

Bridge Technical Report



Genesee County Bridge Technical Report

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Genesee County Bridge Technical Report

The Genesee County Bridge Technical Report is a supporting document and building block for Genesee County's 2035 Long Range Transportation Plan, "Shaping our Transportation Future Together." Bridges are integral to the transportation system, and the stability of these structures is an important part of the transportation planning process.



Since the tragic collapse of the I-35 Bridge in Minneapolis in August 2007, the safety of bridges everywhere has come to the forefront of the transportation planning discussion. Staff has undergone an effort to produce quality data on the current condition of the bridges in Genesee County, and from this data, forecast the future condition of bridges into the year 2035. In partnership with the Michigan Department of Transportation, Genesee County bridge data was compiled and analyzed to produce the findings in this report.

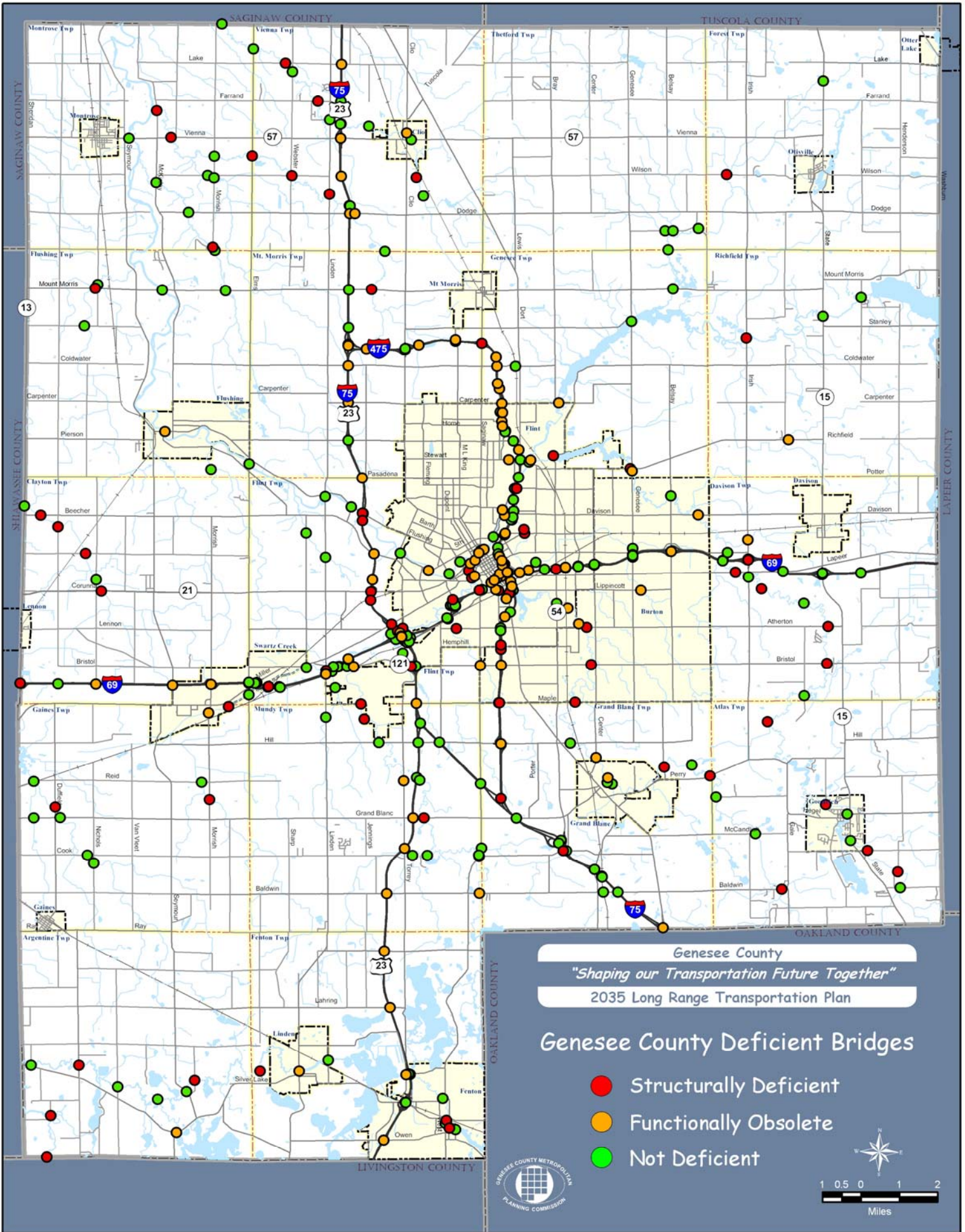
Bridge Programming

In the State of Michigan, funding for bridge improvements is dependent on ownership. A table and map detailing bridge ownership have been provided on pages 2 and 5 respectively of this report. There are currently 191 (52%) bridges in Genesee County owned by the state, and these bridges are funded and maintained at the state level. The remaining 175 bridges are owned by the county and various cities and villages throughout the county. These bridges compete with the other bridges across the state for limited funding