NEWS FROM THE FUTURE: 21st Century Infrastructure Commission: AM Pilot Update 2018 MWEA

View the final report and executive summary at:
www.miinfrastructurecommission.com

Evan N. Pratt, PE,
Washtenaw County, Michigan

Water Resources Commissioner
Director of Public Works
Jennings Randolph International Fellowship

- The Jennings Randolph International Fellowship Program was established at the Eisenhower World Affairs Institute in May 1987 and is administered by the American Public Works Association. The fellowship supports participation at a public works conference of one of our international partners and a public works study tour in that country.

APWA international principles:

- To promote friendship and understanding among public works peers on an international basis.
- To provide an opportunity for APWA members, through contact with our international partners, to broaden their knowledge and exchange experiences and information on trends and advances in public works.
- To provide a venue for the exchange of information among APWA and our international partnering countries. Currently, these countries are Australia, the Czech Republic, Denmark, Finland, Iceland, Mexico, New Zealand, Norway, the Slovak Republic and Sweden.
JRIF study goals (aligned with 21st C goals)

- **Asset Management (AM) Pilot Program**
  - Determine legislative mechanisms enabling state oversight of AM
  - Determine metadata reporting requirements (asset specific condition and financial)
  - Obtain anecdotal experiences from regulators and the regulated community – what do practitioners wish was different?

- **Michigan Infrastructure Council**
  - Obtain legislative language establishing Infrastructure Australia and asset oversight in New Zealand

- **Infrastructure Funding**
  - Determine any carrot-stick approaches in the items above
  - Determine if AUS and NZ evolution included federal or state support for more funding, or if new prioritization systems are primarily to re-allocate capital

- **Smart State**
  - Beyond the scope of study
Simplified Study Goals:

- Do these people have similar or different problems with funding and Asset Management?
- What are these people doing that is successful?
Down Under Spoiler Alert:
Simplified Study Goals:

- Do these people have similar or different problems?
  - SIMILAR – ABSOLUTELY! – Funding gap, electeds/communication

- What are these people doing that is successful?
  - Investment in training and tools – a common language
  - Focusing on community outcomes @current budget vs. add-on
  - Figuring out what NOT to do. What are we incorrectly assuming? Have to ask...it is hard...
  - Painting a better picture of what customers will see if a budget line item is supplemented
  - Better partnering with Planning and Finance
  - Painting a (layperson friendly) picture of consequences for electeds

In short, they are doing things that many of you have tried. The main difference is they have a system that includes a feedback loop for improvement. Municipal Engineers and DPW professionals speak a common language and can more easily learn from each other.

The most noticeable difference is that people there are more self-critical

No one was satisfied with their level of AM “maturity”
WTF “Maturity”:

How good is your organization at:

• Strategic Long Term Plan
• Annual Budget
• Annual Report
• Asset Management Policy
• Asset Management Strategy
• Asset Management Plan(s)
• Governance & Management
• Levels of Service
• Data & Systems
• Skills & Processes
• Evaluation

Begin with the End in Mind.
AM has many aspects beyond our current focus.
Consider NAMS training, it is SAW eligible.
Trip Summary: Key Findings

- Australia and NZ have been 10-15 years ahead of us in Asset Management
- Funding streams somewhat similar
  - Federal aid for road system
  - Three Waters funded locally
  - Energy and Communications privatized
- They have the same infrastructure problems
  - Deteriorated infrastructure, esp from “boom periods”
  - Large Funding Gap
  - Elected bodies control budget –
    - minimal behavior change 10-15 years ago when first advised of big funding gap(s)
- Taxpayers feel they pay enough
- Affordability – some cannot pay more
Trip Summary: Key Findings

- Asset Management “Maturity” – there is a wheel that has already been invented
  - 70% use National Asset Management System (NAMS) by International Public Works (IPWEA) supported by International Federation of Municipal Engineers (IFME)
  - Continuous Improvement approach

- Data and assets are subordinate, tools to providing Customer Service.

- Advice from 30+ professionals/agencies:
  - Create a simple AM process using data in hand, then work to improve it
  - Better communicate the linkage between service delivery and funding
Funding Needs:

- Gaps are large in Australia and New Zealand (though only about 20%-25% of ours)
- Roads and utilities are generally funded similar to here, heavy federal support for transportation infrastructure via regional planning agencies, local water infrastructure is funded almost wholly by local taxpayers
- They quit squawking about “somebody else” filling the gap for local projects
- Different process: Painting a picture of exactly how current spending will impact people in 10 years and beyond.
- Figuring out what people can live without and what they would pay a bit more to have.
- Depreciation cost trends greater than re-investment – core focus to address
Assets are the means. We need to tell a different story – about impacts to customers.
Asset vs. Service

