DEPARTMENT OF TRANSPORTATION

A Guide to Successfully Convert Severely Distressed Paved Roads to Engineered Unpaved Roads – Final Report

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February 2020

Research Report
Final Report 2019-42

LRRB
LOCAL ROAD RESEARCH BOARD

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16. Abstract (Limit: 250 words) On behalf of the Minnesota Local Road Research Board (LRRB), the Western Transportation Institute (WTI) at Montana State University (MSU) and the University of California Davis (UCD) developed *A Guide to Successfully Convert Severely Distressed Paved Roads to Engineered Unpaved Roads*. The guide serves as a comprehensive information source on effective practices for converting severely distressed paved roads to acceptable unpaved surfaces. This final report recounts the effort associated with the seven tasks involved in the completion of this project, the location of each task deliverable, and future research needs to advance this topic.			
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A Guide to Successfully Convert Severely Distressed Paved Roads to Engineered Unpaved Roads — Final Report

Final Report

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EXECUTIVE SUMMARY

Minnesota has an extensive network of rural, low-traffic-volume roads. A large percentage of the roads in this network were paved in past decades, but unfortunately, funding to routinely maintain them has not always been available, which has accelerated the rate of deterioration. Now many of these roads are severely distressed (with, cracks, ruts, and potholes) and funds to continue trying to maintain them or to rehabilitate/reconstruct them are limited. Driving on distressed paved roads can present safety implications along with increased vehicle occupant discomfort and higher vehicle operating costs. Traffic volumes on many of these roads have also been reduced over the years, often to less than is justified for keeping them at a paved standard. Conversely, the size and weight of trucks and agricultural equipment that use these roads have increased significantly.

In situations where repairs are having little effect and/or where sufficient funding to rehabilitate the roads is not available, road agencies may consider converting these severely distressed, low-traffic, paved roads to engineered unpaved roads. Conversion involves pulverizing the existing road materials, with additional supplemental materials and chemical treatments where required, into a shaped and compacted unpaved road. Once converted, maintenance can be carried out with a grader, and dust levels can be kept to an acceptable standard with appropriate chemical treatments. If done correctly, the converted road should provide better, safer performance than the distressed paved road, and grader maintenance will be cheaper than labor intensive patching and crack sealing. The engineered unpaved road can always serve as a quality base for a paved surface if funds are made available later, or if increasing traffic volumes justify it.

This document outlines the effort associated with this project to complete a guidebook on converting severely distressed paved roads to engineered unpaved roads. Chapter 1 provides background tasks involved in this research effort. Chapter 2 provides the methods used to accomplish each task. Chapter 3 provides the results of the survey reporting on identified unpaving projects in Minnesota. Chapter 4 provides conclusions, recommendations, and suggested future research. Supporting information is provided in the appendices.

CHAPTER 1: INTRODUCTION

On behalf of the Minnesota Local Road Research Board (LRRB), the Western Transportation Institute (WTI) at Montana State University (MSU) and the University of California Davis (UCD) developed the *Guide to Successfully Convert Severely Distressed Paved Roads to Engineered Unpaved Roads*. The guide serves as a comprehensive information source on effective practices for converting severely distressed paved roads to acceptable unpaved surfaces.

The research effort was divided into the following seven tasks:

- Task 1 – Kick-off meeting with MnDOT/Local Road Research Boarch (LRRB) Technical Advisory Panel (TAP)
- Task 2 – Detailed outline of the unpaving guide by chapter
- Task 3 – Unpaving guidebook
- Task 4 – Webinar of the unpaving guide
- Task 5a and b – Initial and final memorandum on research benefits and implementation steps
- Tasks 6 and 7 – Final report and editorial review for publication

The effort associated with each task and location of the task deliverables are provided in the following sections.

CHAPTER 2: METHODOLOGY

2.1 TASK 1 – KICK-OFF MEETING

The initial task for this project was a kick-off meeting with the LRRB Technical Advisory Panel (TAP) to review the developed Research Project Workplan, assess the content, review the timeline, and address any suggested changes. The kick-off meeting was held July 26, 2018. The task deliverable kick-off meeting notes were submitted on July 26, 2018. Following the kick-off meeting, meetings were held every 2-3 months with the research team and TAP.

