

2021 Michigan County Road Investment Plan:

A comprehensive 83-county overview of investment requirements to restore Michigan's county road system

County Road Association of Michigan
by L.W. Brown Consulting, LLC

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County Road Association
OF MICHIGAN

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Author Credentials



The author of this study is Larry W. Brown, licensed Michigan Professional Engineer (PE) since 1977, expert consultant and owner of L.W. Brown Consulting, LLC. Larry Brown worked for 40 years (1977-2017) for the Allegan County Road Commission, including six years as its managing director. He was responsible for managing preventative maintenance and road construction projects on nearly 1,800 miles of paved and unpaved roads, along with 154 bridges on a \$32 million budget. He retired in early 2017 and was appointed by the Allegan County Board of Commissioners to a six-year term on the Allegan County Road Commission Board in December 2018.

Brown also served on the 16-member Board of Directors for the County Road Association (CRA) of Michigan from 2015-2018, representing the Association of Southern Michigan County Road Agencies, for which he has also served as president. Perhaps unique to CRA's history, Brown has now rejoined the Board in his capacity as a road commissioner. He is a graduate of Michigan Technological University.

County Road Investment Plan Work Group

The CRA County Road Investment Plan Work Group guided creation of this report and included:

Douglas J. Mills, PE, Engineer-Manager of Baraga County Road Commission (28 years with road commission, 19 years on statewide Local Bridge Advisory Board, 11 years on the Critical Bridge Committee, 31 years as PE)

Dennis G. Kolar, PE, Managing Director of the Road Commission for Oakland County (36 years with road commission, 32 years as PE)

Bradley S. Lamberg, PE, Managing Director of Barry County Road Commission (25 years with road commission, 23 years as PE)

Steven Puuri, PE, CRA Engineering Specialist and retired Managing Director of the Washtenaw County Road Commission (25 years with road commission, 38 years as PE)

Steven A. Warren, Managing Director of Kent County Road Commission (33 years with road commission, founding member and 10 years with TAMC)

Denise Donohue, Executive Director, County Road Association of Michigan

Ed Noyola, Deputy Director and Legislative Liaison, County Road Association of Michigan

With support by Dustin Earley, CRA Communications and Engagement Manager.

Information Sources Utilized

The study and data included in the Executive Report were compiled from numerous sources:

- Interviews and correspondence with all 83 Michigan county road commissions and departments (collectively: “road agencies”);
- Reports from the Local Technical Assistance Program (LTAP) and the Center for Technology & Training, both at Michigan Technological University;
- Data and reports from the Michigan Department of Transportation (MDOT);
- Annual Public Act 51 Reports of 2019;
- and the Michigan County Road Commission Self-Insurance Pool.

Survey timeframe

Survey information was collected from November 2020 through April 2021.

2021 Michigan County Road Investment Plan Report:

A comprehensive 83-county overview of appropriate investment requirements to restore Michigan's county road system

EXECUTIVE SUMMARY

During the first quarter of 2021 the County Road Association (CRA) of Michigan and its engineer-consultant L.W. Brown Engineering compiled multiple primary and published data, sources and surveys of all 83 Michigan county road agencies into the *2021 Michigan County Road Investment Plan*, an update of the Michigan County Road Investment Plan that was first released in May 2019. Countywide data on paved roads has been available only in piecemeal fashion since 1984 when the state's last Highway Needs Study was published. This study has monetized needs on the county system and finds that an **additional \$1.8 billion annually** should be invested in the county road and bridge system to work toward 90% good/fair ratings on counties' 22,744 miles of federal aid-eligible roads by 2031; and to achieve 60% good/fair ratings on counties' 30,716 miles of nonfederal aid-eligible (primary and local) roads by 2031. The counties' 36,540 miles of unpaved roads are not rated; however, the report includes the cost of gravel road surface replenishment. The study addresses only investments to preserve and restore the current system, and does not contemplate system improvements (e.g., additional lanes, roundabouts or paving gravel roads).

