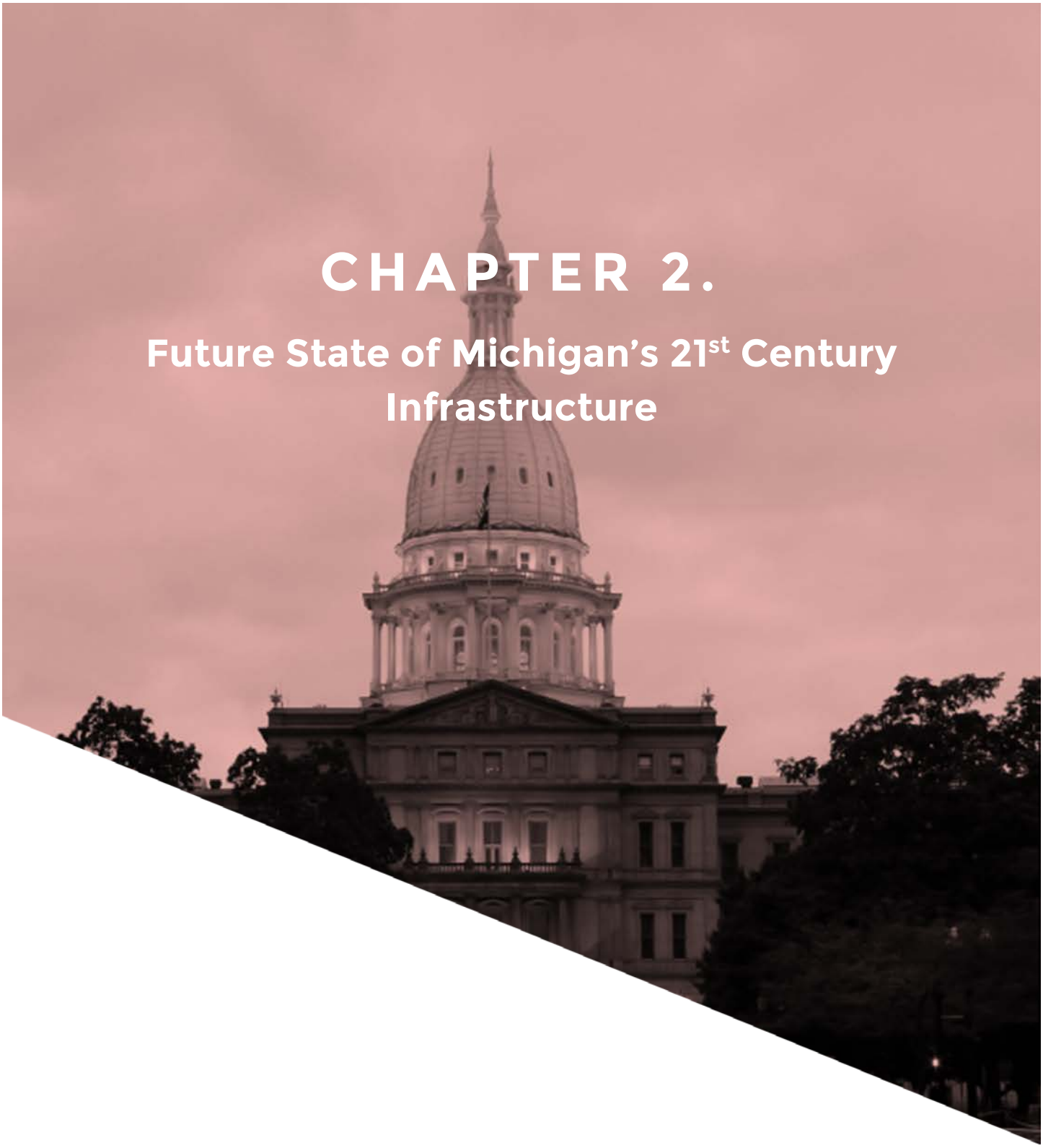


CHAPTER 2.

