



GRAND VALLEY METROPOLITAN COUNCIL

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TECHNICAL COMMITTEE

Wednesday, October 2, 2019

9:30 AM

KENT COUNTY ROAD COMMISSION OFFICES

COMMISSIONERS BOARD ROOM

1500 SCRIBNER NW, GRAND RAPIDS

AGENDA

I. ROLL CALL AND INTRODUCTIONS

**II. APPROVAL OF MINUTES—ACTION: Dated September 4, 2019
Please refer to Item II: Attachment A**

III. OPPORTUNITY FOR PUBLIC COMMENT

**IV. POLICIES AND PRACTICES DOCUMENT REVISION—ACTION: Staff has updated the non-motorized section of the Policies and Practices for Programming Projects document to align with the goals and objectives of the 2045 Metropolitan Transportation Plan.
Please refer to Item IV: Attachment A**

**V. 2045 MTP DEFICIENCIES AND NEEDS ANALYSIS—ACTION: The Technical Committee will be asked to review and take action on the deficiencies and needs analysis for the 2045 MTP.
Please refer to Item V: Attachment A**

VI. OTHER BUSINESS

- Comment period open for GVMC's consultation plan

VII. ADJOURNMENT

MINUTES

**Grand Valley Metropolitan Council
Transportation Division
TECHNICAL COMMITTEE MEETING
Wednesday, September 4, 2019
Kent County Road Commission
1500 Scribner NW Grand Rapids, MI**

DeVries, chair of the Technical Committee, called the meeting to order at 9:30 am. Those present introduced themselves to the Committee.

I. ROLL CALL AND INTRODUCTIONS

Voting Members Present

Rick DeVries (<i>Chair</i>)		City of Grand Rapids
Sue Becker		Alpine Township
Kristin Bennett		City of Grand Rapids
Terry Brod		Cannon Township
Mike Burns		City of Lowell
Scott Conners		City of Walker
Tim Haagsma		Gaines Charter Township
Wayne Harrall	<i>Proxy for Mike DeVries</i>	Kent County
		Grand Rapids Township
Russ Henckel		City of Wyoming
Nicole Hofert		City of Wyoming
Brett Laughlin		Ottawa County Road Commission
Kelly Sheeran	<i>Proxy for Kevin Green</i>	Algoma Township
		Algoma Township
Dan VanderHeide	<i>Proxy for Tim Bradshaw</i>	City of Kentwood
		City of Kentwood
Rod Weersing		Georgetown Township
Kevin Wisselink		ITP-The Rapid

Staff and Non-Voting Guests Present

Dan Czarnecki		City of Lowell
Andrea Dewey		FHWA
Andrea Faber		GVMC Staff
Laurel Joseph		GVMC Staff
Doug LaFave		City of East Grand Rapids
Terry Martin		Caries and Gable
Rick Sprague		Kent County Road Commission
Norm Sevensma		WMEAC-RWBC
Kerri Smit		GVMC Staff
Steve Waalkes		Michigan Concrete Association
George Yang		GVMC Staff
Mike Zonyk		GVMC Staff

Voting Members Not Present

Ken Bergwerff		Jamestown Township
Tim Bradshaw		City of Kentwood/Caledonia Twp.

Mike DeVries
 Tom Doyle
 Adam Elenbaas
 Rachel Gokey
 Kevin Green
 Tim Grifhorst
 Jerry Hale
 Roy Hawkins
 Jim Holtvluwer
 Tom Hooker
 Bill LaRose
 Matt McConnon
 Tom Noreen
 Steve Peterson
 Rick Solle
 Sandy Stelma
 Dan Strikwerda
 Julius Suchy
 Charlie Sundblad
 Toby VanEss
 Phil Vincent
 Steve Warren
 Rod Weersing

Grand Rapids Township
 MDOT
 Allendale Township
 Village of Sand Lake
 Algoma Township
 Tallmadge Township
 Lowell Township
 GFIAA
 Ottawa County
 Byron Township
 Cedar Springs
 Courtland Township
 Nelson Township
 Cascade Charter Township
 Plainfield Township
 Village of Caledonia
 City of Hudsonville
 Village of Sparta
 City of Grandville
 Tallmadge Township
 City of Rockford
 Kent County Road Commission
 Georgetown Township

II. APPROVAL OF MINUTES

DeVries entertained a motion to approve the May 1, 2019 Technical Committee minutes.

MOTION by Conners, SUPPORT by Vanderheide, to approve the May 1, 2019, Technical Committee meeting minutes. MOTION CARRIED UNANIMOUSLY.

III. OPPORTUNITY FOR PUBLIC COMMENT (GENERAL)

None

IV. FY2017-2020 AND FY2020-2023 TIP AMENDMENTS/MODIFICATIONS

Referring to **Item IV: Attachment A** Joseph explained the requests and handouts that were given to the committee. Joseph also explained that there are several items on the report that are showing up “pending” because the FY2020-2023 TIP is currently still pending.

- Kent explained that MDOT is requesting amendments/modifications to the TIP project list in the attached summary. Kent explained the details involved with the projects on the report. Please note that projects with the date of 6/6/2019 in the “Local Fed Approval Date” column were previously acted upon during the development of the FY2020-2023 TIP. MDOT is also requesting committee review of the S/TIP exempt project list.
- The City of Kentwood is requesting to increase the budget for a FY2020 project. This increase will not change the federal funding associated with the project.

- The Kent County Road Commission is requesting to move a project from the illustrative list into FY2020 to utilize STP Rural funds they are purchasing from Montcalm County.

Joseph explained that none of the actions taken today will go into effect on the 2020 TIP until the TIP is active. Joseph added that the local bridge project in Ottawa County was changed from Federal funding to State funding; cost did not change. Harrall asked when the TIP would be approved. Dewey stated that it should be in October.

MOTION by Laughlin, SUPPORT by Wisselink, to recommend to the Policy Committee approval of the FY2017-2020/FY2020-FY2023 TIP amendments/modifications as presented. MOTION CARRIED UNANIMOUSLY

V. **2045 MTP VISION STATEMENT, GOALS AND OBJECTIVES**

Referring to **Item VI: Attachment A** Faber advised the Committee that one of the first steps in updating the MTP is to review the vision statement, goals and objectives to assure that they remain relevant and satisfy federal transportation planning factors. The goals and objectives in the 2040 MTP were too long and needed condensing. Taking into consideration the 10 planning factors from the FAST Act, data from the recent MTP survey, and performance-based planning requirements, the revision process began. The MTP Steering Committee met on Monday, August 26 to further refine them and the unanimously approved vision, goals and objectives are included in your agenda packet. Staff is asking for the committee to review and approve them.

MOTION by Becker, SUPPORT by Sheeran, to recommend to the Policy Committee approval of the revised 2045 Metropolitan Transportation Plan (MTP) vision statement, goals and objectives. MOTION CARRIED UNANIMOUSLY.

VI. **OTHER BUSINESS**

Joseph explained that in June the non-motorized subcommittee met to discuss the non-motorized project list to make preliminary recommendations for projects and that they would support going through the Michigan Grant System process. These projects will potentially be added to the TIP if they make it through the process. The TPSG subcommittee reviewed the project list and approved it. Staff is asking the Committee to make a recommendation to the Policy Committee to send projects through the Grant System process.

MOTION by Harrall, SUPPORT by Conners, to recommend to the Policy Committee sending the projects through the Michigan Grant System process and to allow for staff adjustments. MOTION CARRIED UNANIMOUSLY

VII. **ADJOURNMENT**

DeVries entertained a motion to adjourn the September 4, 2019, Technical Committee meeting at 9:45 am.

MOTION by Bennett, SUPPORT by Haagsma, to adjourn the September 4, 2019 Technical Committee meeting at 9:45 am. MOTION CARRIED UNANIMOUSLY.



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MEMORANDUM

DATE: September 26, 2019
TO: Technical Committee
FROM: Laurel Joseph, Transportation Planner
RE: **Policies and Practices Document Revision**

Staff is requesting Committee review and recommendation for approval of the revised Non-Motorized section of the Policies and Practices for Programming Projects document.

As part of the MTP update process, staff reviews the Policies and Practices document to ensure the MPO's policies and practices align with the goals and objectives of the MTP.

Staff has completed this review and updated the Non-Motorized section (see attached), which referred to specific objectives from the 2040 MTP that were not retained in the 2045 MTP goals and objectives as a result of the significant effort that was made to condense the MTP's goals and objectives. This reduction in the number of Plan goals and objectives was a recommendation that came out of the MPO's last federal certification review.

No other sections were revised.

If you have any questions, please do not hesitate to contact me at (616) 776-7610.

Non-Motorized Transportation Federal Funding Eligibility

Goal:

The MPO shall support the development of an area-wide network of interconnected, convenient, safe, and efficient non-motorized routes so that they may become an integral mode of travel for area residents. A non-motorized element of the Metropolitan Transportation Plan shall maintain a listing of eligible non-motorized projects and funding shall be allocated through the MTP and TIP planning processes to achieve an overall goal of improving the non-motorized system.

Background:

~~The GVMC 2040 Metropolitan Transportation Plan (MTP) lays out goals that pertain to non-motorized transportation in our region. These MTP goals carry over the federal and state level themes encouraging non-motorized transportation. Related objectives include:~~

~~1d: “Sustain and develop the interconnected regional network of non-motorized transportation facilities to provide access to employment, services, schools, and other destinations.”~~

~~3d: “Collaborate with communities, public schools, and MDOT to regionally plan for safe bicycle and pedestrian routes for students to travel to and from home and school.”~~

~~3e: “Encourage the multiple and safe use of transportation rights-of-way by different modes, including non-motorized transportation.”~~

~~Federal surface transportation law provides flexibility to MPOs to fund bicycle and pedestrian improvements from a wide variety of federal programs (STP, CMAQ, TAP, etc.). However, historically the GVMC Committees have primarily funded projects containing only non-motorized elements (as opposed to a roadway project that includes bike/pedestrian facilities) using competitive grant dollars from the regional Transportation Alternatives Program (TAP) allocation.~~

Facility Definitions

The MPO, in cooperation with the Non-Motorized Subcommittee and using AASHTO standards, has developed definitions for each of the non-motorized facility types. These are the non-motorized facility types recognized by the MPO.

Sidewalks – A sidewalk is a paved pathway paralleling a highway, road, or street, and is intended for pedestrians. Sidewalks are typically four to five feet wide and made from concrete, but may be up to a maximum of eight feet wide and made from other materials depending on their location.

Shared Use Paths – Shared use paths mainly serve corridors not served by streets and highways, or where wide utility or former railroad rights-of-way exist (rail-trails), but may also parallel highway, roads, and streets (formally called “sidepaths”). Shared use paths are wider than sidewalks, between 8 and 12 feet wide (10 feet width is federally required for federal funds) with

a soft two to four-foot shoulder on each side, and a minimum width of 14 feet on all structures, such as bridges and boardwalks. They are shared facilities for use by both pedestrians and bicyclists.

Sidepath – Sidepaths are shared use paths that are located immediately adjacent and parallel to a roadway.

Bicycle Lanes – Bicycle lanes are dedicated, marked, and signed rights-of-way assigned to bicyclists. They are paired one-way facilities located on both sides of a street, with standard intersection designs to minimized conflicts between bicycles and automobiles. Standard bicycle lane widths are six feet; five feet is the minimum width adjacent to curbs and four feet is the minimum width when no curb exists. Dedicated bike lanes must be accompanied by both pavement markings and bike lanes signs (R3-17).

Signed Shared Roadways – Signed shared roadways are designated bicycle routes that are signed (D11-1 or W11-1) or have pavement markings to indicate that the roadway is shared with bicyclists (“sharrow” chevron pavement marking).

Unsigned Shared Roadways – Unsigned shared roadways are open to both bicycle and motor vehicle and are designed and constructed under the assumption that they may be used by bicyclists, but are not signed or marked. Unsigned shared roadways typically have wider than the standard 12-foot lane. Shared roadways may also be standard width roadways with a minimum four-foot paved shoulder (where there is no curb and gutter), also known as a “wide-shoulder.”

Bicycle Centers and Staging Areas – Bicycle centers and staging areas are auxiliary facilities to increase the convenience and effectiveness of non-motorized transportation and may offer amenities such as showers and bicycle parking, as well as motorized vehicle parking and network access points.

Pedestrian Bridges and Refuge Islands – Pedestrian bridges are modified road bridge structures that accommodate pedestrians and bicyclists, or they may be pedestrian/bike only structures. A refuge island is a protected area between traffic lanes providing pedestrians or bicyclists with a safe place to wait for gaps in traffic in order to cross a road safely.

Recommended Policy/Practice:

All non-motorized projects included in the GVMC Metropolitan Transportation Plan/Non-Motorized Transportation Plan are eligible for funding as allowed under applicable federal-aid categories. Proposed projects shall be evaluated during the development of the Non-Motorized Plan and scored using evaluation criteria set forth in the plan and agreed upon by the Non-motorized Subcommittee. Project evaluation results – along with fiscal constraint, project readiness, and other context-related factors – shall drive the programming process.

Federal surface transportation law provides flexibility to MPOs to fund bicycle and pedestrian improvements from a wide variety of federal programs (STP, CMAQ, TAP, etc.). However, historically the GVMC Committees have primarily funded projects containing only non-

motorized elements (as opposed to a roadway project that includes bike/pedestrian facilities) using competitive grant dollars from the regional Transportation Alternatives Program (TAP) allocation.

Any allocated funds to the MPO for the Congestion Mitigation and Air Quality (CMAQ) program shall also be eligible and considered for use on bicycle and pedestrian facility improvements. All CMAQ funded non-motorized projects shall be addressed on a case by case basis to prove high use, mode shift, and connectivity and score well using the scoring criteria set forth in the Non-Motorized Plan. For the use of CMAQ funds all projects must demonstrate emission reduction and alleviate congestion.

All non-motorized projects requesting federal funds must be endorsed by the MPO to receive federal funds and be included in the MPO TIP.

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MEMORANDUM

To: GVMC Technical Committee
From: Andrea Faber, Transportation Planner
Re: 2045 MTP Deficiencies and Needs Analysis
Date: September 25, 2019

At the October Technical Committee meeting, staff will present the findings of GVMC's modal needs analysis. To determine current and future transportation need by mode, GVMC worked with various stakeholders from organizations representing transit, passenger rail, air travel, freight movement, and non-motorized modes of transportation. As part of this effort, staff also analyzed deficiencies for pavement and bridge condition, traffic congestion, safety and reliability for all users of the transportation system based on the performance measure targets the Committee has previously supported. These analyses will be the basis for proposing solutions to meet the current and forecasted transportation needs by mode and deficiencies for the 2045 Metropolitan Transportation Plan (MTP).

The lists of modal needs and deficiencies are attached for your review. The modal needs analysis is open for public comment through Tuesday, October 15. For more information, or to submit comments, please visit www.gvmc.org/mtp. A [corresponding map](#) is also available on this webpage.

Endorsing these analyses will allow staff to move forward with the next phases of MTP development, which include selecting preferred alternatives to address current and projected system needs and deficiencies and determining a financially constrained project list.

If you have any questions, please contact me at (616) 776-7603 or andrea.faber@gvmc.org.

Recommended Action: Technical Committee approval of the deficiencies and needs analyses conducted by GVMC staff.

