MME 2024 Summer Workshop

Michigan Municipal Executives

Planning for:

Public Health & Climate Resiliency

Gage Belko, AICP, Associate Planner | MCKENNA

Gage Belko, AICP

Associate Planner

MCKENNA

- Comprehensive (master) planning
- Parks and recreation planning
- Transportation planning
- Sustainability planning
- Zoning administration
- Public engagement
- Urban design

Agenda

Why Plan for Public Health and Climate Resiliency?

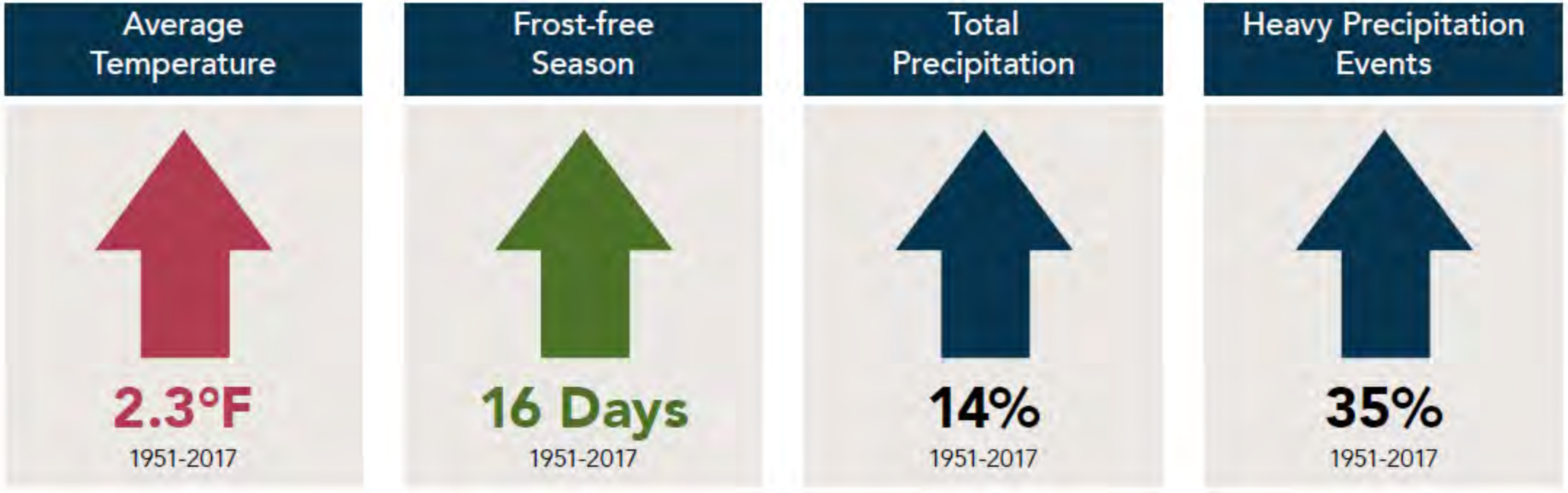
Planning for the Inevitable

- **Aging in Place & Active Transportation**
- **Urban Heat Mitigation & Natural Feature Preservation**
- **Stormwater Management & Coastal Resiliency**

Final Thoughts

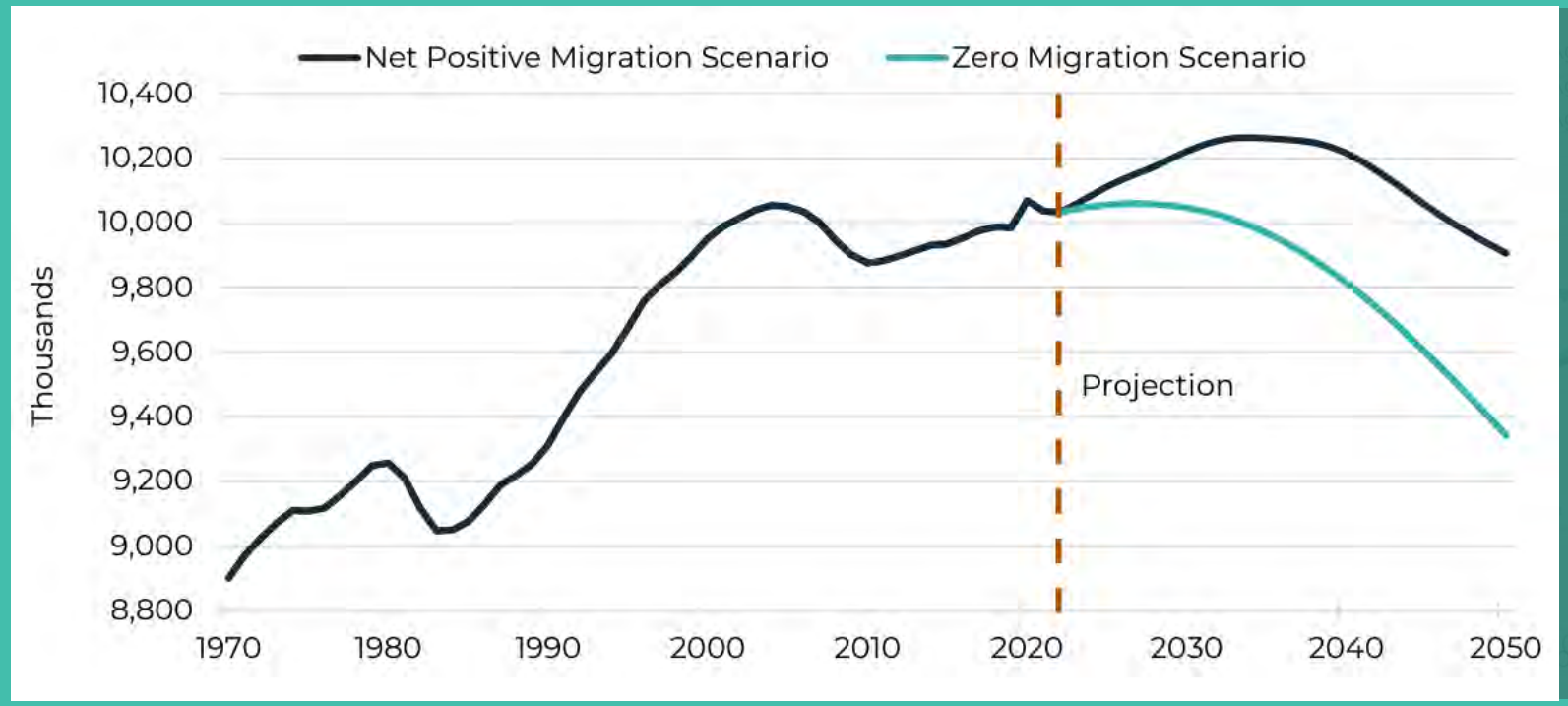
Why Plan for Public Health and Climate Resiliency?

The Great Lakes Region is moving up...



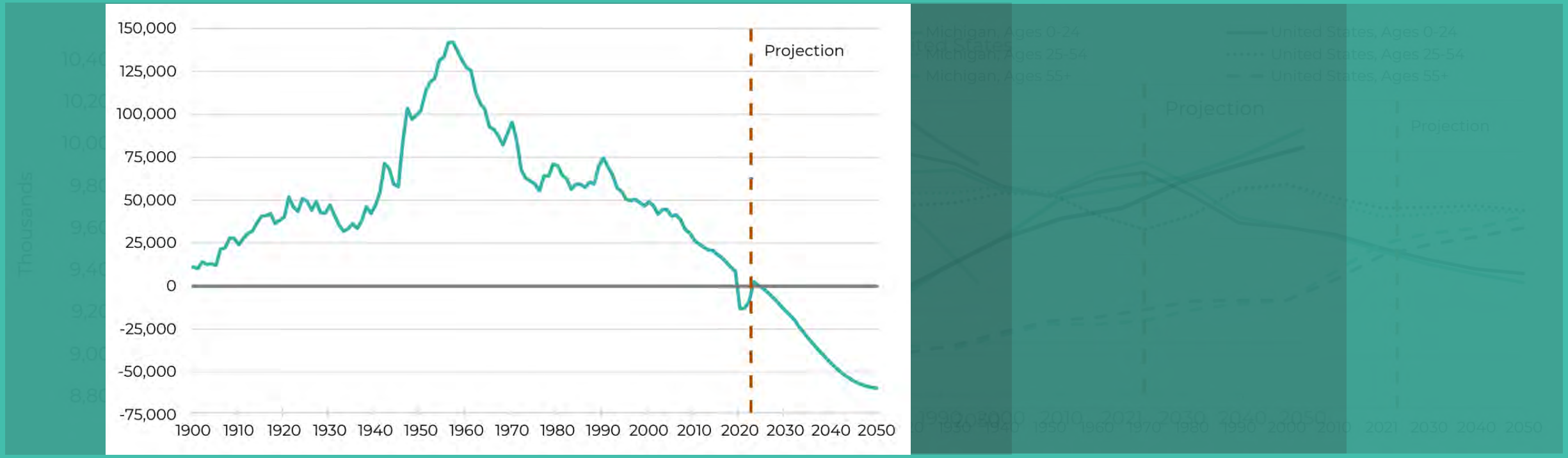
Source: Michigan State University, School of Planning, Design, and Construction; MSU-Extension; Michigan Department of Health and Human Services. Climate and health adaptation planning guide for Michigan communities. 2020

