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INDIANA LTAP
LOCAL ROAD & BRIDGE REPORT

TECHNICAL REPORT

2024

Indiana Local Road and Bridge Report

August 2024

Indiana Local Road and Bridge Report, 2024

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By

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Executive Summary

In 2016, the *House Enrolled Act 1001* (HEA 1001) established a local road and bridge matching grant fund known as *the Community Crossings Matching Grant Fund*. The application process for this grant program requires local government agencies to submit asset management plans for their road network and bridge inventory.

In 2021, the *House Enrolled Act 1576* (HEA 1576) required local unit asset management plans to be available in electronic format and accessible on the internet by July 1, 2022. To comply with this law, the Indiana Department of Transportation (INDOT) contracted with the Indiana Local Technical Assistance Program (LTAP) at Purdue University to collect, house, and make available this information. To access this publicly available information, visit the Indiana LTAP Local Road and Bridge Dashboard website (www.purdue.edu/inltap).

Indiana LTAP asset management data represents 99% of the existing local road inventory and 100% of the existing local bridge network.

The asset management plans submitted to Indiana LTAP by local units of government include road and bridge condition data along with various preservation and rehabilitation treatments and corresponding unit costs. Each year, Indiana LTAP provides a "snapshot" of the current condition of Indiana local agency roads and bridges along with historical trends of condition level changes over time.

From 2016 to 2023, Indiana LTAP has received one or more asset management plans from 92 counties, 120 cities, and 392 towns, representing 100% of county data, 100% of city data, and 88% of town data. This data is used to evaluate historical trends of local road and bridge conditions level changes and represents 99% of the existing local road inventory in Indiana and 100% of the existing local bridge network as defined by the Federal Highway Administration (FHWA).

The current condition of the local road and bridge network is derived from local agency asset management plans submitted to Indiana LTAP in 2023, representing 100% of counties, 98% of cities, and 70% of town agencies. Overall, this data represents 99% of the existing local road network and 100% of the existing local bridge network.

Findings

A summary of the current conditions of local agency road and bridge assets highlights changes in condition ratings over time and estimates the funding level required to preserve the local agency network conditions over a ten-year period. Additional funding requirements are estimated to demonstrate the dedicated infrastructure funding needed to increase the level of service of local agency assets over time. A ten-year horizon was selected to provide consistency among previous LTAP studies and publications and is also consistent with INDOT modeling horizons.

Snapshot (based on data from 2023 local agency asset management plans)

- **City and Town Roads**
  - 28% in good condition, 41% in fair condition, and 31% in poor condition
    - 7% of city and town roads are failed roads
- **County Roads**
  - 28% in good condition, 46% in fair condition, and 27% in poor condition
    - 7% of county roads are failed roads
- **Bridges**
  - 40% in good condition, 55% in fair condition, and 5% in poor condition

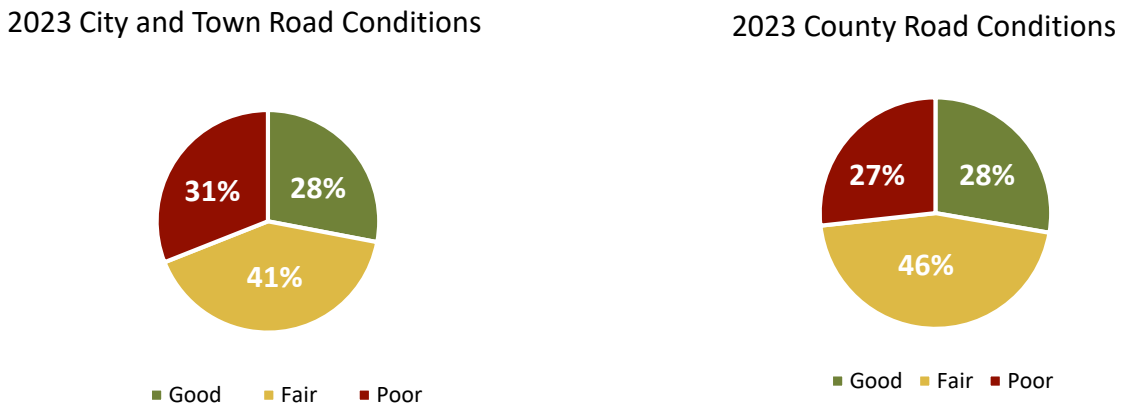

Figure A: Local Road Conditions in 2023

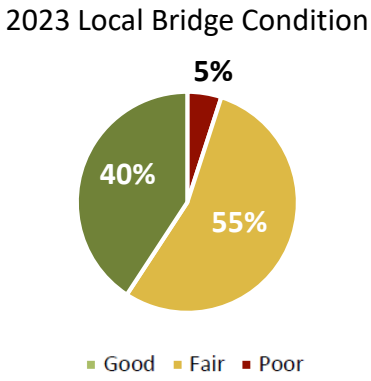

Figure B: Local Bridge Condition in 2023

Trends (based on data from 2016 - 2023 local agency asset management plans)