2.2 TASK 2 – DETAILED CHAPTER OUTLINE OF THE UNPAVING GUIDE

A detailed chapter outline of the unpaving guide was developed for each chapter. The chapter outline included an abstract, relevant reference material, a list of potential graphics to include/create, flowcharts, and or photographs. The chapter outline was submitted to the TAP on October 4, 2018.

2.2.1 Survey of Unpaving Projects in Minnesota

The research team developed a survey to collect information on unpaving projects that have been completed or are planned to occur in Minnesota. The survey was targeted to local road managers and asked questions regarding unpaving projects, including when and where they occurred, methods followed, and costs incurred.

The survey was disseminated by the project TAP via email. Responses were collected and written into summary form. Eight examples of unpaving projects were identified. The research team conducted follow up communication via email and telephone to clarify survey responses and capture additional information. A summary of each identified unpaving project in Minnesota can be found in CHAPTER 3: Survey Results.

2.3 TASK 3 – UNPAVING GUIDE

Using the detailed chapter outline, the Guide to Successfully Convert Severely Distressed Paved Roads to Engineered Unpaved Roads was developed. This guide serves as the key deliverable for this project and a standalone document and can be found on the Local Road Research Board website (lrrb.org) or at mndot.gov/research/reports/2019/201942G.pdf.

2.4 TASK 4 – WEBINAR

A webinar presenting an overview of the contents of the unpaving guide was held October 29, 2019. The webinar presented high level findings from each chapter of the guide. The webinar presentation and recorded webinar can be found on the LRRB's YouTube Channel at youtube.com/lrrbmn.

The webinar was advertised to local county engineers in Minnesota. There were 55 unique login names participating in the live webinar.

2.5 TASK 5a and b – MEMORANDUM OF BENEFITS AND IMPLEMENTATION

The initial memorandum of benefits and implementation (Task 5a) was developed at the start of the project to outline potential benefits of the developed unpaving guide and implementation steps to achieve these benefits. The final memorandum (Task 5b) retrospectively looked at actual benefits achieved, and the implementation measures used to achieve them. The Task 5a and b documents were submitted to the MnDOT administrator and MnDOT/LRRB project liaison for review and approval.

2.6 TASK 6 and 7 – FINAL REPORT AND EDITING FOR PUBLICATION

This final report document was developed to detail the task work associated with this research effort, document the location of the key deliverables, and identify future research needs to advance this topic. This final report concludes the research effort associated with this project.

CHAPTER 3: SURVEY RESULTS

3.1 SUMMARY OF UNPAVING PROJECTS IN MINNESOTA

3.1.1 Survey Findings

This survey identified six counties that have conducted unpaving projects in Minnesota. Past survey results as part of *NCHRP 485 Converting Paved Roads to Unpaved* (Fay et al., 2016) identified six additional counties that had conducted unpaving projects in Minnesota, for a total of 12 counties. Minnesota has 87 counties, so these 12 counties represent approximately 14% of the counties in the state. Using unpaving as a pavement management tool appears to be more common than previously thought in Minnesota. Figure 3.1 shows counties in Minnesota where unpaving projects have occurred (highlighted in dark blue). Table 1 lists the counties and the information source that identified the projects.