The **“public”** in public **service…**



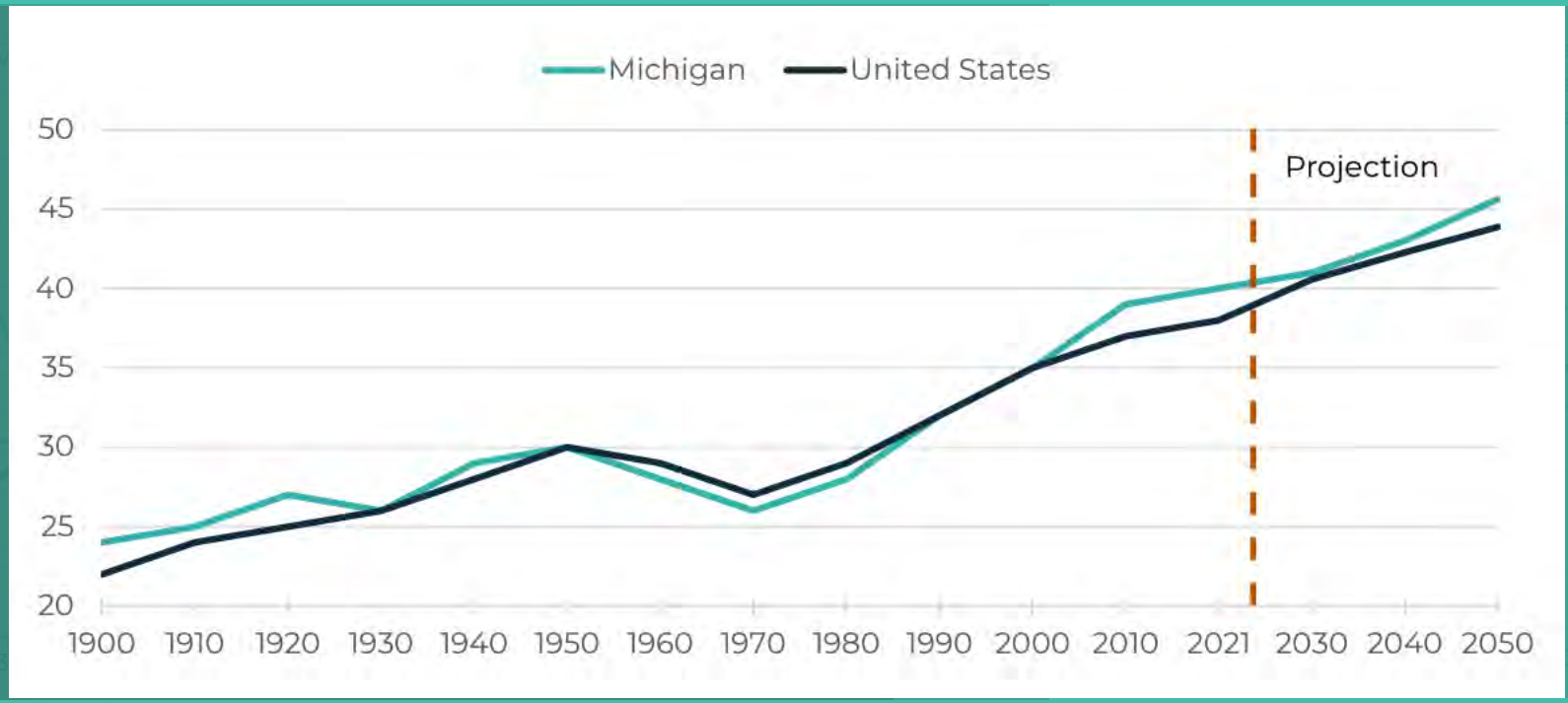
Source: Michigan Center for Data and Analytics

The “public” in public service…



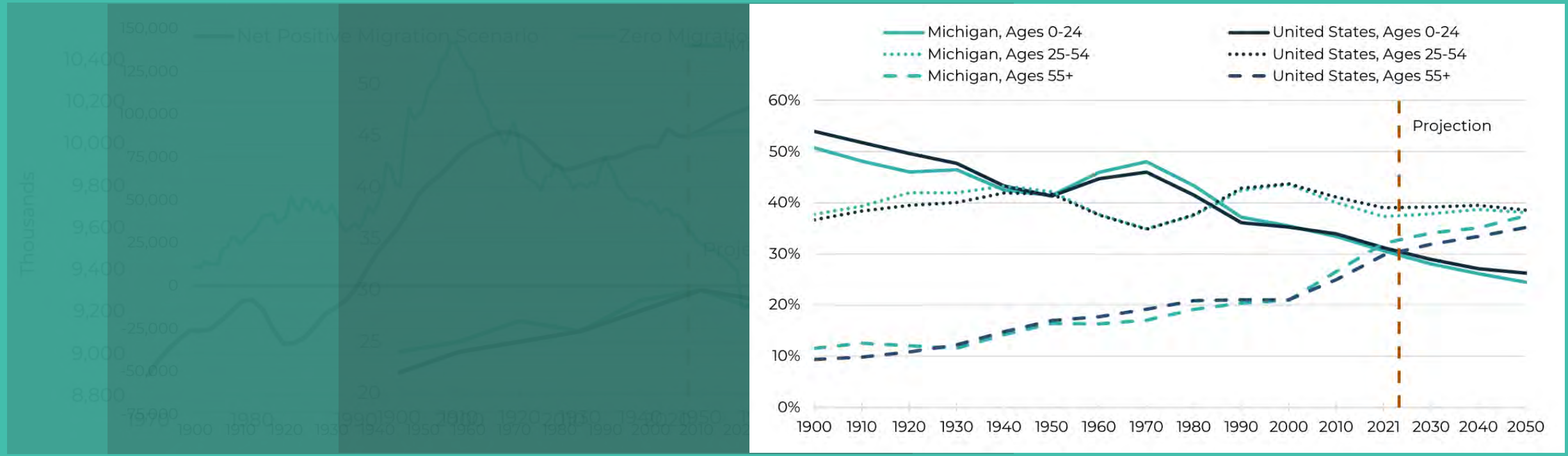
Source: Michigan Center for Data and Analytics

The “public” in public service…



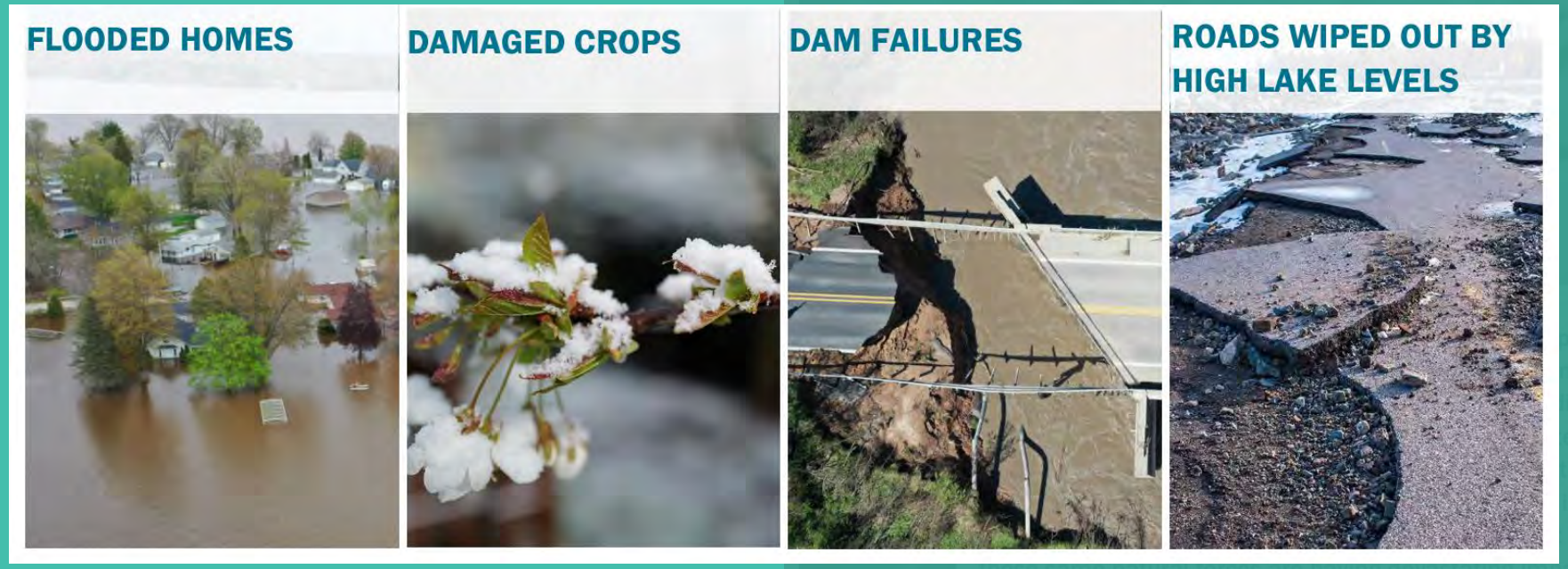
Source: Michigan Center for Data and Analytics

The “public” in public service…



Source: Michigan Center for Data and Analytics

The impacts add up...



Source: Michigan Department of Environment, Great Lakes, and Energy. MI Healthy Climate Plan, 2022.

The impacts add up…

FLOODED HOMES

DAMAGED CROPS

"In 2012, Michigan lost over 90% of its tart cherry crop because of erratically warm weather that fooled our cherry trees into blossoming while in frost season. Michigan's agriculture relies on relatively predictable, stable weather conditions. As the climate changes, we have to operate with increasing uncertainty. Some farmers have been forced to import cherries to make up for the losses, make expensive updates, or just leave the industry. Our industry has a rich, proud history in Michigan rooted in its soil, built by its waters, but now those same natural forces are having devastating impacts on our bottom line."

– Bob Sutherland, President of Cherry Republic

Source: Michigan Department of Environment, Great Lakes, and Energy. MI Healthy Climate Plan, 2022.

The impacts add up...