- City and Town Roads
  - **Good** roads have **increased** by 12%
  - **Fair** roads have **decreased** by 17%
  - ***Poor*** *roads have* ***increased*** *by 5%*
- County Roads
  - **Good** roads have **increased** by 17%
  - **Fair** roads have stayed **the same**
  - **Poor** roads have **decreased** by 13%
- Bridges
  - **Good** bridges have **decreased** by 1.5%
  - **Fair** bridges have **increased** by 4%
  - **Poor** bridges have **decreased** by 2%

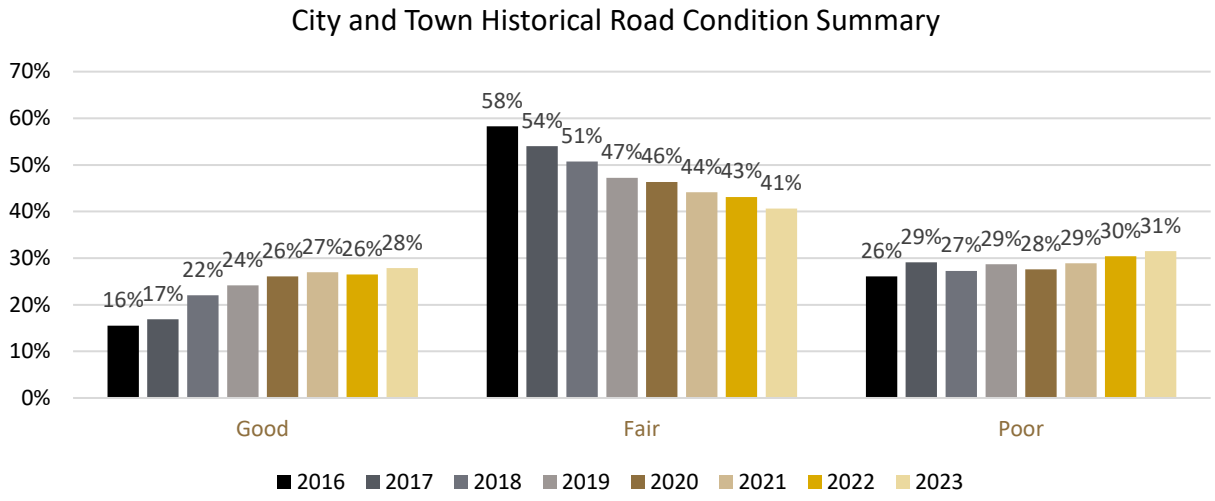

Figure C: City and Town Historical Road Condition Ratings

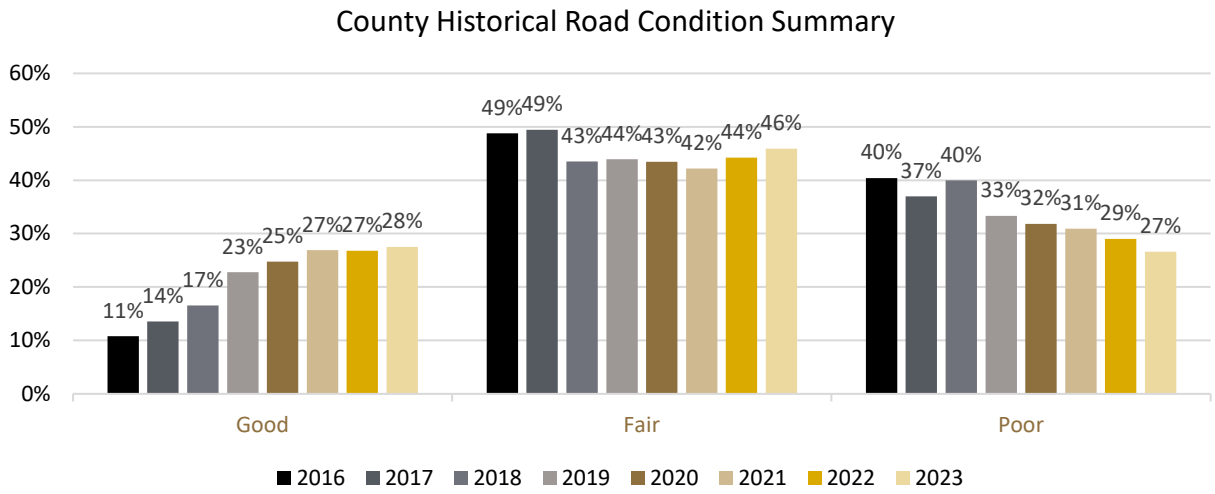

Figure D: County Historical Road Condition Ratings

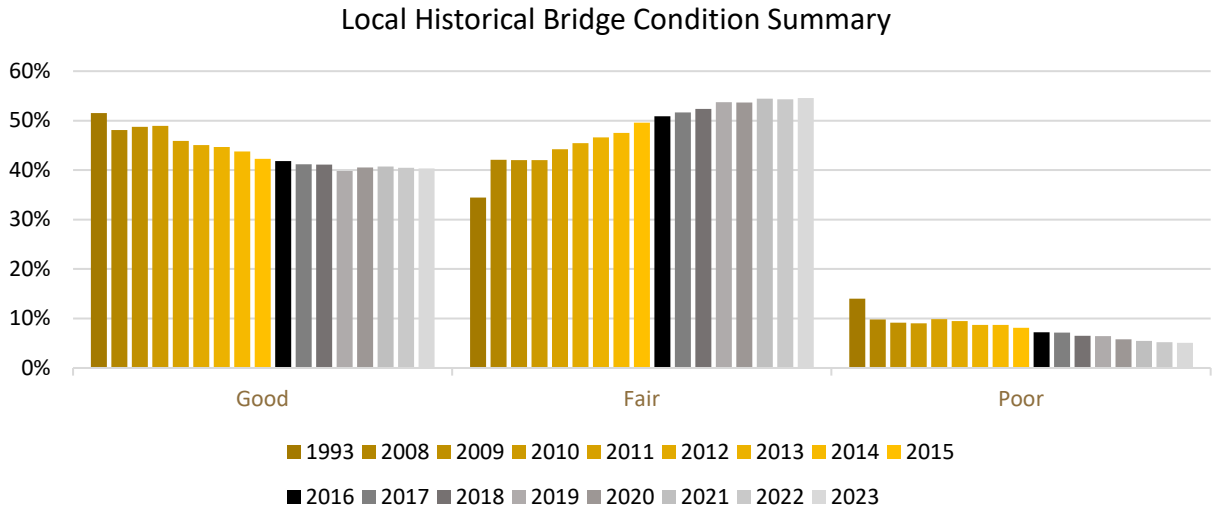

Figure E: Historical Trends in Local County Bridge Conditions

Estimated Dedicated Local Funding Need

Dedicated street and highway department funding for use on the local transportation network includes a variety of funding accounts including the Motor Vehicle Highway (MVH) Account, the Local Road and Street (LRS) Account, the Community Crossings Matching Grand Fund (CCMG), the Cumulative Bridge Fund, and the Local Option Highway User Tax (LOHUT) which includes both the local wheel tax and excise surtax.

Roads

Using the current conditions of local agency paved roads, along with average unit costs for preservation, rehabilitation, and reconstruction, Indiana LTAP estimated the investment levels necessary to *preserve network conditions*, *improve network conditions*, and *eliminate all poor and failed roads* on the local paved road network over a ten-year period. The estimated funding levels are derived from a network analysis that focuses on three main asset management objectives of adding years of life to the network, reducing the percentage of poor roads, and strategically addressing failed roads. Costs included in this analysis represent ***construction costs only*** for the ***existing local transportation network***. No design engineering, right-of-way acquisition, utility relocation, permitting, construction inspection, or other