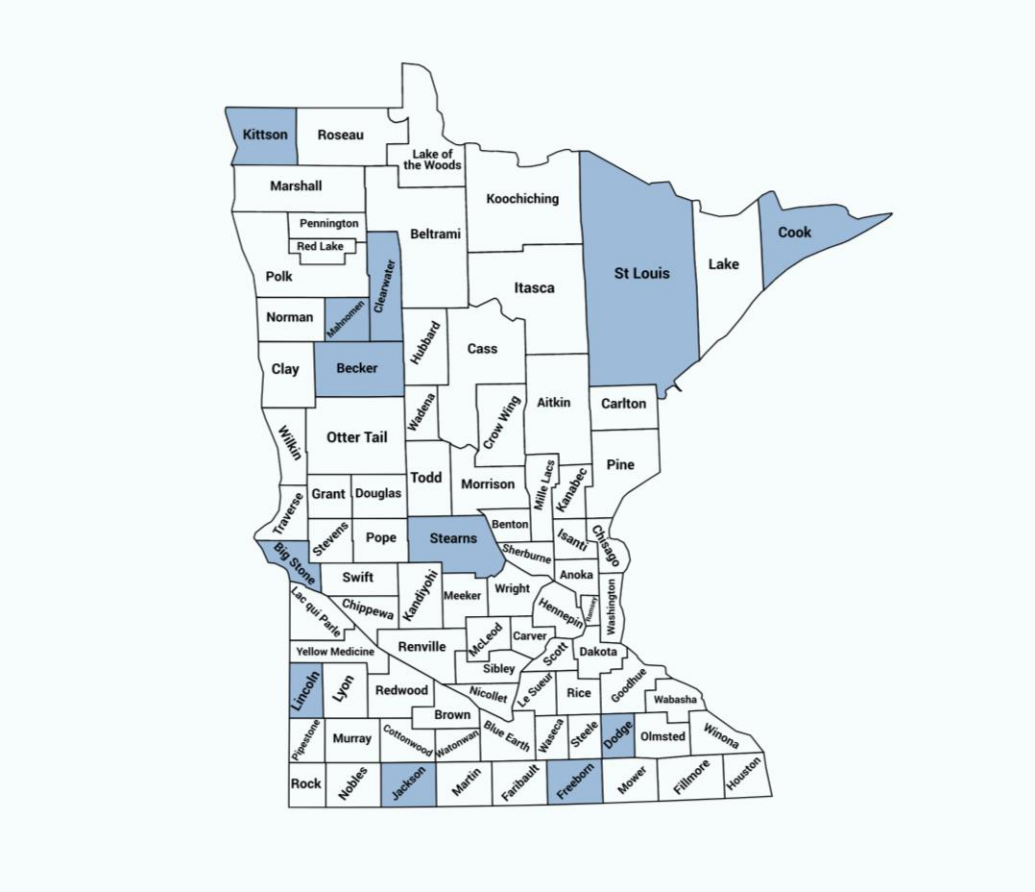

Figure 3.1 Map of Minnesota counties where unpaving projects have occurred (highlighted in blue).

Table 1. Counties in Minnesota where unpaving projects have occurred, and the corresponding information source.

Minnesota County	Information Source
Becker	Fay et. al., 2016
Big Stone	Survey
Clearwater	Fay et. al., 2016
Cook	Survey
Dodge	Survey
Freeborn	Fay et. al., 2016
Jackson	Fay et. al., 2016
Kittson	Survey
Lincoln	Survey
Mahnomen	Fay et. al., 2016
Stearns	Survey
St. Louis	Fay et. al., 2016

Three additional unpaving projects were reported as a part of the survey effort: one in Butler County, Alabama; one in Burleigh County, North Dakota; and one in Minnehaha County, South Dakota. Additional information was not sought on these unpaving projects because they occurred outside of Minnesota. However, the occurrence of these projects has been noted here, because the information may be helpful to adjacent counties in Minnesota, especially for those projects that occurred in North and South Dakota.

3.1.2 Summary of Unpaving Projects

3.1.2.1 Becker County, MN

The summary of this unpaving project was taken from Fay et al. (2016) (see the source document for the references associated with the citations in this excerpt): "Becker County, Minnesota, considered reverting County Road 118 to gravel in 2011. The asphalt was more than 30 years old and badly deteriorated, with numerous potholes presenting what the county considered a safety concern. With an ADT [average daily traffic] of less than 200 vehicles, County Road 118 was not a priority for rehabilitation, and the County did not have the $300,000 required for full-depth reclamation and resurfacing (Bowe 2011). In the summer of 2014, the asphalt surface of County Road 118 was reclaimed, and a calcium chloride surface treatment was used for dust control (Becker County Highway Department 2014)."

3.1.2.2 Big Stone County, MN

This planned conversion is on a 1.5 mile paved "road to nowhere" in the NW corner of Big Stone County. The county plans to let the road deteriorate, or passively convert to unpaved, until it reaches a condition

that impacts safe driving. At this point it will be converted to an unpaved road. County staff estimate that it will take about five more years before the conversion takes place. The road provides access to five farms. The road continues north into Traverse County, where it is an unpaved road. The ADT is low with most vehicles servicing the farms. Example photos of the road geometry and condition of the pavement are provided in Figure 3.2.