- Recreation and tourism
- Agriculture

ALSO

- Property values
- Small business success
- Quality of life

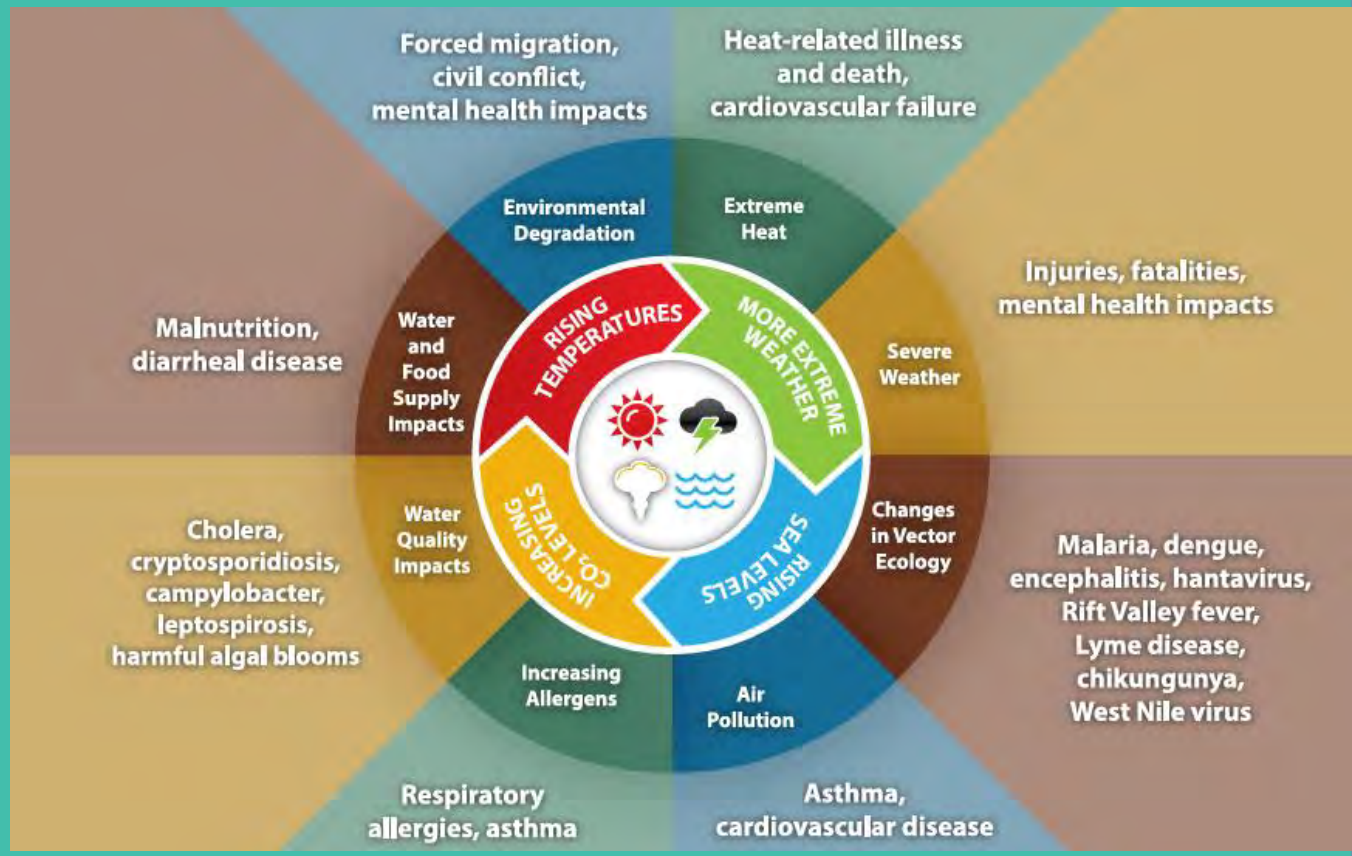
APPROXIMATE ECONOMIC IMPACT IN MICHIGAN PER YEAR

- Recreational Hunting = $11 Billion
- Recreational Fishing = $2 Billion
- Recreational Boating = $3.9 Billion[23]
- Winter Recreation = $3 Billion
- Birdwatching = $40 Billion (Nationally)
- Agricutlure = $70 Billion

Source: Great Lakes Business Network. The costs of climate change for Michigan: Great Lakes State at risk. Accessed: July 8, 2024.

The impacts add up...

- Heat-related illnesses and death
- Zoonotic / vector diseases
- Allergy and asthma attacks
- Mental and physical health impacts
- Disrupted medical needs



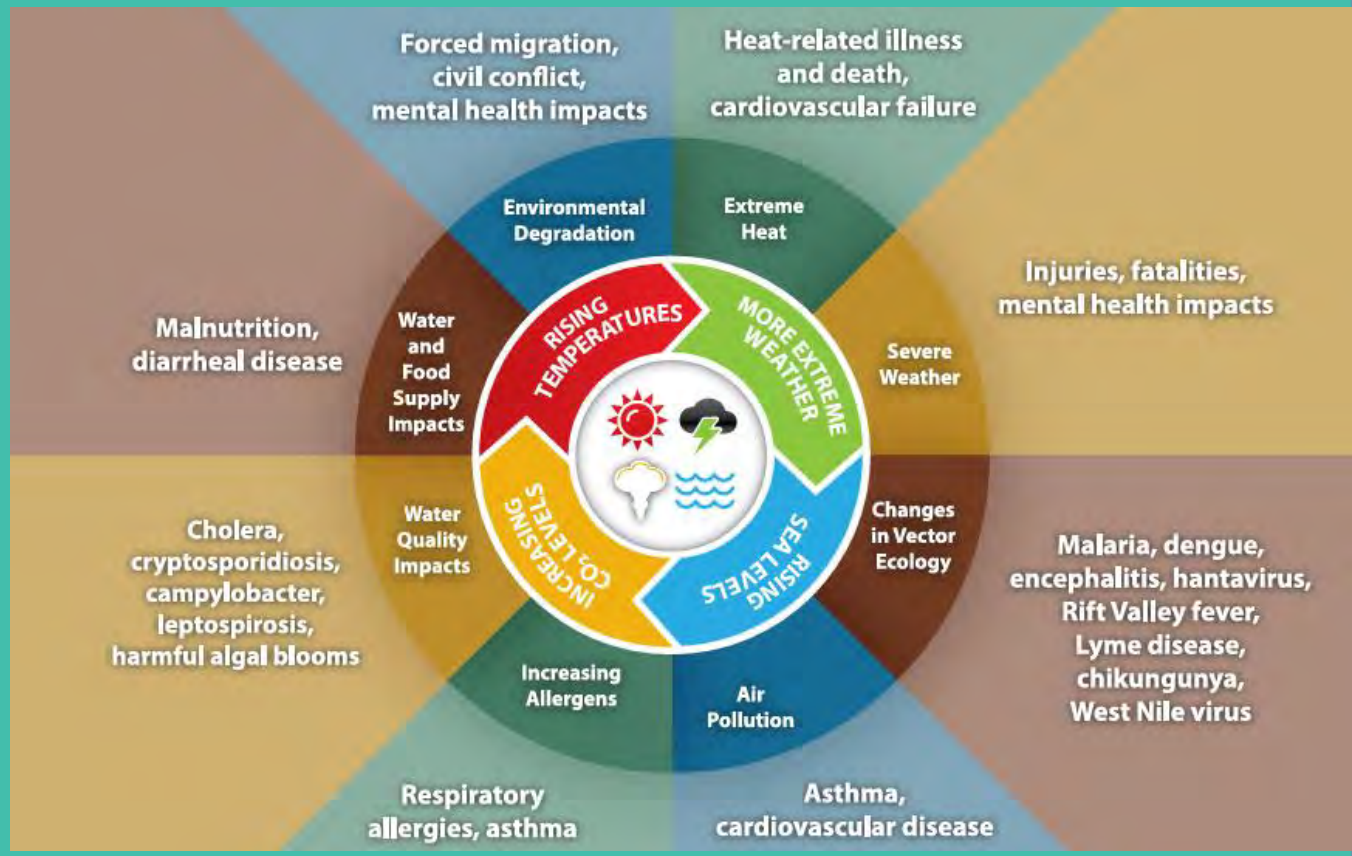
Source: Centers for Disease Control and Prevention. Preparing for the Regional Impacts of Climate Change in the United States, 2020.

MCKENNA

Michigan Municipal Executives

Impacts are not felt equally…

- Children
- Elderly
- Exposed workers
- Pregnant women
- Low-income individuals
- Disabled individuals



Source: Centers for Disease Control and Prevention. Preparing for the Regional Impacts of Climate Change in the United States, 2020.

MCKENNA

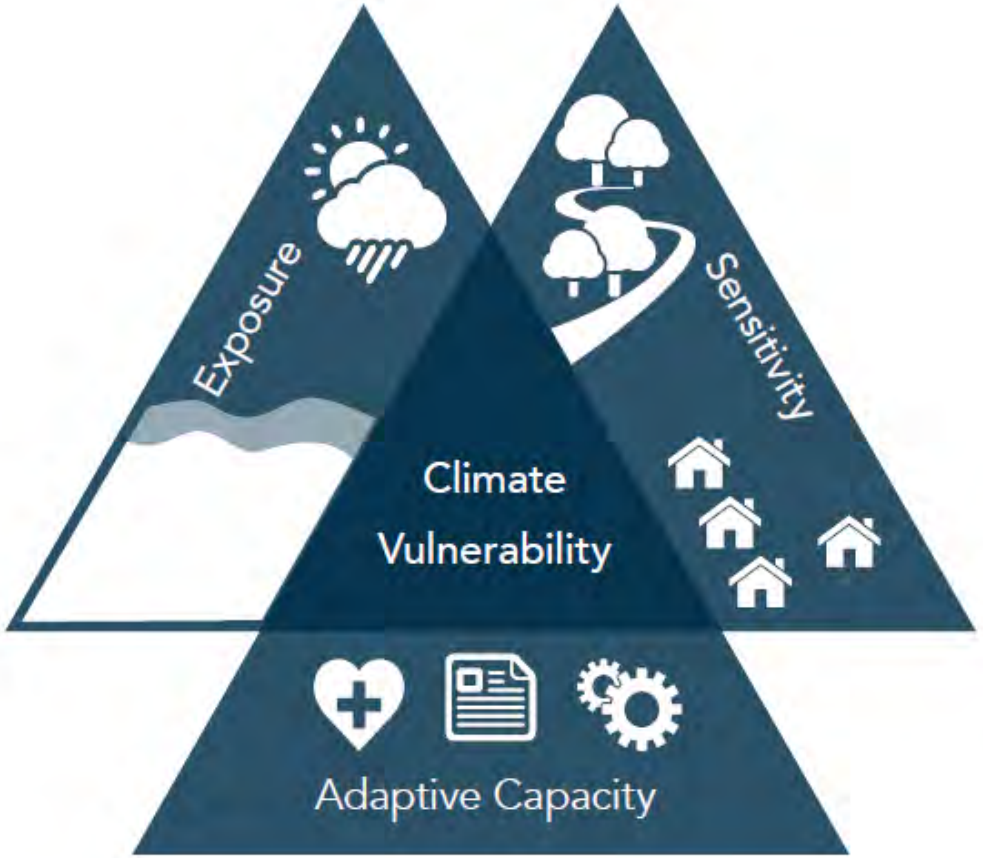
Michigan Municipal Executives

Impacts are not felt equally…

SENSITIVITY + EXPOSURE + CAPACITY

Source: Michigan State University, School of Planning, Design, and Construction; MSU-Extension; Michigan Department of Health and Human Services

