Local Agency Bridge Program
2018 Bridge Conference

Local Bridge Program Summary

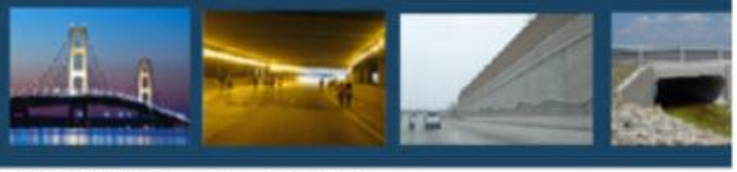
- **FY 2017**
  - 79 Local Bridge Projects Let to Contract: Total = $42 million

Local Bridge Program Summary

- **FY 2017**
  - 79 Local Bridge Projects Let to Contract: Total = $42 million
- **Project Breakdown**
  - 39 Replacement Projects = $30 million
  - 40 Rehabilitation/PM Projects = $12 million
- Low Bid vs Application Estimates
  - $2.6 million in bid savings for FY 2017

Local Bridge Condition

MiBRIDGE Bridge Management and Inspection System



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Structure Condition Dashboard

Jurisdiction: LA Statewide [Display]

Structure Inventory Summary	Count
Total No. of Structures	7,027
Highway (NBI) Structures greater than 20'	6,635
Highway Structures less than 20'	70
Rail Road Structures (X)	250
Pedestrian Structures (P)	64
Other Non-Highway Structures (V, Plaza)	8
Additional Bridge Inventory Information	
Posted Structures	1,039
Closed Structures	52
Fracture Critical Structures	79
Scour Critical Structures	1,221
Scheduled/Under Construction (S, G)	39

Structure Condition Summary	Count
Good/Fair (5 or Greater)	**6,943**
Highway included in NBI	5,685
Non NBI Structures (<20, RR, Ped, etc.)	258
Poor (4)	**596**
Highway included in NBI	540
Non NBI Structures (<20, RR, Ped, etc.)	56
Serious/Critical (3 or less)	**469**
Highway included in NBI	402
Non NBI Structures (<20, RR, Ped, etc.)	67
Unrated Structures	**19**
Highway included in NBI	8
Non NBI Structures (<20, RR, Ped, etc.)	11

SD/FO Summary	Count
*Structurally Deficient	972
*Functionally Obsolete	617
*Non-Deficient Structures	5,046
*No Current SD/FO Rating	250

NBI Condition - Goals Summary	Pct.
*Good/Fair (5 or Greater)	85.8%
Freeway	0.0%
Non-Freeway	85.8%
*Poor/Serious/Critical (4 or Less)	14.2%
Freeway	0.0%
Non-Freeway	14.2%
*Poor NHS Deck Area	18.5%

*Applies ONLY to Highway Structures > 20'

Structure Inventory Summary

Local Bridge Condition

- Local Agency Bridges
  - 6635 NBI Bridges
  - 85.7% Good or Fair
  - 862 Fair (5)
  - **540 Poor (4)**
  - **402 Serious of Critical (3 or less)**

Local Bridge Condition

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  - 6635 NBI Bridges
  - 85.7% Good or Fair
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Local Bridge Condition

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  - 85.7% Good or Fair
  - 862 Fair (5)
  - **540 Poor (4)**
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- 942 Poor/Serious/Critical Bridges
  - Replacement Est = $800 million

Local Bridge Condition

<u>2017 Bridge Applications</u>

- 359 Applications for $270 million
- ~ $48 million in funding (Same past 12yrs)
- 79 Projects selected for FY 2020 (18% approval rate)
  - Replacement – 25 Projects (70% dollars)
  - Rehab/PM - 54 Projects (30% dollars)
- “Mix of Fixes” – improves long term bridge condition vs replacement only

Local Bridge Condition

- Need additional investment of ~$50 to $70 million per year to eliminate Poor/Serious/Critical bridges in 10 years.
- Assumes none of the 862 Fair (5) rated bridges drop to poor.
- Need other sources of funding since Local Bridge Program did not receive any funds from the $1.2 Billion State Transportation bill.