- **A Non-motorized path is an asset.**
- **A family bicycling on that path is an expected LOS.**

- The condition of the asset provides information we use to determine if a family can use the path, and more importantly, when we predict they no longer can use it.
- The IPWEA system of AM planning equips us to explain how additional spending NOW or not spending NOW will affect that family.
- Can determine annualized costs over a long term *and* demonstrate the best value for providing the expected service.
- The IPWEA method then has us show if this can be done with current budget, what the consequence is if not, and how much more spending is needed for that LOS.
Bringing it back home, significant findings:

- What I plan to do based on seeing success:
  - TRANSLATE AM PLANS TO RISK-BASED LOS OPTIONS
    - MY MOM HAS TO BE ABLE TO UNDERSTAND THESE!!
  - FIND OUT WHAT MY CUSTOMERS ARE WILLING TO PAY
  - INVEST IN PEOPLE TAKING NAMS/IPWEA TRAINING
  - BASELINE AM MATURITY & IDENTIFY 2 AREAS OF IMPROVEMENT, USING TRAINED PROFESSIONAL INPUT

For more about my study tour, visit http://arcg.is/1Xmf4T
Segue

AM Maturity Down Under: Continuous Improvement
Michigan’s Future

Michigan’s residents deserve reliable, safe, efficient, and cost-effective infrastructure – a 21st century infrastructure system that creates a foundation for the future.

View the final report and executive summary at:

www.miinfrastructurecommission.com
Final Report

Recommendations

- Report delivered to the Governor by deadline of November 30, 2016 for recommendation review and implementation
- Over 100 recommendations aimed at improving our infrastructure across all asset types
- Recommendations prioritized a healthy environment; reliable, high-quality service; economic prosperity; and value for investment
- In addition to sector-specific recommendations, there were overarching themes:
  - Asset Management
  - Coordinated Planning
  - Sustainable Funding
  - Emerging Technologies
The Problem

For more than half a century, we have not fully addressed the challenges facing our infrastructure systems. As a result, the problems we face today threaten our day-to-day quality of life.

State and Local Capital Spending (% of Total Expenditure)
Annual Average 2010 - 2014

- U.S. Average: 10.2%
- Michigan: 6.4%
- Wisconsin: 8.5%
- Ohio: 9.2%
- Pennsylvania: 9.4%
- Illinois: 9.8%
- Indiana: 9.9%
- New York: 11.3%

Source: U.S. Census Bureau
Spoiler alert: AM and The Funding Gap
What the State is doing/has done:

**Top 5 Recommendations Underway (Oct 2017):**

- AM Pilot in SE and West Michigan – ED 2017-1, report completed April 2018
- Creation of the Michigan Infrastructure Council – goal is Fall 2018 codification, House Bills to be announced shortly
  - Creation of the Water Asset Management Council (WAMC)
  - Updates to TAMC to align with WAMC and MIC efforts
- FY18 Infrastructure Fund - $35M – goal is Nov/Dec supplemental
  - Includes priorities such as water infrastructure, water and transportation asset management, broadband access and adoption and Smart State/Cities matching grant.
- Long-term Water Infrastructure Funding – stakeholder conversations this fall with goal of legislative advancement this fall and FY18-19
- Creation of the Michigan Consortium of Advanced Networks (MCAN) –
  - Creation of broadband access and adoption roadmap
  - Advancement of Smart State/Cities services leveraging technology development and deployment – Executive Order and appointments this fall
Recommendation Implementation

- **Asset Management Pilot Program**
  - Create cursory assessment of condition and needs for all of our infrastructure types
    - Review and enhance SAW
    - Review DEQ asset management permit requirements
  - Coordinate infrastructure projects to enhance capacity, efficiency, and resources
21st Century Infrastructure Commission
Asset Management Pilot

Find the report and executive summary at
www.miinfrastructurecommission.com
Pilot Vision

➢ A culture of asset management across all infrastructure assets.

➢ A statewide assessment of our transportation, water, wastewater and stormwater infrastructure.

➢ A long-term integrated asset management strategy that results in coordination and increased cost efficiencies for utilities and local agencies of all sizes.

➢ The data and information needed to determine funding levels, and the incentives needed, for strategic infrastructure investments.

Pilot Mission

➢ Build a culture of asset management across the state.

➢ Develop consistency across asset owners in asset standards and management practices.

➢ Create mechanisms for coordinated planning and communication across asset owners and types statewide.

➢ Develop a system that will support our understanding of assets and enable us to make informed decisions at a local, regional and state level.
What is Asset Management?

An Asset Management Policy
- Includes key asset management principles such as:
  - Serviceability focused
  - Adopting a whole life cost approach
  - Utilizing risk to prioritize assets
- Senior management is committed to implementing asset management.
- The organization is committed to continual improvement.

