, diverted waste, and recycled content	U.S. Waste Reduction Model (WARM)	<a href="#">U.S. Waste Reduction Model (WARM)</a>		<a href="#">U.S. Waste Reduction Model (WARM)</a> <a href="#">Michigan Department of Health and Human Services</a> <a href="#">Indiana University</a> <a href="#">Indiana University</a>
<b>3.50 COMMUNICATIONS: Ensure equitable access to information technology and create redundancy in telecommunications and broadband networks to protect commerce and public safety in the event of natural or man-made disasters</b>						
<b>3.51 Emergency communications</b> Strengthen public emergency communication channels	In the case of an emergency, do people know best procedures (e.g., how to evacuate and where to go, when to shelter in place, etc)?	Local radio channels and TV stations Local emergency broadcast systems Local sirens and community alerts Evacuation plans and protocols	Michigan Statewide Communication Planning NIST Communication Service Provider Coordination Guide	<a href="#">Michigan Statewide Communication Planning</a> NIST, " <a href="#">How Communities Can Work with Communication Service Providers to Understand Communication Systems</a> "	<a href="#">Local emergency management programs</a>	<a href="#">Michigan Department of Health and Human Services</a> NIST, " <a href="#">Community Resilience Planning Guide Playbook</a> " Templates & Additional Resources (templates included under Step 2) Ready.gov, " <a href="#">Guide for Emergency Preparedness for Individuals with Disabilities</a> "

# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS
<b>3.52 Fiber and broadband</b> Strengthen and increase communications networks	Do people have access to reliable Internet?	Broadband availability Provider availability Download/upload speeds	FCC Connected Nation	<a href="#">FCC coverage maps</a> <a href="#">Connected Nation</a>	<a href="#">Google Speed Test</a>	
<b>3.53 Wi-Fi</b> Offer free-public access to Wi-Fi in easily accessible locations	Is public Wi-Fi available in key locations (schools, downtowns, parking lots) in cases of emergency?	Public Wi-Fi hotspots	Connected Nation Michigan	<a href="#">Connected Nation Michigan map</a>		<a href="#">Michigan Communications Planning</a>

# 4.0 ECONOMY

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**DEFINITION:** Ensuring the capabilities of communities to prosper financially, including the ability to recover after down-turns To build a diverse and robust economy, one that is able to recover quickly from and withstand shocks altogether. Includes:

- Training
- Entrepreneurship
- Business support
- Financing
- Innovation



# 4.0 ECONOMY

## ECONOMY IN MICHIGAN:

Economy is a complicated web of supply and demand, but most simply can be defined as ensuring the capability of individuals to provide their own financial success, mainly through a means of employment. Resilient economies include the businesses, institutions, and agencies that provide financial capital to support community livelihoods. A robust economy provides the resources needed to develop the critical infrastructures—technical, environmental, and social—that are needed for communities to thrive in the long-term; here, one can see a critical link between the preparation of individuals in training and education, and their ability to gain income. A resilient economy is also one that is prepared to weather financial downturns and has measures in place to help aid its members in recovery from lagging revenue streams.

Resilient economy includes:

- **Workers:** workforce development and training; equitable wages; supportive and fair benefits, including training such as language proficiency, education access and attainment, higher education attainment, literacy, retention, job training and apprenticeship.
- **Entrepreneurship:** Local small and medium-sized enterprise retention and development, including a focus on stable income streams, capital and financing, as well as physical innovation incubation.
- **Partnerships:** the public and private sector organizations in a community that organize services, labors, or traded goods to maintain stable means of revenue. Key to resilience are these organizations looking to foster industry diversity and recruitment.

Key to a resilient economy are all of these mechanisms working together in constant fluidity. A resilient economy is one that is prepared to withstand shocks and stresses specific to economic downturn, which includes preparing for dips in typical economic cycles. It is critical to ensure a robust diversity across the participants in good and service delivery, as well as having well-functioning consumers who are prepared to buy goods and services. Consumers are those who buy the goods in an economy. “Prosumers” are those that buy the goods, but then talk about it to others—thereby, acting as a positive economic influencer for the good itself. While industry and business are indeed key for the economy, the protection and preparedness of consumers play a much more significant role in local economies. The price of goods heavily depends on the demand of the good itself, and as such, ensuring that consumers

have a flexible enough income stream to buy the goods they need to both live and thrive are key to a resilient economy. When considering economic shocks impacting individuals, it is important to ensure consumers are able to continue maintaining their purchase power; this means ensuring that they are receiving stable income to spend, and also, feel positive about that income stream continuing to occur. A resilient consumer is one that is not only able to survive a hit to their own income but is prepared to help increase purchasing power in their local economy to help small and medium businesses survive. In this instance, one can see how government agencies are important for informing consumers on the future projects and needs of local economic activity.

## BASELINE

Businesses in Michigan play a substantial role in employment and revenue generation for the state of Michigan. Industry activity in Michigan is heavily centered around manufacturing and is broken down in these main areas: automotive, medical device, cybersecurity, carbon fiber and lightweight composite, and even aerospace manufacturing. Health care, information technology, life sciences, agribusiness, and defense also employ several thousand people in Michigan. However, it’s important to recognize the size of these industries within the state. In 2020, nearly 99.6% of businesses in Michigan were those registered as small businesses, which employed over 1.9 million people across the state.<sup>1</sup>

The most effective tool for delivering robust resilience is having a long-term economic outlook as to what industries, skills, and institutions are necessary for sustainable economic activity. Within Michigan, there are institutions that have been specifically created to maintain a focus on the robustness of the economy. The Michigan Economic Development Corporation (MEDC) is a public/private partnership agency and economic development corporation dedicated to the economic enhancement of the U.S. state of Michigan. MEDC today exists as an interlocal agreement between public agencies and Michigan Strategic Fund, and is focused on promoting economic development and creating good jobs across the state. MEDC and Michigan Economic Developers Association are the two primary ED training providers. The regional planning commissions serve as the EDA economic development districts (EDDs)—with the exception of Southeast Michigan Council of Governments. Together, these entities are focused on developing additional training and partnerships to broaden access to MEDC tools and programming. Of most importance is the central strategic vision that MEDC delivers

<sup>1</sup> 2022 Small Business Economic Profile, U.S. Small Business Administration. <https://advocacy.sba.gov/wp-content/uploads/2022/08/Small-Business-Economic-Profile-US.pdf>

## 4.0 ECONOMY

in collaboration with private and public sector leaders. Specific to resilience, the MEDC takes a role in focusing on two key historical problems and opportunities: economic downturns as well as automation potential.