2018 Call For Applications

- Sent out February 5th to CRA and MML – Call for FY 2021 Construction

- **<u>Deadline – May 1, 2018</u>**

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- Local Bridge Program Website
  - Call Letter/Instructions
  - Estimating Worksheets
  - 2017 Selected Projects for FY 2020

Call For Applications

- Application limit – 5 Total
  - Multiple PM's count as 1 Application
    - No limit on structures in multiple PM application
    - Bundle for cost effectiveness
      - Minimize Mob and Traffic Control costs
    - Good Estimate Range for PM App - $150k-500k
      - **PM projects are often underestimated**
      - Use estimating worksheets
      - Factor in unknowns and small quantities

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      - Factor in unknowns and small quantities
  - PM's selected by RBC consensus

Call For Applications

- Key Items for Applications
  - Complete Narrative
  - Current Signed Resolution
  - Public Utility relocation costs
  - Detailed Cost Estimates – Use Worksheets

Call For Applications

- Key Items for Applications
  - Complete Narrative
  - Current Signed Resolution
  - Public Utility relocation costs
  - Detailed Cost Estimates – Use Worksheets
  - Proper Scoping of Work
    - Rehabilitation and PM projects
    - Replacements – Don’t underestimate size of new bridge
- Applications - Due May 1, 2018

How to Increase Application Rating

- Look for additional sources of funding
  - STP, Safety, Economic Development, etc.
- Closed bridges – consider removing bridge and cul-da-sac road.
- Bundling PM applications
- Increase the Local Agencies funding share – Ex. - 5% to 10% or higher
- Ideas to conserve Local Bridge Program Funds – “Innovative Ideas”

Innovative Solutions

- Need "Innovative Ideas" to reduce bridge costs.
  - Multi Cell or "Clamshell" Concrete Box Culverts
  - Aluminum Box Culverts
  - Timber bridges where appropriate
  - GRS-IBS bridges
  - Deck Spread Box Beam Bridge
  - Folder Steel Plate or Steel Tub
- Need to look at "Innovative" products in reducing bridge replacement costs.

Multi Cell Concrete Boxes

“Clamshell” Concrete Boxes

Construction of the “clamshell” culvert on 12 Mile Road over the Charlotte River in Chippewa County.

CLAMMING UP

keeps costs low for Chippewa County Road Commission

Thinking outside the box (culvert) helped **Chippewa County Road Commission's** (CCRC) drainage project become a shining example of making the seemingly improbable possible.

In 2017, CCRC installed a 30 feet span by 12 feet rise “clamshell”-style pre-cast box culvert to replace an undersized culvert crossing that was failing on 12 Mile Road over the Charlotte River. The larger structure was needed to meet the Michigan Department of Environmental Quality (MDEQ) bankfull width requirements. The idea was generated during a brainstorming session between CCRC and the Upper Peninsula Concrete Pipe Company. Unlike a traditional box culvert which would come as five pieces requiring assembly, the clamshell culvert is divided into a top and bottom half, each having three sides. A total of eleven pieces were assembled to make the box.

The clamshell culvert is a variant of the Upper Peninsula Concrete Pipe Company's three-sided culvert with a pre-stressed top slab, trademarked as Low Span®. Low Span® was developed to allow a larger span flat top culvert under the road yet require minimal re-grading, tree removal and other site work that a traditional round culvert would require.

Due to its design, the large span clamshell culvert can be shipped by multiple trucks and assembled with a crane at the construction site. It is precast concrete and hence isn't made on-site.

“Typically, there would be six-foot lay length, full-box sections going in the excavation and then fastened together,” said **Rob Laitinen**, managing director of CCRC. “Wingwall sections would also be added. There is no way you would be able to truck full-box pieces this size or be able to place them with a reasonable sized crane,” Laitinen said. Each piece has a span across the stream of 30 feet and a lay length of 6 feet. The total assembled width across the roadway is 30 feet as well, Laitinen added.

“The wing walls are installed outside of that. Each three-sided piece has a weight of 66,000 pounds and they measure 30 feet by six feet by six. The 30-foot span was a MDEQ requirement,” Laitinen said.