2021 Michigan County Road Investment Plan Report

Tracking Needs on the Michigan's County Road System.

From 1948 through 1985, the State of Michigan looked formally and comprehensively at the needs of all three road jurisdictional entities: County road commissions (75% of road miles), municipal agencies (17%) and the Michigan Department of State Highways (8%). Each entity had seats on the coordinating committee that produced a periodic **Michigan Highway Needs Study** under the direction of consultant Wilbur Smith & Associates.

The *Needs Studies* summarized and monetized needs of road surfaces, bridge conditions, road agency facilities and equipment. The 1972 Study (4th in the series) reported a \$30 billion plan over 20 years "to improve all highways, roads and streets in Michigan to tolerable standards." The studies were funded off-the-top of the Michigan Transportation Fund (MTF). The final Highway Needs Study in the series was released in 1985.

Getting a Comprehensive Overview Today.

In 2018, the CRA undertook its own study of the financial needs to preserve, maintain and restore Michigan's county road system – part of the fourth-largest local road and bridge network in the US. This 2021 Investment Plan provides new, actionable peer-reviewed information drawn from primary data sources to ensure the needs of the county road and bridge system are accurately depicted and considered in legislative, gubernatorial and media discussions of properly funding and restoring Michigan's transportation infrastructure.

Succinctly, our intent is to establish a level of annual revenue for the 83 county road agencies in Michigan that allows meaningful progress toward restoring Michigan to a safe, efficient system of local roads – which is the statutory mandate of county road agencies.

This study is a “snapshot” of the current target investment for each county road commission and road department in the state. Data from all 83 county road agencies were totaled to determine a statewide target for funding the county road, bridge and right-of-way system. The study addresses bridges, federal aid-eligible roads (typically primary roads) and nonfederal aid-eligible roads (typically local roads) separately, as each of these assets are in very different condition.

State Trunkline System. A word about the state trunkline system: With a centralized engineering staff and fewer lane miles to track, the Michigan Department of Transportation (MDOT) has historically done a good job of tracking its needs and in 2019 characterized its total current funding deficit as \$1.5 billion annually to achieve a goal of 90% good/fair federal aid-eligible roads rating within the next 10 years. All MDOT roads and bridges are federal aid-eligible and by Michigan law MDOT receives 75% of Michigan's annual federal aid allocation.

COVID. Due to pandemic considerations the Michigan Transportation Asset Management Council (TAMC)-required road pavement surface and evaluation rating (PASER) data collection on the federal aid system did not occur in 2020. These 2020 ratings are not key to this report as county road agency data was directly provided for a current PASER rating.

Contents of the 2021 County Road Investment Plan.

The study compiled numerous published, third-party data sources and vetted them with interviews and correspondence with all 83 county road agencies. The study looks at the current financial needs of maintenance and capital investment on 90,000 miles of paved and unpaved county roads (federal aid-eligible and nonfederal aid-eligible); routine preservation/replacement costs for

5,700 bridges; as well as buildings, facilities and equipment needed to run an efficient county road agency that provides a safe, efficient local road system. The comprehensive analysis is contained in this report; the survey and 900-plus pages of individual county data will remain the proprietary intellectual property of CRA.

The study recognizes that there is a backlog of demands on time, funds and resources to restore county road infrastructure, and further recognizes that there are real limits to improvements imposed by available roadwork material and human resources; what the traveling public will tolerate insofar as roadwork; and a realistic funding level.

Performance Goals. That said, goal setting is important to ensure Michigan is aiming for appropriate restoration of the county road and bridge system. Each county road agency per P.A. 325 of 2018 provides its agency performance goals in an ongoing process of maintaining, preserving, upgrading and operating physical assets cost effectively, based on a continuous physical inventory and condition assessment and investment to achieve established performance goals. For this study, the CRA Board of Directors has established the same restoration goal for federal aid-eligible county roads as MDOT is utilizing:

- **90% good/fair for federal aid-eligible roads in 10 years.** These roads currently have an average rating of 52% good/fair across all counties. (*good/fair = PASER 5-10*)

For the local road system CRA has set the following goal:

- **60% good/fair for local, nonfederal aid-eligible roads in 10 years.** These roads currently have an average rating of 46% across all counties.