Congestion deficiency:

The enhanced GVMC travel demand model has the ability to identify peak period capacity deficiencies rather than the daily capacity deficiency in the previous model. Peak hour volume-capacity (V/C) ratio from the enhanced travel demand model is used to identify congested corridors on existing and future highway network. The greater of the two values of AM (7am-9am) and PM (3pm-6pm) peak period V/C ratio is selected for the congestion deficiency analysis. Corridors are identified as “Low/No Congestion,” “Moderate Congestion,” or “Severe Congestion,” as summarized below.

V/C Ratio	Congestion Level
V/C≤0.8	No Congestion
0.8<V/C<1.0	Moderate Congestion
V/C≥1.0	Severe Congestion

Safety Deficiency:

Safety deficiency is defined based on the fatality and serious injury rate on the roadway segments. Traffic crash data are obtained from Roadsoft (developed by MTU) and www.michigantafficcrashfacts.org (developed and maintained by university of Michigan). A segment is defined as safety deficient if the rate of fatalities per 100 million VMT is greater than 1.00, or the rate of serious injuries per 100 million VMT is greater than 5.41 (MDOT’s safety targets for the year of 2019).

Reliability Deficiency:

Travel Time Reliability is a measure of travel time consistency over a period of time. When travel times are unreliable, travelers are more likely to experience unexpected delays. Travel times are shown to be reliable when the 95th percentile travel time remains close to the average travel time.

Travel time reliability is an important performance measure because it can better measure the benefits of traffic management and operation activities than simple averages. Planning time index, which is computed as the ratio of the 95th percent travel time to the free flow travel time, is used to identify reliability deficiency.

Corridors are identified as “No Reliability Deficiency” “Moderate Reliability Deficiency” or “Severe Reliability Deficiency” as summarized below,

V/C Ratio	Congestion Level
PTI \leq 1.35	No Reliability Deficiency
1.35<PTI<1.8	Moderate Reliability Deficiency
V/C \geq 1.8	Severe Reliability Deficiency

Jurisdiction	Road Name	From Description	To Description	Miles	NFC	Road Type	Peak V/C	Daily V/C	Cong Year	Safety Def	Reliability Def	Legal System	PASER
Ada Twp	Ada Dr SE	Thornapple River Dr SE	Headley St SE	0.05	4	Minor Arterial	1.06	0.75	2015	No	N/A	County Primary	8
Ada Twp	E Fulton St	Ada Dr SE	Ada BAS	0.18	4	Minor Arterial w/TWLTL	1.00	0.55	2015	No	N/A	State Trunkline	7
Ada Twp	E Fulton St	Ada BAS	Segment Split	0.29	4	Minor Arterial w/TWLTL	1.00	0.55	2015	No	N/A	State Trunkline	8
Ada Twp	E Fulton St	Segment Split	Bennett St SE	0.31	4	Minor Arterial	1.02	0.66	2015	No	N/A	State Trunkline	4
Ada Twp	Pettis Ave NE	Fulton	Vergennes St SE	0.06	4	Minor Arterial	1.20	0.58	2015	No	N/A	County Primary	7
Algoma Twp	10 Mile Rd NW	Algoma Ave NE	10 Mile/S US 131 RAMP	0.06	4	Minor Arterial	1.00	0.76	2015	No	N/A	County Primary	4
Algoma Twp	10 Mile Rd NW	N US 131	N US 131/10 Mile RAMP	0.19	3	Principal Arterial	1.09	0.87	2015	No	None	County Primary	4
Algoma Twp	10 Mile Rd NW	N US 131/10 Mile RAMP	Belmont Ave NE	0.06	3	Principal Arterial	1.13	0.92	2015	No	None	County Primary	3
Algoma Twp	N US 131	N US 131/14 Mile RAMP	14 Mile Rd NE	0.13	2	Interstate/Freeway	1.13	0.94	2015	No	None	State Trunkline	10
Allendale Twp	Lake Michigan Dr	Lake Michigan/Campus TURN & N Campus Dr	Lake Michigan/Campus TURN	0.12	3	Principal Arterial	1.03	0.64	2025	No	None	State Trunkline	4
Alpine Twp	Alpine Ave NW	N M 37/Vinton TURN	S M 37/7 Mile TURN	0.03	3	Principal Arterial	1.31	0.82	2015	Yes	Moderate	State Trunkline	6
Alpine Twp	Alpine Ave NW	N M 37/Marway TURN	S M 27/Vogelane TURN	0.05	3	Principal Arterial	1.21	0.76	2015	Yes	Moderate	State Trunkline	6
Alpine Twp	Alpine Ave NW	N M 37/Vinton TURN	S M 37/7 Mile TURN	0.03	3	Principal Arterial	1.17	0.80	2015	Yes	None	State Trunkline	6
Byron Twp	E M 6	Byron Center Ave SW	N Byron Center/E M 6 RAMP	0.48	2	Interstate/Freeway	1.00	0.77	2015	No	None	State Trunkline	7
Byron Twp	S US 131/68th RAMP	E M 6/68th RAMP	68th St SW & 68th/S US 131 RAMP	0.17	2	Freeway Off-Ramp	1.02	0.93	2015	No	None	State Trunkline	7
Caledonia Twp	Broadmoor Ave SE	Segment Split	Segment Split	0.20	4	Minor Arterial	1.11	0.94	2015	No	N/A	State Trunkline	5
Cascade Twp	28th/W I 96 RAMP	W I 96/W 28th RAMP	W I 96	0.38	1	Freeway On-Ramp	1.01	0.94	2015	No	None	State Trunkline	6
Cascade Twp	E I 96/E 28th RAMP	E I 96	28th St SE	0.13	1	Freeway Off-Ramp	1.21	1.00	2015	No	None	State Trunkline	6
Courtland Twp	10 Mile Rd NE	Hillview Pl NE	City/Twp Line	0.00	5	Collector w/TWLTL	1.00	0.86	2015	Yes	N/A	County Primary	8
Courtland Twp	10 Mile Rd NE	City/Twp Line	Atlanta	0.10	5	Collector w/TWLTL	1.00	0.86	2015	Yes	N/A	County Primary	8
Georgetown Twp	12th Ave	CSX Transportation	Rosewood	0.01	5	Collector	1.09	0.66	2025	No	N/A	County Primary	6
Georgetown Twp	Baldwin St	Cottonwood Dr	Riverview Dr	0.07	4	Minor Arterial w/TWLTL	1.02	0.72	2015	No	N/A	County Primary	8
Georgetown Twp	Baldwin St	Riverview Dr	Cottonwood	0.09	4	Minor Arterial w/TWLTL	1.02	0.72	2015	No	N/A	County Primary	8
Georgetown Twp	Baldwin St	Riverview Dr	Cottonwood	0.03	4	Minor Arterial	1.06	0.75	2015	No	N/A	County Primary	8
Georgetown Twp	Chicago Dr	Chicago/W I 196	W I 196/Chicago	0.01	3	Principal Arterial	1.25	0.88	2015	No	Moderate	State Trunkline	6
Grand Rapids	1st St NW	E I 196/1st RAMP	Lane Ave NW	0.04	5	One-Way Collector	1.09	0.93	2015	No	N/A	City Major	7
Grand Rapids	1st St NW	Lane Ave NW	1st/E I 196 RAMP	0.01	5	One-Way Collector	1.35	1.15	2015	Yes	N/A	City Major	7
Grand Rapids	2nd St NW	2nd/W I 196 RAMP	Pine Ave NW	0.01	5	One-Way Collector	1.01	0.87	2015	No	N/A	City Major	8
Grand Rapids	2nd St NW	Fremont Ave NW	W I 196/2nd RAMP	0.01	5	One-Way Collector	1.33	1.22	2015	No	N/A	City Major	8
Grand Rapids	Bridge St NW	Alabama Ave NW	Winter Ave NW	0.04	4	Minor Arterial	1.00	0.77	2015	Yes	N/A	City Major	7
Grand Rapids	Bridge St NW	Broadway Ave NW	Summer Ave NW	0.01	4	Minor Arterial	1.01	0.83	2015	Yes	N/A	City Major	6
Grand Rapids	Bridge St NW	Summer Ave NW	Segment Split	0.05	4	Minor Arterial	1.01	0.83	2015	Yes	N/A	City Major	6
Grand Rapids	Burton St SE	Kalamazoo Ave SE	Giddings Ave SE	0.04	3	Principal Arterial w/TWLTL	1.03	0.85	2015	Yes	None	City Major	4
Grand Rapids	Burton St SW	Alice Ave SW	Saint Charles Ave SW	0.03	3	Principal Arterial	1.05	0.83	2015	Yes	Severe	City Major	7
Grand Rapids	Burton St SW	Saint Charles Ave SW	Towner Ave SW	0.05	3	Principal Arterial	1.05	0.83	2015	Yes	Severe	City Major	7
Grand Rapids	Burton St SW	Towner Ave SW	Jerome Ave SW	0.06	3	Principal Arterial w/TWLTL	1.01	0.79	2015	Yes	None	City Major	7
Grand Rapids	Cherry St SW	Bus US 131 & Division/S US 131 RAMP	Segment Split	0.01	4	Local	1.19	1.07	2020	Yes	N/A	City Major	9
Grand Rapids	Cherry St SW	Segment Split	Segment Split	0.05	4	Minor Arterial	1.10	0.91	2020	Yes	N/A	City Major	8
Grand Rapids	Chicago Dr SW	Chicago/Twp Line	Cordelia St SW	0.07	3	Principal Arterial	1.08	0.85	2015	No	Severe	State Trunkline	2
Grand Rapids	Chicago Dr SW	Vanraalte Dr SW	High St SW	0.01	3	Principal Arterial	1.20	0.82	2015	No	Severe	State Trunkline	3
Grand Rapids	Chicago Dr SW	High St SW	Coate Ct SW	0.05	3	Principal Arterial	1.05	0.80	2015	No	Severe	State Trunkline	3
Grand Rapids	Chicago Dr SW	Naylor St SW	Tulip St SW	0.04	3	Principal Arterial	1.05	0.80	2015	No	Severe	State Trunkline	3
Grand Rapids	Chicago Dr SW	Stolpe St SW	Olympia St SW	0.03	3	Principal Arterial	1.05	0.80	2015	No	Severe	State Trunkline	3
Grand Rapids	Chicago Dr SW	Olympia St SW	Liberty St SW	0.05	3	Principal Arterial	1.05	0.80	2015	No	Severe	State Trunkline	3
Grand Rapids	Chicago Dr SW	Liberty St SW	Liberty St SW	0.01	3	Principal Arterial	1.07	0.84	2015	No	Severe	State Trunkline	3
Grand Rapids	Chicago Dr SW	Ritzema Ct SW	Shamrock St SW	0.05	3	Principal Arterial	1.07	0.84	2015	No	Severe	State Trunkline	3
Grand Rapids	Chicago Dr SW	Shamrock St SW	Hall St SW	0.07	3	Principal Arterial	1.07	0.84	2015	No	Severe	State Trunkline	3
Grand Rapids	E Beltline Ave NE	Uturn	Segment Split	0.08	3	Principal Arterial	1.00	0.83	2015	No	None	State Trunkline	6
Grand Rapids	E Beltline Ave NE	uturn	Uturn	0.03	3	Principal Arterial	1.00	0.83	2015	No	None	State Trunkline	6
Grand Rapids	E Beltline Ave NE	Uturn	Bradford St NE	0.05	3	Principal Arterial	1.02	0.85	2015	No	None	State Trunkline	6
Grand Rapids	E Beltline Ave NE	Bradford St NE	Cornerstone College Dr NE	0.09	3	Principal Arterial	1.03	0.84	2015	No	None	State Trunkline	6
Grand Rapids	E Beltline Ave NE	E I 96/Beltline RAMP	Deposit Dr NE	0.01	3	Principal Arterial	1.12	0.95	2015	Yes	Severe	State Trunkline	5
Grand Rapids	E Beltline Ave NE	Deposit Dr NE	Beltline/E I 96 RAMP	0.04	3	Principal Arterial	1.12	0.95	2015	Yes	Severe	State Trunkline	5
Grand Rapids	E Beltline Ave NE	E I 96	W I 96	0.07	3	Principal Arterial	1.12	0.95	2015	Yes	Severe	State Trunkline	5
Grand Rapids	E Beltline Ave NE	Beltline/W I 96 RAMP	W I 96/Beltline RAMP	0.02	3	Principal Arterial	1.03	0.85	2015	Yes	Severe	State Trunkline	8
Grand Rapids	E Beltline Ave NE	W I 96/Beltline RAMP	Segment Split	0.01	3	Principal Arterial	1.00	0.83	2015	Yes	Severe	State Trunkline	8