Michigan's historic focus on manufacturing has resulted in a lack of diversity in employers, but also a positive benefit of having some of the nation's largest single employers being located within the state. While having industry giants has been beneficial to the overall economic development of the state, it has also been inhibiting. When a few companies suffer, unemployment rates can skyrocket; as such, it is an important part of Michigan's strategic vision to focus on diversifying the job providers, both in terms of large corporate opportunities but also in enhancing entrepreneurial activities (specifically when considering the opportunity in developing small and medium businesses into larger enterprises). Financing has historically been a challenge for these entities to "scale." As such, it is important today for communities to recognize their entrepreneurial assets and provide a fostering incubation environment, one that includes both space and financial resources for growth and development.

Public sector agencies specific to economic development associations, regional and local economic development associations, and even non-profit economic organizations like MEDC, play a critical role in streamlining these funding efforts between the federal government and lower-level economic activity. Whether playing a role in distributing funds, or helping to communicate on information, governmental agencies are critical for ensuring a cohesive approach between public/private collaboration. When thinking of resilience, it is increasingly essential that governmental agencies are prepared to communicate clearly and quickly with private agencies and the broader civilian population. Resilience infers a specific degree of preparedness ahead of emergencies, and also a deep need for clear coordination during times of crisis. The more governments can help to act as organizational entities, the better prepared communities will be ahead of and during unexpected events.

### SHOCKS

- Global and national economic downturn: reduces demand for local goods and spending
- Local industry-specific downturns
- Local educational closure impacting the supply of employees/labor for the production of goods and services
- Large employer closure such as a major corporation or institution

- Natural disasters (severe winter weather, thunderstorm/high wind/hail/lightning, wildfire, extreme temperatures, drought, tornadoes, flooding)
- Human-made disasters (nuclear attack, sabotage/terrorism, structural fires, petroleum/gas pipeline accidents, infrastructure failure, transportation/hazardous materials incidents, fixed site/hazardous materials incidents, public health emergencies, subsidence/ground movement, fixed site hazardous materials incident)
- Civil disturbances
- Public health emergency

(Sources: U.S. EDA CEDS guidelines, natural hazards plans)

### STRESSES

- Aging population
- Breakdown of collaboration
- Climate adaptation costs
- Declining tax base/property value
- Industrial/commercial activity decline
- Economic dependency: excessive dependency on a single employer or industry
- Lack of capital/impediments hindering a firm's ability to gain access to the financial resources required to advance its business/unequal financial practices
- Lack of transportation access/options
- Low broadband access and/or adoption
- Skills/jobs mismatch/unemployment/poorly educated workforce

### WHAT YOUR COMMUNITY SHOULD DO

The most vulnerable economies are those that lack robustness across skills, employers, and even economic activity. Long-term strategic planning on economic development needs is important for avoiding short-term shocks both at the local and regional level.

- Conduct a self-assessment
- Consider each of the themes from this section that ranked highly in your self-assessment
- Work with region or county to update a local/regional comprehensive economic development strategy (or CEDS)
- Check out the resources for links to more information on the topics of interest to you
- Use the suggested language in each table as a starting point when crafting policies or regulations or action plans

# 4.10

## WORKERS

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## 4.10 WORKERS

### OVERVIEW

**GOAL:** Create strong training programs

### 4.11 WORKFORCE DEVELOPMENT

**OBJECTIVE:** Expand job and educational training programs that support upward economic mobility, and better living wages so that all working people and their families can afford basic necessities

#### UNDERSTANDING WORKFORCE DEVELOPMENT

What to look for	How to measure	Sample sources
Do we have training programs to prepare our citizens for solid employment opportunities?	Educational attainment and numbers of community colleges, continuing education programs, higher-education programs	U.S. Census Data Data.io Headwaters Economics, "Populations at Risk Tool"

### SUGGESTED ACTIONS

#### Cooperative

- Collaborate with existing young professionals to identify the concerns and needs of younger population. Based on this information, enact a set of initiatives in order to better support young professionals and entrepreneurs such as: business seminars, speakers, business plan competitions, investment forums, social events, relocation support, mentoring, and referrals.
- Create or expand leadership training programs that encourage young private sector emerging leaders to intern or shadow in city hall to cultivate cross-sector ambassadors.
- Partner with career technical centers and community colleges to expand technical educational opportunities both secondary and post-secondary to promote the job-driven skills strategies and support organizations to build a resilient workforce that can better shift between jobs or industries.
- Partner with career technical centers, community colleges, and employers to expand options for high school students to become industry certified while still in high school, as an alternative to college path.
- Partner with career technical centers, community colleges, and employers to create online and distance learning programs for students that lack other means of attaining necessary training.

#### Information

- Complete industry sector value chain and market analysis studies for locally targeted industries.
- Identify workforce skill gaps that might be filled by international workers and create a worker recruitment plan
- Provide training programs and assistance to local businesses to encourage them to provide family-friendly workplace policies and extended benefits.
- Create data-sharing agreements between local governments, private sector employers, and educational entities to maximize the availability and use of data in economic and workforce development planning.

#### Market-based

- Partner with the local business community to support job training programs, apprenticeships, and strategies for lifelong learning to enable vulnerable workers to build their skills and education.
- Enact a living wage policy that covers local government employees, contractors, and entities receiving financial incentives or assistance from the local government.

#### Program

- Adopt a workforce development plan or comprehensive strategy to educate, train, and prepare residents for local employment opportunities.
- Align local economic development policy strategies with workforce development programs.
- Provide childcare options, such as in-home daycare and after-school care.
- Enact family-friendly workplace policies for all local government employees and contractors that include paid sick days, paid family leave, flexible scheduling, teleworking, job sharing, and easily available childcare.
- Provide job training and assistance programs for employees and employers in professions or sectors where wages are below the living wage.

#### Voluntary

- Partner with local school districts to support and expand extracurricular programming in schools, providing adolescents both academic support and exposure to a variety of new experiences and activities.
- Partner with local school districts to narrow the racial education gap by improving the quality of schools attended by children of color, such as recruiting more Black teachers and reducing class sizes.