Future State of Michigan's 21st Century Infrastructure

21ST CENTURY SMART STATE

FUTURE STATE OF MICHIGAN

A smarter state improves quality of life by building infrastructure that optimizes technologies and enables new work processes, services, and products. This construction relies on evaluating residents' experiences with safety, security, health, energy, transportation, and communication. Michigan's future state will be experienced in the following ways:

TRAILS

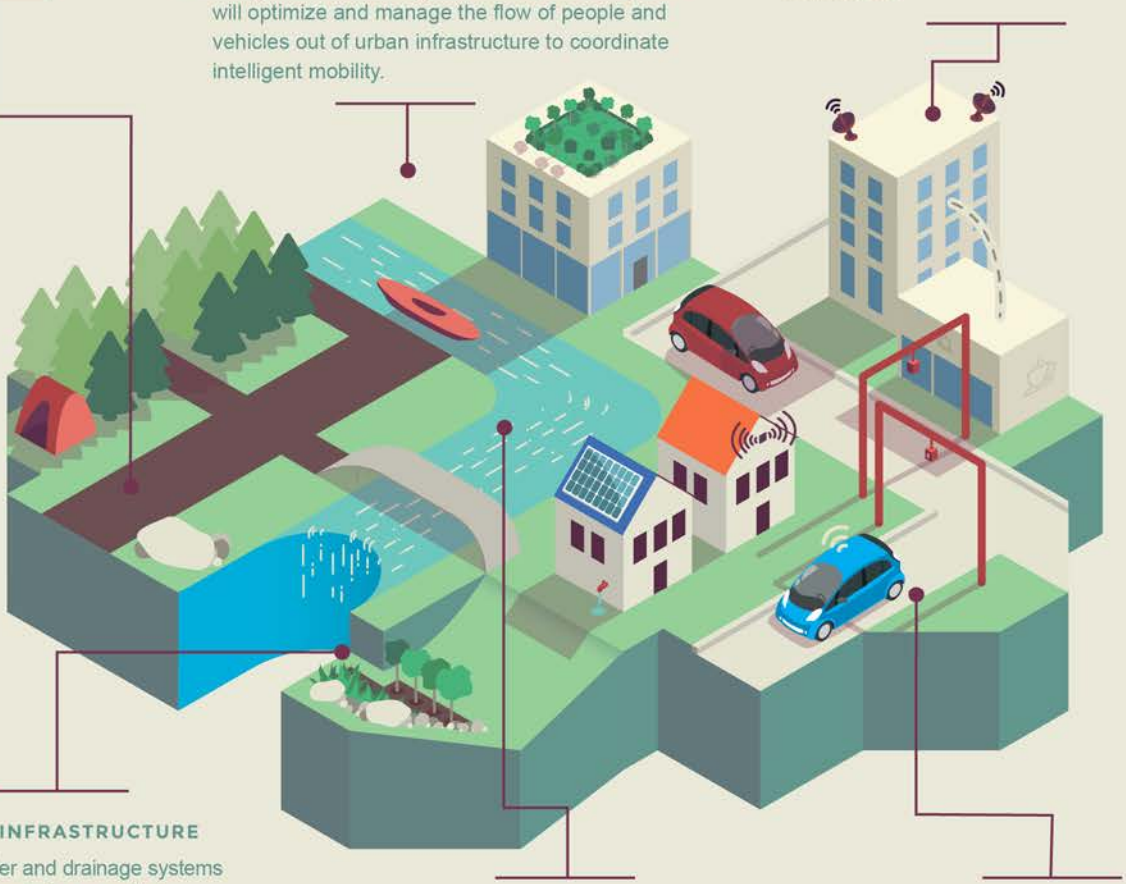
- Statewide efforts like the Iron Belle Trail have improved cross-community trail linkages and economic development opportunities, continuing Michigan's legacy as "The Trail State."

SMART ENVIRONMENTS

- Medical devices transmit patient data from homes to hospitals and alert first responders in case of an emergency, allowing more residents to age in place.
- Street lights make communities safer by prompting city workers to replace the light bulb before it burns out.
- Technology alerts law enforcement of crime or suspicious activity as it happens so they can arrive on the scene sooner.
- Using data from intelligent sensors, control systems will optimize and manage the flow of people and vehicles out of urban infrastructure to coordinate intelligent mobility.

COMMUNICATIONS

- Advanced broadband technology enables employees to work from anywhere, at any time, and provides students with the ability to access educational resources even in the most rural areas.
- Michigan will continue to set industry standards in cyber security by finding innovative ways to defend critical information, control access and identity management, and embrace new and emerging technologies.



GREEN INFRASTRUCTURE

- Stormwater and drainage systems manage water in a way that maximizes benefits to people and nature.
- Michigan's road and rail systems ensure that rivers, streams, and drains remain free flowing to protect ecosystem health and safely move people and goods.