Grand Rapids	E Beltline Ave SE	Calvin College Entrance	Lake Dr SE	0.10	3	Principal Arterial	1.00	0.88	2015	No	Severe	State Trunkline	6
Grand Rapids	E I 196/College RAMP	E I 196	College Ave NE & College/E I 196 RAMP	0.17	1	Freeway Off-Ramp	1.09	1.00	2015	No	None	State Trunkline	8
Grand Rapids	E I 196/Fuller RAMP	E I 196	Fuller Ave NE & Fuller/E I 196 RAMP	0.16	1	Freeway Off-Ramp	1.21	1.14	2015	No	None	State Trunkline	9
Grand Rapids	E I 196/Ottawa RAMP	E I 196	Ottawa Ave NW & W I 196/Ottawa RAMP	0.08	1	Freeway Off-Ramp	1.18	1.04	2015	No	None	State Trunkline	8
Grand Rapids	E I 96	E I 96	E I 96/Beltline RAMP	0.46	1	Interstate/Freeway	1.10	1.05	2020	No	Severe	State Trunkline	7
Grand Rapids	E I 96/Beltline RAMP	E I 96	E Beltline Ave NE	0.34	1	Freeway Off-Ramp	1.00	0.88	2015	No	None	State Trunkline	5
Grand Rapids	Fuller/W I 196 RAMP	W I 196/Fuller RAMP & Fuller Ave NE	W I 196	0.20	1	Freeway On-Ramp	1.04	1.01	2015	No	None	State Trunkline	9
Grand Rapids	Hall St SE	Butler Ave SE	Kalamazoo Ave SE	0.01	4	Minor Arterial	1.00	0.84	2015	Yes	N/A	City Major	7
Grand Rapids	Ionia Ave SW	Segment Split	Ionia/E I 196 RAMP	0.01	4	One-Way Minor Arterial	1.24	1.07	2015	No	N/A	City Major	10
Grand Rapids	Ionia/E I 196 RAMP	Ionia Ave NW	E I 196 & Ionia Ave NW	0.11	1	Freeway On-Ramp	1.05	0.91	2015	No	None	State Trunkline	8
Grand Rapids	Ionia/W I 196 RAMP	Ottawa Ave NW	W I 196	0.10	1	Freeway On-Ramp	1.10	0.98	2015	No	None	State Trunkline	6
Grand Rapids	Kalamazoo Ave SE	Kendall St SE	Kendall St SE	0.00	3	Principal Arterial	1.10	0.77	2015	Yes	None	City Major	6
Grand Rapids	Lake Dr SE	Carlton Ave SE	Robinson Rd SE	0.03	4	Minor Arterial	1.07	0.85	2015	Yes	N/A	City Major	6
Grand Rapids	Lake Michigan Dr NW	Summer Ave NW	Mount Vernon Ave NW	0.05	4	Minor Arterial w/TWLTL	1.02	0.81	2015	Yes	N/A	City Major	4
Grand Rapids	Lake Michigan/E I 196 RAMP	Lake Michigan Dr NW	Lake Michigan/W I 196 RAMP	0.05	1	Freeway Off-Ramp	1.33	1.25	2015	No	None	State Trunkline	6
Grand Rapids	Michigan St NE	N US 131 CD RAMP	N US 131/E I 196 RAMP	0.01	4	Minor Arterial	1.51	0.95	2015	No	N/A	City Major	8
Grand Rapids	Monroe Ave NW	Michigan St NW	Segment Split	0.12	4	Minor Arterial w/TWLTL	1.00	0.74	2025	No	N/A	City Major	8
Grand Rapids	Monroe Ave NW	Segment Split	Trowbridge St NW	0.05	4	Minor Arterial	1.00	0.74	2025	Yes	N/A	City Major	8
Grand Rapids	Mount Vernon Ave NW	S US 131 Ramp	Pearl St NW	0.03	5	One-Way Collector	1.04	0.78	2025	Yes	N/A	City Major	5
Grand Rapids	N I 296/Ann RAMP	N US 131	Ann St NW	0.19	1	Freeway Off-Ramp	1.07	0.99	2015	No	None	State Trunkline	9
Grand Rapids	N I 296/Scribner RAMP	N US 131	Scribner Ave NW	0.17	1	Freeway Off-Ramp	1.11	1.06	2015	No	None	State Trunkline	7
Grand Rapids	N US 131	City/Twp Line	N US 131/Burton RAMP	0.59	2	Interstate/Freeway	1.01	0.94	2015	No	Severe	State Trunkline	7
Grand Rapids	N US 131	Burton/N US 131 RAMP	N US 131/Hynes RAMP	0.26	2	Interstate/Freeway	1.04	0.95	2015	No	Severe	State Trunkline	5
Grand Rapids	N US 131	N US 131/Hynes RAMP	N US 131/Hall RAMP	0.41	2	Interstate/Freeway	1.04	0.95	2015	No	Severe	State Trunkline	5
Grand Rapids	N US 131	Hall/N US 131 RAMP	N US 131/Franklin RAMP	0.25	2	Interstate/Freeway	1.06	0.99	2015	No	Severe	State Trunkline	5
Grand Rapids	N US 131	CSX Transportation	N US 131/Division RAMP	0.23	2	Interstate/Freeway	1.09	1.03	2015	No	Severe	State Trunkline	5
Grand Rapids	N US 131	W I 196/N US 131 RAMP	E I 196/N US 131 RAMP	0.04	1	Interstate/Freeway	1.06	0.94	2015	No	Severe	State Trunkline	6
Grand Rapids	N US 131	Leonard St NW	Scribner/N I 296 RAMP	0.54	1	Interstate/Freeway	1.05	0.94	2015	No	Severe	State Trunkline	6
Grand Rapids	N US 131/Pearl RAMP	N US 131	Pearl St NW	0.13	2	Freeway Off-Ramp	1.07	0.98	2015	No	None	State Trunkline	9
Grand Rapids	Pearl St NW	N US 131/Pearl RAMP	Scribner Ave NW	0.00	3	Principal Arterial	1.03	0.75	2015	Yes	Moderate	City Major	9
Grand Rapids	Plainfield/W I 96 RAMP	Plainfield Ave NE	Plainfield/W I 96 RAMP & N Plainfield/W I 96 RAMP	0.08	1	Freeway On-Ramp	1.00	0.98	2015	No	None	State Trunkline	10
Grand Rapids	Plymouth Ave NE	E I 196	W I 196	0.11	4	Minor Arterial w/TWLTL	1.06	0.59	2025	No	N/A	City Major	8
Grand Rapids	S US 131	S US 131/W Burton RAMP	Century/S US 131 RAMP	0.68	2	Interstate/Freeway	1.01	0.95	2015	No	None	State Trunkline	6
Grand Rapids	S US 131	S US 131/Century RAMP	Century/S US 131 RAMP	0.42	2	Interstate/Freeway	1.05	1.01	2015	No	Severe	State Trunkline	6
Grand Rapids	S US 131	S US 131/Century RAMP	CSX Transportation	0.31	2	Interstate/Freeway	1.06	1.02	2015	No	Severe	State Trunkline	6
Grand Rapids	S US 131	Wealthy/S US 131 RAMP	Division/S US 131 RAMP	0.10	2	Interstate/Freeway	1.01	0.95	2015	No	Severe	State Trunkline	5
Grand Rapids	S US 131	E I 196/S US 131 RAMP	Bridge St NW	0.14	2	Interstate/Freeway	1.03	0.90	2015	No	Severe	State Trunkline	6
Grand Rapids	S US 131	S US 131/W I 196 RAMP	S US 131/E I 196 RAMP	0.01	1	Interstate/Freeway	1.07	0.95	2015	No	Moderate	State Trunkline	6
Grand Rapids	S US 131	Leonard St NW	S I 296/Turner RAMP	0.58	1	Interstate/Freeway	1.04	0.91	2015	No	Moderate	State Trunkline	7
Grand Rapids	S US 131/Market RAMP	S US 131	Market Ave SW	0.14	2	Freeway Off-Ramp	1.11	0.97	2015	No	None	State Trunkline	7
Grand Rapids	S US 131/Pearl RAMP	S US 131 CD RAMP & E I 196/S US 131 RAMP	Mount Vernon Ave NW	0.17	2	Freeway Off-Ramp	1.00	0.89	2015	No	None	State Trunkline	7
Grand Rapids	Turner/S I 296 RAMP	Turner Ave NW	S US 131	0.21	1	Freeway On-Ramp	1.03	0.97	2015	No	None	State Trunkline	6
Grand Rapids	W I 196/2nd RAMP	W I 196	2nd St NW	0.14	1	Freeway Off-Ramp	1.17	1.09	2015	No	None	State Trunkline	7
Grand Rapids	W I 196/College RAMP	W I 196	Hastings St NE & College Ave NE & College/W I 196	0.10	1	Freeway Off-Ramp	1.05	0.88	2015	No	None	State Trunkline	9
Grand Rapids	W I 196/Lake Michigan RAMP	W I 196	Bristol Ave NW	0.26	1	Freeway Off-Ramp	1.10	1.04	2015	No	None	State Trunkline	6
Grand Rapids	W I 196/Ottawa RAMP	W I 196	N Division Ave	0.11	1	Freeway Off-Ramp	1.01	0.87	2015	No	None	State Trunkline	9
Grand Rapids	W I 196/Ottawa RAMP	Ionia/W I 196 RAMP	W I 196	0.21	1	Freeway Off-Ramp	1.01	0.87	2015	No	None	State Trunkline	9
Grand Rapids	Wealthy St SE	N US 131/Division RAMP	Segment Split	0.12	3	Principal Arterial	1.06	0.85	2015	No	Severe	City Major	6
Grand Rapids Twp	E I 96	E I 96/Fulton RAMP	E Fulton St	0.62	1	Interstate/Freeway	1.05	0.89	2015	No	None	State Trunkline	7
Grand Rapids Twp	E I 96	E Fulton St	I 96 Crossover	0.70	1	Interstate/Freeway	1.05	0.89	2015	No	None	State Trunkline	7
Grand Rapids Twp	E I 96	I 96 Crossover	E I 96/E Cascade RAMP	0.07	1	Freeway Off-Ramp	1.31	1.14	2015	No	None	State Trunkline	7
Grand Rapids Twp	E I 96/EB Fulton RAMP	E I 96	E I 96/EB Fulton RAMP & E I 96/WB Fulton RAMP	0.14	1	Freeway Off-Ramp	1.20	1.03	2015	No	None	State Trunkline	7
Grand Rapids Twp	W I 96	E Fulton St	E Fulton St	0.58	1	Interstate/Freeway	1.01	0.88	2015	No	Severe	State Trunkline	7
Grand Rapids Twp	W I 96	I 96 Crossover	Cascade/W I 96 RAMP	0.55	1	Interstate/Freeway	1.01	0.88	2015	No	Severe	State Trunkline	7
Grandville	44th St SW	44th/W I 196 RAMP & W I 196/44th RAMP	44th/W I 196 RAMP	0.10	3	Principal Arterial	1.04	0.80	2015	Yes	Moderate	City Major	4
Grandville	44th St SW	44th/E I 196 RAMP	44th/E I 196 RAMP	0.16	3	Principal Arterial w/TWLTL	1.04	0.80	2015	Yes	Moderate	City Major	4
Grandville	Baldwin/E I 196 RAMP	E I 196	E I 196	0.41	1	Freeway On-Ramp	1.09	0.86	2015	No	None	State Trunkline	8

Grandville	Chicago Dr SW	Chicago Dr	W I 196	0.20	3	Principal Arterial	1.25	0.89	2015	No	Moderate	City Major	3
Grandville	E I 196	E I 196/28th RAMP	Wilson Ave SW	0.22	1	Interstate/Freeway	1.02	0.89	2015	No	Severe	State Trunkline	8
Grandville	E I 196	I 196 Crossover	E I 196/Chicago	1.46	1	Interstate/Freeway	1.06	0.95	2015	No	Severe	State Trunkline	7
Grandville	W I 196	I 196 Crossover	Chicago/W I 196	1.31	1	Interstate/Freeway	1.02	0.96	2015	No	None	State Trunkline	8
Grandville	W I 196/Baldwin RAMP	W I 196	Baldwin/E I 196 RAMP & Baldwin St	0.24	1	Freeway Off-Ramp	1.11	0.96	2015	No	None	State Trunkline	8
Grandville	W I 196/Chicago RAMP	W I 196	County Line	0.22	1	Freeway Off-Ramp	1.09	1.00	2015	No	None	State Trunkline	7
Hudsonville	32nd Ave	Enterprise Dr	Corporate Grove	0.13	4	Minor Arterial w/TWLTL	1.07	0.89	2025	No	N/A	City Major	9
Hudsonville	32nd/E I 196 RAMP	32nd Ave	E I 196	0.43	1	Freeway On-Ramp	1.01	0.88	2015	No	None	State Trunkline	3
Hudsonville	W I 196/32nd RAMP	W I 196	32nd/W I 196 RAMP	0.38	1	Freeway Off-Ramp	1.09	1.02	2015	No	None	State Trunkline	3
Jamestown Twp	E I 196	I 196 Crossover	City/Twp Line	1.30	1	Interstate/Freeway	1.04	0.95	2015	No	None	State Trunkline	5
Kentwood	28th St SE	Ridgemoor Dr SE	Woodland Dr SE & Radcliff Ave SE	0.12	3	Principal Arterial w/TWLTL	1.01	0.88	2015	No	Severe	State Trunkline	5
Kentwood	Broadmoor Ave SE	Towncenter Ct SE	Patterson Ave SE	0.11	3	Principal Arterial	1.14	0.91	2015	Yes	Severe	State Trunkline	6
Lowell Twp	Alden Nash/W I 96 RAMP	Alden Nash Ave SE	W I 96	0.21	1	Freeway On-Ramp	1.16	0.84	2015	No	None	State Trunkline	7
Lowell Twp	E I 96/Alden Nash RAMP	E I 96	Alden Nash Ave SE	0.21	1	Freeway Off-Ramp	1.30	1.03	2015	No	None	State Trunkline	7
Plainfield Twp	Cannonsburg Rd NE	Marquette Rail	Mill Creek Ave NE	0.02	4	Minor Arterial	1.05	0.75	2015	Yes	N/A	County Primary	3
Plainfield Twp	Cannonsburg Rd NE	Leland Ave NE	Park Dr NE	0.09	4	Minor Arterial w/TWLTL	1.15	0.72	2015	Yes	N/A	County Primary	3
Plainfield Twp	Cannonsburg Rd NE	Park Dr NE	Lamoreaux Dr NE	0.09	4	Minor Arterial w/TWLTL	1.13	0.77	2015	Yes	N/A	County Primary	3
Plainfield Twp	Cannonsburg Rd NE	Northland Dr NE	N M 44/West River RAMP	0.01	5	Collector	1.07	0.65	2015	No	N/A	County Primary	6
Plainfield Twp	N US 131/10 Mile RAMP	N US 131	10 Mile/N US 131 RAMP & 10 Mile Rd NE	0.41	2	Freeway Off-Ramp	1.02	0.92	2015	No	None	State Trunkline	8
Plainfield Twp	N US 131/River RAMP	N US 131	W River Dr NE	0.31	2	Freeway Off-Ramp	1.11	1.00	2015	No	None	State Trunkline	8
Plainfield Twp	Northland Dr NE	W River Dr NE	Rogue River Rd NE	0.49	3	Principal Arterial	1.06	0.67	2015	No	Severe	State Trunkline	7
Plainfield Twp	River/S US 131 RAMP	W River Dr NE & Ball Park Dr NE	S US 131	0.27	2	Freeway On-Ramp	1.03	0.88	2015	No	None	State Trunkline	8
Rockford	10 Mile Rd NE	Wolverine Blvd NE	City/Twp Line	0.10	5	Collector w/TWLTL	1.00	0.86	2015	Yes	N/A	County Primary	8
Rockford	10 Mile Rd NE	Wolverine Blvd NE	City/Twp Line	0.04	5	Collector	1.05	0.91	2015	Yes	N/A	County Primary	8
Walker	28th St SE	Riverbend Dr SW	Walleye Dr SW	0.21	3	Principal Arterial	1.08	0.88	2015	No	Moderate	State Trunkline	7
Walker	Alpine Ave NW	Alpine/E I 96 RAMP	N I 296/Alpine RAMP	0.01	3	Principal Arterial	1.10	0.91	2020	No	None	State Trunkline	7
Walker	Alpine Ave NW	N I 296/Alpine RAMP	W I 96	0.11	3	Principal Arterial	1.10	0.91	2020	No	None	State Trunkline	7
Walker	Alpine Ave NW	W I 96/Alpine RAMP	W I 96/Alpine RAMP	0.01	3	Principal Arterial	1.10	0.91	2020	No	None	State Trunkline	7
Walker	S US 131	City/Twp Line	S I 296/Turner RAMP	0.28	1	Interstate/Freeway	1.00	0.86	2015	No	Severe	State Trunkline	8
Walker	S US 131	S US 131/E I 96 RAMP	E I 96	0.19	2	Interstate/Freeway	1.12	0.92	2015	No	Severe	State Trunkline	8
Walker	S US 131	S US 131/W I 96 RAMP	N Park St NE	0.06	2	Interstate/Freeway	1.15	0.89	2015	No	Severe	State Trunkline	8
Walker	W I 96/Walker RAMP	W I 96	Walker/W I 96 RAMP & Walker Ave NW	0.31	1	Freeway Off-Ramp	1.00	0.84	2015	No	None	State Trunkline	8
Wyoming	28th St SE	28th/N US 131 RAMP	N US 131/28th RAMP	0.01	3	Principal Arterial	1.05	0.96	2015	Yes	Severe	State Trunkline	8
Wyoming	28th St SE	N US 131/28th RAMP	Norfolk Southern Railway	0.04	3	Principal Arterial	1.07	0.89	2015	Yes	Severe	State Trunkline	8
Wyoming	36th St SW	Perry Ave SW	Perry Ave SW	0.00	4	Minor Arterial	1.02	0.81	2015	Yes	N/A	City Major	6
Wyoming	36th St SW	Taft Ave SW	Taft Ave SW	0.01	4	Minor Arterial	1.03	0.79	2015	Yes	N/A	City Major	6
Wyoming	36th St SW	Hubal Ave SW	Hubal Ave SW	0.01	4	Minor Arterial	1.26	0.89	2015	Yes	N/A	City Major	6
Wyoming	E I 196	Chicago/W I 196	I 196 Crossover	1.60	1	Interstate/Freeway	1.06	0.94	2015	No	None	State Trunkline	7
Wyoming	Eastern Ave SE	40th St SE	40th St SE	0.01	4	Minor Arterial w/TWLTL	1.06	0.65	2025	Yes	N/A	City Major	3
Wyoming	N US 131	36th/N US 131 RAMP	32nd St SW	0.65	2	Interstate/Freeway	1.01	0.93	2015	No	Severe	State Trunkline	7

GVMC Condition Needs Analysis

The GVMC Needs for Pavement Condition were assessed by comparing five financial scenarios. Each scenario, optimized by using a mix of fixes, has a timeline out to 2045. A condition analysis out to the MTP’s 2045 benchmark proves difficult due to financial uncertainties, so for the analysis using deterioration curves and treatment techniques highlighted in the scenario graphs below, we only grew those out to 2030.