> “To our knowledge, this is the first clamshell culvert using pre-stress reinforcement providing longer span widths.”
>
> – John Kloet, president and general manager, Upper Peninsula Concrete Pipe Company

The culvert was manufactured in Escanaba, and is a relatively new invention.

“As far as I know, we are one of three producers of a “clamshell” box in North America. The others are in Ontario and Southern California,” said John Kloet, president and general manager of the Upper Peninsula Concrete Pipe Company. “However, those other locales are both “conventional” reinforcement “clamshells”, which would mean shorter span widths than what Michigan needs.”

“To our knowledge, this is the first clamshell culvert using pre-stress reinforcement providing longer span widths,” Kloet said.

The project cost $350,000, and the culvert's life expectancy is more than 100 years. Replacing the previous culvert with a bridge would have cost CCRC around $650,000 to $750,000.

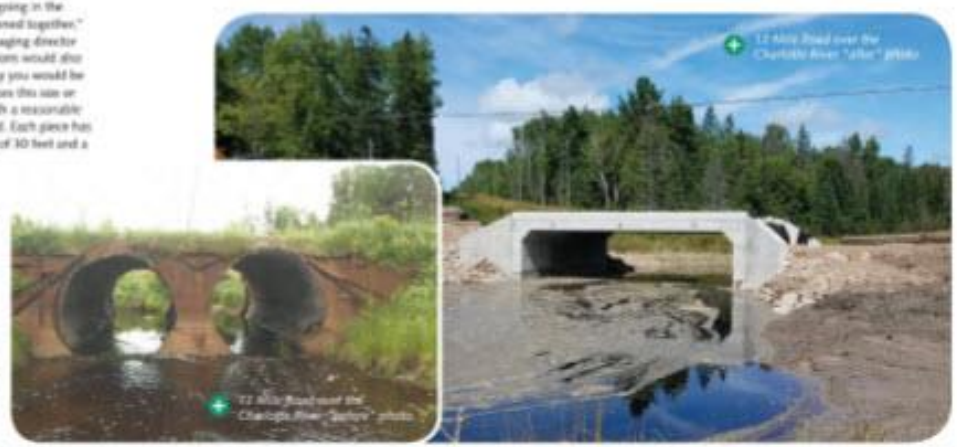
“We liked the savings, we liked that we could do the project with our own people and these are precast standard elements that can be easily reproduced. It was manufactured in a controlled environment instead of manufactured in the field where weather can become a problem,” Laitinen said.

The site was right for a culvert rather than a bridge. There are very soft soils in the area and on those types of soils to use a bridge foundation would involve deep steel foundation piling and lightweight geofoam backfill, according to Laitinen.

To further complicate matters there is an artesian aquifer in this area and any deep piling would penetrate into that and possibly cause leakage of groundwater alongside the piling. Having a full structural bottom slab embedded well below the streambed in the feature that eliminates both of these very costly elements, he added.

CCRC's culvert project has the approval of the public as well.

“The public likes the aesthetics of the structure and how quickly it went together. The road closure was 30 days. With a bridge it could have easily been 60 or more,” Laitinen said.