Figure 3.2 Road segment in Big Stone County.

Contact: Todd Larson, toddlarson@co.stevens.mn.us

3.1.2.3 Clearwater County, MN

The summary of this unpaving project was taken from Fay et al. (2016): "In Clearwater County, Minnesota, one mile of asphalt concrete in poor condition was converted to an unpaved road. The road was originally a narrow gravel road that was paved with a bituminous surfacing for dust control while it was being used as a detour for an adjacent project. The pavement was under-designed, but still lasted 10 years. Eventually the road became unserviceable. The county had planned to put another overlay on the road, but it would have made the already narrow road even narrower and therefore a safety concern. For this reason, the road was converted to unpaved. New gravel was hauled and spread onto the existing surface to supplement existing materials, after which a recycler was used to mix the new and existing materials to form a new unpaved wearing course. The road was converted five or more years ago (prior to 2010) and has an ADT of between 51 and 100 vehicles. At this time the road is performing well, but public reaction to the road conversion has been negative, and there has been pressure to repave the road."

3.1.2.4 Cook County, MN

Cook County converted a segment of a previously paved roadway to a gravel road in 2018.

Contact: Krysten Foster, Krysten.Foster@co.lake.mn.us

3.1.2.5 Dodge County, MN

Three miles of County Road K are being passively unpaved. The road segment starts at TH 56 (43.935735, -92.859017) and ends at CSAH 9 (43.935670, -92.799090). The road was originally paved with a thin surface in 1973, with a thin overlay placed in 1990. The road has an ADT of 110 with minimal trucks and runs parallel to a paved State Aid road one mile to the south.

The road is too narrow to reclaim and pave because raising the road profile would create a total road driving surface width of less than 22 feet. Considering its low traffic count and proximity to a parallel route, reconstruction cannot be justified. Using this information, attempts have been made to secure a County Board decision to mill off the surface and return the road to gravel. Until recently, the Board had made the decision to maintain it. To meet this requirement, the County has filled isolated potholes, but when larger areas require patching, the existing bituminous material is removed and a "gravel ahead" sign is erected to notify drivers. Following this procedure, it is estimated that the road will have passively converted to 100 percent unpaved in about five years. With recent Board "buy in" for the concept of unpaving, the County is currently requesting bids to mill the asphalt off and then place 4 in of new aggregate to form an unpaved wearing course.

The following photos were provided showing the road condition during the passive unpaving process (Figure 3.3).

Figure 3.3. Road segment in Dodge County.

Contact: Guy Kohlnhofer, guy.kohlnhofer@co.dodge.mn.us

3.1.2.6 Freeborn County, MN

Fay et al. (2016) identified an unpaving project in this county, but no additional information was provided.

Contact: Sue Miller, sue.miller@co.freeborn.mn.us 507-377-5188

3.1.2.7 Jackson County, MN

Fay et al. (2016) identified an unpaving project in this county, but no additional information was provided.

Contact: Tim Stahl, tim.stahl@co.jackson.mn.us

3.1.2.8 Kittson County, MN

Unpaving has occurred in two locations along the old trunk highway turnback roads. Each location had about 0.5 miles of asphalt concrete that was in very poor condition with numerous potholes. Because these locations were on local county roads and not State Aid County roads, the decision was made to unpave them for easier and less costly maintenance now and in the future. The cost to reclaim was less than a bituminous overlay. For example, the cost to reclaim CR 55 was $4,000.

Contact: Kelly Bengtson, kbengtson@co.kittson.mn.us

3.1.2.9 Lincoln County, MN

A three-mile section of CR 134 was unpaved following data collection and consideration of many options summarized below.

In 1974, the road was first graded and made into a gravel road surface. In 1977, ammonium lignin sulfonate (by-product from the wood pulping process) was applied for dust control and soil stabilization. In the early 1980's a 4 in-thick asphalt concrete surface was placed on the road. The current road structure consists of 3.5 in. of base course, 4 in. of asphalt concrete, with 12 ft-wide paved driving lanes and 2.0 to 2.5 ft-wide shoulders. By contrast, a typical road design for the traffic that this road carries would consist of 12 in. of base course surfaced with 4 in. of asphalt concrete, with 12 ft-wide driving lanes and 5 ft shoulders. Therefore, it is evident that CR 134 is under designed.