ancillary costs are included. Additionally, added capacity projects and new corridor investments are not included. Table A outlines the need from a city/town perspective, county perspective, and collective local transportation network perspective. It is important to note that 18% of the county road network consists of unpaved roads. These assets require routine maintenance to preserve the condition of the facility at a cost of $3,000 per mile. With over 11,600 centerline miles of unpaved roads in the local network, it is estimated that approximately $35M per year over the next ten years is needed to support these unpaved facilities. This cost is included in the county portion of road investment in Table A.

To preserve the existing local road network, an annual investment of $1.26B is required over the next ten years.

To improve the local road network, an investment of $2.04B to $2.69B is estimated annually for the next ten years.

Table A: Annual Local Road Investment Need Over 10-Years

	Annual Local Road Investment Need over 10-Years		
Investment Levels	**City/Town**	**County**	**Total**
Preserve Network Conditions	$ 625,000,000	$ 635,000,000	**$ 1,260,000,000**
Improve Network Conditions	$ 900,000,000	$ 1,135,000,000	**$ 2,035,000,000**
Eliminate Poor & Failed Roads	$ 1,150,000,000	$ 1,535,000,000	**$ 2,685,000,000**

Bridges

The estimated bridge funding level represents the annual cost to replace, rehabilitate, and preserve existing bridge structures on the local agency network. A network strategy was utilized to estimate these costs which is consistent with INDOT's bridge asset management program. Costs included in this analysis represent ***construction costs only*** for bridges that are ***20 feet or greater in span length***. These figures do not include any small structure (<20 ft span) costs, design fees, construction inspection costs, right-of-way easement or procurement costs. An annualized cost using a 2.5% inflation factor was estimated with Table B showing the investment need for each bridge treatment type.