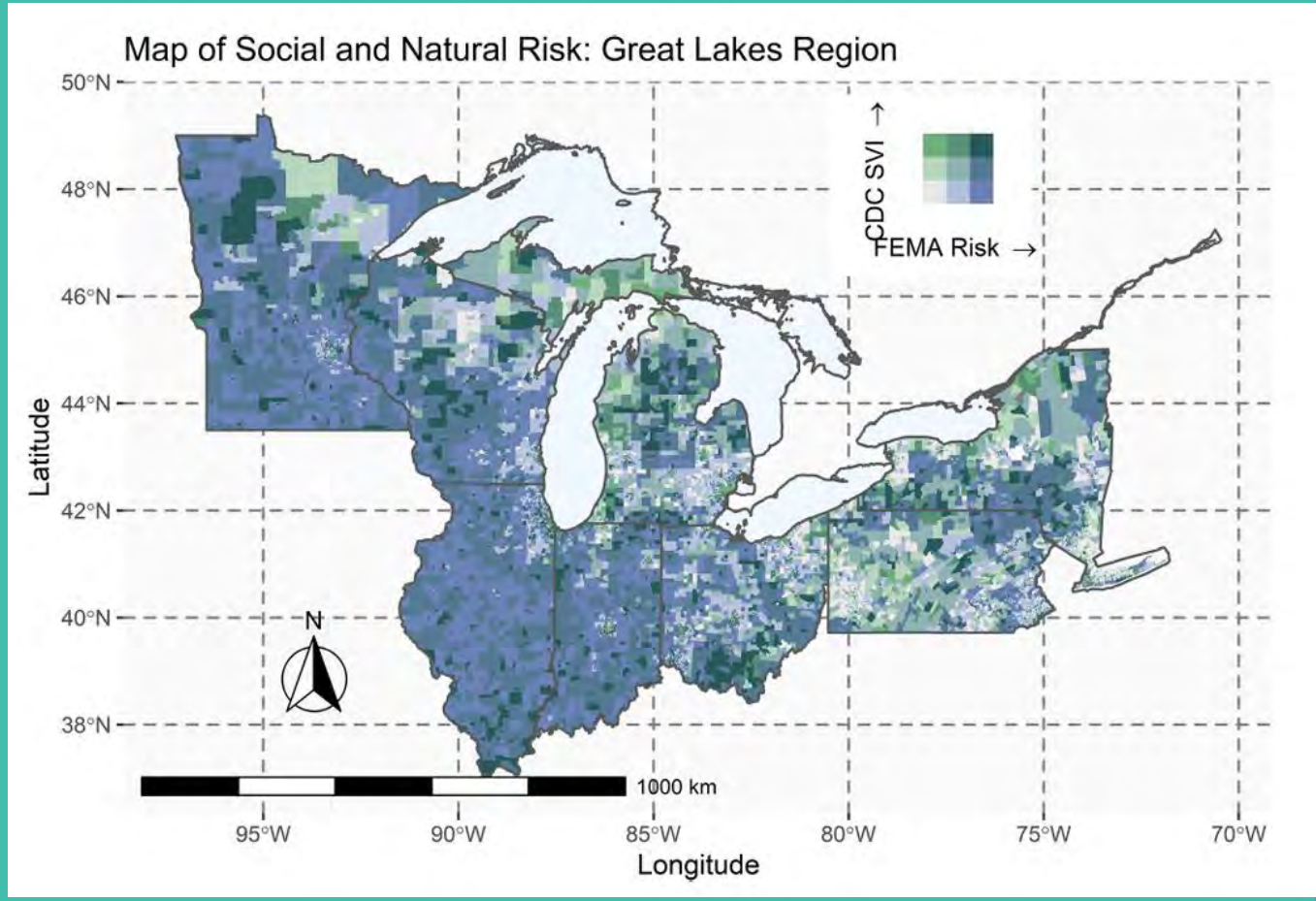
MME Summer Workshop | July 16-19, 2024



EXPOSURE	ADAPTIVE CAPACITY	SENSITIVITY
• Area impacted by climate hazard(s) • Severity of climate hazard(s) • Frequency of climate hazards	• Mobilizable response resources • Information, skills & communication • Institutional and social capital	• Household & community characteristics • Quality of housing & other physical systems • Functionality of, access to services & utilities

Impacts are not felt equally...

VULNERABILITY + RISK



Source: Van Berkle, et al. Great Lakes Integrated Sciences and Assessments. Planning for Climate Migration in Great Lake Legacy Cities, 2022.

Equitable interventions...

SENSITIVITY + EXPOSURE

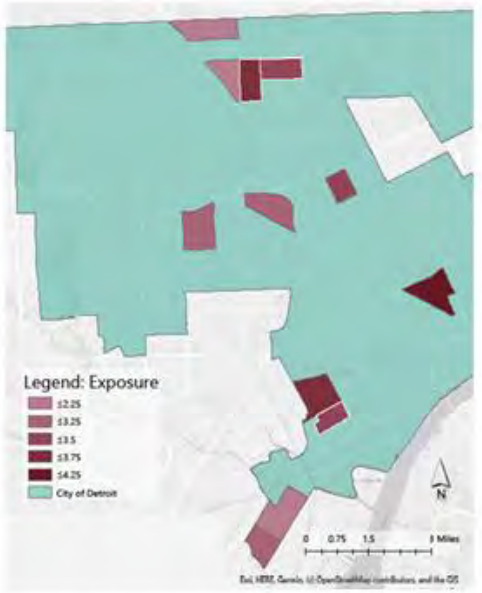


Figure 6: Tracts graded on Exposure metrics, selected tracts highlighted

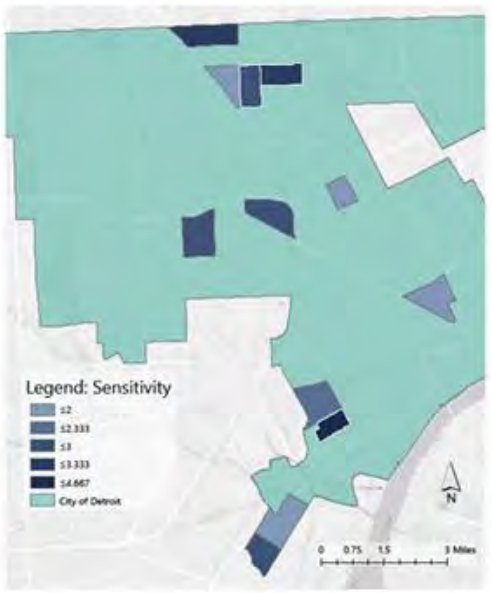


Figure 7: Tracts graded on Sensitivity metrics, selected tracts highlighted

	Exposure				Sensitivity			
Tract	Temperature	Emissions	Traffic	Canopy	Population	Age	Poverty	Score
5242	4	4	2	4	5	5	4	28
5387	5	2	4	4	3	5	1	24
5386	5	2	3	4	5	4	1	24
5219	3	4	5	5	1	1	3	22

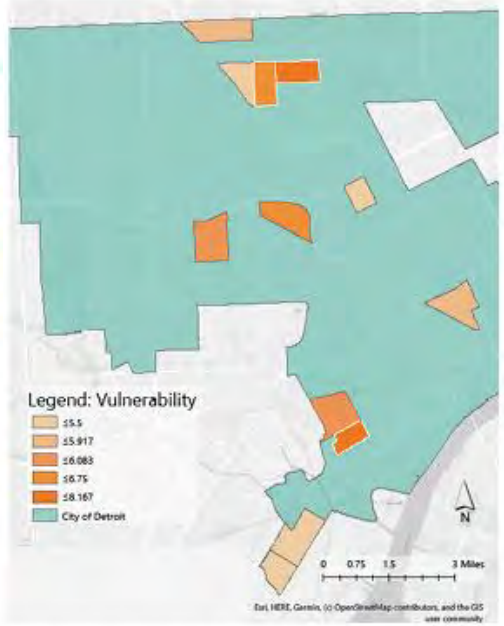
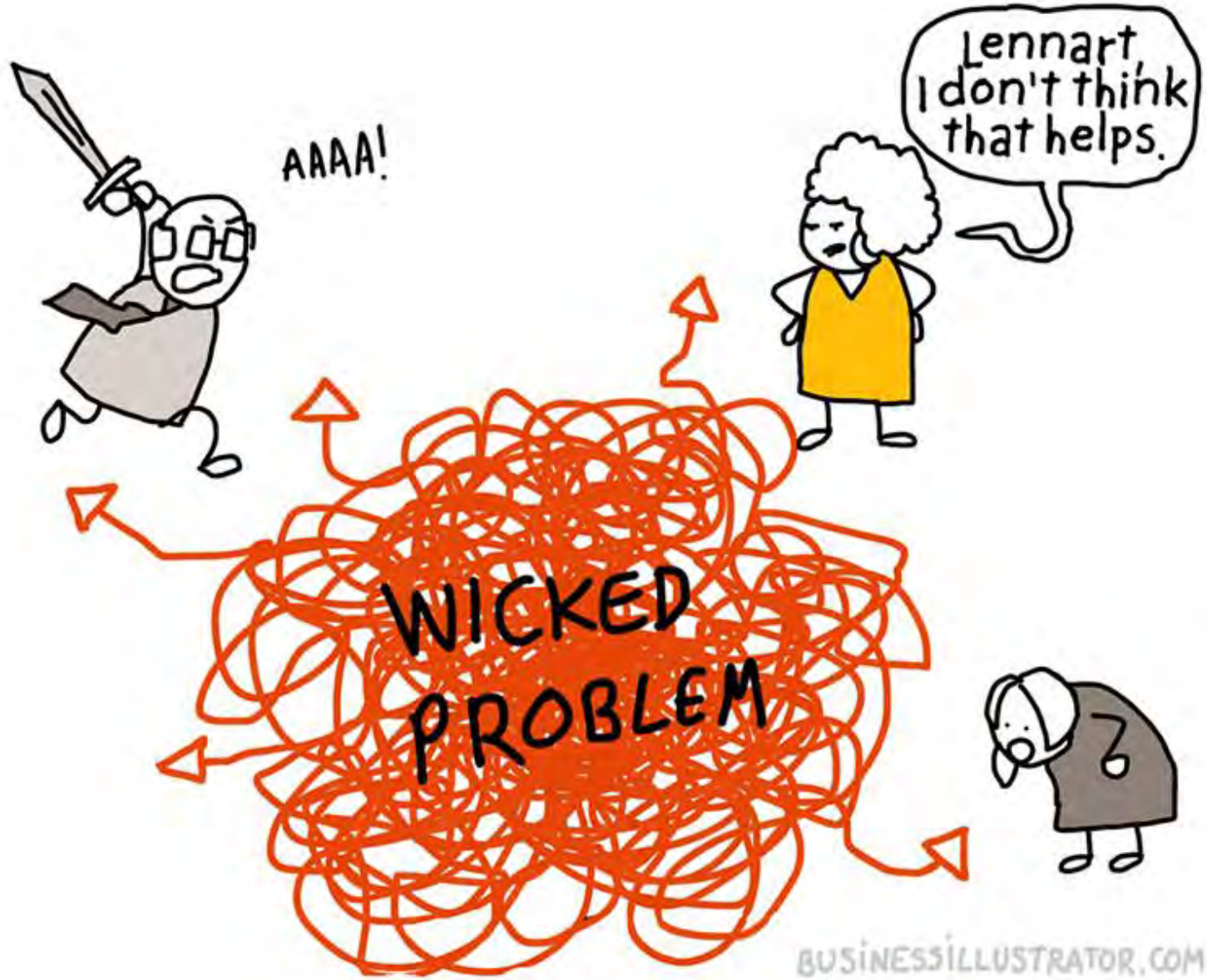


Figure 8: Tracts graded on combined metrics, selected tracts highlighted

Source: Belko, et al. University of Michigan. Detroit's Strategic Urban Forest Plan, 2020.

“Wicked Problems”


AAAA!
Lennart, I don't think that helps.
WICKED PROBLEM
BUSINESSILLUSTRATOR.COM

Planning for the Inevitable

Aging in Place & Active Transportation

What is Aging in Place (AIP)?