12 Mile Road over the Charlotte River “after” photo

12 Mile Road over the Charlotte River “before” photo

“Clamshell” Concrete Boxes

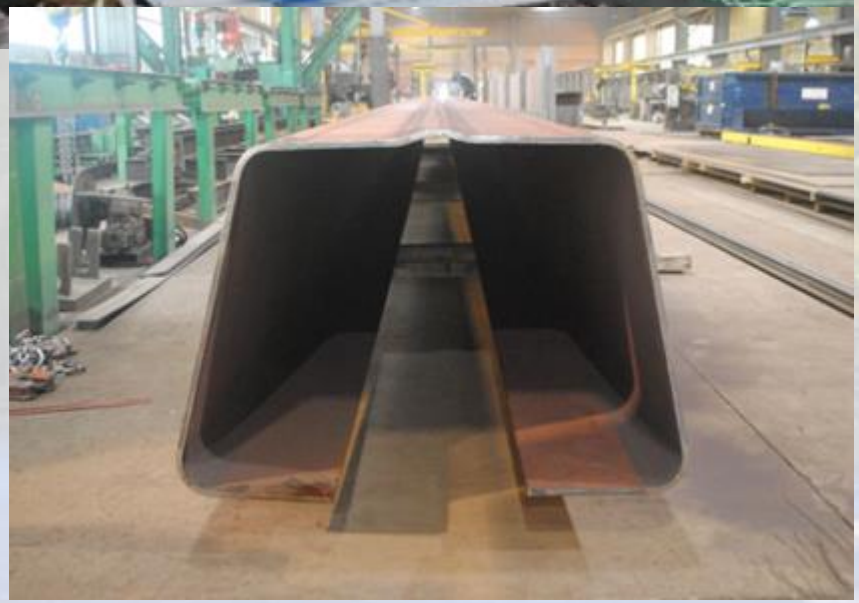
Aluminum Box Culvert

Timber Bridges

GRS-Integrated Bridge System (IBS)

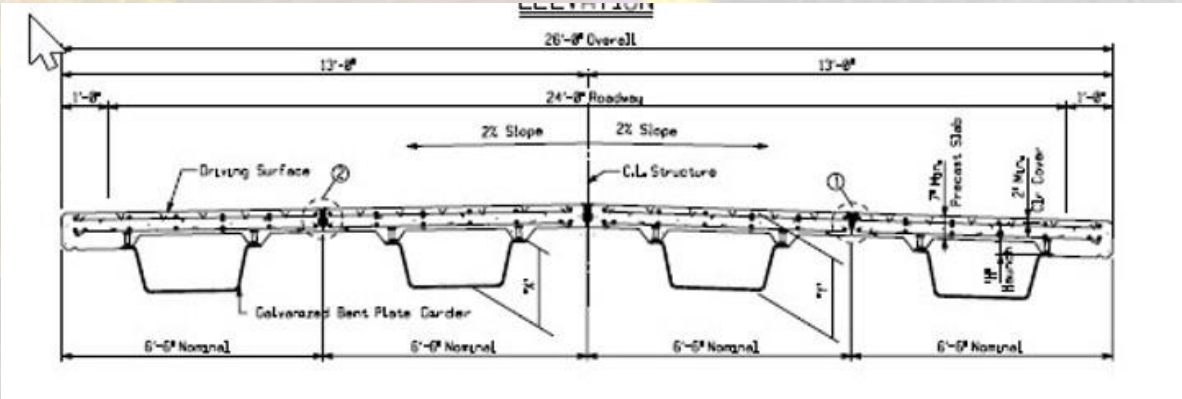
Deck Spread Box Beams

Folded Steel Plate Girders



Steel Tub Girders

- Steel Tub Girders
  - Light Weight
    Required for Old Existing Substructure
    Shipping & Lifting
  - Hot-Dip Galvanized
    Long Term Maintenance Free
  - Shallow Depth
    Allowed for Modification to the Crown of the Roadway
    Maintained the Existing Vertical Clearance Under the Bridge



Research Project - Bridge Plans

MDOT and Wayne State University

- Template Plans/Guides for Single Span Bridges (Superstructure)
  - Assist Designers with plan development
- Life Cycle Cost Analysis to Determine
  - Most Cost Effective Designs
- Increase Design Plan QA
- Designer develops substructure plan
- Instructions/Plans/Guides available to LA and Consultants
  - Plans in MicroStation/AutoCAD format

Design - QC/QA

- FHWA and MDOT review of Local design consultant QC/QA
  - One page QC/QA certification document in Program Application
  - Must be completed prior to obligation of funds
  - MDOT developing programmatic review process
    - MDOT Design
    - Consultant Design

Bridge Asbestos Testing

- Bridge Decks and ALL questionable material to be tested
  - Rehab and Replacement projects
    - Required with MDEQ "Notification of Intent to Demo" form
    - Small Sample, test takes a day or two
    - Need a certified tester
- Asbestos testing should be completed prior to letting project