WATER

- Water utilities are financially stable and provide safe, reliable, and high-quality service for all residents.
- Water systems are designed and built using the best available cost-effective technologies to equitably provide services to residents and businesses.
- Infrastructure will monitor water quality and water levels and alert government officials to maintenance issues before larger, more costly problems develop.

TRANSPORTATION

- Michigan leads the way in research and development of intelligent vehicles.
- Intelligent traffic systems allow commuters to avoid congestion by suggesting alternative travel routes.

Guiding Principles

The 21st Century Infrastructure Commission's goal is to enhance Michigan residents' quality of life, drive economic growth, and create a strong foundation for vibrant communities. We can achieve this by planning for 21st century infrastructure systems that are safe, reliable, efficient, and cost-effective for all residents.

The Commission developed the following guiding principles to direct the recommendations for creating a 21st century infrastructure system for the state of Michigan:

- **Create infrastructure systems that enhance quality of life, enable economic growth, and provide a strong foundation for vibrant communities.** Strong, modern infrastructure is vital to attracting and retaining residents and businesses. Infrastructure systems serve as the backbone for our communities; therefore, we should preserve, maintain, and improve our infrastructure systems.
- **Promote coordination, cooperation, and communication.** All levels of government and infrastructure entities in Michigan are incentivized to coordinate, cooperate, and communicate throughout the infrastructure planning, management, and implementation process. Programs and infrastructure projects need to have clear, established objectives and performance metrics, which track progress and effectiveness of work undertaken.
- **Build a culture of strategic investment through asset management**. Infrastructure asset management uses a continuous improvement model and a risk-based approach, ensuring infrastructure needs are prioritized and funded.
- **Design infrastructure systems that are adaptable, flexible, and resilient.** Michigan's infrastructure should be able to adapt to changing demographics and technologies, as well as climate impacts. To maximize public health protection, Michigan's infrastructure should also be safe and resilient in the face of cyber and physical threats.
- **Leverage a variety of public and private investment and financing resources.** A range of funding and financing options will ensure adequate investment in and operation of safe, reliable, efficient, and cost-effective infrastructure. Coordination of project planning and implementation across infrastructure sectors will facilitate optimal solutions as well as shared sourcing and cost allocation.
- **Encourage meaningful public engagement.** Transparency, accountability, and opportunities for public engagement are reflected in infrastructure planning, prioritization, economically sustainable funding models, and financing mechanisms that result in high levels of satisfaction with infrastructure service.
- **Prioritize environmental quality and sustainability efforts across all infrastructure sectors.** Sustainable practices, including green infrastructure, environmental efficiency, and beneficial reuse, are prioritized in infrastructure planning.
- **Embrace emerging technologies, visionary planning principles, and innovative approaches.** Infrastructure designers and providers embrace new technology and cutting edge planning principles to meet the needs of 21st century infrastructure systems in project planning, design, and implementation.

Outcomes

In addition to developing guiding principles, the Commission and its technical advisors—with input from stakeholders—assessed Michigan's current and future state of infrastructure. The Commission then developed a series of recommendations to achieve this vision.

The Commission's recommendations are organized across this report by four key types of infrastructure: communications, energy, transportation, and water. The Commission also developed a set of cross-cutting recommendations that impact all areas of infrastructure (presented in Chapter 3). Regardless of the type of infrastructure, however, the Commission developed recommendations that will lead Michigan to realize the following outcomes:

EP **Economic prosperity:** The state's infrastructure system serves as the platform for our economic success, including our communities, businesses, and residents. Our infrastructure systems must be built for a 21st century Michigan to fully meet the state's current needs and expectations. Modern infrastructure and coordinated investments are essential to support the economic prosperity of our state.

HE **A healthy environment:** The state's infrastructure system is interconnected with the health of our people, environment, and communities. Investments in communications, energy, transportation, and water networks and technologies support a Pure Michigan that, in many ways, defines the character of our state.

QS **Reliable, high-quality service:** The state's infrastructure system provides its users with reliable, high-quality services to support vibrant communities and business operations. Our transportation systems move people and cargo effectively and efficiently, our energy systems provide affordable and reliable electricity and heat to homes and businesses, our communications systems enable Michiganders to stay connected in a global world, and our water management systems protect and enhance public and environmental health.

VI **Value for investment:** The state's infrastructure system is supported through wise investments that ensure we get the most value from limited financial resources. Through coordinated asset management across Michigan's infrastructure systems, we can make strategic and optimal decisions about infrastructure repair and replacement to ensure greater value for our investments.