provided by the Michigan Local Bridge Program. The program provides approximately \$30 million annually and funds improvements to 13-15 bridges state wide. A Regional Bridge Council (RBC) made up of representatives from local agencies, is responsible for determining which bridges receive funding. There are 7 RBC's across the state. Of the 175 locally owned bridges in Genesee County, 91 (52%) are deficient.



Bridge Deficiencies – Present and Future

For the purposes of this report, bridge deficiencies are characterized by two classifications: structurally deficient (SD) and functionally obsolete (FO). Structurally deficient refers to the health of a bridge while functionally obsolete refers to the performance of a bridge. A bridge is considered deficient if it meets either of these criteria. The Michigan Highway Bridge Report, published by the Michigan Department of Transportation adequately defines both terms:



Structurally Deficient (22%): a bridge is classified as structurally deficient if the deck, superstructure, substructure, or culvert is rated in ‘poor’ condition. A bridge can also be classified as structurally deficient if its load carrying capacity is significantly below current design standards or if a waterway below frequently overtops the bridge during floods.

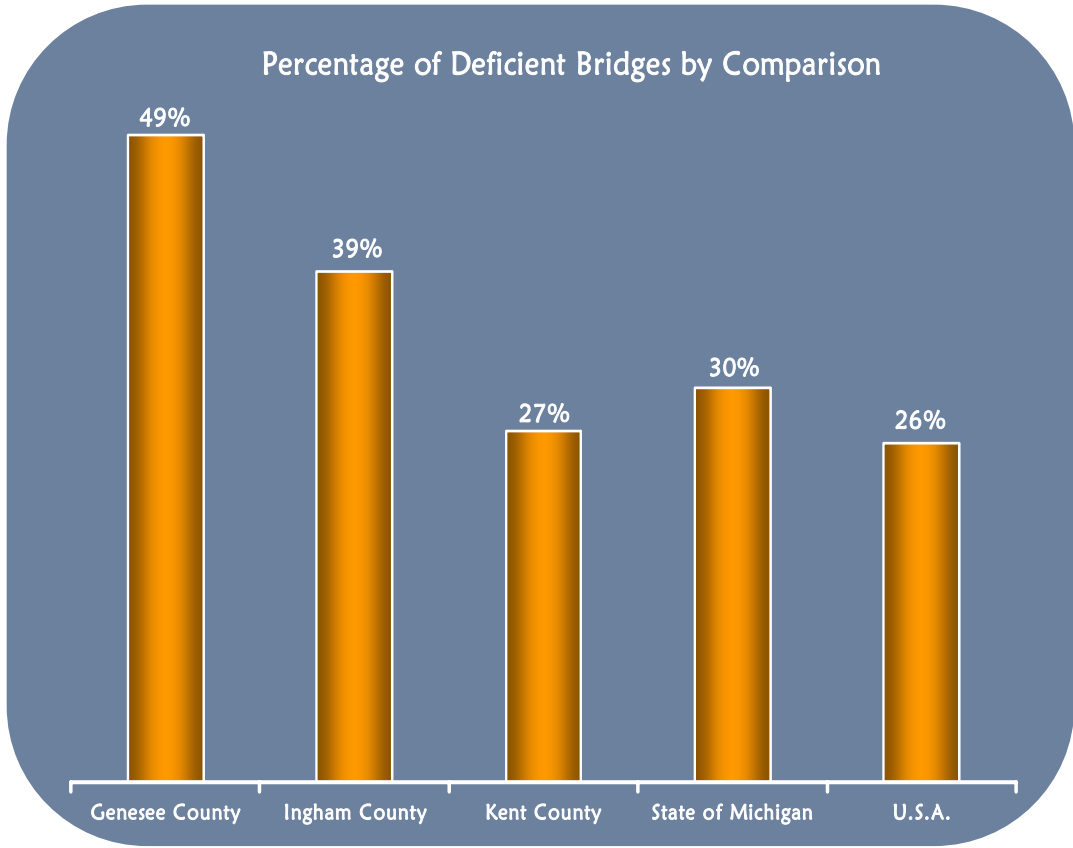
Functionally Obsolete (27%): bridges classified as functionally obsolete are NOT structurally deficient, but their design is outdated. They may have lower load carrying capacity, narrower shoulders, or less clearance underneath than bridges built to the current standard.