Aging in Place (AIP) describes the ability to stay in your community (and thriving) through all stages of life – from childhood to old age.

AIP planning helps people live *healthier lifestyles*, both physically and mentally.

- Barrier-free entryways
- Roll-in showers
- Safe, stable stairways with handrails
- Sitting- and standing-height countertops
- Easy-use faucets and handles
- Watertight roofs and quality heating

- Multi-modal / active transportation
- Quality stage-of-life housing
- Parks with multiple amenities
- Multigenerational programming / events
- Diversified businesses

What is Active Transportation?

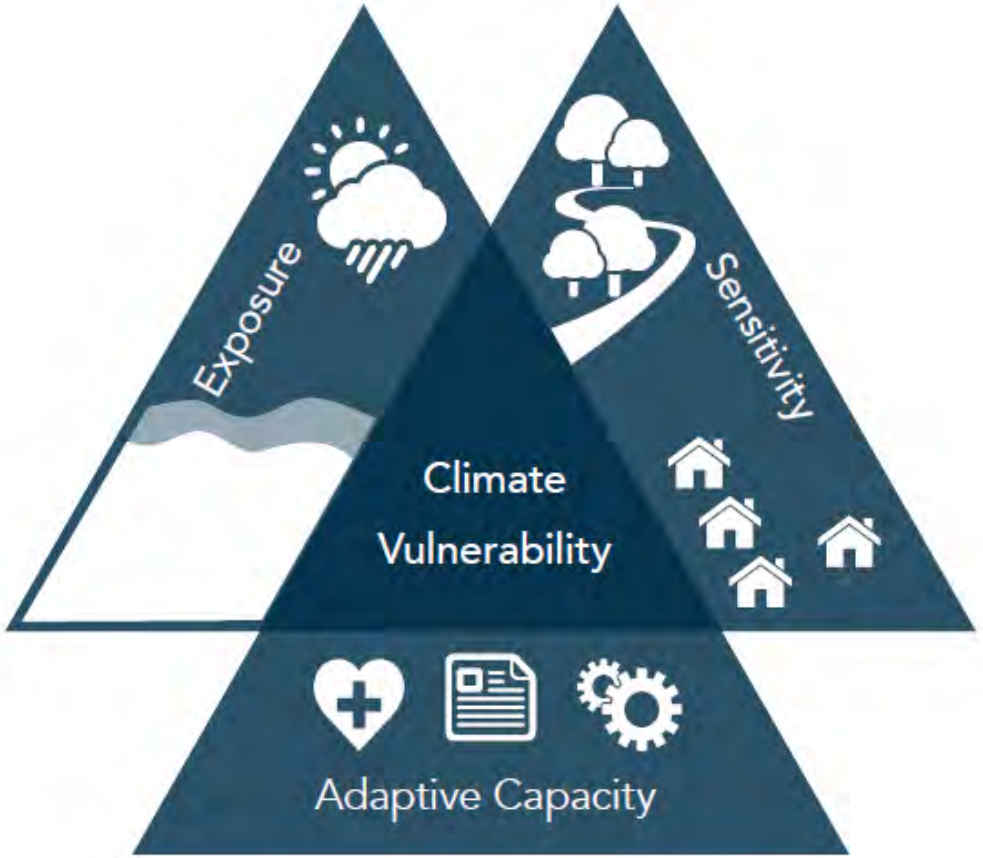
Multi-modal transportation, non-motorized transportation, Complete Streets…these terms all describe a system of mobility that supports access – getting what you need independently and safely, no matter your age, ability, or income.

- "15-Minute City", localized economies
- Transit-oriented, mixed-use development
- Growth boundaries
- Multi-use paths, signage
- Reduced parking requirements



Relationship to Public Health & Climate Resiliency

- **Reduced car dependence** (fewer emissions)
- **Housing diversity / security** (missing middle housing)
- **Land use efficiencies** (higher densities)
- **Mental and physical health benefits** (social capital, wellness, resiliency)



EXPOSURE	ADAPTIVE CAPACITY	SENSITIVITY
• Area impacted by climate hazard(s) • Severity of climate hazard(s) • Frequency of climate hazards	• Mobilizable response resources • Information, skills & communication • Institutional and social capital	• Household & community characteristics • Quality of housing & other physical systems • Functionality of, access to services & utilities

Case Study:
Marine City

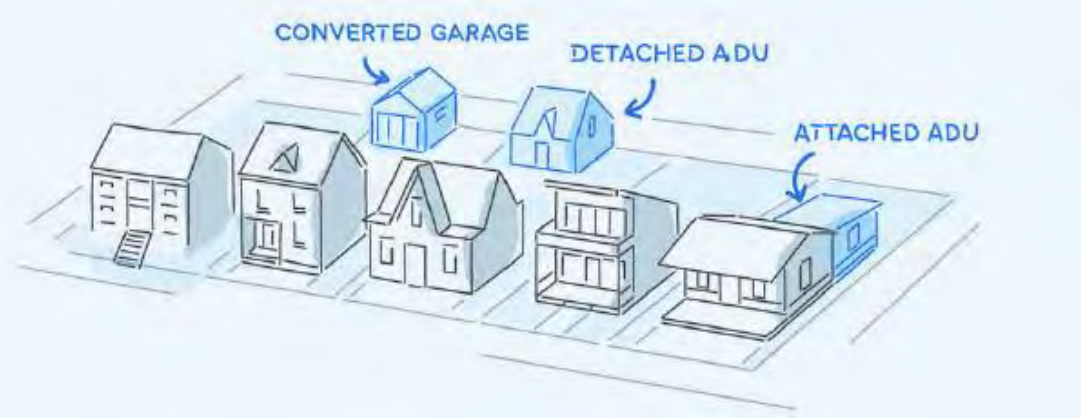
Challenge(s)

- Aging population
- Aging homes and infrastructure

Solution(s)

- Zoning for:
  - Duplex conversions, ADUs, cluster housing
  - Missing middle (see also: ULI Attainable Housing)
  - Multifamily senior housing, assisted living
- Home improvement program (see also: Southfield CHORE program)

MME Summer Workshop | July 16-19, 2024



Case Study:

Royal Oak Township

Challenge(s)

- Sidewalk / route gaps
- Dangerous crosswalks, intersections
- High impervious surface area
- Limited land availability

Solution(s)

- Prioritize Safe Routes to School
- Increase transit and NMT capacity through road diets
- Landscaped pedestrian islands and transit stops

MME Summer Workshop | July 16-19, 2024

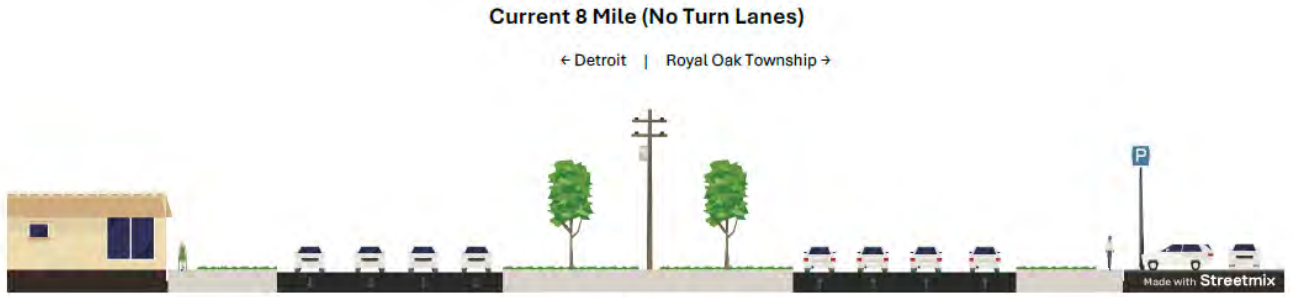
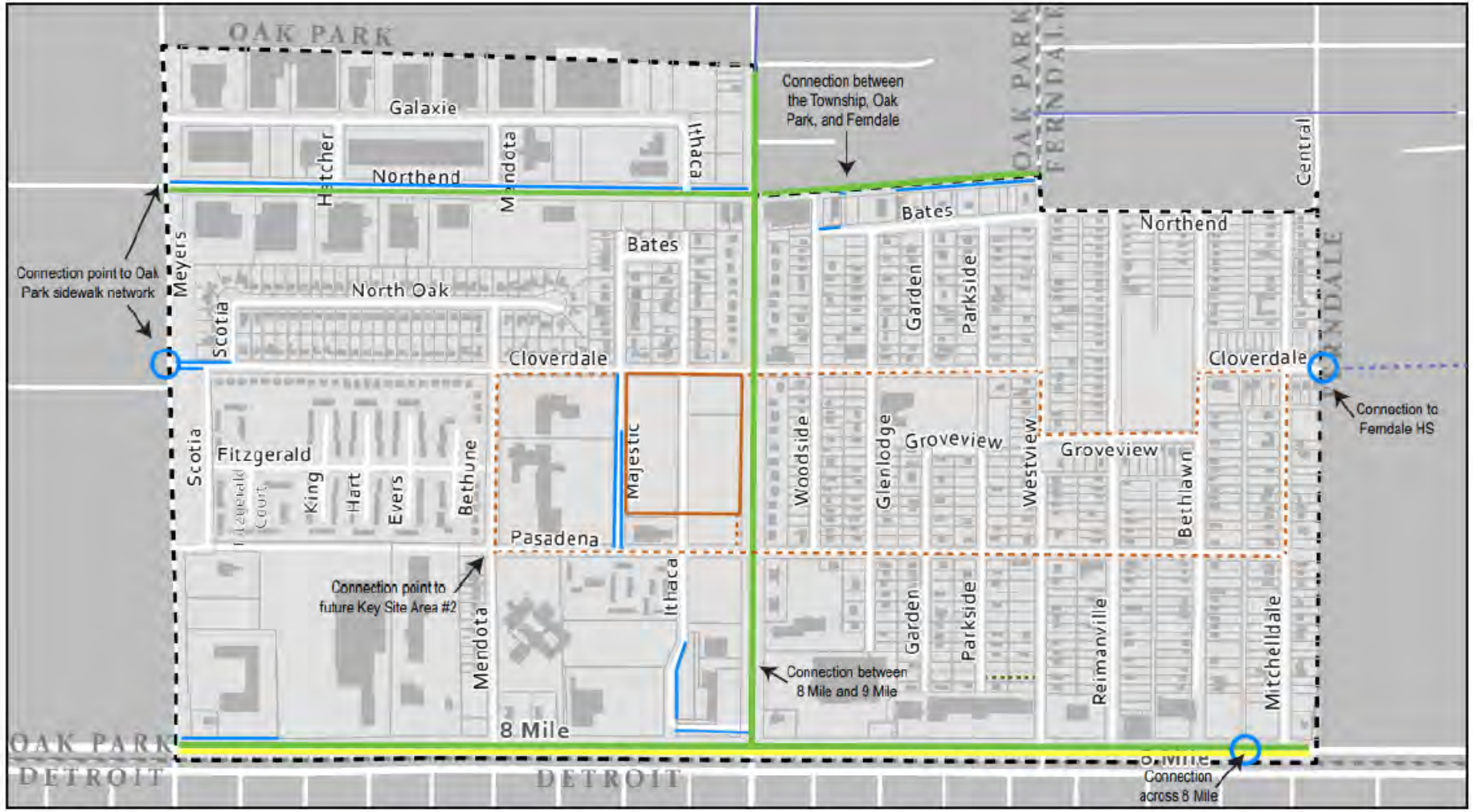


Image Source: Reimagine Washtenaw Corridor Improvement Study (left), RIPTA & Toole Design Group (top right), BeyondDC (bottom left).