## 4.10 WORKERS

### 4.11 EQUITABLE WAGES

**OBJECTIVE:** Ensure all workers are paid fairly and justly in regards to attainment of a quality lifestyle

#### UNDERSTANDING EQUITABLE WAGES

What to look for	How to measure	Sample sources
Are workers compensation levels in line with living expenses?	Total cost of living compared to portion of income	Cost of living calculator Bankrate

#### SUGGESTED ACTIONS

##### Policy & Regulation

- Setting strong baseline minimum wage foundations including sector specific compensation (prevailing wage mechanism legislation) .
- Utilizing contract mechanisms that require workers on projects to be paid fairly and justly.

##### Cooperative

- Ensuring dialogue between unions and workers representatives
- Providing wage data into monitoring agencies for tracking and monitoring progress on wages.

##### Program

- Fostering talent development within the workers ecosystem can help to increase the skill-set of employees, and therefore encourage higher wages and pay.

- Developing union membership and ensuring workers have fair representation for wage discussions with employers
- Providing stimulus funding directly into certain sectors or workers (especially during times of economic downturn).

##### Voluntary

- Encouraging compensation that goes above the national threshold for minimum wages.
- Tracking employee salaries, including in measuring annual raises; comparing compensation against inflation.
- Encouraging a culture within organizations to compensate every employee fairly.
- Auditing pay structures can help to get ahead of fair compensation.

### 4.13 SUPPORTIVE & FAIR BENEFITS

**Objective:** provide benefits that support individuals and families during any stoppage of work (including retirement and unemployment).

#### UNDERSTANDING SUPPORTIVE & FAIR BENEFITS

What to look for	How to measure	Sample sources
Are indirect payments enough to cover needed expenses (insurance, unemployment, days off?)	Total cost of living compared to portion of income	Fair Labor Association Bureau of Employment Relations

#### SUGGESTED ACTIONS

##### Policy & Regulation

- Ensure workers policies and compensation are in-line with costs of living.

##### Cooperative

- Partnering with local institutional providers around things like medical and hospital services can help to make expensive services more accessible.

##### Informational

- Creating campaigns around access to things like free vaccines or flu shots, can help employees to take upfront preparedness measures.
- Conducting a review of employee expenditures as compared to benefits provided on an annual basis is important for adjusting things like insurance compensation.

- Creating benefits fairs or summits can be useful tools ahead of annual enrollment sessions.

##### Program

- Developing in-house programs around benefits for employees can help to reduce benefit/income burden; providing things like in-house childcare, additional days off, and flexible working hours can help to increase quality of life for workers
- Creating “healthy worker” programs can help to reduce the risk of medical treatment as well as increasing employee satisfaction in the workplace.

# 4.20

## ENTREPRENEURSHIP

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## 4.20 ENTREPRENEURSHIP

### OVERVIEW

**GOAL:** Create an ecosystem ripe for entrepreneurship.

### 4.21 BUSINESS RETENTION & DEVELOPMENT

**OBJECTIVE:** Strengthen and grow small and medium-sized enterprises.

#### UNDERSTANDING BUSINESS RETENTION & DEVELOPMENT

What to look for	How to measure	Sample sources
Are there equal opportunities and support for local entrepreneurs looking to start a business?	Number of small and medium-sized businesses located in the community	U.S. Small Business Administration

### SUGGESTED ACTIONS

#### Cooperative

- Partner with local colleges, local businesses, retired executives, and others to provide programs to support training for small businesses, targeted industries, and entrepreneurs.
- Partner with local investors and regional economic agencies to promote financing for small businesses, targeted industries, and entrepreneurs.

#### Informational

- Increase awareness of business incubators, co-working spaces, and accelerators including commercial kitchen spaces. Support the development of business incubators, co-working spaces, and accelerators.
- Adopt an economic localization plan to increase local

production for local consumption and export.

- Promote purchasing preferences for locally produced goods and services in the local government and anchor institutions
- Create or support promotional campaigns to bank locally, buy locally, or buy from small and independent businesses and retailers.
- Adapt business retention and expansion programs (e.g., economic gardening or other enterprise supports) to assist local firms with economic recovery post-disruption.
- Through programs for small businesses, promote business continuity and preparedness planning, such as ensuring businesses understand their vulnerabilities—including supply chains—in the face of disruptions and are prepared to take actions to resume operations after an event.

### 4.22 AVAILABLE CAPITAL

**OBJECTIVE:** Ensure local capital and investment opportunities are available for starting new businesses.

#### UNDERSTANDING CAPITAL AVAILABILITY

What to look for	How to measure	Sample sources
Are investors present and interested in early stage funding for new businesses? VCs? PEs? Funds?	Investment in new businesses; presence of venture capital	MEDC entrepreneurial opportunities

### SUGGESTED ACTIONS

#### Cooperative

- Broaden the industrial base with diversification initiatives, such as targeting the development of emerging clusters or industries that: (a) build on the region's unique assets and competitive strengths; and (b) provide stability during downturns that disproportionately impact any single cluster or industry.

- Adopt policies and regulations that increase overall market demand for green buildings and associated materials, renewable energy products and infrastructure, and recyclable products.
- Connect entrepreneurs and business owners with lenders and investors to facilitate investment in the local economy.
- Attract small to mid-size businesses by increasing opportunities and support for infill development and adaptive reuse.

## 4.20 ENTREPRENEURSHIP

### 4.23 INNOVATION INCUBATION

**OBJECTIVE:** Create opportunities and incubators to support dynamic business activity

#### UNDERSTANDING INNOVATION INCUBATION

What to look for	How to measure	Sample sources
Is there space for business and entrepreneurs to grow?	\$/ft <sup>2</sup> commercial footage; cheaper rates and flexi spaces for new business	Local economic development organizations Redevelopment authorities

#### SUGGESTED ACTIONS

##### Cooperative

- Partner with local community organizations in order to connect small businesses with public benefits, as well as to navigate and organize necessary documentation for public benefit applications and to track the applications' status after submission.
- Provide focused support, resources, and services to young entrepreneurial companies through business incubators

##### Information

- Providing marketing and advertisement on new businesses can help to foster the reputation/services of new businesses

##### Policy & Regulation

- Providing incentives like tax breaks for smaller businesses/new innovators can help to attract relocation, but also, provide a capital boost for start-ups and SMBEs

### 4.24 ACCESSIBLE FINANCING

**OBJECTIVE:** Ensure banking and financing support is available to all regardless of credit worthiness

#### UNDERSTANDING FINANCING

What to look for	How to measure	Sample sources
Are loans available to cover the costs of starting and maintaining new and small/medium businesses?	Credit union, banking loan availability	7a loans and 504 loans

#### SUGGESTED ACTIONS

##### Cooperative

- Partner with local banks and credit unions to help residents get safe and affordable banking services, so residents can avoid costly check-cashing services and unexpected fees and have access to online banking and bill payments.