Of the 369 bridges in Genesee County, 180 of them are currently deficient. Genesee County has a 49% bridge deficiency rating; a percentage much higher in comparison to other local, state, and national figures. In fact, the 49% bridge deficiency rating ranks the third worst in the entire State of Michigan, trailing only Wayne and Newaygo counties.

Genesee County Bridge Deficiencies				
Owner	SD	FO	% Deficient	Total Bridges
MDOT	23	66	47%	191
Genesee County Road Commission	41	12	44%	120
City of Burton	3	4	78%	9
City of Clio	0	1	100%	1
City of Fenton	2	0	33%	6
City of Flint	10	13	72%	32
City of Flushing	0	1	100%	1
City of Grand Blanc	0	1	33%	3
City of Linden	0	1	50%	2
City of Swartz Creek	0	1	50%	2
Village of Goodrich	1	0	50%	2
TOTAL	80	100	49%	369

SD = Structurally Deficient

FO = Functionally Obsolete



Source: MDOT and National Bridge

Genesee County Bridge Improvements 2003-2007

Agency	Project	Total Cost
City of Burton	Terms St. Bridge Replacement over Thread Creek	\$ 450,000.00
City of Fenton	Torrey Road Bridge over Shiawassee River	\$ 1,305,300.00
City of Flint	Chevrolet Ave. (Bridge replacement at Flint River)	\$ 2,976,849.30
City of Flint	Beach Garland Bridge Improvements	\$ 2,082,000.00
City of Flint	W. 12th Street Bride over Thread Creek	\$ 755,000.00
City of Swartz Creek	Bridge Reconstruction on Elms Rd. over the Swartz Creek	\$ 950,000.00
Village of Goodrich	Hegel Rd Bridge over Kearsley Creek	\$ 404,000.00
GCRC	Oak Rd Bridge (over Flint River)	\$ 1,099,589.43
GCRC	Baldwin Rd Bridge (over CSX Railroad)	\$ 2,529,327.50
GCRC	Irish Rd Bridge (over Kearsley Creek)	\$ 1,174,533.45
GCRC	Willard Rd. Bridge Replacement	\$ 440,000.00
MDOT	I-475 (under Selby St)	\$ 56,341.00
MDOT	I-475 (6 bridges on I-475)	\$ 211,447.00
MDOT	I-69 (12 bridges west of I-75)	\$ 1,260,547.15
MDOT	I-69 (4 bridges over I-69)	\$ 234,765.00
MDOT	I-75 (over Court St)	\$ 793,448.13
MDOT	I-75 (under Pierson Rd)	\$ 737,137.47
MDOT	M-21 (over Mistequay Crk)	\$ 86,898.00
MDOT	M-21 (over Swartz Crk)	\$ 30,656.00
MDOT	I-475, M-13 (Preliminary Engineering for the Overlay and bridge repair on I-475 under Hill Road and M-13 over Mistequay Creek and I-69)	\$ 124,321.00
MDOT	I-69 (Bridge repair at Genesee Road and Kearsley Creek)	\$ 68,440.39
MDOT	I-69 (Preliminary Engineering for the Overlay and repair on 14 bridges on I-69 west of I-75)	\$ 46,490.00
MDOT	I-69 (Preliminary Engineering for the Repairs and overlay on EB bridge over Grand Trunk Railroad and Swartz Creek)	\$ 16,400.00
MDOT	I-69 (Deep overlay on bridge over M-15)	\$ 593,232.64
MDOT	M-57 (Bridge improvements over Brent Run Creek)	\$ 388,869.32
MDOT	US-23 (Bridge improvements over Lahring Rd.)	\$ 932,832.97
MDOT	I-75 Bristol Rd Bridge - Over Bristol Rd - Structure replacement	\$ 3,683,628.00
MDOT	US-23 - Under Torrey Road - Deck replacement	\$ 724,324.00
MDOT	US-23 - Thompson to I-75 - Deck Overlay	\$ 4,900,862.00
MDOT	I-475 - Capital Preventive Maintenance on Ramp East over I-475	\$ 876,620.00
MDOT	I-475 - Overlay and Capital Preventive Maintenance on 7 Bridges	\$ 6,761,740.00
MDOT	I-69 - Overlay and Capital Preventive Maintenance on 13 Bridges	\$ 5,009,560.00
MDOT	New Superstructure for 7 Bridges - I-75, US-23 and M-54 Business Route (BR) (Saginaw Rd.)	\$ 5,659,550.00
MDOT	Preventive Maintenance on 12 Bridges throughout Genesee County	\$ 657,797.00
MDOT	2 Bridges in I-69 / I-475 Interchange Area	\$ 1,022,000.00
MDOT	Overlay, Paint, Joint & Railings on Dodge Rd., Wilson Rd. and Farrand Rd. Bridges over I-75	\$ 2,337,000.00
MDOT	Overlay, Painting on 6 Bridges along I-75, Baldwin Rd., Cook Rd. and M-54	\$ 4,129,792.00
MDOT	Overlay on 2 Bridges over CSX RR and M-54 BR (Saginaw Rd.)	\$ 2,144,000.00
TOTAL		\$ 57,655,299

