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

### Structure Condition Dashboard

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA Statewide</td>
<td></td>
</tr>
</tbody>
</table>

#### Structure Inventory Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No. of Structures</td>
<td>7,027</td>
</tr>
<tr>
<td>Highway (NBI) Structures greater than 20'</td>
<td>6,635</td>
</tr>
<tr>
<td>Highway Structures less than 20'</td>
<td>70</td>
</tr>
<tr>
<td>Rail Road Structures (X)</td>
<td>250</td>
</tr>
<tr>
<td>Pedestrian Structures (P)</td>
<td>64</td>
</tr>
<tr>
<td>Other Non-Highway Structures (V, Plaza)</td>
<td>8</td>
</tr>
</tbody>
</table>

#### Additional Bridge Inventory Information

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foated Structures</td>
<td>1,039</td>
</tr>
<tr>
<td>Closed Structures</td>
<td>52</td>
</tr>
<tr>
<td>Fracture Critical Structures</td>
<td>79</td>
</tr>
<tr>
<td>Scour Critical Structures</td>
<td>1,221</td>
</tr>
<tr>
<td>Scheduled/Under Construction (S, G)</td>
<td>39</td>
</tr>
</tbody>
</table>

#### Structure Condition Summary

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good/Fair (6 or Greater)</td>
<td>6,943</td>
</tr>
<tr>
<td>Highway included in NBI</td>
<td>5,685</td>
</tr>
<tr>
<td>Non NBI Structures (&lt;20, RR, Ped, etc.)</td>
<td>258</td>
</tr>
<tr>
<td>Poor (4)</td>
<td>596</td>
</tr>
<tr>
<td>Highway included in NBI</td>
<td>540</td>
</tr>
<tr>
<td>Non NBI Structures (&lt;20, RR, Ped, etc.)</td>
<td>56</td>
</tr>
<tr>
<td>Serious/Critical (3 or less)</td>
<td>469</td>
</tr>
<tr>
<td>Highway included in NBI</td>
<td>482</td>
</tr>
<tr>
<td>Non NBI Structures (&lt;20, RR, Ped, etc.)</td>
<td>67</td>
</tr>
<tr>
<td>Unrated Structures</td>
<td>19</td>
</tr>
<tr>
<td>Highway included in NBI</td>
<td>8</td>
</tr>
<tr>
<td>Non NBI Structures (&lt;20, RR, Ped, etc.)</td>
<td>11</td>
</tr>
</tbody>
</table>

#### SDIFO Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Structurally Deficient</td>
<td>972</td>
</tr>
<tr>
<td>*Functionally Obsolete</td>
<td>617</td>
</tr>
<tr>
<td>*Non-Deficient Structures</td>
<td>5,046</td>
</tr>
<tr>
<td>*No Current SDIFO Rating</td>
<td>250</td>
</tr>
</tbody>
</table>

#### NBI Condition - Goals Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Good/Fair (5 or Greater)</td>
<td>85.8%</td>
</tr>
<tr>
<td>Freeway</td>
<td>0.0%</td>
</tr>
<tr>
<td>Non-Freeway</td>
<td>85.8%</td>
</tr>
<tr>
<td>*Poor/Serious/Critical (4 or Less)</td>
<td>14.2%</td>
</tr>
<tr>
<td>Freeway</td>
<td>0.0%</td>
</tr>
<tr>
<td>Non-Freeway</td>
<td>14.2%</td>
</tr>
<tr>
<td>*Poor NHS Deck Area</td>
<td>18.5%</td>
</tr>
<tr>
<td>*Applies ONLY to Highway Structures &gt; 20'</td>
<td></td>
</tr>
</tbody>
</table>
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

- Local Agency Bridges
  - 6635 NBI Bridges
  - 85.7% Good or Fair
  - 862 Fair (5)
  - **540 Poor (4)**
  - **402 Serious of Critical (3 or less)**
- 942 Poor/Serious/Critical Bridges
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)
- 942 Poor/Serious/Critical Bridges
  - Replacement Est = $800 million
Local Bridge Condition

2017 Bridge Applications
- 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

- Deadline – May 1, 2018
2018 Call For Applications

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

- **Deadline – May 1, 2018**

- 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
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
- 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

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

John Klotz, 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 Klotz, president and general manager of the Upper Peninsula Concrete Pipe Company. However, those other locations 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," Klotz said.

The project cost $750,000, and the culvert's life expectancy is more than 100 years. Replacing the previous culvert with a bridge would have cost CCRC around $610,000 to $730,000.

"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 grout, according to Laitinen.

To further complicate matters there is an extensive 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 is 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 closed was 30 days. With a bridge it could have easily been 60 or more." Laitinen said. 

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 ft. span by 12 ft. tall “clamshell” style pre-cast box culvert to replace an undersized culvert running that was falling on 12 Mile Road over the Charlevoix River. The larger structure was needed to meet the Michigan Department of Environmental Quality (MDEQ) backfill 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.

"Typically there would be six foot 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-length pieces this size or be able to place them with a reasonable steel 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 48,000 pounds and they measure 30 feet by 12 feet by six. The 30-foot span was a MDEQ requirement," Laitinen said.
“Clamshell” Concrete Boxes
Aluminum Box Culvert
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
Preserving Roads & Bridges

The Michigan Transportation Asset Management Council (TAMC) - A resource for independent, objective data on the condition of Michigan's roads and bridges and a resource for implementing the concepts of Asset Management.
Bridge Asset Management
Regional Bridge Council Meetings

Financial and Program Update

Bay Region: May 2\textsuperscript{nd} @ 10:00am, Genesee CRC
Grand Region: May 9\textsuperscript{th} @ 10:00am, Ottawa CRC
Metro Region: April 25\textsuperscript{th} @ 10:00am, St. Clair CRC
North Region: April 19\textsuperscript{th} @ 10:00am, MDOT Gaylord Office
Southwest Region: April 30\textsuperscript{th} @ 10:00am, Van Buren CRC
Superior Region: April 20\textsuperscript{th} @ 8:30am, Marquette CRC
University Region: May 7\textsuperscript{th} @ 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
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