Additional assumptions are noted on pages 8-10.

This study identifies the appropriate level of necessary investment into the county road and bridge system to meet its performance goals to be \$1,844,185,000 annually to be distributed across 83 county road agencies according to PA 51 provisions. This is a reduction from the \$2,050,500,000 identified in the FY 2019 Investment Plan and supports the conclusion that improvements have been accomplished through FY 2019 from the 2015 Transportation Funding Package, which went into effect in 2017. More gains may be anticipated as funding increases in the future. It is clear the continued dialogue of sustainable funding should occur now to continue progress on improving the condition of Michigan's county road and bridge system.

Ratings on Nonfederal Aid-eligible Roads.

Michigan has a specific protocol for rating roads. PASER ratings *are currently not required* for nonfederal aid-eligible roads (local roads) and only appear in the online Michigan TAMC “dashboards” as submitted. However, a majority of county road agencies are rating their paved local roads to better manage these transportation assets. This study and the 2019 County Road Investment Plan considered these ratings for nonfederal aid-eligible paved roads.



Investment Plan Definitions and Baseline Assumptions

The analysis for this study was based on the best available data in the first quarter of 2021. The target level of investment for each county was based on the following six categories:

1) Bridges – A list of all county road agency bridges was obtained from MDOT. The list included the structure number, county and deck area. For this report, a straight-line depreciation method was used to determine the required annual investment for replacement.

A 50-year lifespan was used, as specified in the “Uniform Accounting Procedures” for concrete bridges. The estimated cost of demolition (\$46/sq. ft.) and concrete replacement (\$350/sq. ft.) were obtained from the 2021 MDOT Local Agency Programs Bridge Cost Estimate Worksheet. Approach work for each structure was estimated at \$200,000/bridge for rural counties and \$400,000/bridge for urban counties. Replacement deck areas were assumed to increase by 20% more than the existing structures. The approach estimates and deck area increases for replacement were based on experience and conversations with several county engineers. Contingency, mobilization, preliminary/construction engineering costs were added in this study as a methodology refinement from the 2019 County Road Investment Plan report.

2) Buildings, Maintenance Facilities – All existing county road agency buildings and facilities were listed. Straight-line depreciation on these items was used to determine the required annual investment. Replacement costs for buildings for administration (\$190/sq. ft.); equipment maintenance and heated storage (\$190/sq. ft.); cold storage (\$50/sq. ft.); and salt storage (\$50/sq. ft.), all with a life span of 40 years were used. These values were based on conversations with architects and county road agencies who had recent experience with these structures.

Fuel, brine and emulsion storage facilities were assigned a replacement value established by insurance companies. A life span of 20 years was assumed for these types of facilities based on experience from county road agencies.

3) Total Maintenance – The best data available for the current level of maintenance funding for county road agencies is the annual PA 51 report, line 116, of 2019. An increase of 20% was used for the target investment, which was the assumption used in the 2019 County Road Investment Plan, and in the last Needs Study performed by the State of Michigan in 1983.

Work considered to be maintenance includes winter maintenance, pothole patching, guardrail replacement, tree and vegetation removal, culvert replacement, grading gravel roads, drainage, sign replacement and related tasks. These are types of work that all county road agencies have fallen behind on, as they put limited funds toward road surfaces and bridges. An increase of 20% is a step forward and is what counties can reasonably expect to achieve with the current workforce. It should be noted that this will not fully cover the cost of public expectations in routine maintenance operations, such as tree removal and culvert replacement.