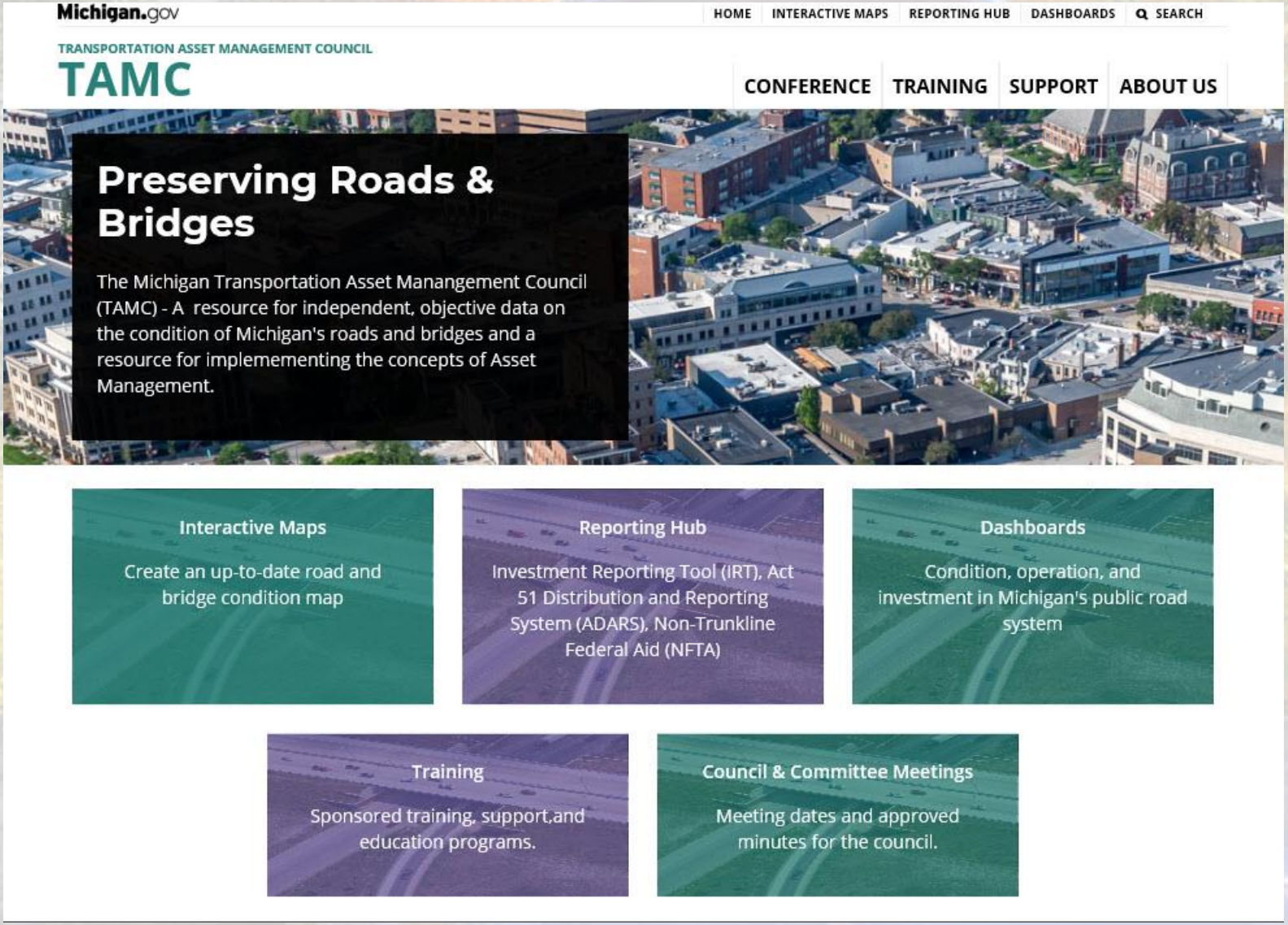
Bridge Asset Management

- Transportation Asset Management Council (TAMC)
- New look to the website
- Bridge Asset Management Webinars
  - Part 1
    - Introduction, bridge condition evaluation, assessment of maintenance needs
  - Part 2
    - Cost estimating, optimization of bridge preservation actions