- Partner with local banks and credit unions to provide residents get free financial counseling to help with credit repair, access to affordable and safe checking and savings accounts, home-ownership preparation, and retirement saving.



# 4.30

## PARTNERSHIPS

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## 4.30 PARTNERSHIPS

### OVERVIEW

**GOAL:** Create a strong, regional economic system to support diverse industries, strong employment anchors, and strategies for overcoming crises.

### 4.31 INDUSTRY DIVERSITY

**OBJECTIVE:** Diversify and plan for loss/gain of major employers.

#### UNDERSTANDING INDUSTRY DIVERSITY

What to look for	How to measure	Sample sources
Do we have multiple employment opportunities so we don't suffer during economic downturn?	Number of employers, ensuring job types are diversified	Bureau of Labor and Economics for geographical distribution (GIS)

### SUGGESTED ACTIONS

#### Information

- Maintain a database, ideally geo-located, that links with municipal business licenses, tax information, and other business establishment data bases to track local and regional “churn” and available development sites. This data can also be integrated with hazard information to make rapid post-incident impact assessments.
- Maintain and provide regional industrial and business park inventory and promote available sites.

#### Program

- Green-collar jobs. Support job training for green-collar jobs and the equitable transition to renewable energy and a sustainable economy. Use comprehensive planning to designate suitable areas for small, innovative green businesses. Shift economic development and workforce training programs to support local jobs in sustainable businesses. Incorporate clean energy job training programs for local residents into rooftop solar and other energy projects (APA, 2020. P. 25, D.2.1).

- Address physical and sector vulnerabilities. Create and implement climate action and resilience plans and programs that identify strategies to address physical and sector vulnerabilities exacerbated by climate change, utilizing risk assessment practices. Such studies also need to take into consideration uncertainties in climate change impacts at regional levels so that adaptive responses are balanced with potential for risk (APA, 2020. P. 28, D.7.1).
- Support business disaster preparedness and recovery. Support the development of business disaster recovery and continuity plans and actions and business emergency operations centers to spur faster recovery after a disaster (APA, 2020. P. 28, D.7.2).

#### Policy & Regulation

- Streamline permitting, development, and other regulatory processes at the local level to meet changing business needs and provide a predictable legal and regulatory environment.

### 4.32 INDUSTRY RECRUITMENT

**OBJECTIVE:** Identify strategic opportunities for economic growth.

#### UNDERSTANDING INDUSTRY RECRUITMENT

What to look for	How to measure	Sample sources
Do we know which types of companies we want to attract?	Economic development strategies at the local, state, and regional level	Brookings Institute MEDC

### SUGGESTED ACTIONS

#### Program

- Amend existing local economic plans and strategies to focus market demand for green jobs, technology, products and services.
- Advertising specific campaigns for attracting diversity/targeted industries can help to increase industry awareness

of local and regional benefits.

#### Cooperative

- Develop incubation space.

#### Policy & Regulation

- Tax breaks specific to industry can help to showcase the “want” of specific industry attraction.

## 4.30 PARTNERSHIPS

### 4.33 LOCAL ECONOMIC LEADERSHIP

**OBJECTIVE:** Work with local and regional education institutions and economic development organizations to make sure relief is available to small businesses.

#### UNDERSTANDING SUPPORTIVE GOVERNMENTAL FRAMEWORKS

What to look for	How to measure	Sample sources
Is there financial support for organizations suffering from revenue losses?	Loss of income for organizations with <50 employees	Michigan Small Business Relief Program
Are local businesses adequately prepared to deal with shocks?	Establishment of Ready Business or other similar community	Ready.gov, "Business Preparedness Guides"

#### SUGGESTED ACTIONS

##### Cooperative

- Work with local institutional and business leaders to support leadership succession and recovery plans for short, intermediate, and long-term recovery needs.
- Open some municipal prioritization and decision-making up to new ideas from citizens through digital engagement—crowd-source ideas, solicit solutions, and fund the most popular and feasible suggestions.
- Collaborate with the state insurance commission to explore local insurance incentives for resilience. One direct way insurers can incentivize resilience is by offering premium discounts to customers who make resilience upgrades and thereby reduce their climate risk.
- Coordinate with universities, community colleges, the local workforce investment board, private firms and other community stakeholders to align research, workforce development, and resources to support targeted industry sectors.

##### Information

- For resilience improvements that require new funding sources, commit to exploring the potential of public/private partnerships to deliver the desired solution. Explore with the business community methods to fund the costs of climate adaption, such as transfer of development rights, increment financing, community benefit districts, and other special assessments.
- Provide information that assist businesses to be more resilient to climate change such as industry-specific best practices.

##### Policy & Regulation

- Require safe development practices in business districts and surrounding communities. Strategies may include locating structures outside of floodplains, preserving natural lands that act as buffers from storms, and protecting downtowns and other existing development from the impacts of extreme weather.
- Strengthen building codes to ensure new buildings are climate change-ready.

### 4.34 REGIONAL STRATEGY

**OBJECTIVE:** Create and regularly update a regional economic strategy for growth, retention, and recovery.

#### UNDERSTANDING REGIONAL STRATEGIES

What to look for	How to measure	Sample sources
Is there alignment between local, state, and regional governments on the main strategies for growth?	Updated regional economic development strategy	Economic Development Collaboratives of Michigan

#### SUGGESTED ACTIONS

##### Information

- Updating and maintain regional economic development strategies/reports.

##### Program

- Maintaining dialogue and strength of regional economic development agencies around mutual goals and needed development is important.
- Attract new businesses through district themes and form district development authorities within each.

##### Cooperative

- Creating and fostering regional summits for cohesive dialogue on regional development needs.

##### Policy & Regulation

- Developing tax agreements across states can help to foster "races to the top" for companies looking to come towards the best environmentally performing states, but can also help to avoid competition amongst states that would mutually benefit from large industrial relocation.

## 4.30 PARTNERSHIPS

### 4.35 PREPARED P3S

**OBJECTIVE:** Strong public/private partnerships between government, major employers, educational, and non-profit institutions.