4) **Equipment** – Straight-line depreciation was used to determine the annual target investment for equipment. Equipment and life span values were established directly from county road agency communications in the first quarter of 2019 and adjusted for inflation.

5) **Federal Aid-Eligible Road Investment** – The level of investment for this category was determined by using the number of centerline miles of gravel and paved roads eligible for federal aid. The work group limited the project to assuming that only 15% of this investment could be done each year due to limitations on funding, county road agency capacity, contractor capacities and traffic disruptions. The annual investment level required on the paved road system was determined using the PASER system. The federal-aid eligible system current PASER ratings were established by having each county road agency computer their current PASER rating by centerline mile through the Roadsoft program developed and maintained by a team of software and civil engineers at the Center for Technology & Training (CTT) at Michigan Technological University (MTU).

The cost per mile for the treatments listed for hot mix asphalt (HMA), seal coat/chip seal and composite surfaces were obtained from a statewide survey conducted by MTU's Local Technical Assistance Program (LTAP) and completed in 2015. Those figures have been adjusted for inflation. The cost per mile for treatments listed for concrete surfaces were established by the Road Commission for Oakland County. Based on our experience, a gravel road requires an average of 1,000 cu. yds. of aggregate every seven years (approx. equal to the 15% per year used.)

6) **Nonfederal Aid-Eligible Road Investment** – Like the federal aid-eligible roads, the level of investment for nonfederal aid-eligible roads was determined by using the number of centerline miles of gravel and paved road ineligible. Again, it was assumed only a maximum of 15% of this work could be addressed in each year due to limitations on contractor capacities and traffic disruptions.

Based on our experience, a gravel road requires an average of 1,000 cu. yds. of aggregate every seven years (approx. equal to the 15% per year used).

The cost per mile for the treatments listed for the nonfederal aid-eligible paved (HMA, seal coat/chip seal and composite surfaces) system were obtained from a statewide survey conducted by the MTU LTAP and completed in 2017 and adjusted for inflation for this report.

These six categories cover the majority of the required annual investment for the county road agencies. Totals for each category are shown in Chart 1-1. Each category had an 8% administrative charge applied, which is slightly less than the 8.5% administrative charge MDOT currently allows and is in keeping with county road agencies' historical administrative overhead, according to PA 51 annual reports.

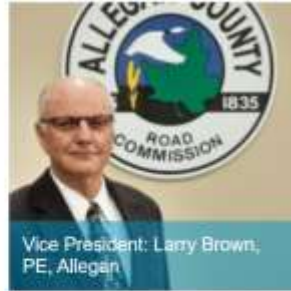
This 2021 County Road Investment Plan does not include funding for new construction or capacity improvements. The intent of this study is to show the required investment to make significant progress in restoring the existing county road system as of January 2021, when the data was harvested.

Chart 1-1: Fiscal Summary Sheet for 2021 County Road Investment Plan

Following is the summary of fiscal needs for the six categories that are critical to improving Michigan's county road system. Annual costs for these categories used in compiling the 2021 County Road Investment Plan, come from data for paved and unpaved county primary and local roads in the first quarter of 2021.

Need Category	Annual Cost
Bridges	\$ 222,177,467 ↑
Buildings, Maintenance Facilities	\$ 44,624,483 ↑
Maintenance	\$ 912,903,033 ↑
Equipment	\$ 164,615,464 ↑
Federal Aid-Eligible Roads	\$ 764,613,642 ↓
Nonfederal Aid-Eligible Roads	\$1,516,405,856 ↓
Annual County Road Investment Needs	\$3,625,366,945 ↑
Less county road revenue documented in 2019 PA 51 Report	- <u>\$1,734,106,480*</u> ↑
<small>*Total revenue is Line 97 minus Lines 77 & 78 from PA 51 Reports of 2019.</small>	
Outstanding Annual Funds Needed for County System	\$1,844,185,068 ↓

County Road Association of Michigan Board of Directors



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