The network chosen for this analysis includes all MPO Federal Aid Roads with the omission of MDOT facilities. MDOT facilities were omitted as budgets vastly change annually depending on the scope of projects selected for our region. The budget for this chosen network includes federal, state, and local match dollars. As such, our annual investment for 2019 was 21 Million dollars and will be our baseline for defining various financial scenarios for future analysis.

Quality pavement management comes in the form of a “mix of fixes”. With multiple jurisdictions represented in the analysis area it was difficult to define an exact dollar figure for each improvement. Changes in road width and improvements made in the right of way vary greatly depending on the location of the facility. Input was provided at the State, County, and City level to determine a reasonable cost for various treatments.

Cost Assumptions & Trigger Settings

Within the Roadsoft software, PASER (Pavement Surface Evaluation & Rating) ratings determine at what point a road surface type will be triggered and applied a fix to extend the service life of the facility. Below is an outline of fixes, costs, and PASER triggers used to apply our scenario analysis out to 2030.

<i><u>Working Pavement Management Strategies</u></i>	
<u>Asphalt Standard</u>	<u>Cost/Lane Mile</u>
Reconstruct – (Down to dirt)	\$ 1,200,000
Mill and Fill – 3”	\$ 300,000
Mill and Fill – 1 1/2”	\$ 150,000
Cape/Fog/Chip seal	\$ 25,000
Crack Sealing	\$ 4,000
<u>Asphalt Composite</u>	
Reconstruct – (Down to dirt)	\$ 1,500,000
Heavy Overlay – w/ milling & base work	\$ 408,000
Capeseal	\$ 25,000
Crack Sealing	\$ 4,000
<u>Concrete</u>	
Reconstruct – (Down to dirt)	\$2,000,000
Heavy CPM (Joint repair & Slab Replacement)	\$ 180,000
<u>Sealcoat Standard</u>	
Reconstruct to All Season	\$ 600,000
Sealcoat	\$ 25,000

Analysis Improvement PASER Trigger Settings

	Min	Max	Reset
<u>Asphalt & Composite (2,750 lane miles)</u>			
Crack Sealing	6	7	7
Sealcoat	5	6	8
Overlay	4	4	9
White Topping	1	4	10
Reconstruct	1	3	10
<u>Concrete (94 lane miles)</u>			
Heavy CPM	5	5	8
White Topping	1	4	10
Reconstruct	1	4	10
<u>Sealcoat – Standard (20 lane miles)</u>			
Sealcoat	5	6	8
Reconstruct	1	4	10

System Deterioration/Deterioration Curves

Every pavement from the day it is placed will deteriorate depending upon construction methods, materials, weather, traffic load and a number of other factors will deteriorate at a given pace. For this effort the deterioration curves used within the Roadsoft Program were used. These curves are based upon the pavement deterioration rates within the GVMC Federal Aid network. While it is possible to use Roadsoft to complete a future analysis, it was determined that a manual approach would be more appropriate for this report. This approach allows for more detailed tracking of deterioration over time and gives more precise output for analysis.

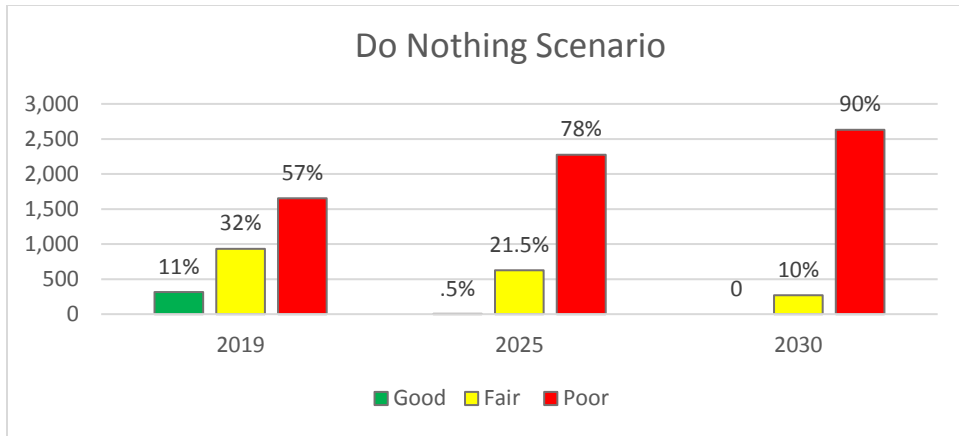
Investment Scenarios

As mentioned above we used \$21 million as our baseline to determine how changing our budget would affect the condition of our network. We chose five funding scenarios to summarize the number of lane miles in the charts below. Each alternative is organized by year for Good, Fair, and Poor conditions, identified by the PASER system.

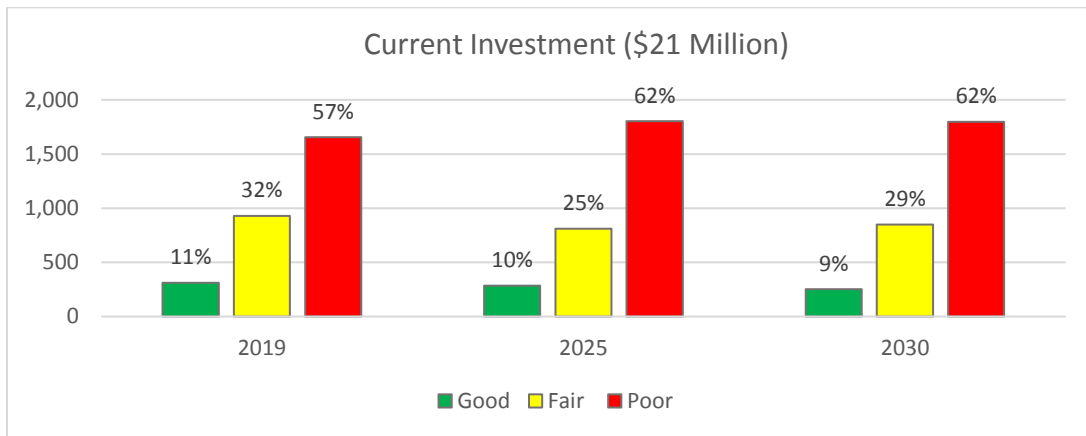
PASER Maintenance Defined

- Good – (PASER 10-8) no maintenance necessary
- Fair – (PASER 7-5) in need of preventative maintenance
- Poor – (PASER 4-1) in need of reconstruction

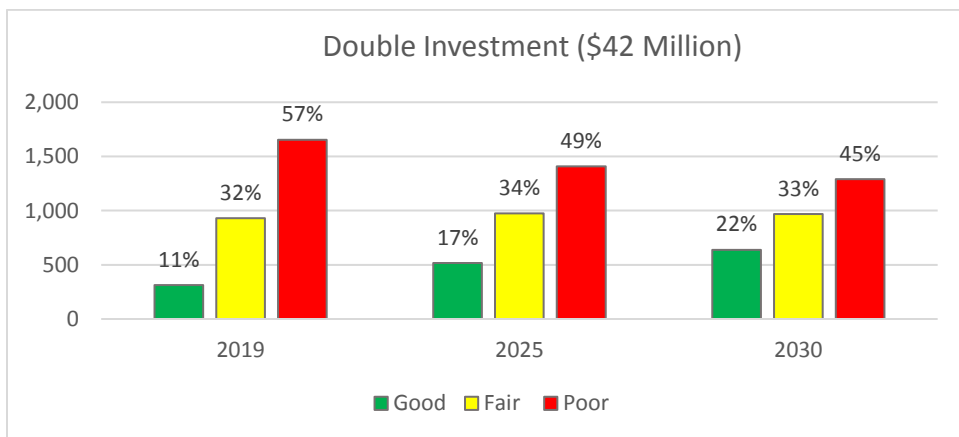
The first alternative is a do nothing scenario where if tomorrow we had no money to fix the roads, our deterioration curves would take over and send us down a slippery slope. The Y axis represents lane miles and the X axis is the percentage of good, fair, and poor.



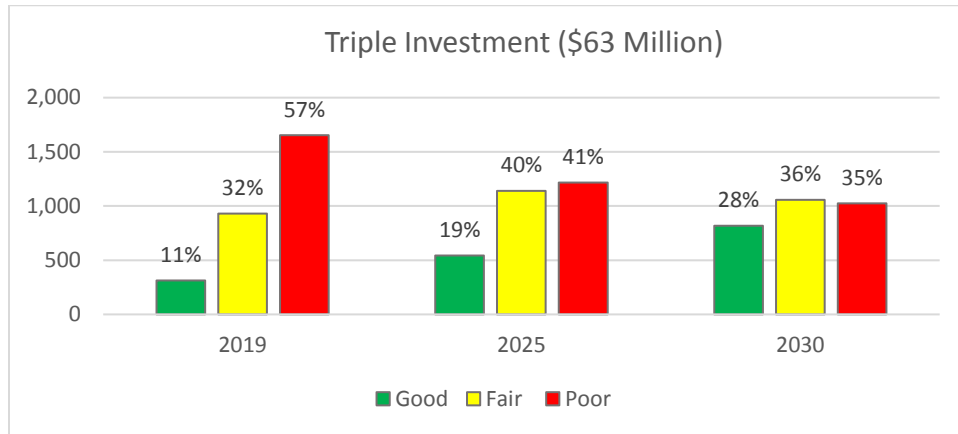
The second alternative is a scenario where we would maintain the current levels of funding (\$21 million annually) with a 4% inflation and 2% in funds per year. As seen in the graph below we still have system wide deterioration by lane miles.



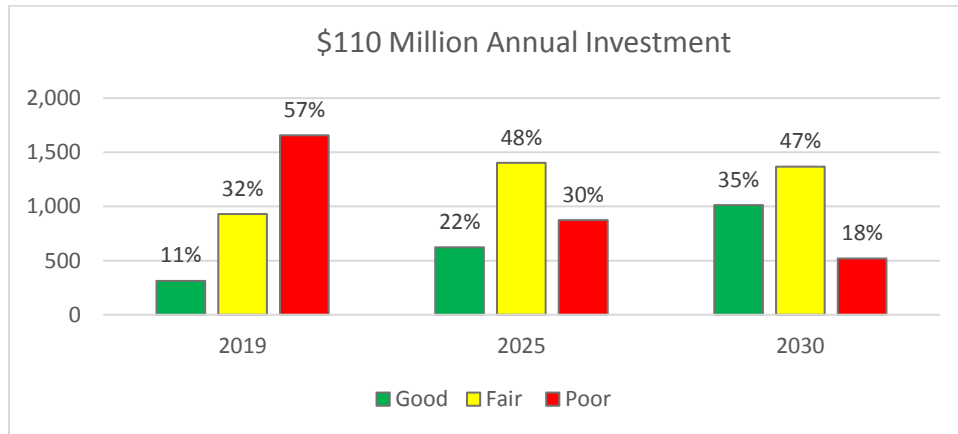
The third alternative is a scenario where we would double the current levels of funding (\$42 million annually) with a 4% inflation and 2% increase in funds per year. This is the threshold where we will be able to maintain the current PASER rating of 4.4 out to the year 2030.



The fourth alternative is a scenario where we would triple the current levels of funding (\$63 million annually) with a 4% inflation and 2% increase in funds per year. This is the threshold where we will be able to maintain a PASER rating of 5.0 out to the year 2030.



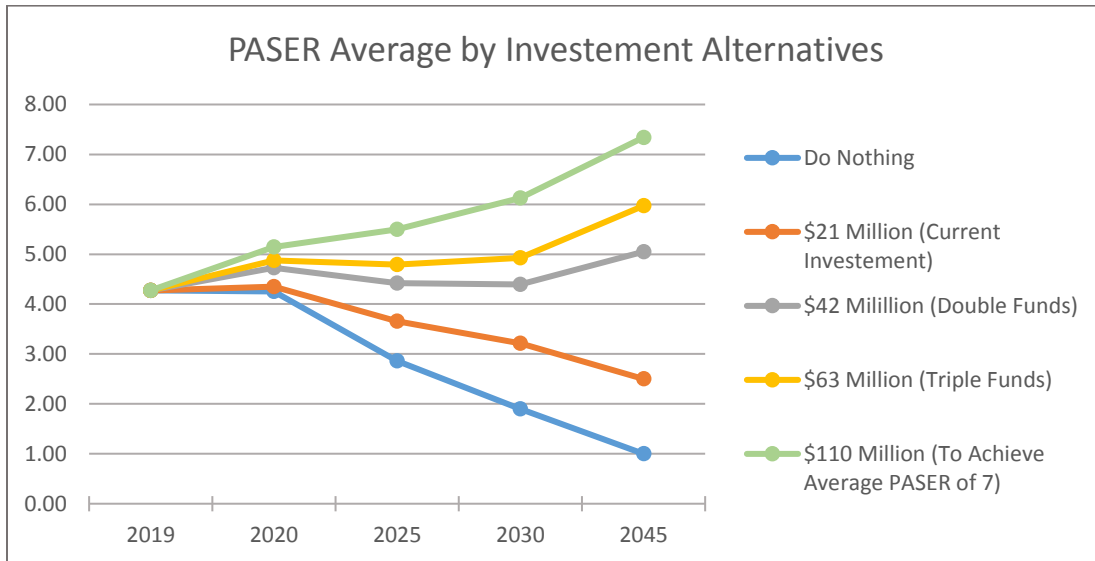
The final alternative is a scenario that is least likely with an assumed budget of \$110 million annually with a 4% inflation and 2% increase in funds per year. This is the threshold where we will be able to maintain a PASER rating of 6.0 out to the year 2030.



Summary/Results

While it is nearly impossible to predict for certain, infrastructure conditions long term, certain realities are inevitable. The condition of the local federal aid system in the GVMC area is in rapid decline and without a significant increase in investment and optimal timing of improvements this decline will become more rapid. Many factors are contributing to this situation. The stagnant and some cases reduction of investment in the system combined with the increase in basic costs to maintain the system are the two prime factors. Weather will also play a significant role in the decline of the system. The

graph below depicts growth using the previous financial levels to get an average PASER rating by investment to 2045.