UNDERSTANDING P3s		
What to look for	How to measure	Sample sources
Is there overlapping expertise/interest between public and private sectors in regards to delivering high quality services?	Critical success factors; project financing, risk sharing opportunity between public/private entities	Local public private partnership offices/ contacts within government (i.e., City of Detroit Public-Private Partnerships Division)

### SUGGESTED ACTIONS

#### Information

- Providing reports on the state of economy, including its strengths, to ensure economic development needs are clear.
- Developing clear estimations of financing gaps and needs to create thresholds of partnerships for private sector development.

#### Program

- Having specific talent/offices within local and regional government agencies who are specifically appointed for P3 development.

#### Policy & Regulation

- Developing legal frameworks/partnership agreements on risk-sharing mechanisms are critical for smooth P3 development.

# 4.0

## METRIC RESOURCE TABLE

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# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS	EXAMPLES
<b>4.10 WORKERS: Support upward economic mobility of workers</b>							
<b>4.11 Workforce development + training</b> Expand job and educational training programs that support upward economic mobility, and better living wages so that all working people and their families can afford basic necessities	Do we have training programs to prepare our citizens for solid employment opportunities?	Educational attainment and numbers of community colleges, continuing education programs, higher-education programs	U.S. Census Data Data.io Headwaters Economics Populations at Risk Tool	<a href="#">Michigan's Labor Market News</a> <a href="#">Datausa</a> Headwaters Economics, <a href="#">Populations at Risk Tool</a>	U.S. Census, " <a href="#">Why We Ask Questions About Educational Attainment, Undergraduate Field of Degree</a> " <a href="#">Sixty by 30 Alliance Michigan</a>	National Household Education Survey (NHES); National Assessment of Educational Progress (NAEP); National Postsecondary Student Aid Study (NPSAS) <a href="#">Champion Toolkit</a>	<a href="#">Upper Peninsula Michigan Works!</a> <a href="#">Michigan Reconnect</a>
<b>4.12 Equitable wages</b> Ensure all workers are paid fairly and justly in regards to attainment of a quality lifestyle	Are workers compensation levels in line with living expenses?	Total cost of living compared to portion of income	Cost of living calculator Bankrate	<a href="#">Cost of living calculator for Michigan</a>	<a href="#">Bankrate</a> <a href="#">Bureau of Employment Relations, Department of Labor and Economic Opportunity</a> <a href="#">Michigan Opportunity Podcast</a>	Economic Policy Institute, " <a href="#">How to Raise Wages</a> "	<a href="#">Grand Rapids Equitable Economic Development and Strategic Mobility Plan</a> Networks Northwest, " <a href="#">Enhancing Economic Prosperity in the Labor Force</a> " <a href="#">A New Economic Development Strategy for Michigan: Put People First to Create Good Paying Jobs</a>
<b>4.13 Supportive and fair benefits</b> Provide benefits that support individuals and families during any stoppage of work (including retirement and unemployment)	Are indirect payments enough to cover needed expenses (insurance, unemployment, days off)?	Total cost of living compared to portion of income	Fair Labor Association Bureau of Employment Relations	<a href="#">Fair Compensation Toolkit</a>	<a href="#">Department of Labor and Economic Opportunity</a> Economic Policy Institute	<a href="#">Helping Hand of Michigan: Guiding Michigan Citizens to Assistance Resources</a>	<a href="#">Bridges Administrative Policy Manual, Department of Health and Human Services</a> <a href="#">Good Jobs for Michigan program</a>
<b>4.20 ENTREPRENEURSHIP: Foster entrepreneurship, new business growth, and support small businesses</b>							
<b>4.21 Business retention and development</b> Strengthen and grow small and medium-sized enterprises	Are there equal opportunities and support for local entrepreneurs looking to start a business?	Number of small and medium-sized businesses located in the community	U.S. Small Business Administration	<a href="#">U.S. Small Business Administration (SBA) database</a>	<a href="#">Michigan Small Business Relief Program</a>	<a href="#">Fact sheets for entrepreneurship</a> Ready.gov, " <a href="#">Ready Business Preparedness Guides</a> "	
<b>4.22 Available capital</b> Ensure local capital and investment opportunities are available for starting new businesses	Are investors present and interested in early-stage funding for new businesses? VCs? PEs? Funds?	Investment in new businesses; presence of venture capital	MEDC	<a href="#">MEDC Entrepreneurial Opportunities</a>	Tech Startup Stabilization Fund Business Accelerator Fund	<a href="#">Fund your business calculator</a>	<a href="#">Michigan Rise</a>
<b>4.23 Innovation incubation</b> (Economic gardening) Create opportunities and incubators to support dynamic business activity	Is there space for businesses and entrepreneurs to grow?	\$/square-foot of commercial square footage; cheaper rates and flexi-spaces for new businesses	Local economic development organizations, redevelopment authorities	n/a	<a href="#">SBDC Michigan Business Accelerator</a>	n/a	<a href="#">Michigan Main Street Initiative</a>
<b>4.24 Accessible financing</b> Ensure banking and financing support is available to all regardless of credit worthiness	Are loans available to cover the costs of starting and maintaining new and small/medium businesses?	Credit union, banking loan availability	7(a) loans and 504 loans	<a href="#">SBA Funding Programs</a> <a href="#">504</a> <a href="#">7(a) loans</a>	First Capital Fund; Pre-Seed Fund; Business Accelerator Fund	<a href="#">Fund your business calculator</a>	<a href="#">Match on Main</a>