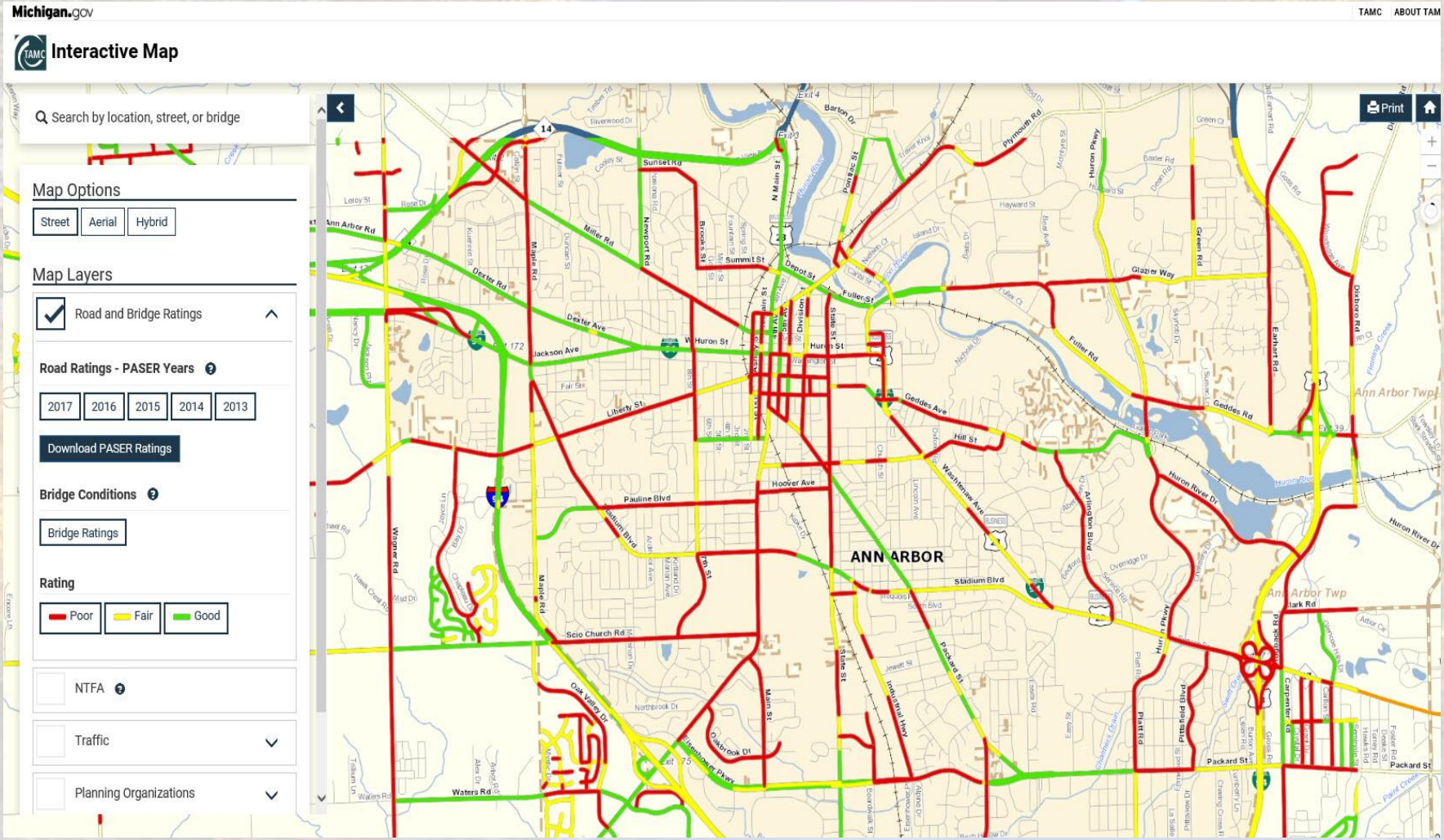
Bridge Asset Management

- Workshop
  - Gather data prior to workshop
    - Focus on overview of Bridge Asset Management
    - Excel and Word tools for data organization/report template
    - Develop a customized draft bridge asset management plan
- **Leave with practical asset management plan for your agency**