Future New Transportation Facilities

Royal Oak Township

March 5, 2024

LEGEND

- New 5-foot Sidewalk
- New Double-Sided On-Street Bike Lane
- New Bus Rapid Transit (BRT) Lane
- New Walking Path
- Potential Route of New Walking/Multi-Use Path
- New Temporary Mid-Block Path
- Planned Bike Lane Outside Township
- Planned Sidewalk Outside Township
- New Multi- Jurisdictional Crosswalk

0 0.1 Miles

N

Basemap Source: Michigan Center for Geographic Information, v. 17a.
Data Source: County or Local Community Source, McKenna 2023.
State of Michigan, 2023.
SEMCOG Open Data Portal, 2023.

Case Study:
Sustainable Rochester

B	Mobility	PRIORITY	TIMEFRAME	PARTNERSHIPS
STRATEGIES + ACTIONS	**B.1** Complete a City of Rochester Mobility Plan to plan infrastructure, operations, technology and behavioral strategies to improve network function in the City.	C	1+ years	CITY, DPW, MDOT, DDA, PC, CC, CM, BO
	B.2 Set an overall Citywide Vehicle Level Of Service (LOS) goal of C and consider Multimodal Level of Service indicators in all traffic evaluation.	B	1 year	CITY, DPW, CC, PC, DDA
	B.3 Identify high priority planned trail, biking, and pedestrian connections and amenities in the City for near-term mobility improvements. Specifically consider strategic placement of bike lanes, bicycle racks, and designated cut out lanes for ridesharing pickups and drop-offs.	A	< 6 Months	CITY, DPW, CM
	B.4 Consider piloting a bike-sharing program.	C	1+ years	CITY, CC

DEVELOPMENT COMPONENT	INDICATOR	BASELINE	TARGET / FUTURE TREND
4 *Walkability*	**4.1 Regional** National Walkability Index	4.3 - 11.2 walkability index score	Grow
	4.2 Local Intersection Density	20.8 - 192.3 / square mile	10% increase
5 *Traffic*	**5.1 Regional** Overall Traffic Counts	8,833 - 31,799 AADT	Maintain baseline
	5.2 Local Trip Generation	Site Specific - ITE peak hour trip generation average of adjacent parcel(s)	5% higher trip generation than average of adjacent parcel(s)
6 *Travel Time*	**6.1 Regional** Average Commute Time	27.7 minutes	Reduce
	6.2 Local Intersection Delay	Site specific	15% higher peak hour intersection delay
7 *Nonmotorized Infrastructure*	**7.1 Regional** Regional Nonmotorized Infrastructure	2,291 miles	Grow
	7.2 Local Nonmotorized Transportation Infrastructure	61 miles	15% increase

Case Study:
Sustainable Rochester

E	Strong Neighborhoods	PRIORITY	TIMEFRAME	PARTNERSHIPS
STRATEGIES + ACTIONS	**E.1** Consider developing a local affordable housing incentive program and work with the Oakland County Community & Home Improvement Division to coordinate implementation.	C	1+ years	UC, CITY, DDA
	E.2 Consider to implement the local historic district, historic commission, and historic preservation guidelines and work with the Oakland County Community Historic Commission and the Rochester-Avon Historical Society to coordinate implementation.	C	1+ years	BO, CITY, DDA

DEVELOPMENT COMPONENT	INDICATOR	BASELINE	TARGET/ FUTURE TREND
15 *Housing Mix*	**15.1 Regional** Housing Tenure & Type	36% of housing stock multiple family / 37% of housing stock renter occupied	Grow
	15.2 Local Number of Multifamily Units	2,144 units	20% increase of total multifamily units
16 *Housing Affordability*	**16.1 Regional** Percent of Households with Housing Cost Burden	17.2% (mortgage) / 44.2% (renters)	Maintain baseline
	16.2 Local Median Unit Price	$361,735 (median house value) / $861 (median rent)	10% of units at median housing cost

Planning for the Inevitable

Urban Heat Mitigation & Natural Feature Preservation

What are Urban Heat Islands (UHI)?

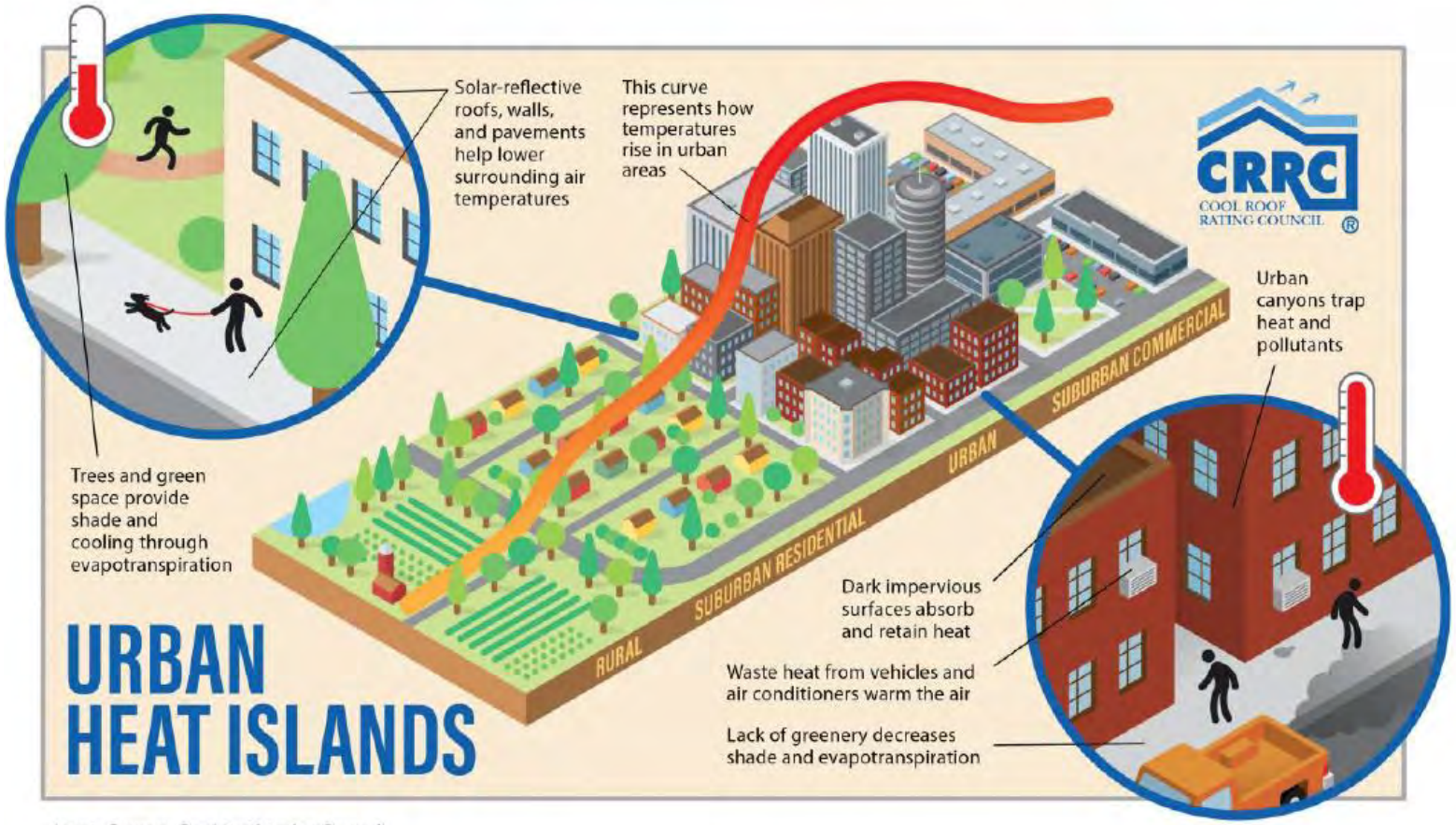


Image Source: Cool Roof Rating Council

Preserve…Conserve…Mitigate?

Mitigating UHIs (i.e., reducing their impact) is a multi-pronged approach. The preservation (or dedicated conservation) of existing natural areas is a good start by ensuring a limit or boundary to intensive development…but there are other strategies for consideration.

- Residential street trees
- Rooftop gardens
- LEED building standards

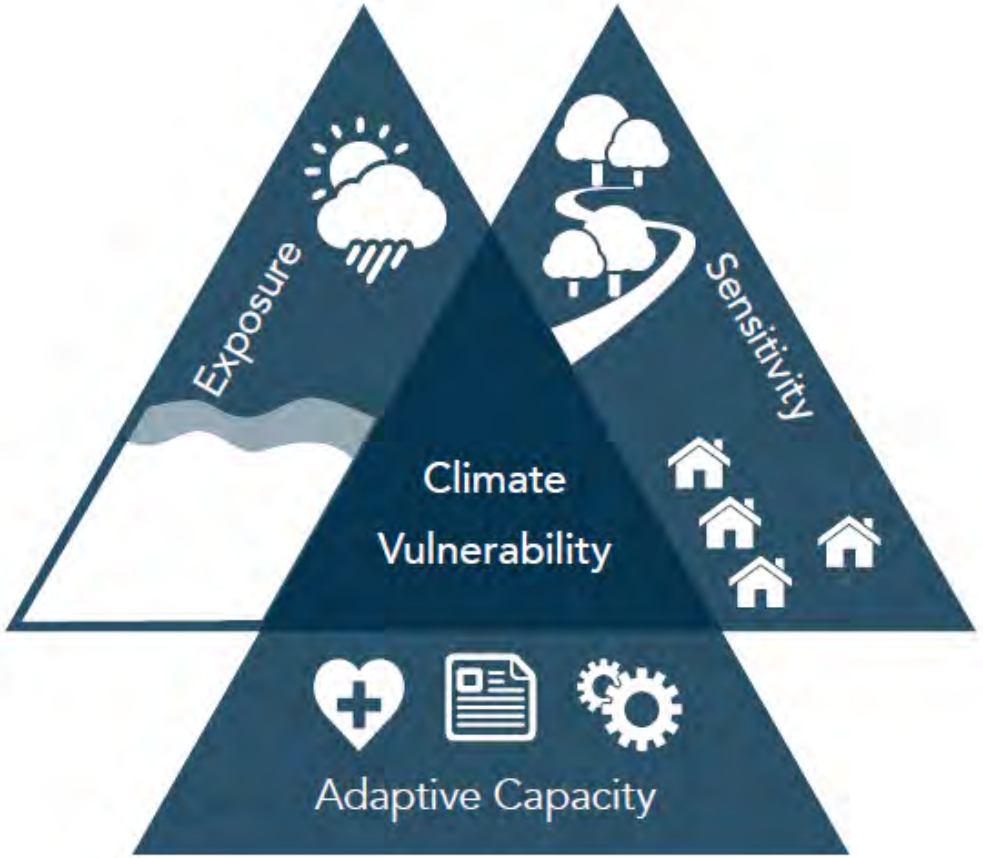
- Urban forestry / agriculture
- Public parks, green and blue spaces
- Public education programs, interpretive signage
- Reflective building materials, LEED standards
- Cooling centers and shade structures