The road was never designed or built to handle the heavier agricultural loads seen today. The road is currently posted at 5-ton per axle all year. A semi-truck that is legally loaded at 80,000 lbs on other non-posted roads would be approximately 30,000 lbs overweight on CR 134. The ADT ranged from a high of 55 in 1993 to a low of 20 in 2008.

From 2008-2012, the County spent an average of $174,000 per year on bituminous surface maintenance on various roads. This includes patching and crack filling. This number does not include items like shouldering, seal coats, or overlays.

It took a while to convince the County Board and the public that unpaving was the best option for this road, but the County had to wait until the road was in need of major work and patches were no longer going to be a feasible option before unpaving could commence.

The following options for CR 134 were proposed. The first three options were brought to the County Board. Options 4, 5 and 6 were developed by the board and from public comment following a public meeting to discuss the issue.

Option 1 – Continue patching

Budget restraints had limited the amount the County could spend on patching CR 134 over the last 5 years. This resulted in an exponential increase in the number of potholes that formed with 51 areas in need of a patch at an estimated cost of $47,400 on CR 134. The County still anticipated at least 15-20 locations per year requiring patching in the future.

Concerns: The County would still need to patch each year. This option would not solve the base thickness problem. The road would still need to be posted at 5 ton per axle all year. Concerns existed for plow trucks either having a blowout or catching a patch, causing damage to the truck and injuring the driver. CR 134 would eventually need to switch to a blade route for snow removal.

Option 2 – Thin overlay

Place either a 1.25 in. or a 1.5 in. asphalt concrete overlay. Cost estimates for this option were $190,000 to $210,000 if it had been added to the 2013 paving project list, increasing to $250,000 to $270,000 if the project was completed in future years.

Concerns: This was considered to be a short-term fix, with patching being required again within a few years. It would also not solve the base thickness issue and the road would still need to be posted at 5 ton per axle all year.

Option 3 – Mill and revert to gravel

Mill the surface and revert to a gravel road. A typical gravel road in this county has 3 in. or less of surface aggregate. After conversion, CR 134 would have a 7.5 in.-thick wearing course consisting of a recycled asphalt pavement/aggregate base blend. The road would only need to be posted at 5 ton per axle during spring load restrictions. The estimated cost would be $32,000 to $36,000 to complete work.

Concerns: The county will have to maintain the gravel surface.

Option 4 – Full depth reclamation / thin pavement

Full-depth reclamation of the existing pavement with an appropriate stabilizer. The prepared base would be surfaced with 2 in. of asphalt concrete. This would partially address failing base locations. The estimated cost would be $420,000.

Concerns: The base thickness would be thinner than typical (7.5 in. instead on 12 in.), resulting in the continued need for a load limit posting of 5 ton per axle all year. With the new surface, the public may not abide by these limits. The road would need a future overlay.

Option 5 – Reconstruct the road

Grade the road to current standards. Obtain a minimum 50 ft right-of-way for the entire road. This would address failing base locations. Estimated cost of $1,500,000.
Concerns: The County may not be able to obtain easements from landowners. Additional costs for utility relocation expenses are possible.

Option 6 – Leave as is / do not patch
Some [community members] have mentioned they would rather deal with the potholes than have a gravel surface. This would cost the least for now.
Concerns: The road would continue to deteriorate and this option does not solve the base thickness problem. The road would continue to be posted at 5 ton per axle all year. The County would eventually switch to a blade route for snow removal. The road would be a safety hazard to the traveling public.

Additional information about CR 134 that was used in the decision-making process was the existence of a transmission line that did not require the utility to repair the road to the same condition. Also, funding for the road could come from the County Tax levy from property taxes, but not from the State Aid gas tax funds. In 2017, the County put out a bid for unpaving the 3 miles of CR 134. The bids ranged from $14,500 to $20,950.

Figure 3.4 provides examples of how the paved road was failing (top photos) and an example paved road (bottom photo left) and an example gravel road in the county (bottom photo right).