Generally not in place for Michigan Communities

Strategic Asset Management Plan (SAMP)
- Clearly defines the roles & objectives for assets and asset management in supporting community goals and achieving desired levels of service.
- Includes asset management objectives such as:
  - Minimizing interruptions to supply
  - Reducing wastewater overflows
- Has a decision making framework for community investments.
- Encourages the continued development of the AMP.

Generally not in place for Michigan Communities

Asset Management Plan (AMP)
- Sets goals for and measures performance outcomes.
- Addresses community goals and system weakness.
- Includes the rationale for asset management decisions based on community goals.
- Includes Capital Investment Plans which articulate the investment needed to attain desired levels of service.
- Includes Operational and Maintenance Plans which articulates the strategy for the day to day management of the assets.

Approach used by MDOT, Grand Rapids, Ann Arbor etc. MDEQ approach is more focused on the process of asset management than the
# Asset Management Maturity Assessment

## Asset Management Maturity Self-Assessment

### How Do You Measure Up?

**Webinar:** Tuesday, February 28, 2018 – 9:00-11:00 a.m.

Michigan public and private entities have been implementing infrastructure asset management programs for decades. But are they maximizing the value of their investments and meeting their public’s expectations? This webinar will guide agencies through the processes of an asset management maturity self-assessment. During the webinar, attendees will have an opportunity to discuss how they compare to the rest of the state with real-time feedback to their anonymous self-assessment.

**Who should attend:**
- Decision-makers in Michigan local government agencies overseeing storm water, sanitary sewer, storm sewer, and/or transportation and water services.
- This webinar will be especially beneficial for communities that have implemented asset management strategies and want to assess and improve their asset management programs.

**Topics Covered:**
- Asset Management Committee
- Resources and Roles & Responsibilities in place and understood
- Learning and Development
- Asset Management Policy
- Asset Management Governance
- Level of Service
- Future Trends
- Risk & Vulnerability
- Prioritization of Investments
- Asset Management Plan

### Benefits of Attending the Webinar:
- Participants will learn how to implement asset management strategies.
- Participants will be able to compare their asset management data with those of other states.
- Participants can be guided to help build your asset management program.
- Results of the webinar will help the Government’s offices guide asset management legislative and regulatory processes.

Register today at: on.michigan.gov/2M37tDv

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### Table: Asset Management Maturity Assessment

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<tr>
<th>Topic</th>
<th>Focus Area</th>
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<td>Organizational Adoption of Asset Management</td>
<td>Asset Management Commitment</td>
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<tr>
<td></td>
<td>1.1 Overall Strategic Planning</td>
</tr>
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<td></td>
<td>1.2 Resources and Roles &amp; Responsibility in place and understood</td>
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<td>1.3 Learning And Development</td>
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<tr>
<td>Asset Management Policy</td>
<td>Asset Management Policy and Strategy</td>
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<td>Asset Management Governance</td>
<td>Asset Management Governance</td>
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<td>Linking assets to services and outcomes</td>
<td>Level of Service</td>
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<td></td>
<td>2.1 Level of Service Framework</td>
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<td>Future Trends</td>
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<td>2.2 Future Trends (Impact Of Growth, Climate Change, AV, SMART Cities etc.)</td>
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<tr>
<td>Robust Risk Assessment and Prioritization of Investments</td>
<td>Risk &amp; Vulnerability</td>
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<td></td>
<td>3.1 Asset Risk Framework</td>
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<td></td>
<td>Prioritization of Investments</td>
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<td>3.3 Robust Capital Investment Planning</td>
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<tr>
<td>Life Cycle Management</td>
<td>Optimized Asset Interventions</td>
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<tr>
<td></td>
<td>4.1 Optimized Asset Interventions - Life Cycle Costing</td>
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<tr>
<td>Asset Management Information Requirements</td>
<td>Asset Management Planning</td>
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<td></td>
<td>4.2 Asset Management Plans (AMP)</td>
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<tr>
<td>Asset Information Strategy</td>
<td>The rationale for collecting data</td>
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<tr>
<td>Asset Inventory</td>
<td>What information we do have for each asset</td>
</tr>
<tr>
<td>Asset Management Information</td>
<td>Ensuring confidence in the data</td>
</tr>
<tr>
<td>Asset Management Information Mgt</td>
<td>5.4 Asset Management Information Management</td>
</tr>
<tr>
<td>Analysing Data</td>
<td>5.5 What is the data telling us</td>
</tr>
</tbody>
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Image: https://www.michigan.gov/assetmanagementcommission/0,5678,7-457—,00.html
Pilot Participation
13,500 miles of wastewater pipe data
6,700 miles of stormwater data
14,800 miles of drinking water
4,856 bridges
23,025 miles of road
14,399 culverts