MCKENNA

Michigan Municipal Executives

Relationship to Public Health & Climate Resiliency

- **Minimizing impacts of extreme temperatures** (more shade, shelter)
- **Increasing biodiversity** (habitats, food sources, and migratory patterns)
- **Engaged public** (education, empowerment, visible interventions)
- **Mental and physical health benefits** (green/blue natural areas, physical activity, access to critical services)



EXPOSURE	ADAPTIVE CAPACITY	SENSITIVITY
• Area impacted by climate hazard(s) • Severity of climate hazard(s) • Frequency of climate hazards	• Mobilizable response resources • Information, skills & communication • Institutional and social capital	• Household & community characteristics • Quality of housing & other physical systems • Functionality of, access to services & utilities

Case Study:
Birmingham

Challenge(s)

- Additional shade, shelter, and vegetation
- Accessibility to and through parks

Solution(s)

- Preservation is easier than replacement
- Prioritize tree and pollinator garden plantings, focusing on native species
- ADA-compliant restrooms, paths, mini-parks and pop-up parks
- Incentivize sustainable building practices

New Park Space

Mini Parks and Undedicated Public Lands. Since Birmingham is built out, there are few opportunities to create new park space. However, there are opportunities to leverage existing vacant land to enhance the network. Existing mini-parks are included in the walkability analysis, but most of them do not have many amenities, or even signage that identifies them as public places, as not all are dedicated (that is, with a deed restricting its use for a public park) as park space. The Parks Department has begun efforts to dedicate all these areas as parks. Following the completion of that process, the mini-parks should receive signage and additional amenities to identify them as city parks and enhance their function as neighborhood green space.

Benefits of Birmingham's Urban Forest

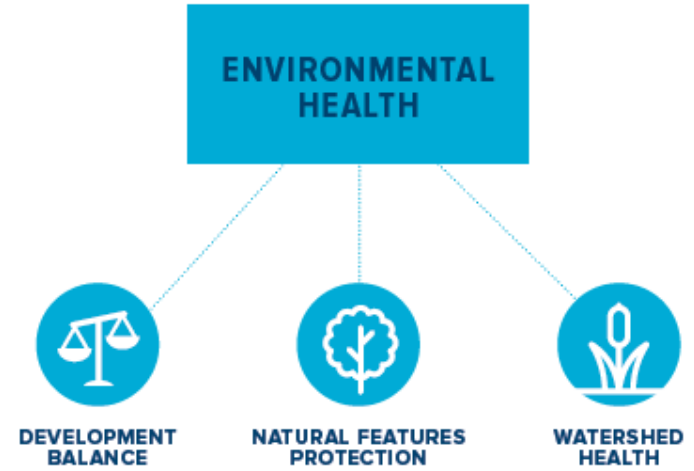
Communities around the US are increasingly starting to think of trees as a key part of the stormwater infrastructure system. Trees act as a "living utility" by intercepting stormwater and absorbing it before it becomes a burden on municipal pipes and waterways.

Birmingham's urban forest is already a key element of its green infrastructure. An inventory of the city's trees is in process (15,547 trees have been inventoried within the city along streets and in select parks so far). These trees provide the folllowing benefits:

1,189,646 pounds	2,771,413 gallons	12,683,407 gallons
of carbon dioxide is sequestered annually	of runoff is avoided annually	of rainfall is intercepted annually

Case Study:
Sustainable Rochester

A	Environmental Health	PRIORITY	TIMEFRAME	PARTNERSHIPS
STRATEGIES + ACTIONS	**A.1** Consider developing a green initiative program that incentivizes green roofs and/or solar panel titles/roofs.	C	1+ years	CITY, UC, DPW, PC
	A.2 Identify high priority parks and open space activities in and near Downtown and continue to maintain a current Parks and Recreation Plan.	C	1+ years	CITY, DPW
	A.3 Develop a Citywide geolocated tree inventory and update tree mitigation requirements in the Zoning Ordinance.	C	1+ years	CITY, DPW
	A.4 Continue to work with the Clinton River Watershed Council in evaluating projects that affect the Sustainable Rochester development indicators.	B	1 year	CITY, DPW, CRWC



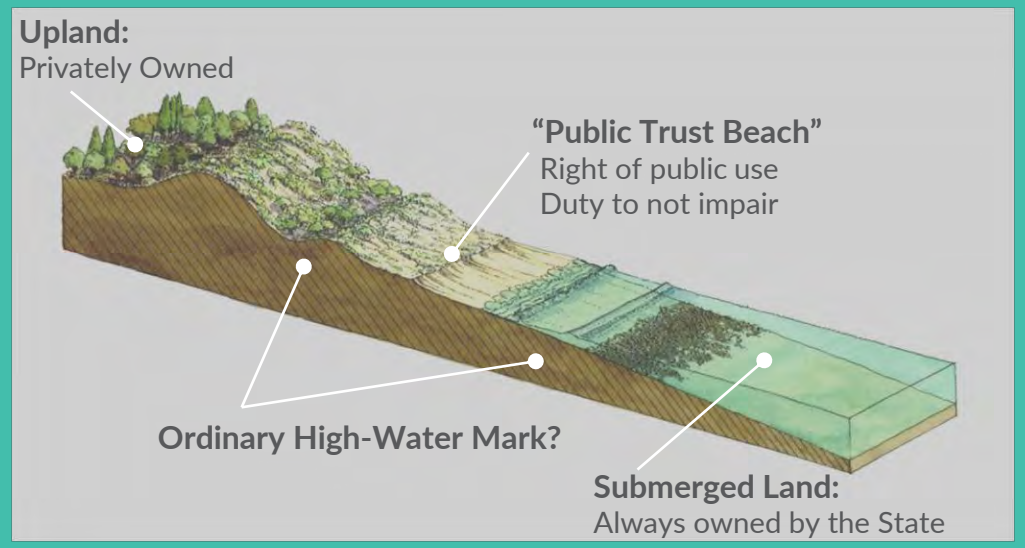
DEVELOPMENT COMPONENT	INDICATOR	BASELINE	TARGET / FUTURE TREND
1 *Development Balance*	**1.1 Regional** Percent of Land Use: Impervious Surfaces	36.6%	Reduce
	1.2 Local Parks and Open Space Acres / 1,000 residents	24.8 acres / 1,000 residents	10% increase
2 *Natural Features Protection*	**2.1 Regional** Percent of Land Use: Tree Canopy	31.1%	Grow
	2.2 Local Net Tree Change	Site specific	15% increase in total number of trees
3 *Watershed Health*	**3.1 Regional** Beneficial Use Impairments (BUI) of the Clinton River Watershed	8 BUIs	Reduce
	3.2 Local Development within Flood Hazard Zones	Existing development within flood hazard zones	0% net increase

Planning for the Inevitable

Stormwater Management & Coastal Resiliency

What's up with this weather lately?

Michigan is already one of the rainiest states in the U.S. and will likely stay that way with rising levels of precipitation and severe storms. Aged infrastructure and traditional development patterns within sensitive areas exacerbates runoff, flooding, and shoreline degradation.



- Rain gardens / bioswales
- Stormwater collection
- Permeable surfaces

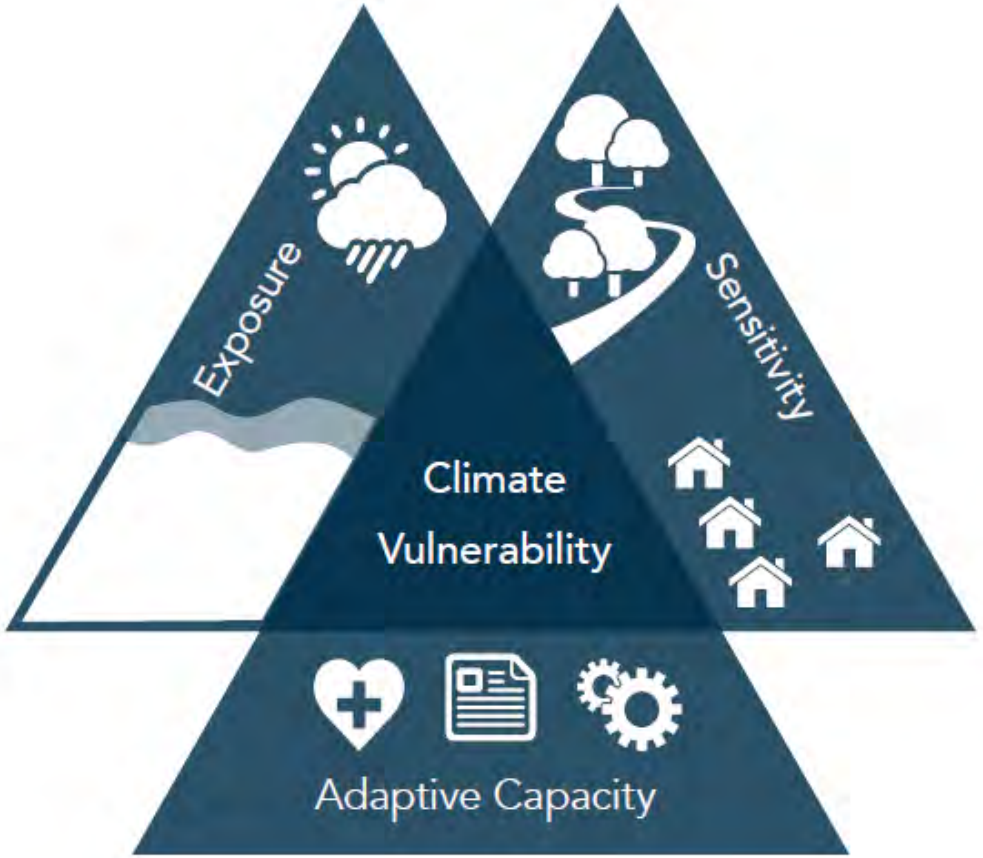
- Capital improvements plan – prioritize infrastructure upgrades
- Low-Impact Design, green infrastructure
- Inspect privately-owned infrastructure
- Developer-funded CIA, EIA for projects to determine impact / capacity
- No-Build Zones – public / private conservation areas, increased setbacks
- Hazard Mitigation Plan, scenario planning

MCKENNA

Michigan Municipal Executives

Relationship to Public Health & Climate Resiliency

- **Reducing exposure to erosion, flooding, and contamination** (setbacks, density/impervious limits, sanitary/storm systems, vegetative buffers)
- **Protecting life, property, and biodiversity** (emergency management, capital outlay, preservation)
- **Engaged and informed public** (coastal stewardship, clear policy and regulations, environmental impact analyses)



EXPOSURE	ADAPTIVE CAPACITY	SENSITIVITY
• Area impacted by climate hazard(s) • Severity of climate hazard(s) • Frequency of climate hazards	• Mobilizable response resources • Information, skills & communication • Institutional and social capital	• Household & community characteristics • Quality of housing & other physical systems • Functionality of, access to services & utilities

Case Study:
Birmingham

Challenge(s)

- Built-out, aged infrastructure
- Rising flood risks
- Continued funding, maintenance (MDNR)

Solution(s)

- Low-Impact Design / Green Infrastructure can supplement traditional infrastructure, absorb and retain water, and requires less regular maintenance.