Furthermore, Ingham and Kent Counties, housing the Cities of Lansing and Grand Rapids respectively, show considerably less deficiency ratings than Genesee County while maintaining a comparable number of bridges.

In fact, Kent County, where only 27% of bridges are rated deficient, has 150 more total bridges than Genesee County. This trend in bridge deficiency shown between the surveyed counties may in part be explained through the average age of bridges in each county.



Kent County, with the lowest percentage of deficient bridges, also has the youngest average bridge age at 37 years. Ingham County is next with an average bridge age of 43 years, followed by Genesee County with the oldest bridges at an average age of 46 years. With an older stock of bridges in Genesee County, the number of those classified as deficient is expected to grow considerably by the year 2035. Assuming an average bridge service life of 50 years, 329 of the existing bridges in Genesee County will need to be replaced by 2035, as they will have reached an age of

50 years or more. An estimated 90% of the bridges in the county will be deficient at that time. The reconstruction of one bridge was estimated at an average cost of \$2.5 million, including engineering and design costs. To provide the necessary improvements through 2035, roughly \$1.5 billion (with 5% compounded annually for anticipated cost increases) will be needed.

It should be understood that the severity of the bridge problem lies primarily with those that are classified as “structurally deficient.” These bridges are classified as deficient because their condition either is or has begun to fail. As these bridges pose the most vulnerability to the transportation system, future funding and improvement efforts should be concentrated at these locations throughout the county.

Future Plans

The future of the bridge program in Genesee County is dictated by available funding. In the past five years, Genesee County has performed considerably well in attaining funding for bridge projects. This performance can not always be guaranteed, as the funding is competitive on both a regional and statewide level. Over the past five years, Genesee County has received approximately \$11.5 million a year in local and state bridge funding. In relationship to our previous LRTP bridge category spending policy, the amount spent on bridge repair in the past five years has greatly exceeded our goal. If this figure is forecasted out to 2035, it would equal roughly \$310 million in revenue for bridge projects in Genesee County. Unfortunately, even with this optimistic revenue estimate, the bridge funding projection falls severely short of the estimated \$1.5 billion needed in improvement costs through 2035.

There is an obvious disconnect between the revenue needed to handle the future bridge dilemma in our county and the revenue our county is projected to receive. As the large majority of bridge funding comes from the Federal Government, through the Michigan Department of Transportation, a re-evaluation of how transportation dollars are allocated toward bridge improvements is needed. It should be reinforced that in relationship to other areas in Michigan, and in relationship to state and national averages, Genesee County demonstrates a more imminent need for increased funding due to the large proportion of bridges in disrepair.

On July 31, 2008, the Genesee County Metropolitan Planning Commission held a bridge listening session to generate understanding about the current state of bridges in the county and to explore potential improvements that can be made now and in the future. The meeting was attended by local officials, state and federal agency staff, and planning commission staff.