Recommendations

The federal aid system within the GVMC study area has reached the point in its life cycle where deterioration will continue to accelerate if additional resources are not allocated. The above chart shows a summary of this deterioration given the various investment alternatives discussed earlier in this report.

It is with great pride that many of our member jurisdictions are seeking additional funds through mileages and getting creative with match dollars to leverage as many improvements as possible in our MPO. As a whole with the help of our members and MDOT, our MPO is doing best that we can to maintain the existing network with the funds available.

It is the recommendation of this report to combat the deteriorating conditions being witnessed on the network today to the maximum extent possible. In addition, GVMC will work with local municipalities to provide data and assure that the proper fixes are implemented at the proper time on the proper facilities.

Safety Investment Need

For safety, and many of the other transportation concentrations, need is difficult to determine long term. Changing technologies, vehicle improvements, aging populations and shifts in travel patterns and modes all contribute to changes in the needs of the transportation system. For this reason, GVMC will only forecast needs for a 10 year period. This strategic safety plan is designed to be updated every 2-4 years, at a minimum before each Regional Long Range Plan is developed.

Itemized Need by Category

Drunk/Distracted/Young Driver Awareness Program – GVMC will need to determine if this area is an area where GVMC would like to expend federal resources. An awareness program similar to the Clean Air Coalition or WESTRAIN could be established to bring a localized presence to this area. On average, drunk driving takes 17 lives per year in the GVMC study area. In addition, the rising use of the latest technologies (cell phones, GPS, DVD players), are cause for concern as distracted driving appears to be contributing to more and more crashes. There were 8 fatalities that resulted from distract driving in the GVMC area in the year of 2016 and 2017.

The estimated cost of one fatality now stands at \$4,538,000. If GVMC makes an investment of \$150,000 per year in a public awareness program, the total investment over the next 10 years would total \$1,500,000. If one life were saved as a result of this program over those 10 years, there would be a positive return on the funding invested of nearly 3 to 1.

Current Federal Investment - \$0

Possible Federal Investment - \$150,000/ Year * 10 Years = \$1,500,000

Intersection & Corridor Safety – Appendix A depicts a total of 50 intersections ranked by number of fatalities and serious injuries from 2013-2017. Each year this data will be updated and the list will change due to the change of crash

numbers, fatalities and serious injuries at the intersections. Due to the fluidity of this list it is difficult to develop a hardened list of intersection safety needs.

In the past GVMC and its member communities have partnered with Wayne State University, AAA, and the Michigan OHSP to complete intersection safety studies. Many of the suggested solutions identified during these efforts were low cost solutions that have been implemented by local jurisdictions using local funding sources. Higher cost improvements have either been put on hold waiting for funding or have been completed on a minimal basis using competitive statewide STP Safety funding administered through MDOT.

To proactively address intersection issues, GVMC could work with safety partners as was done in the past to determine intersections that require additional attention. Under this scenario, a focused intersection safety study would be undertaken every 4 years. This study would identify a small number (6-8) of intersections that exhibited characteristics that warranted safety related improvements. Additionally, funding would be dedicated to implement solutions to address issues identified in the study process.

This approach of having funding dedicated to solutions would lead to more efficient alleviation of identified intersection safety issues.

Current Federal Investment - \$ Minimal

Possible Federal Investment – Study \$100,000 each * 2 studies = \$200,000

As for corridor safety, Appendix B depicts a total of 50 segments ranked by number of fatalities and serious injuries from 2013-2017. Based on a study conducted in 2015 by RAND Corporation for the Center for Disease Control and Prevention's (CDC's) National Center for Injury Prevention and Control, an online tool MV PICCS (Motor Vehicle Prioritizing Interventions and Cost Calculator for States) was developed to evaluate the cost-effectiveness of various traffic crash interventions. Appendix C describes the 14 traffic crash interventions and definitions in the study used by CDC. All intervention strategies in the table are ranked by effectiveness on a scale of 1 to 5, with 5 being considered the most effective.

Based on the calculation from The MV PICCS, if the strategies shown in Appendix C were used in Michigan, 263 lives could be saved and 14,172 injuries could be prevented in Michigan with a cost of \$67,234,000/year for implementation, which means an average investment of \$255,642 in traffic safety for saving a life by using the strategies. The average traffic fatalities and injuries per year during the past five years in the GVMC area were 67 and 1,592, respectively. Therefore, a 20% reduction of traffic crash fatalities and injuries in 10 years in the GVMC area would cost \$3,323,346 for the implementation of the listed strategies in Appendix C. This would be a relatively low cost endeavor.

Current Federal Investment - \$ Minimal

Possible Federal Investment – \$3,323,346 in 10 years

Senior Mobility and Safety – As discussed earlier this non-traditional transportation issue will become more and more apparent as the driving population ages. The primary focus for GVMC can be to emphasize improved signage along major corridors. In combination with the revised MUTCD requirements GVMC can invest federal funding in the identification and replacement of substandard signage. Long considered one of the primary elements of a comprehensive asset management plan, many jurisdictions already have a sign inventory and a methodology for substandard sign replacement. This effort would ensure that appropriate resources are available to all agencies to bring this aspect of the transportation system up to standards and keep them there.

Current Federal Investment - \$ 0

Possible Federal Investment – \$75,000/yr * 10 years = \$750,000

Bicycle and Pedestrian Safety – From a safety standpoint, investment in physical non-motorized facilities does not appear to be warranted as there are not identifiable locations where additional dedicated non-motorized facilities would provide a safety benefit. This does not imply that efforts to expand the network of non-motorized facilities should not continue, merely that there are not locations

where significant crashes exist to justify expenditure of federal funding for separated facilities.

There may be need for public education to increase awareness by the traveling public of the other modes that may lead to reducing the crash rates. This could be a localized program similar to Clean Air Action and WESTRAIN efforts currently underway at GVMC. Partnering with Michigan OHSP, local bike shops, or other foundations may provide some of the funding necessary to carry on this task.

Current Federal Investment - \$ 0

Possible Federal Investment – \$35,000/yr * 10 years = \$350,000

Car/Deer Crashes – As outlined earlier, there are no proven methods or technologies available to improve this safety condition. Short of educating the deer, the only other approach would be to educate the drivers during peak car deer crash periods October – December. An approach could be to implement a localized coordinated effort with the Michigan Deer Crash Coalition (MDCC) to bring this issue to the forefront during peak fall months.

Current Federal Investment - \$ 0

Possible Federal Investment – \$25,000/yr * 10 years = \$250,000

10 Year Safety Needs Summary

Drunk/Distracted Driving Campaign	\$ 1,500,000
Intersections & Segments	\$ 3,523,346
Senior Mobility	\$ 750,000
Non-Motorized	\$350,000
Car/Deer	<u>\$ 250,000</u>
Total 10 Year Safety Needs	\$ 6,373,346

Appendix A: Intersection Ranking by Number of Fatalities and Serious Injuries from 2013-2017

No	Intersection Name	Township	Total Crash	Type KA Crash	Pedestrian Crash	Fatality	Serious Injury	Number of K+A
1	28th Ave & Baldwin St	Georgetown	69	4	0	0	10	10
2	E M 6 & E I 196	Georgetown	10	2	0	1	8	9
3	Lake Michigan Dr & 8th Ave	Tallmadge	82	5	0	0	8	8
4	Buchanan Ave SW & 32nd St SW	Wyoming	31	4	0	0	8	8
5	60th St SE & East Paris Ave SE	Gaines	43	5	0	1	7	8
6	15 Mile Rd NW & M 37 NW	Sparta	12	4	0	2	5	7
7	28th St SE & Eastern Ave SE	Grand Rapids	228	7	6	0	7	7
8	Northland Dr NE & 14 Mile Rd NE	Algoma	55	4	0	2	4	6
9	6 Mile Rd NW & Fruit Ridge Ave NW	Alpine	16	3	0	2	4	6
10	3 Mile Rd NE & E Beltline Ave NE	Grand Rapids TWP	25	3	0	0	6	6
11	Knapp St NE & E Beltline Ave NE	Grand Rapids	115	6	2	1	5	6
12	Madison Ave SE & 28th St SE	Grand Rapids	144	6	1	0	6	6
13	Burlingame Ave SW & 28th St SW	Wyoming	179	4	2	1	5	6
14	Michael Ave SW & 36th St SW & Milan Ave SW	Wyoming	60	5	3	0	6	6
15	60th St SE & Patterson Ave SE	Gaines	33	5	0	1	5	6
16	Egner Ave NE & Cedar Springs Ave NE	Solon	2	1	0	2	3	5
17	17 Mile Rd NE & Pine Island Dr NE	Solon	17	5	0	1	4	5
18	Podunk Ave NE & 14 Mile Rd NE	Oakfield	16	4	0	2	3	5
19	Belding Rd NE & Ramsdell Dr NE	Cannon	31	4	0	0	5	5
20	6 Mile Rd NW & Baumhoff Ave NW	Alpine	8	4	1	1	4	5

Appendix A: Intersection Ranking by Number of Fatalities and Serious Injuries from 2013-2017 (Continued)

No	Intersection Name	Township	Total Crash	Type KA Crash	Pedestrian Crash	Fatality	Serious Injury	Number of K+A
21	Wilson Ave NW & Remembrance Rd NW	Walker	80	3	0	1	4	5
22	28th St SW & Buchanan Ave SW	Wyoming	164	4	5	0	5	5
23	E Fulton St SE & Birmingham Rd	Lowell	7	3	0	0	5	5
24	44th St SE & Eastern Ave SE	Grand Rapids	187	2	1	0	5	5
25	Kalamazoo Ave SE & 60th St SE	Gaines	101	4	2	0	5	5
26	Adams St & 32nd Ave	Jamestown	17	2	0	0	5	5
27	Myers Lake Ave NE & 18 Mile Rd NE	Nelson	14	4	1	2	2	4
28	14 Mile Rd NE & Myers Lake Ave NE	Courtland	33	3	0	1	3	4
29	14 Mile Rd NE & Lincoln Lake Ave NE	Oakfield	29	3	0	0	4	4
30	15 Mile Rd NE & Myers Lake Ave NE	Courtland	5	1	0	0	4	4
31	10 Mile Rd NW & M 37 NW	Sparta	29	2	0	0	4	4
32	Juneview Dr NE & Childsdale Ave NE	Plainfield	5	1	0	0	4	4
33	N US 131 & E I 96/N US 131 RAMP	Walker	22	3	0	0	4	4
34	8th Ave & Ironwood Dr	Tallmadge	43	4	0	0	4	4
35	Alpine Ave NW & N I 296/Alpine RAMP	Walker	187	1	0	1	3	4
36	Fuller Ave NE & Sweet St NE	Grand Rapids	25	3	1	0	4	4
37	N US 131/Wealthy RAMP & N US 131	Grand Rapids	79	3	1	0	4	4
38	Breton Rd SE & 28th St SE	Grand Rapids	245	3	2	0	4	4
39	28th St SW & Byron Center Ave SW	Wyoming	128	4	0	0	4	4
40	28th St SW & 28th St SE & S Division Ave	Grand Rapids	195	4	1	0	4	4

Appendix A: Intersection Ranking by Number of Fatalities and Serious Injuries from 2013-2017 (Continued)

No	Intersection Name	Township	Total Crash	Type KA Crash	Pedestrian Crash	Fatality	Serious Injury	Number of K+A
41	28th St SW & Clyde Park Ave SW	Wyoming	163	4	2	1	3	4
42	Century/S US 131 RAMP & S US 131	Grand Rapids	16	1	1	0	4	4
43	44th St SW & W I 196/44th RAMP & 44th/W I 196 RAMP	Grandville	116	3	0	0	4	4
44	Chicago Dr & Port Sheldon St	Georgetown	68	4	0	0	4	4
45	36th St SE & Eastern Ave SE	Wyoming	70	3	1	0	4	4
46	Pratt Lake Ave SE & 64th St SE	Bowne	2	1	0	2	2	4
47	32nd Ave & Riley St	Jamestown	25	3	0	1	3	4
48	Byron Rd & 8th Ave	Jamestown	30	4	0	0	4	4
49	Patterson Ave SE & 68th St SE	Caledonia	33	4	0	1	3	4
50	20 Mile Rd NW & Tyrone Ave NW	Tyrone	7	1	0	1	2	3

Appendix B: Segment Ranking by Number of Fatalities and Serious Injuries from 2013-2017

NO.	Segment	From	To	Length	Township	Total Crash	Type KA Crash	Pedestrian Crash	Fatality	Serious Injury	Number of K+A
1	60th St SE	East Paris Ave	Patterson Ave	1.001	Kentwood	42	5	0	0	10	10
2	E I 196	E M 6	W M 6	0.342	Georgetown	9	3	0	1	8	9
3	M 37 NW	15 Mile Rd	City/Twp Line	1.413	Sparta	13	5	0	2	7	9
4	Cherry Valley Ave	N M 37 & 108th St	Kinsey Ave SE	0.855	Caledonia	26	5	0	4	5	9
5	W I 196	Butterworth St SW	I 196 Crossover	0.186	Grand Rapids	73	7	0	3	5	8
6	28th Ave	Baldwin St	Lark St	0.095	Georgetown	13	3	0	0	8	8
7	14 Mile Rd	Lappley Ave	Wabasis Ave	0.999	Oakfield	23	7	0	1	7	8
8	28th St SE	City/Twp Line	Eastern Ave SE	0.198	Grand Rapids	156	7	4	1	6	7
9	M 37 NW	Oconnor St	15 Mile Rd NW	1.264	Sparta	19	5	0	3	4	7
10	Broadmoor Ave SE	Valley Point West Dr SE	76th St SE	0.795	Caledonia	56	4	0	0	6	6
11	E Fulton St SE	Hawthorne Hills Dr SE	City/Twp Line	0.454	Ada	13	2	0	0	6	6
12	Wilson Ave	Burton St	Johnson Park	0.72	Walker	60	6	0	2	4	6
13	28th St SW	Buchanan Ave SW	28th St SE & Division Ave	0.25	Wyoming	195	6	6	1	5	6
14	28th St SE	Jefferson Ave SE	Madison Ave	0.175	Grand Rapids	69	6	5	2	4	6
15	Buchanan Ave	Avonlea St	32nd St SW	0.063	Wyoming	10	2	0	0	6	6
16	Coit Ave	Hubbard St	Elmdale St NE	0.132	Grand Rapids	6	1	0	0	6	6
17	S US 131	Century/S US 131	Hall St SW	0.2	Grand Rapids	38	3	1	0	6	6

Appendix B: Segment Ranking by Number of Fatalities and Serious Injuries from 2013-2017 (Continued)