Case Study:
Birmingham

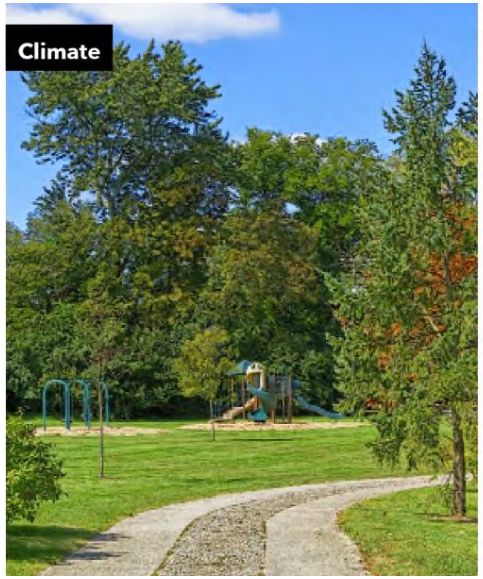
Tree Canopy:
Expressed as number of trees/acre.
(Collected: Perimeter Tree Count, Interior Tree Count, Estimated Canopy %)

Recycling Facilities:
Yes/No/How Many

Gardens and Landscaping:
Native Plantings, Decorative Planters

Bicycle Facilities:
Yes/No, What is Present

Green Stormwater Infrastructure:
Yes/No, What is Present



Case Study:

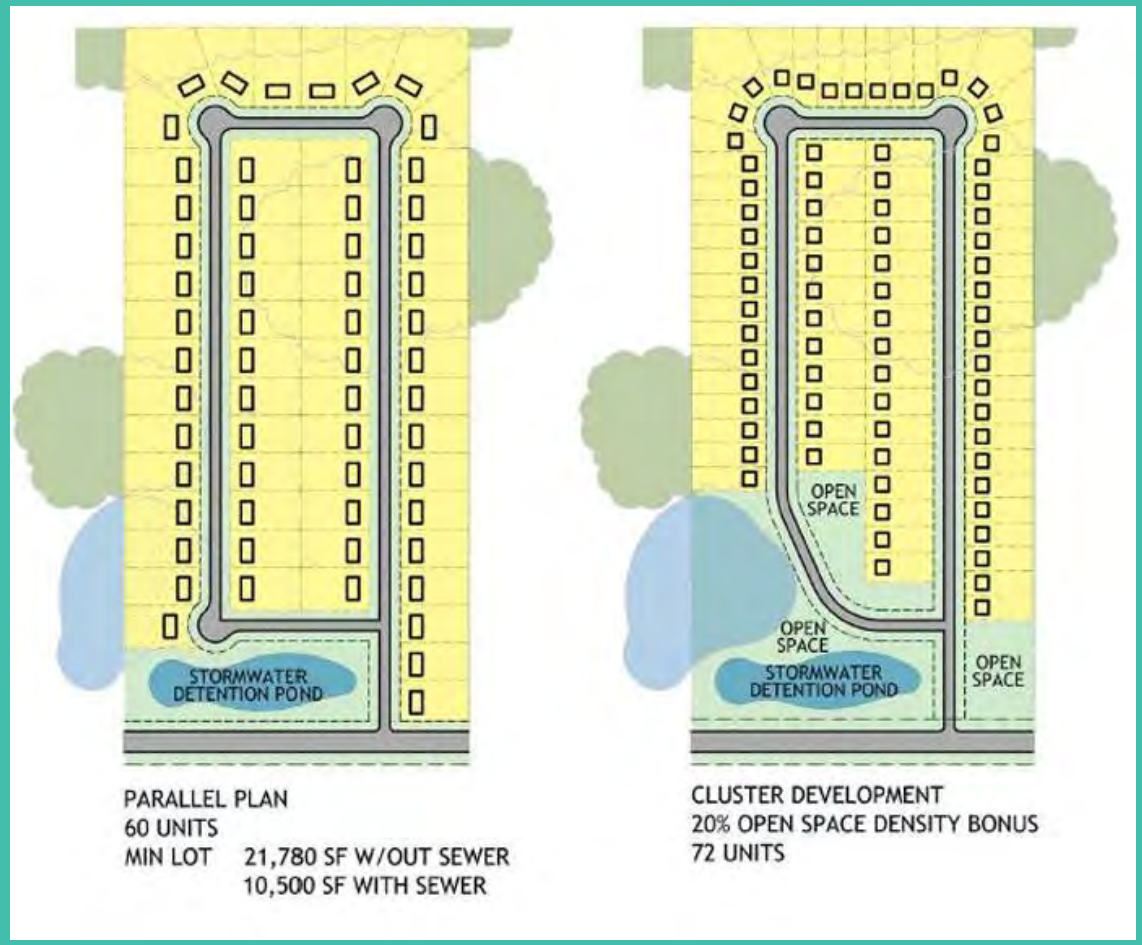
Ganges Township

Challenge(s)

- Sensitive dunes and waterways
- Lack of public sanitary/storm systems (relying on private or septic systems)

Solution(s)

- Prioritize cluster housing and “long lot” development near sensitive ecosystems.
- Establish waterfront setbacks to the OHWM; consider shoreline overlay district(s).
- Collaboration with shoreline HOAs to achieve cohesive protections.



Case Study:
Sustainable Rochester

D	Public Services	PRIORITY	TIMEFRAME	PARTNERSHIPS
STRATEGIES + ACTIONS	**D.1** Identify the top 5 public works projects outlined in the City's asset management planning process that will most benefit Rochester's long-term sustainability and work to develop partnerships for implementation.	B	1 year	CITY, DPW, CC
	D.2 Consider the adoption of Smart City infrastructure initiatives.	C	1+ years	CITY, DPW, CC
	D.3 Address City emergency response times through operational and capital investment and update Sustainability measures as improvements are made.	B	1 year	CITY, CC

DEVELOPMENT COMPONENT	INDICATOR	BASELINE	TARGET/ FUTURE TREND
10 *Pipe Maintenance*	**10.1 Regional** Municipal Water and Sewer Expenditures Per Capita	$406.13 water and sewer expenditures / capita	Maintain baseline
	10.2 Local Linear Feet of Pipe	Combined Pipe Length – 398,723 linear ft.	2% increase
11 *Pipe Condition*	**11.1 Regional** Age of Water and Sanitary System	1869	Reduce
	11.2 Local Percent of Deficient / Critical Pipes	High Risk Sanitary Pipe – 9,985 linear ft. Water Pipes < than 8 in. (diameter) – 88,207 linear ft.	Sanitary – reduce 15% Water – reduce 5%
12 *System Capacity*	**12.1 Regional** U.S. Census Urbanized Area	Rochester within UZA and half of Oakland Township	Maintain baseline
	12.2 Local Net Change in ERU	At capacity	0% change

Final Thoughts

The future is healthy and resilient...as long as we have a PLAN

- Identify, Quantify, and Analyze
- Build Consensus
- Articulate Goals and Objectives
- Stand By Your Plan

The future is healthy and resilient...as long as we have a PLAN

- **Identify, Quantify, and Analyze**
- **Build Consensus**
- **Articulate Goals and Objectives**
- **Stand By Your Plan**

- Focus on data, not politics (**not <u>why</u>** its happening, but **<u>what</u>** is happening)
- Talk about **<u>impacts</u>** of climate change without saying the word climate change (e.g., increased SW runoff)
- **<u>Visual cues</u>** of recent events (e.g. flooding damage, etc.)

The future is healthy and resilient...as long as we have a PLAN

- Identify, Quantify, and Analyze
- **Build Consensus**
- Articulate Goals and Objectives
- Stand By Your Plan

- **Educate** throughout, but especially at the beginning – and remember: education **≠** policy change
- Presentations from scientific **experts**
- Effective planning appeals to **emotions**
- Be sensitive of **pre-existing values** and world view.
- Stakeholders can describe how the climate is **impacting their job**
  - Farmers
  - Public Works officials
  - Emergency responders
  - Public health officials
  - Natural resource managers

The future is healthy and resilient...as long as we have a PLAN

- Identify, Quantify, and Analyze
- Build Consensus
- **Articulate Goals and Objectives**
- Stand By Your Plan

- Focus on **local solutions** to global issues – global discussions of climate change are not very productive at the local level
- Recognize both **immediate** and **long-term** impacts.
- Consider **tradeoffs** (e.g. waterfront setbacks vs. the fiscal benefit of waterfront development)
- Focus on identifying **actions of no regret** and non-climate benefits of actions.
- Acknowledge the **uncertainty** of climate science
- Keep terms and explanations **simple**

The future is healthy and resilient...as long as we have a PLAN

- Identify, Quantify, and Analyze
- Build Consensus
- Articulate Goals and Objectives
- **Stand By Your Plan**

Planning is a **public** process; be prepared to address:

- Opposition/Skepticism/Disinterest
- Powerful interests
- Existing development patterns
- Outdated regulations
- Lack of coordination between communities

Implement, Evaluate, and Modify…develop or update:

- Zoning Ordinance
- Capital Improvements Plan
- Hazard Mitigation Plan
- Parks and Recreation Plan
- Economic Development Plan
- Development Review Processes

Thank You!

Questions?

MCKENNA

Gage Belko, AICP

Associate Planner

gbelko@mcka.com

248.596.0920