A number of questions, comments, concerns and suggestions were discussed at the Bridge Listening Session; however, one common theme came through: local jurisdictions need more money. The table below highlights this and other major themes presented at the session. A full meeting summary is included at the end of this report.

Bridge Listening Session

Factors Negatively Affecting Bridge System	Potential Solutions to Improve Bridge System
Inadequate funding for local agencies to repair/maintain bridges	#1 priority is to increase funding for local bridges!
Serious lack of local preventive maintenance activities	Implement routine preventive maintenance program
Age of Genesee County bridge system	Implement innovative funding mechanisms - Local tax millage, grant opportunities, etc.
Legal Loads for Freight Vehicles – Michigan has highest legal loads of any state in nation	Perform more of a "mix of fixes" - including reconstruct, rehabs, routine and preventive maintenance
Michigan Climate – Freeze / Thaw weather patterns	Better coordination of funding sources and the control of each
Low revenues but expensive construction	Education! Educate citizens and local officials alike as to the bridge problems and importance of taking action

BRIDGE LISTENING SESSION

Genesee County Metropolitan Planning Commission

July 31, 2008

On July 31, 2008, the Genesee County Metropolitan Planning Commission held a bridge listening session to generate understanding about the current state of bridges in the county and to explore potential improvements that can be made now and in the future. The meeting was attended by local officials, state and federal agency staff, and planning commission staff. To focus the group, a questionnaire was distributed and attendees were given time to briefly answer each question. Each question is listed below with ideas and comments generated by the group.

1) What funding is available to fix bridges in Genesee County?

- * Local Bridge Program - competitive program for each region (GC is located in the 13 county Bay Region) that receives roughly \$10-\$11 million annually to fix bridges. This program fixes roughly 10-12 bridges a year in the Bay Region.
- * The State maintains over 1000 bridges in the Bay Region, with roughly \$25 million per year allocated toward the upkeep of those bridges.
- * Other local funding seems to be basically non-existent. No road/bridge millage in place in the county.

2) What maintenance programs are in place in Genesee County?

- * Local maintenance programs are reactive as opposed to preventative. Most maintenance is done by local crews who perform basic "band-aid" fixes to keep bridges functional. Unfortunately, as the bridges deteriorate more, the fixes are getting larger and more frequent.
- * State maintenance programs have become a little more preventative in recent years with small rehabilitative maintenance and epoxy overlays being performed. MDOT has a region-wide and state-wide bridge crew who performs this type of work.
- * Annual and Bi-Annual Bridge Inspections

3) What factors have led us to our current situation? (49% bridges deficient)

- * Legal Loads for Freight Vehicles - Michigan has the highest legal loads of any state in the nation.
- * Climate - freeze/thaw weather patterns can wreak havoc on roadways.
- * On system bridges have not received adequate local funding.
- * Serious lack of preventive maintenance activities
- * Age of system
- * Low revenues but expensive construction

4) Do you know of any innovative funding methods that are being used in other areas?

- * County-wide millage for roads and bridges (Saginaw, Gladwin, Tuscola)
- * Highways For Life - this federal grant program is all about building faster, safer, with better quality, less cost and causing less work zone congestion
- * Currently state forums (TF2) are ongoing to address the funding crisis
- * Prioritization w/a mix of fixes - fund more preventive maintenance

5) Do you know of any innovative maintenance programs that are being utilized in other areas?

- * Need to become more proactive as opposed to reactive
- * MDOT has a maintenance guidebook available on their website. This manual is called the *Bridge Capital Scheduled Maintenance Manual*. The manual showcases a number of different innovative maintenance techniques proven to be effective.

6) In your opinion, what should be done to improve the state of bridges in the County?

- * #1 priority is to increase local funding
- * Implement some kind of routine preventive maintenance program
- * Develop regional long range transportation plan to prioritize bridge funding

- * Request Federal Earmark Projects
- * Educate on bridge situation and importance of taking action
 - Local agencies
 - County agencies
 - General Public
- * Public/Private Partnerships - make private entities (manufacturing, freight etc.) pay fair share.
- * Public Bonds
- * Implement Funding Mechanism - Local tax millage
- * Perform more of a “mix of fixes” including reconstruction, rehabs, routine and preventive maintenance
- * Provide for “mix of fixes” through more flexible funding arrangements
- * Better coordination between funding sources and the control of each. If revenue is decreasing, give locals more control over what funds can be used for.