NO.	Segment	From	To	Length	Township	Total Crash	Type KA Crash	Pedestrian Crash	Fatality	Serious Injury	Number of K+A
18	S US 131	US 131 Crossover	Ball Park Dr NE	0.558	Plainfield	75	3	0	0	6	6
19	Lake Michigan Dr	8th Ave	Tallmadge Woods Dr	0.141	Tallmadge	45	3	0	0	6	6
20	14 Mile Rd NE	Northland Dr	14 Mile Ct	0.99	Courtland	37	5	0	3	3	6
21	14 Mile Rd NE	Henrietta Dr & Holmden	Wellman Ave	0.191	Oakfield	3	3	0	1	5	6
22	W I 96	Morse Lake Ave SE	I 96 Crossover	1.322	Lowell	36	2	0	0	6	6
23	N US 131	N US 131/Wealthy RAMP	Wealthy St SW	0.119	Grand Rapids	153	5	0	0	6	6
24	N US 131	10 Mile Rd NE	10 Mile/N US 131 RAMP	0.36	Algoma	19	2	0	0	6	6
25	E Beltline Ave NE	Bradford St NE	Leonard St NE	0.498	Grand Rapids	205	5	0	0	5	5
26	E Fulton St	Crahen Ave	Forest Hill Ave	0.119	Grand Rapids	45	4	0	0	5	5
27	E Fulton St SE	Veronica St	Birmingham Rd	0.321	Lowell	18	3	0	0	5	5
28	Wilson Ave NW	W Grand Blvd NW	Chesterfield Blvd NW	0.145	Walker	18	4	3	1	4	5
29	28th St SE	Broadmoor Ave SE	Lake Eastbrook Blvd SE	0.424	Grand Rapids	245	4	2	0	5	5
30	36th St SW	Michael Ave SW	Dunbar Ave SW	0.189	Wyoming	32	4	1	0	5	5
31	Cedar Springs Ave	Egner Ave	20 Mile Rd NE	0.257	Solon	2	2	0	2	3	5
32	Myers Lake Ave NE	14 Mile Rd	15 Mile Rd NE	1.006	Courtland	17	2	0	0	5	5
33	Lake Michigan Dr	Cheyenne	14th Ave	0.844	Tallmadge	36	4	0	0	5	5

Appendix B: Segment Ranking by Number of Fatalities and Serious Injuries from 2013-2017 (Continued)

NO.	Segment	From	To	Length	Township	Total Crash	Type KA Crash	Pedestrian Crash	Fatality	Serious Injury	Number of K+A
34	N I 296/Alpine RAMP	N I 296/Alpine RAMP	Alpine Ave & N I 296	0.37	Walker	162	3	0	1	4	5
35	44th St SW	Kenowa Ave	W I 196/44th RAMP	0.114	Grandville	80	4	0	0	4	4
36	W I 196	Grand Rapids Eastern Railroad	Eastern Ave NE	0.226	Grand Rapids	44	3	0	0	4	4
37	Byron Rd	16th Ave	8th Ave	1.01	Jamestown	15	4	0	0	4	4
38	E Beltline Ave	3 Mile Rd NE	East Beltline Ln	0.16	Grand Rapids	11	2	0	0	4	4
39	E Fulton St SE	Bronson St SE	Headley St SE	0.349	Ada	31	4	0	0	4	4
40	28th St SW	Hook Ave SW	Dehoop Ave SW	0.203	Wyoming	140	3	2	0	4	4
41	28th St SE	Breton Rd SE	Woodlawn Ave	0.485	Grand Rapids	203	3	2	0	4	4
42	Chicago Dr	Laville Ave SW	Blandford Ave	0.219	Wyoming	17	3	0	0	4	4
43	Riley St	8th Ave	Coronation Ct	0.72	Jamestown Twp	3	1	0	0	4	4
44	Childsdale Ave	Kuttshill Dr NE	Juneview Dr NE	0.18	Plainfield Twp	10	1	0	0	4	4
45	84th St SW	Centre Industrial Dr SW	Clyde Park Ave	0.259	Byron Twp	32	4	0	1	3	4
46	W M 6	Broadmoor Ave	W M 6/M 37 RAMP	0.395	Caledonia	17	3	0	0	4	4
47	8th Ave	Luce St SW	Fox Run	1.243	Tallmadge	8	4	1	0	4	4
48	8th Ave	Meyer Ln	Ironwood Dr	0.849	Tallmadge	29	4	0	0	4	4
49	Vergennes St	Alden Nash Ave	Lincoln Lake Ave SE	0.815	Vergennes	11	4	0	2	2	4
50	Vinton Ave	9 Mile Rd NW	Bluebird Acres Dr NW	0.699	Alpine	2	2	0	1	3	4

Appendix C: Traffic Crash Interventions

Name of Intervention	Description	Effectiveness	Use	Currently Used in Michigan?
Automated red-light camera enforcement (red-light camera)	<i>Red-light cameras</i> , is used to capture an image of a vehicle whose driver fails to stop for a red light. Tickets are generally sent to offenders by mail.	5	Medium	No
Automated speed-camera enforcement (speed camera)	Speed cameras captures an image of a vehicle whose driver is driving in excess of the posted speed limit. Unlike red-light cameras, which are deployed only at intersections, mobile speed cameras are often used to cover multiple road segments.	5	Medium	No
Alcohol interlocks	Alcohol interlocks, also called ignition interlocks, are devices that prevent a vehicle from starting until the driver has blown into a tube and determined that his or her BAC is below the allowable level set by the state (0.02 in most jurisdictions). This intervention calls for interlocks to be installed on the vehicles of convicted repeat DWI offenders, as well as high-BAC and first offenders, depending on state legislation.	5	Medium	No
Sobriety checkpoints	At a sobriety checkpoint, teams of police officers stop cars at a specific location to check drivers for alcohol levels. States generally publicize such events to discourage drivers from drinking, particularly during times when drunk driving is more common than usual (such as holiday weekends).	5	Medium	No
Saturation patrols	Saturation patrols consist of an increased police presence in selected locations where they patrol the area looking for suspicious driving behavior. In contrast to sobriety checkpoints, they do not stop every vehicle	4	High	No

Bicycle helmet laws for children(bicycle helmet)	To reduce the likelihood of trauma to the head and its related consequences, bicycle helmet laws mandate the use of helmets by children while they are riding bicycles.	5	Medium	No
Universal motorcycle helmet laws(motorcycle helmet)	This law requires all motorcyclists, regardless of age or experience level, to wear a helmet the meets safety standards set by DOT. These laws contrast with partial helmet laws, which typically apply only to riders below a certain age.	5	Medium	No
Primary enforcement of seat belt laws	States with seat belt laws vary in their enforcement. A primary law allows police to ticket an offender exclusively for not wearing a seat belt. A secondary law allows police to write a ticket for not wearing a seat belt only if the driver has been pulled over for a different offense.	5	Medium	Yes
High-visibility enforcement for seat belts and child restraint laws	High-visibility enforcement is a technique that combines intense enforcement over a fixed period (for example, one or two weeks) with a publicity campaign. A campaign focused on restraint use generally includes all forms of restraints: seat belts, child safety seats, and booster seats.	5	Medium	No
License plate impoundment	This intervention requires a driver who has been convicted of DWI to surrender the vehicle's license plate, which is either impounded or destroyed. In some jurisdictions, the license plate is not physically removed; rather, officers place stickers on the license plate to indicate that it is invalid. The stickers are designed so that, if someone tries to remove them, they leave a visible pattern on the plate. Because it is relatively easy for police to observe whether a vehicle has a license plate or the stickers, this intervention deters convicted DWI offenders from driving that vehicle.	4	Medium	Yes
Limits on diversion and plea agreements	Although all states have penalties for DWI, many states have additional programs that allow some offenders to be	4	Medium	Yes

	diverted out of the normal procedures or to plead guilty to a lesser offense and receive a lighter sanction. These programs are most often targeted at first-time offenders, with the goal of reducing the DWI case load by diverting people who are thought to be unlikely to reoffend. Limits on diversion and plea agreements would increase the number of DWI arrestees convicted of more-serious DWI-related charges.			
Vehicle impoundment	This intervention results in the vehicle of a DWI offender being confiscated for a period of time and stored in a public impound lot. An offender can either reclaim or surrender his or her vehicle when the impoundment period ends.	4	Medium	No
In-person license renewal	This intervention requires all drivers over age 70 to renew their driver's licenses in person at a department of motor vehicles instead of using mail-in or online renewal	2	Medium	No
Higher seat belt fines	This intervention adds \$75 to a state's existing fine, which represents a significant increase over existing seat belt fines in most states.	4	Low	No

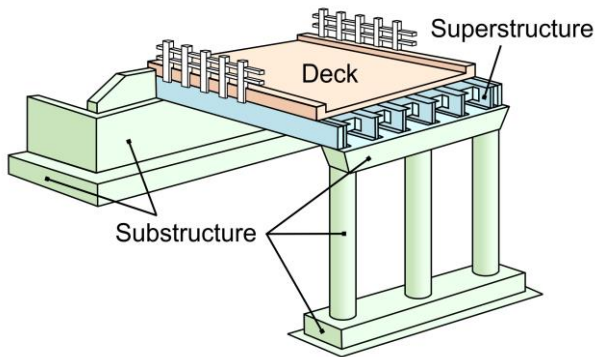
Sources: Effectiveness and use ratings from UNC Highway Safety Research Center, 2011; Goodwin, Kirley, et al.,2013.

TRANSPORTATION PERFORMANCE MANAGEMENT

BRIDGE PERFORMANCE MANAGEMENT

BRIDGE CONDITION

Federal law, outlined in the National Bridge Inspection Standards (NBIS), defines a bridge as a structure carrying traffic with a span greater than 20 feet and requires that all bridges be inspected every two years to monitor and report condition ratings. The FHWA requires that for each applicable bridge, the performance measures for determining condition be based on the minimum values for substructure, superstructure, deck, and culverts. The FHWA further requires counting this condition by the respective deck area of each bridge and express condition totals as a percentage of the total deck area of bridges in a state.



Condition ratings are based on a 0-9 scale and assigned for each

ANATOMY OF A BRIDGE

culvert, or the deck, superstructure and substructure of each bridge. These ratings are recorded in the National Bridge Inventory (NBI) database. Condition ratings are an important tool for transportation asset management, as they are used to identify preventative maintenance needs, and to determine rehabilitation and replacement projects that require funding.

REPORTING ON BRIDGE CONDITION

The FHWA requires that State DOT's establish 2-year and 4-year targets for a 4-year performance period for the condition of infrastructure assets. State DOT's will establish their first statewide targets on **May 20th, 2018**. State DOTs are required to submit three performance reports to FHWA within the 4-year performance period.

- Baseline Performance Report
-October 1st, 2018
- Mid-Performance Period Progress Report
-October 1st, 2020
- Full Performance Period Progress Report
-October 1st, 2022

The two performance measures for assessing bridge condition are:

- % of NHS bridge deck area in Good Condition; and
- % of NHS bridge deck area in Poor Condition.

The MPO's will establish targets by either supporting a State DOT's statewide target, or defining a target unique to the metropolitan area each time State DOTs establish a target. As part of the Full Performance Period Progress Report, MPOs will report their established targets, performance, progress, and achievement of the targets to their respective state DOT in a manner that is agreed upon by both parties and documented in the Metropolitan Planning Agreement. The MPOs are not required to provide separate reporting to the FHWA. However, State DOTs and MPOs will need to coordinate and mutually agree to a target establishment reporting process. The minimum penalty threshold requires that no more than 10% of NHS bridges measured by deck area be classified as structurally deficient.

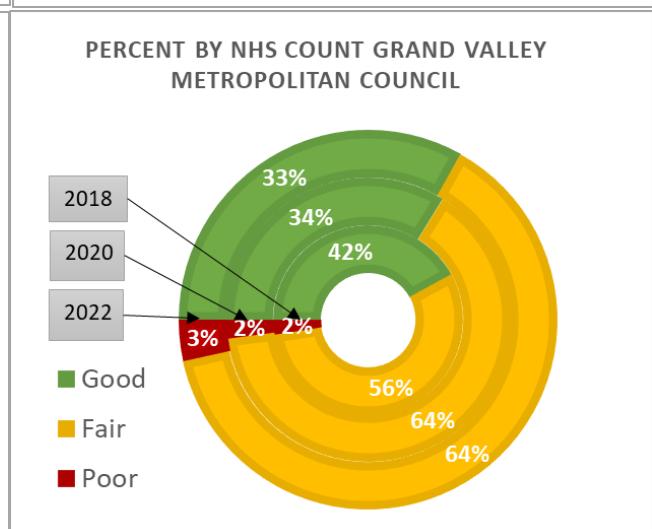
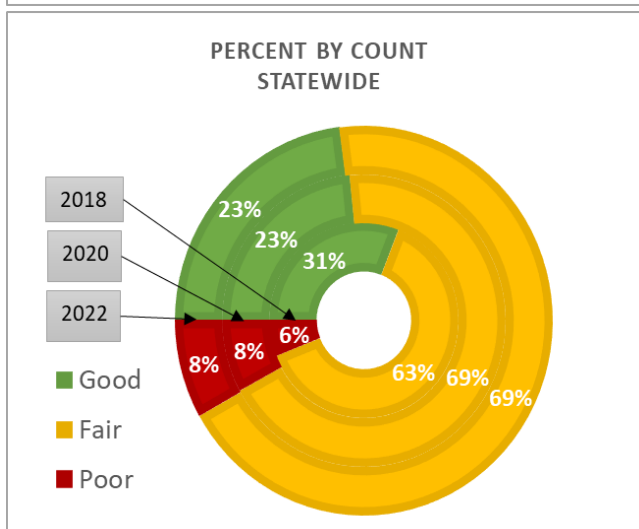
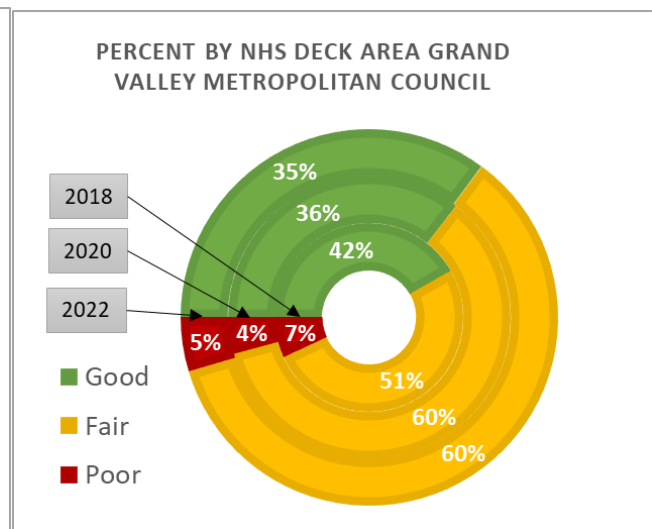
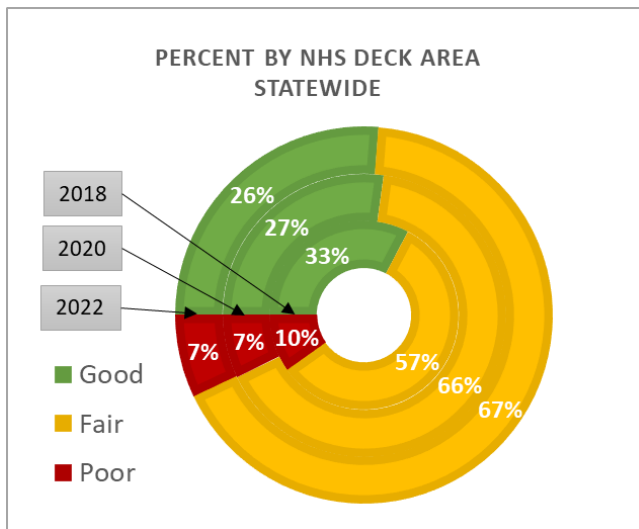
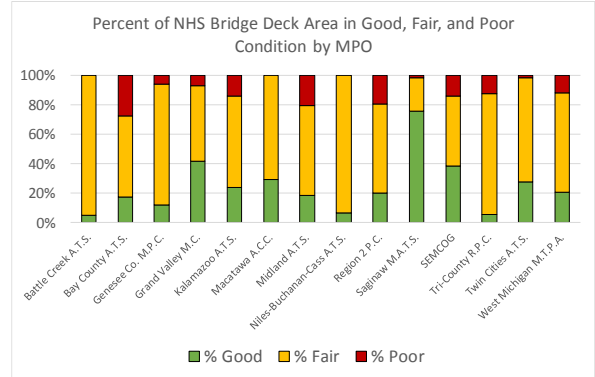
NBI Condition Ratings		
7-9	Good Condition	Routine maintenance candidate.
5-6	Fair Condition	Preventative maintenance and minor rehabilitation candidate.
4	Poor Condition	Poor Major rehabilitation or replacement candidate.
2-3		Serious or Critical Emergency repair or high priority major rehabilitation or replacement candidate. Unless closely monitored it may be necessary to close until corrective action can be taken.
0-1		Imminent Failure or Failed Major rehabilitation or replacement candidate. Bridge is closed to traffic.