# METRIC RESOURCE TABLE

# OBJECTIVE	WHAT TO LOOK FOR	HOW TO MEASURE	DATA AND EVALUATION SOURCES	DATA AND EVALUATION SOURCE LINKS	SUPPORTING RESOURCES	PLANNING TOOLS	EXAMPLES
<b>4.30 PARTNERSHIPS: Create a strong, regional economic system to support diverse industries, strong employment anchors, and strategies for overcoming crises</b>							
<b>4.31 Industry diversity</b> Diversify and plan for loss/gain of major employers	Do we have multiple employment opportunities so we don't suffer during economic downturn?	Number of employers, ensuring job types are diversified	Bureau of Labor and Economics for geographical distribution (GIS) Datausa.io for statistical distribution	Datausa.io <a href="#">BLE</a>	Regional economic development organizations, local economic development organizations	<a href="#">National Association of Development Organizations</a> <a href="#">Brookings Institute</a>	
<b>4.32 Industry recruitment</b> Identify strategic opportunities for economic growth	Do we know which types of companies we want to attract?	Economic development strategies at the local, state, and regional level					
<b>4.33 Local economic leadership</b> Work with local and regional ed institutions and economic development organizations to make sure relief is available to small businesses	Is there financial support for organizations suffering from unanticipated revenue losses?	Loss of income for organizations with <50 employees	Michigan Small Business Relief Program	<a href="#">Michigan Small Business Relief Program</a>	Paycheck Protection Program; Employee Retention Tax Credits: <a href="#">Small Business Administration Paycheck Protection Program</a>	<a href="#">NIST Guide for Planning and Infrastructure</a> <a href="#">COVID relief options</a>	<a href="#">Detroit Future Cities</a>
	Are local businesses adequately prepared to deal with shocks?	Establishment of Ready Business or other similar community	Ready Business	Ready.gov, <a href="#">"Ready Business Preparedness Guides"</a>			
<b>4.34 Regional Strategy</b> Create and regularly update a regional economic strategy for growth, retention, and recovery	Is there alignment between local, state, and regional governments on the main strategies for growth?	Updated regional economic development strategy	Regional development commissions	<a href="#">Economic Development Collaboratives of Michigan</a>	<a href="#">Michigan Association of Regions</a> <a href="#">Regional Prosperity Initiative</a>	Assistance can be found by contacting National Association of Development Organizations National Association of Regional Councils Michigan Association of Planning American Planning Association	<a href="#">Western Michigan Comprehensive Development Strategy</a> <a href="#">Economic Development Strategy for Southeast Michigan</a> <a href="#">SEMCOG: Increasing prosperity for a resilient economy</a>
<b>4.35 Prepared P3s</b> Strong public/private partnerships between government, major employers, educational, non-profit institutions	Is there overlapping expertise/interest between public and private sectors in regards to delivering high quality services?	Critical success factors; project financing; risk sharing opportunity between public/private entities	Local public/private partnerships offices/contacts within government (i.e., City of Detroit Public-Private Partnerships Division)	Specialists within the targeted project sector, i.e., PPP partnership specialist transportation; PPP specialist, housing. Each region is likely to have a contact.	Each locality and sector is likely to have a law practice that specializes in providing expertise on creating the contracts needed. <a href="#">Our state of generosity</a> <a href="#">Council of Michigan Foundations</a>	<a href="#">ULL: Public/Private Partnerships</a> <a href="#">Brookings Institution: Public/private partnerships for fighting the biggest crises of our times</a>	<a href="#">Grand Rapids Innovation Park</a> <a href="#">Doug Meijer Medical Innovation Building</a> <a href="#">Michigan State Police, Emergency Management, and Homeland Security P3 Program</a> <a href="#">I-75 MDOT P3</a>

# APPENDIX

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# HOW TO BUILD YOUR OWN SURVEY

## LOOKING FOR A PLACE TO START?

**Is your community new to resilience planning?  
You are not alone!**

Resilience is a complex challenge, and it can feel overwhelming for a local community to tackle alone. But you are not alone. There are available resources, tools, a network of peer communities and assistance from regional and state agencies. The first step is understanding your strengths and weaknesses. Once you've evaluated where you are today, it's easier to start charting the path forward. This self-assessment is designed to empower your local leaders, staff and decision-makers to start the conversation, if you haven't already, to pinpoint the roadblocks.

We recommend starting with the resilience readiness survey to evaluate your local capacity. See the following pages to see the survey template or read on to learn more:

**Part 1: Resilience Readiness**—Recognizing that this is a complex topic, MEDC developed a specific survey for RRC communities to assess resilience readiness at the local level. This survey is focused on evaluating local awareness and capacity to identify gaps in understanding shared vision. Communities are encouraged to customize the survey to fit their needs.

**Part 2: Evaluate and Act**—MEDC's intent is to support RRC communities in becoming more resilient. Several assessment tools already exist that address a wide range of scales and priorities. MEDC encourages communities to establish a task force to determine the best assessment tool(s) for your community. While the evaluation category naming may differ from MEDC's resilience framework, there is significant overlap with MEDC's four themes of place, place, infrastructure and economy. The corresponding MEDC themes are noted in the chart on page 71.

**Is your community NEW to resilience planning?**

**Start here with the resilience readiness evaluation!**

## PART 1: RESILIENCE READINESS

**Purpose:** This survey is intended for communities to self-assess where they are on the continuum of resilience planning and identify appropriate tools to help them along their journey. The magnitude and urgency of these issues can be overwhelming. This assessment provides a baseline of readiness to tackle these large and complex issues of people, place, infrastructure and economic resilience through planning, policy, regulation, incentives and partnerships. The process is anything but linear, and there is an opportunity to advance specific initiatives without having everything “figured out.” There is also a necessity to continually come back to education and capacity-building based on new data and/or the evaluation of implementation strategies.

**Is your community ALREADY talking about resilience?**

**Start with a task force to identify potential indicators.**

## PART 2: EVALUATE AND ACT

Part 2 builds in the framework of people, place, infrastructure and economy. This is based on professional experience and case study review of numerous resilience frameworks, refined for Michigan communities. Part 2 focuses on indicators, both point in time shocks and on-going stresses that restrict a community's performance and long-term resilience. With this baseline, communities can take steps toward measurable improvements. At the local level, every community will have their own values, challenges and drivers for change, but there are county and regional opportunities to address common stresses and protect shared assets.

See the toolkit resources for a list of assessment tools to help your community take resilience planning to the next level and drill down into your unique assets and vulnerability.

# SAMPLE RESILIENCE ASSESSMENT: LOCAL LEADERSHIP

SELF ASSESSMENT CHART				
STEP 1: READY AND PREPARE	STEP 2: EVALUATE AND ACT			STEP 3: RECALIBRATE
Phase 1: Build Awareness and Capacity	Phase 2: Assess Vulnerabilities	Phase 3: Set Priorities	Phase 4: Take Action	Phase 5: Track Data and Metrics
Engage the local community around a shared vision	Anticipate potential shocks	Determine goals, objectives and priorities	Prepare for anticipated shocks	Track implementation efforts
Empower staff, volunteers and partners	Identify stresses reducing performance	Learn from other communities	Mitigate stresses to increase performance	Examine successes
Allocate time, resources and funding	Collect baseline data	Develop a plan of implementation strategies	Connect people to respond to threats	Modify strategies as needed

## DIRECTIONS:

Use the following as a template to develop a survey for local leadership, including the legislative body, planning commission, municipal staff/department heads and other relevant boards/commissions. We recommend uploading the questions to a web-based survey platform for ease of distribution and tracking, but this template may also be used as a discussion guide or in-person dot voting. The most important element is to bring the group back together to share and discuss the results.