Asset Management Pilot

69 subject matter experts
95 maturity assessment attendees
12 stakeholder meetings
150 coordination & communication summit attendees
158 pilot communities
8 state departments
Asset data covering the geography of 158 communities
## Data Collected

<table>
<thead>
<tr>
<th></th>
<th>Drinking Water</th>
<th>Wastewater</th>
<th>Stormwater</th>
<th>Roads</th>
<th>Bridges</th>
<th>Culverts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Segments/Number</strong></td>
<td>540,121</td>
<td>335,273</td>
<td>324,289</td>
<td>-</td>
<td>4,856</td>
<td>14,338</td>
</tr>
<tr>
<td><strong>Miles</strong></td>
<td>15,104</td>
<td>13,505</td>
<td>6,673</td>
<td>23,025**</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* Data from communities that did not sign a data sharing agreement was removed from this dataset prior to the analytics phase of the Pilot.

** Miles of road with condition ratings. 22,462 miles supplied by TAMC plus 563 miles collected direct from communities during the Pilot.
Utilizing condition grade and/or estimated percent of effective useful life remaining to determine opportunities of coordinated investment.

<table>
<thead>
<tr>
<th>Condition Grade</th>
<th>Percent of Effective Useful Life Remaining</th>
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<tbody>
<tr>
<td>Very Good</td>
<td>&gt; 85%</td>
</tr>
<tr>
<td>Good</td>
<td>60 – 85%</td>
</tr>
<tr>
<td>Fair</td>
<td>30 – 60%</td>
</tr>
<tr>
<td>Poor</td>
<td>10 – 30%</td>
</tr>
<tr>
<td>Very Poor</td>
<td>&lt; 10%</td>
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</tbody>
</table>
The sample size of the data collected as part of the Pilot was not considered sufficient to depict an actual representation of condition grades across the Pilot areas and beyond. The results shown are therefore illustrative only and show the type of analysis that can be carried out.
Recommended Implementation

Michigan Infrastructure Council
(Treasury)

MPSC (LARA)
TAMC (MDOT)
WAMC (DEQ)
Questions and Dialogue?

- Link to Statewide Asset Management Report:

- Link to 21st Century Infrastructure Report:
  https://www.michigan.gov/snyder/0,4668,7-277-61409_78737---,00.html

ESRI Story Map Link:  http://arcg.is/1Xmf4T
Bringing it back home, significant findings:

- **Asset Management (AM) Pilot Program**
  - Both Australia and New Zealand have been where Michigan and other leading states in the US are at today.
  - Currently legislative efforts are in roughly the third iteration of AM oversight criteria and enabling agency authority.
  - First generation legislation strove to establish standards and reporting criteria, primarily of a technical nature specific to assessing each asset’s condition.
  - Subsequent efforts have recognized that a large percentage of assets are embedded in communities, and therefore in community planning goals with regard to stated desires for both physical and financial outcomes.
  - Third generation efforts are aimed at linking performance toward community master plan goals and community budgeting decisions. All three countries see local pressures that exacerbate the gap between long term (50-100 year) infrastructure investment, political cycles, and unexpected local budget pressures in other areas.
  - The success trajectory in Australia and New Zealand appears to be linked to audits that provide a feedback loop through review of overall plan goal execution and financial discipline not just American-style auditing processes.
  - Determining remaining service life of assets is foundational, as no cost-benefit analysis is possible otherwise. Depreciation and re-investment curve comparisons are also critical. Accounting aspects must be addressed for a successful program.
Bringing it back home, significant findings:

- **Michigan Infrastructure Council**
  - Infrastructure Australia (IA) has a clear charge and legislative authority to assess the condition of infrastructure regularly as well as evaluate the efficiency of investments.
  - Initial findings are that IA is in the lead role in working with other federal and state agencies to produce meaningful audits as well as recommendations. There is currently a 30-year Infrastructure Plan and a recently established evaluation process for significant projects to be placed on a Priority List.
  - In New Zealand, a nimble group of Treasury sub-agencies appear to work in conjunction with each other.
    - The Office of the Auditor General (OAG) is responsible for producing summaries of community planning and infrastructure implementation, including success stories along with recommended areas for improvement.
    - The National Infrastructure Unit (NIU) is a department of the Treasury with a particular focus on receiving and summarizing asset and investment information.
    - A 2015 legislative effort sought to improve the ability of these agencies to learn the effectiveness of investments, giving even more focus on an outcome based process.

- In both countries, there has been strategic acknowledgement of the tug between the need for services in less populated areas and the dramatically higher return on investment in cities and more densely populated areas. Levels of service are generally expected to be different between the two.