GRAND VALLEY METROPOLITAN COUNCIL

Target Setting Facts for MPO's:

- All targets below are still in draft form, including 2018 values. 2018 values will be finalized on March 15th.
- Condition improvement is estimated based on projects programmed through the MDOT capital program, both MDOT and local agency. The improvement is applied the year after the date of letting.
- Deterioration is estimated based on comparing network wide deterioration rates to the age and condition of each major component of each structure.
- The significant increase in statewide deck area condition between 2018 and 2020 is primarily due to the deck replacement of the I-75 over the Rouge River bridge, which represents nearly 4% of the NHS deck area statewide.
- The targets are highly dependent on the deck area of bridges that fall to poor, and so the smaller the inventory considered, the higher potential for a single bridge to skew results. The statewide targets are assumed to be less variable than an individual MPO.

Number of NHS Bridges by Condition (Feb 2018)			
	Good	Fair	Poor
Statewide	916	1869	178
Grand Valley Metropolitan Council			
MDOT	111	154	6
Local	11	7	1



Data: March 2018

Needs Assessment

Transit

The Rapid

- COA
 - In the data collection phase
 - Existing conditions report should be available early October
 - Looking at where jobs and household growth is happening
 - Grappling with the disconnect between jobs and people and how to serve that with transit
- TOD Study
 - Selecting a consultant this week (9/23)
 - 18 month process
 - Steering committee with regional stakeholders including GVMC
 - Hoping to impact CIPs for the communities involved
 - Could have land use/zoning impacts as well
- Priorities/Needs
 - Off-road bus training facility
 - Fleet size is a limitation to expanding service – they currently send out the whole fleet during PM peak time.
 - Service and fleet expansion will then necessitate facility expansion – will need more regional facilities
 - First mile/last mile service
 - Pilot happening now for GoBus eligible riders in the SE part of the service area
- Challenges
 - As destinations get further out from the central urbanized area there will be a struggle with balance and potentially longer headways/less service in EJ/opportunity areas where the core ridership is
 - Limitations based on facilities in service jurisdictions that The Rapid doesn't have authority over
 - Crosswalks, curbs, ped facilities
- There is interest in service expansion from townships outside the current service area
 - Plainfield, Allendale, Gaines (Amazon)
- WMX
 - Looking at a 3 year pilot
 - Working on routing and capital and operational costs
- Autonomous Vehicles
 - There will always be a person from ITP on every bus
 - Opportunities for driver assist technology
 - Interested in monitoring the situation, and are supportive of it, but it is not a top priority at this point
- BRT

- There is not currently a good candidate for the third BRT line – one of the conclusions of the Align Study
- Instead they will focus on incremental upgrades to the existing system to make it more BRT-like
 - More dedicated lanes, etc.
- Recommend establishing a mode shift goal for the region – potentially as part of a future planning effort

Bicycle and Pedestrian

- Updated the NM inventory and project list (NM needs list)
 - Over \$76.5 Million dollars
 - About 200 projects
 - Sidepaths/Shared Use paths, multi-use trails, bike lanes/paved shoulders, pedestrian bridges, sidewalks, pedestrian improvements, etc.
 - Over 174 Miles of proposed NM Facilities
 - On average, the total amount spent (including local match) leveraging GVMC TAP and MDOT TAP funds in the region is about \$3.5million
 - At that rate, using only these sources of funding, it will take over 20 years to implement all the projects on the needs list (not including maintenance costs)
- Have not updated the plan itself since 2014
 - Plan to do that in 2021/2022
- Needs/Priorities identified in the Grand Region NM Plan (completed in 2018) – GVMC on Core Plan Team
 - Grand Region as a whole
 - Coordinated and Consistent Wayfinding system
 - Expand “Driving Change” education program
 - Communication and support regarding NM Issues
 - On-going and Long-term maintenance of NM GIS Database
 - Measuring progress
 - NM Improvements on Non-freeway State Trunklines
 - GVMC Region
 - Interurban/River to River Trail
 - Connect Fred Meijer Kenowa Trail to the Fred Meijer M-6 and Kent Trails
 - Improve surface condition of Fred Meijer Flat River Valley Trail north of Lowell
 - Improve connectivity of Fred Meijer Grand River Valley Rail Trail to downtown Lowell and Fred Meijer Flat River Valley Rail Trail
 - Plainfield Twp trail millage – goal of 30+ miles of NM facilities connecting to the White Pine State Trail and more.
 - Connecting Fred Meijer Standale Trail to Fred Meijer Pioneer Trail in Walker
 - Connecting Fred Meijer Pioneer Trail to Fred Meijer White Pine Trail in Walker
 - Modify route of North Country Trail to increase the amount of trail that is off-road
 - Nonmotorized bridge and/or bike/ped facilities on the Forest Hill Ave bridge over I-96 in Kentwood

- Determine primary east-west NM corridor(s) between Grand Rapids and Lowell
- Idema Explorers Trail along the Grand River in Ottawa County
- Connecting North Bank Trail across Ottawa County connecting Spring Lake to Grand Rapids
- 4' wide paved shoulders along Leonard St/Dr from 24th Ave to 148th Ave
- North-south connection between Kenowa Trail in Jamestown Twp and Allegan

Passenger Rail Needs

WESTRAIN

Passenger rail issues are currently being monitored by the WESTRAIN Collaborative. The WESTRAIN Collaborative is a group of agencies working to identify passenger rail service issues in West Michigan. Participants include the Michigan Department of Transportation, the Grand Valley Metropolitan Council, the Macatawa Area Coordinating Council, Michigan Association of Railroad Passengers (MARP), the Cornerstone Chamber of Commerce, Sharp Marketing, the City of Bangor, the Rapid, Van Buren County Public Transit, and the Southwest Michigan Planning Commission. The focus of WESTRAIN is to secure and maintain passenger rail service from Grand Rapids to communities along the Pere Marquette line to Chicago, Illinois, and beyond. The WESTRAIN Collaborative has also worked closely with Amtrak on a number of initiatives to increase awareness of and traffic on the Pere Marquette rail line. Utilizing special promotions, giveaways, and other marketing strategies, WESTRAIN serves to continue to help attract new riders to the passenger rail experience.

WESTRAIN supports building a rail connection in New Buffalo that would connect CSX tracks to Amtrak tracks which would allow Pere Marquette trains to operate on Amtrak-owned 100 mph service tracks between New Buffalo and Porter, Indiana, where the service would continue on to Chicago. This new connection will allow the *Pere Marquette* passengers to switch to the *Wolverine/Blue Water* services to access points east in Michigan and west to Chicago and for *Wolverine/Blue Water* passengers to access destinations along Michigan's west coast to Grand Rapids. The first step is a feasibility and engineering study that is currently unfunded.

It is also worth noting that because the Midwest Regional Rail Initiative (described below) shows significant change to the current Amtrak service between Holland/Grand Rapids and Chicago, routing the service via Kalamazoo. Under this scenario, the *Pere Marquette* line south of Holland may be eliminated, including the St. Joseph and Bangor passenger rail stations. WESTRAIN supports continued intercity passenger rail service by Amtrak at the existing *Pere Marquette* Amtrak station communities linking Chicago, St. Joseph, Bangor, Holland, and Grand Rapids.

Midwest Regional Rail Initiative

The Midwest Regional Rail Initiative (MWRRI) is a cooperative effort between Amtrak, the Federal Railroad Administration (FRA), and nine states—Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin—to develop an improved and expanded passenger rail system in the Midwest. In September 2004, MWRRI released a report conducted by their consultant, Transportation Economics & Management Systems, Inc., which outlines a new vision for passenger rail travel in the Midwest. This vision is a transportation plan known as the Midwest Regional Rail System (MWRRS), a 3,000-mile rail network serving nearly 60 million people. MWRRS would operate as a hub-and-spoke system providing through-service in Chicago to locations throughout the Midwest. Trains operating at speeds up to 110 mph would link Chicago with Milwaukee, Madison and Minneapolis; Des Moines and Omaha; St. Louis

and Kansas City; Indianapolis and Cincinnati; Grand Rapids and Detroit; Toledo and Cleveland; as well as many smaller cities and towns. Increased speeds and service efficiencies would reduce travel times dramatically. The Chicago-Detroit trip, for example, would drop from the current five hours, thirty-six minutes to less than four, Chicago-Twin Cities from the current eight plus to less than six, and St. Louis-Kansas City from five hours, 40 minutes to just over four hours. The nearly eight-plus-hour Chicago-Cincinnati trip would be cut in half. The total capital investment for the MWRRS, including infrastructure and rolling stock, is estimated to be \$7.7 billion (in 2002 dollars). The rolling stock for the entire system will cost approximately \$1.1 billion. Infrastructure improvements required to implement the MWRRS are estimated to cost \$6.6 billion, or about \$2 million per mile. This compares favorably with typical highway costs of \$10 million per mile. The funding plan consists of a mix of funding sources, including federal loans and grants, state funding, general funds, and capital and revenue generated from system-related activities, such as joint development proceeds. Federal funding will be the primary source of capital funds. MWRRS funding is based on the establishment of an 80/20 federal/state funding program similar to those that already exist for highways; implementation will remain the responsibility of the states. The State of Michigan would contribute \$873 million for infrastructure and \$234 million for train equipment. As of 2019, the MWRRI is still an active initiative. However, most recently, states have been focused on completing work that has been awarded through FRA's High Speed Intercity Passenger Rail Grant Program.

As noted in the previous section, rail passenger service from between Grand Rapids and Chicago would be routed through Kalamazoo. This service could begin in Holland, operate to Grand Rapids and then to Kalamazoo. This would provide improved access to the Accelerated Rail Service both east and west out of Kalamazoo, providing additional higher speed connections from Grand Rapids and Holland. This routing could also support local efforts to establish commuter rail service between Holland and Grand Rapids, and is being evaluated by the West Michigan Express (WMX) Task Force.

Coast-to-Coast Initiative

In late 2016, a feasibility study known as the Coast-to-Coast initiative concluded that the re-establishment of rail passenger service between Detroit, Lansing, Grand Rapids, and Holland is a concept worth pursuing. The study examined three different routes from Detroit to Holland via Lansing and Grand Rapids that could be established by upgrading existing rail. The first route passes through Ann Arbor and Jackson; the second passes through Ann Arbor and Howell; and the third bypasses Ann Arbor, heading from Wayne to Howell. The study concluded that the routes that pass through Ann Arbor are viable options that merit further study. The route through Jackson showed the greatest potential ridership and revenue, while the route through Ann Arbor and Howell promised the greatest return on investment. The study also looked at the cost of establishing basic, 79-mph service on the route through Ann Arbor and Howell and establishing 110-mph service. While the 110-mph service would require greater capital investment, it would yield higher ridership that would allow the service to potentially recover its operating costs. The next major step toward establishing Coast-to-Coast passenger rail

service is a full feasibility study to include environmental impact analyses, an implementation plan, and a review of public-private partnership options. These next steps are currently unfunded.

Recommendation

Encourage MDOT with the FRA to conduct a more detailed study, alternative analysis, economic and environmental impact analysis for rail passenger service options in West Michigan. This study should include routes between Holland/Grand Rapids and Chicago and Holland/Grand Rapids and Detroit/Toledo. This could result in more than one rail passenger route to/from West Michigan.

This recommendation is consistent with the Michigan State Rail Plan, Recommended Investment Package of improvements.

Freight Needs

On Wednesday, September 25, the Freight Subcommittee, which included representatives from many area industries as well as GVMC, MDOT, the Grand Rapids Chamber of Commerce and The Right Place, met to determine current issues in shipping and receiving freight.

The results of the meeting and the issues identified are below.

It was noted that the City of Grand Rapids has grown significantly in number of jobs versus residents, which has resulted in additional commuters in and out of the city and therefore more congestion. Currently, there are no secondary routes. **Areas where bottlenecks consistently occur causing driver delays and loss of profit include:**

- East Beltline/WB I-196/96 interchange backups due to construction
- I-96 between Cascade Road and I-196
- Northbound US-131 to Cedar Springs
- The need for a new bridge on Freeman Ave. over the CSX line/yard between Hall St. and Market Ave. (primarily for truck traffic)
- US-131 between 28th and the S-Curve (has the oldest pavement in Grand Rapids and the highest traffic volumes per day outside of Detroit); the Hall/Franklin/Wealthy area needs to be reconfigured due to closely placed interchanges and congestion issues
- Work may need to be done to accommodate the new Amazon Distribution Center in Gaines Twp. as bottlenecks may occur there in the future

Safety and operational concerns included:

- Sixty trucks/day travel from US-131 to Hall to Godfrey alongside an elementary school. The City of Grand Rapids is trying to redirect truck traffic away from Grandville Ave. in this area, way limits routing options
- Clearing incidents on US-131 can cause delays also
- Limitation on when refuse/waste trucks can access new residential areas in downtown Grand Rapids

Freight rail issues included:

- The Grand Elk railyard along Hynes Ave., east of US-131, is at capacity more often than not, and the railyard is landlocked by US-131 and businesses. Therefore, additional yard capacity is needed to accommodate growth.
- The Genesee Wyoming (Grand Rapids Eastern RR) line from Lowell to Grand Rapids is under new ownership and may result in service changes.
- There was a need for more intermodal rail service from Grand Rapids, vs Chicago or Ohio.

Proposed solutions:

- MDOT discussed some options for improving US-131 operation between Hall Street and the S-Curve area. There is currently an active Planning and Environmental Linkages (PEL) study, targeting this segment.
- Building peak use lanes/applying Active Traffic Management (ATM), which includes shoulders that are built to the standard of a lane and are opened up during peak periods along some freeway corridors. The benefit is that less space is needed (instead of a lane and a shoulder, which is how lanes are traditionally built, only a lane-width shoulder is needed), but ITS infrastructure is also involved.
- Expanding CSX rail yard, which impacts the potential bridge on Freeman Ave. between Hall St. and Market Ave. Conceptual plans are in the City's engineering office, but it is costly. This bridge could take truck traffic away from the current routing along Hall Street to US-131, through neighborhoods and schools.
- Shifting toward a more intermodal system to ship and receive freight. There was significant interest from industry in taking trailers off the road and using rail to move goods. This would enhance safety, reduce congestion, and improve air quality. An intermodal facility could potentially be built on vacant land along existing rail lines.
- Developing a container rail service in the Grand Rapids area.
- Increasing connectivity and reducing congestion between Holland and Grand Rapids by using the West Michigan Express.
- Reacting more quickly to clear incidents and crashes to reduce traffic congestion.
- Increasing the use of weave/merge lanes on area freeways.
- Add interchange at M-6/48th St. and east end of the GRF airport.