Bridge Asset Management



Bridge Asset Management



Regional Bridge Council Meetings

Financial and Program Update

Bay Region: May 2nd @ 10:00am, Genesee CRC

Grand Region: May 9th @ 10:00am, Ottawa CRC

Metro Region: April 25th @ 10:00am, St. Clair CRC

North Region: April 19th @ 10:00am, MDOT Gaylord Office

Southwest Region: April 30th @ 10:00am, Van Buren CRC

Superior Region: April 20th @ 8:30am, Marquette CRC

University Region: May 7th @ 9:00am, Ingham CDR

Bridge Unit Staff

- **Keith Cooper: Bridge Program Manager**
  - Phone: (517) 373-2346
- **Mark Harrison: Project Development Engineer**
  - Phone: (517) 373-2286
- **Tim Barry: Bridge Staff Engineer**
  - Phone: (517) 335-2844
- **Pablo Rojas: Bridge Staff Engineer**
  - Phone: (517) 373-2232
- **Rita Levine: Bridge/Rural Staff Engineer**
  - Phone: (517) 373-0041


Questions?

NEPA and Environmental Classification

- MDOT-LAP Currently Concurs with NEPA Classifications as Determined by Agency or their Consultants
- Federal Regulations Require MDOT-LAP to Approve the Classifications
- This Will Change the Process for MDOT-LAP and Local Agencies
- MDOT-LAP and MDOT Environmental are Working with FHWA to Determine What Documentation Will Be Required

NEPA and Environmental Classification

- What This Means:
  - Agencies Will Submit "Documentation" to MDOT-LAP Along With NEPA Classification
  - MDOT-LAP / MDOT Environmental Will
    - Review the "Documentation" to Verify NEPA Requirements Have Been Met
    - Approve Classification
- New Process Expected to Begin in FY 2020

NEPA and Environmental Classification

- New Employee Hired for More Complicated Reviews and Environmental Assessments:
  - Eric Costa
    - Phone: (517) 335-6153
    - e-mail: CostaE@Michigan.gov

NEPA and Environmental Classification

- Mark Harrison / Lynnette Firman Will Review "Documentation" and Approve ≈99% of the Projects
- Eric Will Review "Documentation" on more Complicated Projects
  - 4(f) Properties with R.O.W. Acquisition(s)
  - 6(f) Properties (Acquired by Land and Water Conservation Funds)
  - Section 106: Historic/Archaeological Resources
  - Threatened / Endangered Species with Impacts
- Eric Will Review Environmental Assessments

TIP Amendments and Administrative Modifications

- Metropolitan Planning Organization (MPO)
- TIP Amendment: A Significant Change that Requires the Project to Go Through the Planning Process
- Administrative Modification (Admin Mod): A Minor Change That Can Be Approved by the MPO
- General Program Account (GPA): A Line Item in the TIP that Includes More Than One Project

TIP Amendments and Administrative Modifications

- MPOs with a Bridge GPA
  - PM Projects
  - Change in Funding on One Project
    - Admin Mod if Funding Change is Less Than 25% of GPA Balance
    - Amendment if Funding Change Causes GPA Balance to be Exceeded by More Than 25%
  - Shift in Fiscal Years ➔ Admin Mod
  - Reconstruction / Replacements Cannot be in a GPA

TIP Amendments and Administrative Modifications

- MPOs w/o Bridge GPA or Bridge Reconstruction /Replacement
  - Change in FY ➔ Admin Mod
  - Change in Scope ➔ Amendment
  - Change in Funding
    - < 25% Total Project Cost ➔ Admin Mod
    - > 25% Total Project Cost ➔ Amendment

TIP Amendments and Administrative Modifications

- Amendment Cycles
  - SEMCOG: 3 Amendments per Year
  - Other MPOs: 4 to 6 Amendments per Year

- Missing a Cycle Could Delay Project