

Summary of the Infrastructure Innovation Tour

for the University Research Corridor

June 2019

BACKGROUND

Michigan's University Research Corridor (URC) embarked on a six-stop Infrastructure Innovation Tour over nine months in 2018 and 2019 for the purpose of generating conversations about infrastructure needs, promoting innovation, and fostering future collaboration. The issues were identified in the report *Foundation for the Future: URC Contributions to Infrastructure Improvement* presented by the URC in Spring 2018. Expert teams gathered at each tour stop to discuss issues and opportunities related to infrastructure challenges in water, mobility, trade, and communications. In June 2019, the tour culminates in a tour wrap-up event in Detroit that shares tour highlights, themes common across Michigan, and potential implications for other communities facing similar infrastructure concerns.

THE TOUR STOPS

The URC assembled expert teams at each tour stop that included researchers from the URC institutions of Michigan State University, the University of Michigan, and Wayne State University, as well as topic experts from host universities. Invited participants also included local and state government leaders, business and economic development leaders, state and county agency personnel, and local, state, and federal elected officials. For more information on each tour stop, see the URC project website at <https://urcmich.org/infrastructure-tour/>.

- **City of Monroe and Water Infrastructure**

*Algal blooms and their direct effect on infrastructure, communities, industry, and human health
October 2018*

What did we hear about community experiences?

The City's water infrastructure challenge is maintaining water quality so that it meets permit requirements. They have been reactive to permits and threats to the water supply, and want to be more proactive. The City has ongoing funding needs for maintaining its infrastructure.

Which research expertise is relevant across the URC?

Research expertise in the areas of chemistry, public health, water and environmental sciences, and public policy is relevant for Monroe and its water infrastructure issues.

What connections exist, and what connections need further development?

The dialogue at this tour stop identified the need for coordination with URC researchers on algal blooms, the lead and copper rule, PFAS, coordinated infrastructure, and emerging contaminants. The municipality seeks methods for improving water quality treatment and to be more knowledgeable about forthcoming regulations.

- **Sanilac County and Rural Broadband Access**

*Rural and urban access to broadband, and securing widespread connectivity
November 2018*

What did we hear about community experiences?

The lack of investment in broadband by the State of Michigan leaves rural and poor populations high and dry in terms of connectivity. The experts at this tour stop are looking for more creative public-private partnerships, with the Merit Network partnership serving as a model, to begin filling the gaps in broadband coverage. Expanding broadband contributes directly to workforce development and business development opportunities.

Which research expertise is relevant across the URC?

Research expertise in the areas of agricultural technology, social sciences like poverty research, telemedicine, and engineering is relevant for this issue.

What connections exist, and what connections need further development?

This dialogue lifted up the important roles played by the Intermediate School Districts (ISDs) and Merit Network's Michigan Moonshot. Several states invest in broadband installation and maintenance while Michigan spends nothing. Good models exist at the local level such as Lapeer County and at the state level like Colorado, Minnesota, California, and Maine.

- **Sterling Heights, Macomb County and Roads and Transportation**

Impacts of Michigan's failing road infrastructure on communities, and the research underway to meet these challenges

April 2019

What did we hear about community experiences?

The public-private collaboration behind Innovate Mound Road, an initiative to rebuild one of the most important corridors in Southeast Michigan, is moving \$40B in imports and exports. This project will enhance the roadway experience for commuters and the major industries that line it (including automotive, aerospace and defense) as well as expand

opportunities for businesses to create jobs in Michigan. Generally, when talking about roads in Michigan, “it’s bad all over.”

Which research expertise is relevant across the URC?

Research expertise in engineering and information technology is relevant to this issue.

What connections exist, and what connections need further development?

Michigan needs a stronger connection between the development and availability of new technologies and local road infrastructure decision making. Municipal leaders seek innovations that will ensure a higher return on investment (e.g., safety, longevity, cost efficiency) for road projects, and university researchers seek real-world opportunities to test their innovations. For example, we need more projects like the installation of sensors on the Mackinac Bridge by MSU and MDOT.

- **City of Kalamazoo, Southeast Michigan and PFAS and Water**

Water infrastructure and contamination issues, including per- and polyfluoroalkyl substances (PFAS)

April 2019

What did we hear about community experiences?

Sound infrastructure is fundamental to the quality of life, and communities like Parchment and Kalamazoo have been facing a confusing and frightening situation with the emerging carcinogenic contaminants known as PFAS and PFOA in the water supply. The lack of information about the chemicals and their location and movement coupled with the need to respond quickly and communicate to residents for public safety creates a difficult challenge for community leaders. They want to know from state officials and researchers--not to mention the manufacturers of these chemical compounds--what is known that they can tell their residents.

Which research expertise is relevant across the URC?

Among the relevant research expertise for this issue are PFAS compound testing and analysis, public health, biochemistry, biotechnology, agricultural technology, and engineering. Research areas prioritized by the dialogue participants include testing/analyzing PFAS compounds and site locations, researching the health effects of PFAS on humans, and developing innovations to remediate PFAS contamination.