You are encouraged to adapt the definitions to fit the unique context and needs of your community. The survey should include background information and context specific to your community. You may also decide to break the survey into multiple parts or modify the Likert scale as desired. This survey is not about comparing your results to another community; this is about starting meaningful conversations that will empower your community and local leadership to keep moving forward.

## QUESTIONS FOR LOCAL LEADERSHIP

This survey is intended for our community to self-assess where we are on the continuum of resilience planning and identify appropriate tools to help us along our journey. This assessment provides a baseline of readiness to tackle these large and complex issues of people, place, infrastructure and economic resilience through planning, policy, regulation, incentives and partnerships.

**1. What would you say is the baseline for your community? How are households feeling about their ability to respond to and recover from “shocks” such as an economic crisis or natural disaster? (1–5, 1 = Strongly disagree, 5 = Strongly agree)**

- Planning with my neighbors and my community will help my household after a major economic or natural disaster.
- I am confident I can be of help to my neighbors or community in the event of a disaster.
- People in my neighborhood know how to work together to prepare and respond to a disaster.
- What variables would impact their ability to respond and recover?

# SAMPLE RESILIENCE ASSESSMENT: LOCAL LEADERSHIP

## 2. Existing conditions: Where does the community currently stand on resilience? (1–5, 1 = *Strongly disagree*, 5 = *Strongly agree*)

- Community awareness: Does the community understand the impacts and opportunities of resiliency planning and policy?
- Broad community support: Does the community feel that this is a priority?
- Strong leadership: Is there political will to advance resilience as a priority?
- Management and capacity: Does the community have dedicated staff and/or volunteers to make resilience a priority?
- Data: Does the community have the necessary technology or partnerships to gather, manage and assess data?
- Local and regional partnerships: Does the community have existing partners?
- Vision: Does the community have a strong vision for resilience?
- Plans and policies: Does the community have existing plans?
- Budget: Does the community have dedicated budget or financial tools to advance resiliency?
- Participation: Does the community have broad methods and tools to engage stakeholders? Has resilience been discussed recently or identified as a priority?

## 3. Community context and language matter: How do we talk about resilience now? How should we talk about resilience in the future?

- What are words, strategies or local assets associated with resilience that would be positively received by the community? Examples may include ideas that are locally accepted, projects that the whole community would support or successful initiatives that could be expanded.
- What are words, strategies or local challenges associated with resilience that would be negative or triggering to the community? Examples may include terms that have been politicized at the local or national level, failed initiatives/ ballot proposals or past projects with undesirable outcomes.

## 4. Where does the community stand on resilience within the context of MEDC's resilience framework?

The RRC resilience toolkit is organized using the following framework of people, place, infrastructure and economy.

This framework is broad enough to cover the range of topics that define resilience, but also focused on the needs of Michigan communities, specifically those engaged in the RRC program. The framework also introduces a process that easily aligns with existing planning procedures, but includes certain elements that are essential to resilience planning.

## 5. Draft MEDC Resilience Framework: Using a 1–3 scale (1 = *Poor*, 2 = *Fair*, and 3 = *Good*) rate your community's readiness to take on each phase in the resilience planning process.

- People: People refers to protecting and strengthening the well-being and health of communities. This includes well-being, equity, leadership, strategy, social cohesion and social capital. When it comes to "People," how do you think your community is doing with each phase? (1–3 scale)
- Any other comments you would like to add about people?
- Place: Place refers to providing for physical buildings and spaces that enable a thriving community. This includes parks and open space, housing, affordable housing, schools, community centers, libraries, municipal buildings and basic necessities (grocery stores, health care). When it comes to "Place," how do you think your community is doing with each phase? (1–3 scale)
- Any other comments you would like to add about place?
- Infrastructure: Infrastructure refers to strengthening our environment and systems that support society. This includes water (water bodies, stormwater, drinking water, wastewater, snow and ice); energy (electricity, fuels); communications; and transportation (bridges, roads, rail, transit, non-motorized paths, transportation access and transportation affordability). When it comes to "Infrastructure," how do you think your community is doing with each phase? (1–3 scale)
- Any other comments you would like to add about infrastructure?
- Economy: Economy refers to ensuring equitable capacities for communities to overcome shocks and develop prosperity. This includes Jobs, job diversity, industry, income, income inequality and employers. When it comes to "Economy," how do you think your community is doing with each phase? (1–3 scale)
- Any other comments you would like to add about economy?

# SAMPLE RESILIENCE ASSESSMENT: LOCAL LEADERSHIP

## DIRECTIONS:

Use the following as a template to develop a survey for the local community. This survey is intended to collect public feedback on community resilience without asking about the technical aspects of resilience. The public generally perceives local planning and policy in terms of its impact on their household/ neighborhood stability and quality of life. These survey questions should be asked at the beginning of the planning process and again after a project/initiative has been implemented for a period of time.

We recommend uploading the questions to a web-based survey platform for ease of distribution and tracking. The survey should include any background information or additional context specific to your community. It may be helpful to provide a definition for community resilience.

## QUESTIONS FOR THE PUBLIC

*(1–5, 1 = Strongly Disagree, 5 = Strongly Agree)*

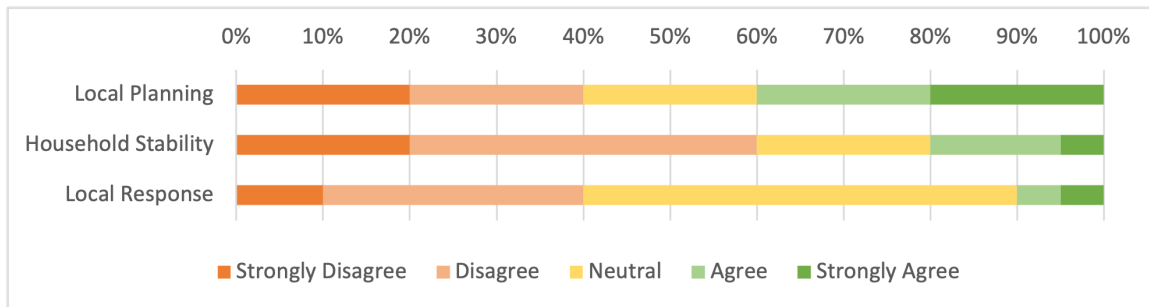
1. Planning with my neighbors and my community will help my household after a major economic crisis, natural disaster or public health crisis.
2. I am confident I can be of help to my neighbors or community in the event of a crisis or disaster.
3. People in my neighborhood know how to work together to prepare and respond to a crisis or disaster.
4. Optional comments.