3.1.2.10 Mahnomen County, MN

The summary of this unpaving project was taken from Fay et al. (2016) (please see the source document for the references associated with the citations in this excerpt): "Mahnomen County, Minnesota, converted two stretches of road to gravel in 2011: County State Aid Highway (CSAH) 15 and CSAH 1. CSAH 15 was originally paved in 1978 from revenue share dollars. It had an ADT of 122 vehicles; it also had a commissioner living along it at the time it was paved and was considered as an island of pavement surrounded by gravel roads. By 2011, the ADT was 115 vehicles, and the pavement surface had deteriorated significantly. About two miles of the existing road was pulverized, after which a new wearing course was placed and treated calcium chloride (Mahnomen County 2011; MCEA Members Forum 2011)."

Figure 3.4. CR 134 in Lincoln County.

Contact: Joe Wilson, jwilson@co.lincoln.mn.us

"The CSAH-1 section was 2.4 miles long and had an asphalt concrete surface in poor condition. The ADT was between 100 and 150 vehicles. The road was converted to an unpaved road sometime between 2010 and 2013. Supplemental gravel was spread on the road surface and mixed with the existing materials using a reclaimer. A surface stabilizer was incorporated into part of the new layer. The road was converted because of high maintenance costs, and the decision to convert was based on a cost analysis. Documents used in the conversion process by Mahnomen County included the State Aid rules for operation changes (State Aid Operation 8820). At this time the road is performing well and has saved the county money. Outreach efforts included a public hearing at a County Board meeting, which was deemed successful. Additionally, when the road conversion was approved, the county notified affected users. The county felt they were able to present factual information to the public; however, some local residents were unhappy and felt they were getting unfair treatment. There has been no pressure to repave."

3.1.2.11 Stearns County, MN

Stearns County had a half-mile segment of road with badly deteriorated pavement. The road has an ADT of 150 with a mix of cars and farm equipment/trucks. This road should probably not be part of the county road system and the County is in the process of investigating passing ownership to the township. About four years ago the pavement condition had deteriorated to a point that there were concerns that snowplows would plow off chunks of asphalt. Consequently, the County converted the road to an unpaved surface. A reclaimer was used to pulverize the asphalt and blend it with the underlying aggregate base to achieve the specified 50/50 blend, resulting in a 7 in.-thick unpaved wearing course. Calcium chloride was sprayed onto the surface for dust control.

The two residents along the road were not happy after the reclamation process, primarily because of dust. The relatively new commissioner had concerns as well, and so the county decided it should not give the road to the township with the complaints that would accompany the revocation [re: unpaving]. The following spring the road was double chip sealed to eliminate the dust issue at a cost of $15,000 (2015), and the County received a thank-you note. The new surface has held up to the farm traffic thus far and the county is now looking into handing the road over to the township.

Contact: Jodi L. Teich, jodi.teich@co.stearns.mn.us

3.1.2.12 St. Louis County, MN

The summary of this unpaving project was taken from Fay et al. (2016) (please see the source document for the references associated with the citations in this excerpt): “In St. Louis County, a number of roadways have been converted to gravel in recent years. Most of these roads had been paved for political reasons when the county had available funding. However, this was often undertaken with no base improvements, causing maintenance issues as the road surfaces aged. The county did not have money for other rehabilitation options and informed the area commissioner and residents of their plans to convert the roads. Results of the road conversions have been successful, with one road located south of Buhl now safer and able to handle higher vehicle speeds since being converted (MCEA Members Forum 2011).”

CHAPTER 4: CONCLUSIONS, RECOMMENDATIONS AND FUTURE RESEARCH

The following conclusions, recommendations, and future research ideas identified during the study and through the development of the guide are provided below.