Challenges to resolving the issues identified above include:

- The US-131 freeway between 28th St. and the S-curve project is cost prohibitive at current funding levels.
- CSX is a large company and sees Grand Rapids as the end of a spoke versus a hub, which could make it difficult to enhance intermodal service options in Grand Rapids. The Committee expressed interest in reaching out to the intermodal department at CSX and speaking to them directly. The Chamber of Commerce is open to facilitating these conversations, but needs a strong case and buy-in from the business community. It was noted that CSX has 40 acres of property on Market Street that is not currently in use, and there may be opportunity there for an intermodal shipping terminal.
- The downside of vital streets (complete streets) is that they often result in road diets being used and a loss of lanes, which makes it difficult for bus and truck traffic to navigate, especially when a bus and truck are traveling the same segment at the same time. The result is pushing the truck traffic to highways, which can lead to congestion and more travel time delays for all traffic.

- Waste haulers start at 3:00 am for garbage pickup to reduce congestion from vehicles traveling behind them. However, some locations have noise ordinances in place that restrict operating times, which can make it difficult for waste haulers to avoid hauling trash at peak times.

The GRF airport also submitted a separate list of needs from their Master Plan (attached).

Gerald R. Ford International Airport Authority

Aviation Activity Report

	12/2017	12/2016	Percent Change	01/2017 - 12/2017	01/2016 - 12/2016	Percent Change
<u>Passenger Activity</u>						
Enplaned Passengers	117,561	108,926	7.93	1,413,310	1,333,956	5.95
Deplaned Passengers	116,141	107,091	8.45	1,398,312	1,319,674	5.96
Passenger Totals	<u>233,702</u>	<u>216,017</u>	<u>8.19</u>	<u>2,811,622</u>	<u>2,653,630</u>	<u>5.95</u>
<u>Aircraft Operations</u>						
Air Carrier	2,087	1,970	5.94	25,546	24,276	5.23
Commuter & Air Taxi	1,556	1,496	4.01	16,788	17,747	-5.40
Military	85	56	51.79	899	1,023	-12.12
General Aviation						
Itinerant	1,524	1,458	4.53	25,119	25,791	-2.61
Local	876	934	-6.21	14,080	12,721	10.68
Total G.A.	<u>2,400</u>	<u>2,392</u>	<u>0.33</u>	<u>39,199</u>	<u>38,512</u>	<u>1.78</u>
Total Operations	<u>6,128</u>	<u>5,914</u>	<u>3.62</u>	<u>82,432</u>	<u>81,558</u>	<u>1.07</u>
<u>Cargo Activity</u>						
Mail						
Enplaned Mail	0	0	0.00	0	4	-100.00
Deplaned Mail	0	0	0.00	0	0	0.00
Mail Totals	<u>0</u>	<u>0</u>	<u>-100.00</u>	<u>0</u>	<u>4</u>	<u>-100.00</u>
Freight						
Enplaned Freight	3,717,799	3,656,491	1.68	42,810,242	42,003,178	1.92
Deplaned Freight	3,909,220	4,112,528	-4.94	45,475,606	44,077,688	3.17
Freight Totals	<u>7,627,019</u>	<u>7,769,019</u>	<u>-1.83</u>	<u>88,285,848</u>	<u>86,080,866</u>	<u>2.56</u>
Cargo Totals (Mail, Freight)	<u>7,627,019</u>	<u>7,769,019</u>	<u>-1.83</u>	<u>88,285,848</u>	<u>86,080,870</u>	<u>2.56</u>

Gerald R. Ford International Airport Authority

Aviation Activity Report

	12/2018	12/2017	Percent Change	01/2018 - 12/2018	01/2017 - 12/2017	Percent Change
<u>Passenger Activity</u>						
Enplaned Passengers	139,299	117,561	18.49	1,641,019	1,413,310	16.11
Deplaned Passengers	136,382	116,141	17.43	1,624,223	1,398,312	16.16
Passenger Totals	<u>275,681</u>	<u>233,702</u>	<u>17.96</u>	<u>3,265,242</u>	<u>2,811,622</u>	<u>16.13</u>
<u>Aircraft Operations</u>						
Air Carrier	2,741	2,087	31.34	30,975	25,546	21.25
Commuter & Air Taxi	1,348	1,556	-13.37	15,821	16,788	-5.76
Military	81	85	-4.71	1,375	899	52.95
General Aviation						
Itinerant	1,630	1,524	6.96	24,329	25,119	-3.15
Local	776	876	-11.42	11,523	14,080	-18.16
Total G.A.	<u>2,406</u>	<u>2,400</u>	<u>0.25</u>	<u>35,852</u>	<u>39,199</u>	<u>-8.54</u>
Total Operations	<u>6,576</u>	<u>6,128</u>	<u>7.31</u>	<u>84,023</u>	<u>82,432</u>	<u>1.93</u>
<u>Cargo Activity</u>						
Mail						
Enplaned Mail	0	0	0.00	0	0	0.00
Deplaned Mail	0	0	0.00	0	0	0.00
Mail Totals	<u>0</u>	<u>0</u>	<u>-100.00</u>	<u>0</u>	<u>0</u>	<u>-100.00</u>
Freight						
Enplaned Freight	3,509,844	3,717,799	-5.59	44,988,424	42,810,242	5.09
Deplaned Freight	3,921,485	3,909,220	0.31	46,055,523	45,475,606	1.28
Freight Totals	<u>7,431,329</u>	<u>7,627,019</u>	<u>-2.57</u>	<u>91,043,947</u>	<u>88,285,848</u>	<u>3.12</u>
Cargo Totals (Mail, Freight)	<u>7,431,329</u>	<u>7,627,019</u>	<u>-2.57</u>	<u>91,043,947</u>	<u>88,285,848</u>	<u>3.12</u>

Gerald R. Ford International Airport Authority

Aviation Activity Report

	08/2019	08/2018	Percent Change	01/2019 - 08/2019	01/2018 - 08/2018	Percent Change
<u>Passenger Activity</u>						
Enplaned Passengers	158,159	147,459	7.26	1,203,926	1,089,123	10.54
Deplaned Passengers	156,402	144,676	8.11	1,202,408	1,087,402	10.58
Passenger Totals	314,561	292,135	7.68	2,406,334	2,176,525	10.56
<u>Aircraft Operations</u>						
Air Carrier	0	2,690	-100.00	19,383	20,134	-3.73
Commuter & Air Taxi	0	1,504	-100.00	8,359	10,515	-20.50
Military	0	64	-100.00	458	880	-47.95
General Aviation						
Itinerant	0	2,497	-100.00	13,469	16,539	-18.56
Local	0	648	-100.00	6,061	6,884	-11.96
Total G.A.	0	3,145	-100.00	19,530	23,423	-16.62
Total Operations	0	7,403	-100.00	47,730	54,952	-13.14
<u>Cargo Activity</u>						
Mail						
Enplaned Mail	0	0	0.00	0	0	0.00
Deplaned Mail	0	0	0.00	0	0	0.00
Mail Totals	0	0	-100.00	0	0	-100.00
Freight						
Enplaned Freight	4,265,813	4,103,613	3.95	30,922,044	30,016,426	3.02
Deplaned Freight	3,925,626	4,244,955	-7.52	30,872,021	30,404,909	1.54
Freight Totals	8,191,439	8,348,568	-1.88	61,794,065	60,421,335	2.27
Cargo Totals (Mail, Freight)	8,191,439	8,348,568	-1.88	61,794,065	60,421,335	2.27

4.4 OFF-AIRPORT TRANSPORTATION CONSIDERATIONS

The Airport currently has one primary access point for passengers which is via Oostema Boulevard. During peak demand, this access point can become congested, which may increase delays. An additional access route is necessary to open up development areas for future development. It will also address safety issues along the roadway from merging traffic (Michigan turns), vehicle accidents at the Patterson / Oostema intersection, and to separate West Michigan Aviation Academy traffic from airport traffic. A new access road will improve capacity or reduce delays. However, as previously mentioned, the existing capacity of Oostema Boulevard is sufficient to handle airport traffic. In particular, if there is an accident on Oostema Boulevard at the intersection with Patterson Avenue, the primary access point to GFIA is blocked leaving Van Laar Drive as the only access point to the airport. Therefore, an additional access point to the passenger terminal would be beneficial and is desirable. In addition, a new access road will allow for access to development areas north and east of the Patterson Avenue and Oostema Boulevard intersection. The additional access point would provide some redundancy of the facilities and increase the resiliency of the Airport. The new access point to GFIA should be located along Patterson Avenue north of Oostema Boulevard just south of Danvers Drive.

The Grand Rapids metropolitan area has experienced success with the Silver Line, a bus rapid transit (BRT) line currently in operation in Grand Rapids. Bus rapid transit has grown significantly in the United States in recent years and is continuing to grow. Although no demand currently exists at GFIA for additional bus service or rail, for future planning purposes, additional modes should be considered. This has a benefit of reducing congestion region-wide and improve air quality.

4.5 AIR CARGO CAPACITY AND REQUIREMENTS

Air cargo facility requirements will address building square footage, and aircraft apron square yardage needs and access to the air cargo area via an additional access point to Thornapple River Drive.

Most often air cargo facility efficiency is measured through the amount of total air cargo handled per square foot. The most operationally efficient cargo facilities operate approximately one metric ton of cargo per square foot of building. Major cargo airports including Los Angeles International Airport and Hong Kong International Airport approach this level of efficiency. Smaller airports that do not have specialized cargo equipment or buildings typically approach 2.0 square feet per annual ton. Based on on-site evaluation of the building and analyzing cargo movements for air cargo activity at GFIA, the Airport currently operates around 1.2 square feet per annual ton. This rate is used to determine building space requirements.

At current annual cargo tonnage of 38,438 tons, GFIA requires 52,000 square feet of building space. Existing air cargo space is 174,400 square feet. The forecast for the Airport for 2021 is slightly greater than 2016, requiring 53,000 square feet. At 2026 and 2031, the Airport needs 56,000 and 60,000 square feet. At the end of the planning horizon in 2036, the Airport is expected to need 64,000 square feet of building space. Throughout the planning period, the Airport is expected to meet and exceed requirements.

The current fleet mix includes one wide-body, two narrow-body and six small cargo aircraft. Within the planning horizon, GFIA is expected to transition to various combinations of wide- and narrow-body aircraft but never exceed three jet aircraft at one time. Six small cargo aircraft will remain throughout the planning

period. Current and expected tenants use the Airbus A-300 (A-300) and A-310 (A-310), Boeing B-757 (B-757), and Boeing B-767 (B-767). The A-300, A-310 and B-757 require 8,000 square yards (SY) of apron space while the B-767 requires 9,200 square yards. Together, the six small cargo aircraft require 8,900 square yards of apron.

The current fleet of the A-310, two B-757 and six small cargo aircraft requires 32,900 square yards of apron which GFIA greatly exceeds. In 2021, the expected fleet includes an A-310, a B-757, a B-767 and six small cargo aircraft for a required space of 34,100 square yards. The forecast adjusts to two B-767s and six small cargo aircraft requiring 27,300 square yards, as FedEx phases out the A-310 aircraft. This fleet remains until 2036 when the fleet mix changes to three B-767s and six small cargo aircraft requiring 36,500 square yards. GFIA currently has 92,000 square yards available for cargo operations which far exceeds the requirements.

While there are no current aircraft using the UPS apron, the forecast for the cargo apron requirement for the 20 year planning horizon does not exceed current capacity.

While the existing landside requirements for the air cargo area far exceeds the requirements, there is limited truck parking at the FedEx facility. Potential for expansion exists by building truck parking positions in other adjacent locations.

Access to the air cargo area is via Air Cargo Drive from Thornapple River Drive. Due to the bridge over the CSX railroad north of this intersection, visibility is limited for drivers turning from Air Cargo Drive onto Thornapple River Drive. This sometime creates a difficult turning maneuver as a result of unanticipated fast moving vehicles appearing over the bridge. Within the next five years, a safety project is anticipated to improve access to the air cargo area by construction of a new connector from the vicinity of FedEx with Thornapple River Drive. This new road is sufficiently south of the intersection of Air Cargo Road with Thornapple River Drive to permit safer turns onto the roadway, especially for large trucks.

Table 4-58 provides the facility requirements for air cargo.

TABLE 4-58
CARGO REQUIREMENTS

	Existing	Forecast				
		2016/ 1.3 MEP	2021/ 1.6 MEP	2026/ 1.8 MEP	2031/ 2.0 MEP	2036/ 2.2 MEP
Freight (pounds)	82,594,482	86,100,000	88,700,000	94,200,000	100,000,000	106,100,000
Freight (tons)	36,873	38,438	39,598	42,054	44,643	47,366
Cargo Building (SF)	174,400	52,000	53,000	56,000	60,000	64,000
Aircraft (Peak Demand)	1 A-310 1 B-757 6 C-208	1 A-310 2 B-757 6 C-208	1 B-767 1 A-310 1 B-757 6 C-208	2 B-767 6 C-208	2 B-767 6 C-208	3 B-767 6 C-208
Apron (SY)	92,000	32,900	34,100	27,300	27,300	36,500
Landside (SY)	43,800	15,046	15,336	16,204	17,361	18,519
Building Frontage (lf)	998	433	442	467	500	533

Source: RS&H, Inc. Analysis, 2017

Notes: Currently UPS does not operate air cargo aircraft at GFIA and only FedEx is included in this analysis. Blue text indicates demand exceeds capacity.

4.6 UTILITY CAPACITY AND REQUIREMENTS

With the exception of communications that can be accommodated, the existing utility infrastructure for the terminal core and airfield can accommodate future demand. However, utilities are recommended to be upgraded in order to allow for a compressed natural gas filling station and electrical charging stations should the industry shift towards alternative fuels.

Section 4.9.1, On-Airport Land Use Planning will identify the need for consideration of utility requirements for undeveloped Airport parcels. Future consideration will also be given to expected and planned utility infrastructure upgrade as utilities begin to age.

4.7 GENERAL AVIATION REQUIREMENTS

General Aviation (GA) is well developed at GFIA and plays a significant role in the economy of Grand Rapids. Virtually every type of GA service offered exists at the Airport.

4.7.1 Background

Discussion of GA Facility Requirements will be addressed in two primary topics. The first is Fixed Base Operator (FBO) that will include aircraft maintenance, flight training, and T-hangars. Also, this category includes Charter and Aircraft Management Services that provides fractional, aircraft sales, brokerage, and consulting services. This category services large airport tenants that serve aircraft owned by many different aircraft owners. An example tenant at GFIA is Northern Jet Management.

The second primary topic is corporate aviation. Corporate aviation is differentiated from FBO and Charter and Aircraft Management Services as these are individual companies that build hangars to store their own aircraft. Corporate aviation is significant at GFIA and is poised for further expansion.