# SAMPLE SURVEY RESULTS: TEMPLATE

## DIRECTIONS:

Use the following as a template for visualizing survey results. Most online survey platforms offer built-in visualization options, but the charts and tables can always be customized in Excel.

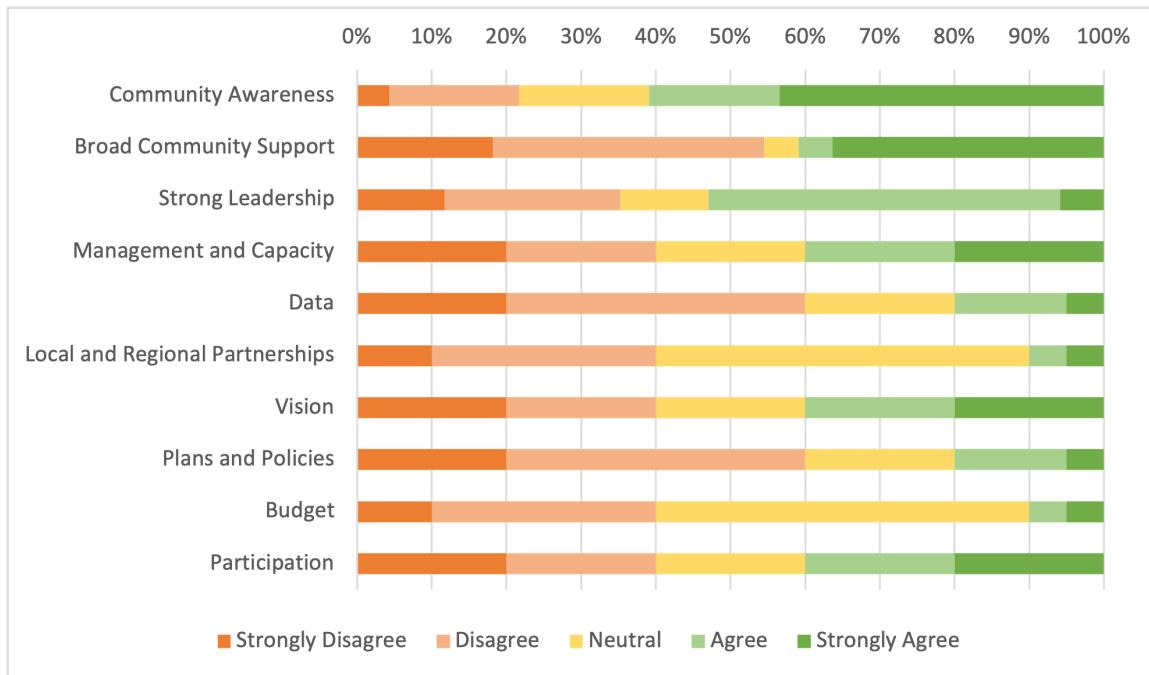
### 1. What would you say is the baseline for your community? How are households feeling about their ability to respond to and recover from “shocks” such as economic crises and natural disasters?



*Ideally, this summary of local leader perceptions should be compared with actual responses from the community.*

### 2. Existing conditions: Where does the community currently stand on resilience?

*While the survey should be administered to several individuals, certain individuals have greater knowledge of aspects.*



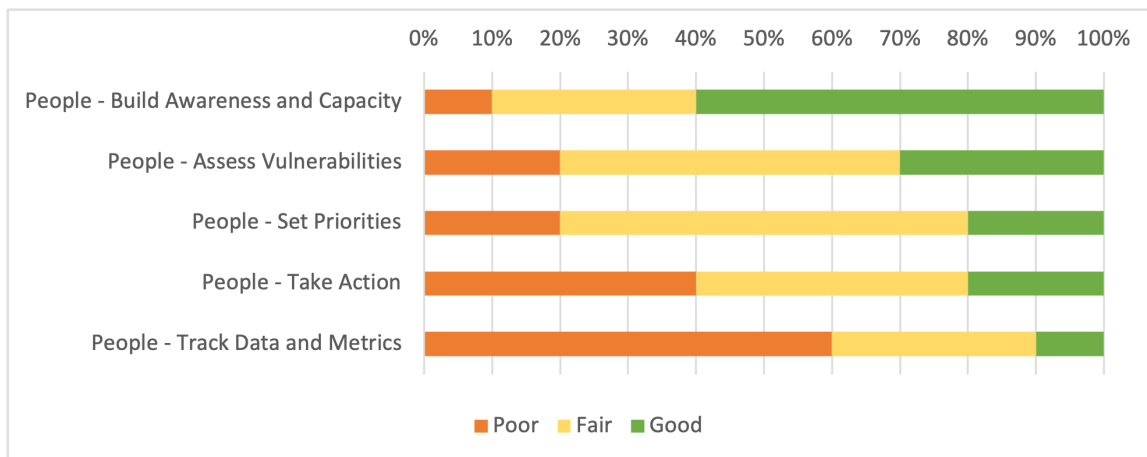
*It is important to look at individual responses as well as the collective opinion. This chart quickly summarizes the community's strengths and weaknesses in the context of resilience planning. Strengths should be leveraged to address weaknesses. Open-ended questions may also be added to the survey to get at the heart of particular issues.*

# SAMPLE SURVEY RESULTS: TEMPLATE

## 3–4. Community context and language matter: How do we talk about resilience?

*These questions would generate a list of both positive and negative (or triggering) words/ideas that could be represented in a word cloud or another format to help shape the conversation around resiliency.*

## 5. Where does the community stand on resilience within the context of MEDC’s resilience framework?



*This question drills in a bit deeper with the different elements of resilience, specifically people, place, infrastructure and economy. The chart quickly summarizes the community’s perceived readiness and capacity for each element within the context of the resilience planning stages. Each stage and phase builds on the one prior. Without a strong foundation of awareness and data, it can be very challenging to make meaningful progress on goals. You will note that open-ended questions may also be added to the survey for each element.*