- Limited information on the cost of unpaving projects is available, and thus it is suggested that agencies track these costs. The cost information will aid the decision-making process of whether unpaving is a feasible option. Publication of a summary report of unpaving costs is suggested.
- Limited safety data is required to be collected on low-volume rural roads and unpaved roads. At this time, the Federal Highway Administration (FHWA) only requires the Five Fundamental Data Elements (FDEs) of safety data to be collected on unpaved roads. The collection of additional FDEs has been under consideration. A research problem statement was submitted for the Fiscal Year 2020 National Cooperative Highway Research Program (NCHRP) that called for projects to identify additional FDEs that are appropriate, achievable, and implementation-ready for unpaved roads. The research problem statement was not selected for funding, thus it is recommended that additional funding sources be pursued to support this effort. The developed research problem statement is attached in Appendix A: Safety data research problem statement

- **Safety Data Research Problem Statement**.
- Consideration of light pavement surfacing options such as chip seals and Otta seals to extend the life of the road surface and provide users with a road that has a sealed surface is recommended.
- Formal evaluation of the implementation of the guide on selected conversion projects in coming years is also recommended. Observations from these evaluations should be used to revise and/or update the guide where appropriate.

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APPENDIX A: SAFETY DATA RESEARCH PROBLEM STATEMENT

Safety Data Research Problem Statement

The following research needs statement (RNS) was developed as a part of the Rural Transportation Issues: Research Roadmap, NCHRP 20-122, Appendix E (in review).

Research Problem Statement

Newer federal regulations (beginning with The Moving Ahead for Progress in the 21st Century (MAP-21) and continuing with the Fixing America's Surface Transportation (FAST) Act) strongly supported the view that quality data for all public roads provides the foundation for making important decisions regarding the design, operation, and safety of roadways. The federal regulations required that states must have safety data (e.g., roadway, traffic, and crash) systems with the ability to perform safety problem identification and countermeasure analysis. The Model Inventory of Roadway Elements (MIRE) establishes a basic data set that can be used in GIS-based analysis of roadway characteristics and safety. Roadway and Safety data consistent with MIRE recommendations is critical for agencies of all sizes. These consistent data sets are needed to aid agencies in developing safety performance measures and making sound safety investments to reduce fatal and injury crashes.

Subsequent regulations required states to adopt and use a subset of the MIRE data (known as Fundamental Data Elements or FDE) in the safety data systems. As there are 37 FDE and collecting all of this information for every roadway would be a challenge for states, a tiered system was created. Therefore, 37 FDE are required for non-local paved roads, 9 FDE are required for paved local roads, and 5 FDE are required for unpaved roads.

The 5 FDE that are required only describe the ownership, functional class, beginning, and end points of the unpaved roadway. While the requirements were put in place intentionally to not overburden states and due to the local agency barriers for data collection, they do not provide enough data to perform safety problem identification and countermeasure analysis, to showcase the safety difference between paved and unpaved roads, nor to identify national trends.

Safety data analysis is needed as unpaved roadways account for almost 35% of U.S. roads and are owned and maintained by multiple agencies (including local, Tribal, and Federal Lands). Unpaved roads accounted for 546 fatal crashes in 2016 with 93% of these fatal crashes being single-vehicle crashes (Rosemarie Anderson). Safety concerns with unpaved roads include, but are not limited to: no shoulders, narrow lanes, sharp curves, limited sight distance, roadside obstacles, minimal signing and delineation. At times, safety or safety issues on unpaved roads are caused by things that are not common on paved roads, such as road surface condition and road dust.

Therefore, research is needed to identify additional FDE that are appropriate, achievable, and implementation-ready for unpaved roads. These FDE could be provided as suggested additional data collection elements to local agencies.

Research Objective

The objectives of this research are to:

- Identify the necessary FDE for analyzing safety data on unpaved roads
- Explore and document the barriers for local, Tribal and Federal Lands agencies for collecting, maintaining, and sharing this data with state DOTs.
- Create guidance and training for local, Tribal, and Federal lands for collecting the unpaved road data
- Conduct a pilot data collection

Urgency, Payoff Potential, and Implementation

The anticipated product for this research is appropriate, achievable, implementation-ready, MIRE Fundamental Data Elements used for unpaved roads. These suggested additional FDE can be included in the next version of MIRE or as a supplement to the current MIRE version 2.0.

The research project would provide local and Tribal transportation agencies, and Federal Lands agencies with a guide for consistent data sets to help develop safety performance measures and prioritize safety investments to reduce fatal and injury crashes.

Persons Developing the Problem

Anthony R. Giancola and Jaime Sullivan with the support of the TRB Subcommittee on Rural Road Safety Policy, Programming and Implementation