What connections exist, and what connections need further development?

More is unknown than known with this issue. Monitoring and testing are critically important activities at this stage in problem identification. Gaining a greater understanding

of where PFAs chemicals exist and what their effects are will inform the remediation efforts. This group of experts identified modeling groundwater contamination such as the work underway by Dr. David Hyndman to be critical, as well as monitoring and testing coordination with URC researchers and EGLE.

- **Sault Ste Marie and Maritime Trade and Soo Locks**

*Economic and environmental challenges and opportunities surrounding maritime shipping and lock expansion
May 2019*

What did we hear about community experiences?

The Soo Locks and the maritime shipping trade that they bring are central to the economic vitality of the community and much of the inland U.S. The forthcoming upgrade of the locks provides a significant leveraging opportunity for the community to address related objectives such as workforce development, economic development, housing stock enhancement, environmental restoration and protection, and recreation and tourism growth. Local experts voiced concerns about scaling up for the construction phase, longer-term climate and meteorological impacts on the upper Great Lakes and St. Marys River, and being integral partners on the Army Corps of Engineers-led project.

Which research expertise is relevant across the URC?

These interlocking systems require research expertise in maritime trade and policy, naval architecture, economics, urban planning, large lake modeling, engineering, freshwater ecology and hydrogeology, meteorological sciences, and information technology.

What connections exist, and what connections need further development?

Local experts acknowledge that good connections exist with the Army Corps of Engineers (ACE) during the planning and design phase of the locks upgrade. The URC should work with the ACE on the design team since the project would benefit from a data-driven decision-making process and appropriate technology such as sensors. A collaborative model for finding and deploying talent that was used in East Lansing may be useful for the Sault Ste Marie cities.

- **Detroit Tour Summary FORTHCOMING**

*Share tour highlights, themes common across Michigan, and potential implications for other communities facing similar infrastructure concerns
June 2019*

FINDINGS

A. What was the value of these dialogues to URC researchers?

The dialogues helped URC researchers to identify current and future partners and applications for their research as well as to clarify and frame problems and research questions. In some cases, URC researchers shared their work with the cross-disciplinary expert teams at the tour stops.

What was the value of these dialogues to local experts?

Local experts gained access to specialists in fields relevant to their local issues and identified potential research partners and funding opportunities. The tour stops brought objective research and data to help with local decision-making. The in-person dialogues shrunk the space between the “ivory tower” and City Hall.

What do we think we heard and learned?

The right people were around the table. The URC’s thoughtful approach to shaping the dialogues meant inviting stakeholders who would bring unique perspectives, connections, and expertise to the conversations. The person-to-person connections that were fostered at the tour stops appear to build and strengthen a foundation for on-going problem-solving and innovation around Michigan’s infrastructure challenges.

The URC approach encourages longer-term thinking. All of the infrastructure issues are complicated, multi-faceted challenges that require diverse skillsets and research-practice-research feedback loops that yield data-driven decision-making.

The discussions around infrastructure improvement need to continue with the URC playing a key role. Participants at several of the tour stops expressed the desire to continue the dialogue with the URC and invited experts.

B. What are the implications for research-to-practice-to-research feedback loops from having conducted these dialogues?

- How do we scale projects and coordinate across a region or the state? How do we connect communities and researchers with ‘right-sized’ projects?
- Communications with the public need to provide messages tailored to a lay audience and be provided with a frequency appropriate to the issue.
- Changing personnel among local governments and organizations tends to happen with greater frequency than at the URC institutions. How are relationships maintained over time and how do we keep the ‘right’ people up-to-date?

Do better means exist for supporting Research-Practice-Research information?

- Consider re-energizing the Infrastructure Network with the VPs of Research.



C. While each tour stop focused on a specific issue and community, are there common themes that we can take away from the tour?

- Michigan needs to comprehensively re-invest in all forms of infrastructure in order to serve residents, attract business and industry and future leaders.
- Innovative solutions to tech and financing are needed and likely will involve public-private coordination.
- With each infrastructure challenge, someone or some group is being left behind. Many inequities exist in Michigan from insufficient infrastructure investment and development that limit our prosperity.
- We have the expertise, but the coordination is lacking as is the political will in the Michigan legislature. Without legislative support for infrastructure investment, it will be very difficult for Michigan to move up in the rankings.

D. Based on what we heard and learned at each tour stop, what are the implications for other communities across the state facing the same or similar infrastructure concerns?

At least one, and likely more, of the infrastructure topics covered by the Innovation Tour touch all Michiganders. Communities would benefit from tapping into the results from the Infrastructure Innovation Tour, and the network of experts to accelerate the identification of resources and solutions. Most communities are revenue-limited and need creative partnerships to safely deliver services to residents.

CONCLUSION

Where the URC goes next with the information gleaned from the tour is a topic for discussion at the tour wrap-up in Detroit. Developing a to-do list to advance problem-solving around these infrastructure challenges will begin in Detroit. The list of tasks will aid the URC in understanding how to reach other communities with the same or similar needs in order to move Michigan forward.

FOR MORE INFORMATION

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