The annual investment required for the local bridge network over the next 10 years is $580M per year.

Table B: Annual Local Bridge Investment Need per Treatment Type Over 10-Years

Replacement	$ 522,200,000
Rehabilitation	$ 43,300,000
Preservation	$ 14,300,000
Total Annual Bridge Need	**$ 579,800,000**

Gap in Local Road and Bridge Infrastructure Investment

The estimated gap in road and bridge funding for the local transportation network is obtained by utilizing the estimated funding needs for roads and bridges at varying levels of investment and comparing those investment requirements to the existing revenue amounts as reported for local fiscal year 2023. The Annual Operations Report for Highway and Street Departments, submitted to the Indiana State Board of Accounts, report that local agencies across Indiana received approximately $853M in dedicated road and bridge funding from January 1, 2023, through December 31, 2023. This dedicated funding amount represents receipts collected in the MVH restricted fund (MVH-R), LRS fund, CCMG fund, local wheel tax and excise surtax fund, and cumulative bridge fund. Table C below highlights the gap in funding at each infrastructure investment level.

To preserve and improve the local transportation network, additional funding of $987M to $2.41B per year over the next ten years is required.

Table C: Annual Local Funding Required for Construction, Reconstruction, & Preservation Over a Ten-Year Period

Annual Local Funding Required for Construction, Reconstruction, & Preservation over a Ten-Year Period					
Investment Levels	**Local Road Need**	**Local Bridge Need**	**Total Local Network Need**	**Available Dedicated Funding***	**Funding Gap**
Preserve Network Conditions	$ 1,260,000,000	$ 579,800,000	**$ 1,839,800,000**	$ 853,217,940	**$ (986,582,060)**
Improve Network Conditions	$ 2,035,000,000	$ 579,800,000	**$ 2,614,800,000**	$ 853,217,940	**$ (1,761,582,060)**
Eliminate Poor & Failed Roads	$ 2,685,000,000	$ 579,800,000	**$ 3,264,800,000**	$ 853,217,940	**$ (2,411,582,060)**

**Available dedicated funding includes MVH-R, LRS, CCMG, local wheel tax/excise surtax, and cumulative bridge. MVH Unrestricted is not included due to other street and highway department responsibilities.*

Introduction

In the 2016 legislative session, *House Enrolled Act 1001* (HEA 1001) established the local road and bridge matching grant fund, commonly referred to as the Community Crossings Matching Grant (CCMG) Program. This program, administered by the Indiana Department of Transportation (INDOT) and funded by revenues generated through electric vehicle registration fees, hybrid vehicle registration fees, a statewide transportation improvement registration fee, and a percentage of the gas use tax, provides local agencies the opportunity to apply for road and bridge funding assistance to construct, reconstruct, and preserve local transportation facilities. The maximum grant amount a local unit of government can receive in a calendar year is determined by INDOT and is currently set at $1 million (although there is a pilot program for calendar year 2024 that raised the cap to $1.5 million). To be eligible to apply for CCMG funds, the local unit of government must have an INDOT approved pavement asset management plan (PAMP) and/or bridge asset management plan (BAM) as well as a commitment to provide local matching funds as prescribed by law (50% match for larger communities; 25% for smaller communities, IC 8-23-30-6). Indiana LTAP aids local agencies to meet the PAMP and BAM requirements through asset management training, asset condition rating training, plan development assistance, and review of submitted PAMPs and BAMs on behalf of the state.

In 2023, there were 522 PAMPs submitted which represents 100% of counties, 98% of cities, and 70% of town agencies. Overall, the local assets reported in 2023 account for 99% of the local road network. These plans contain the data on which the current state of the local agency road network condition is based. The current state of local agency bridge structure condition is based on data contained in the National Bridge Inventory (NBI) database maintained by the Federal Highway Administration (FHWA), which is also used to prepare local agency BAMs. This report describes these conditions and provides a range of investments levels necessary to support the preservation, rehabilitation, and reconstruction of these local transportation assets over a ten-year period.

Asset Management

Asset management systems have been used by transportation agencies in the United States since the 1970s to manage and maintain safe, durable, and cost-effective transportation networks. The adoption of such systems has been shown to save money and increase asset condition (Vasquez 2011 and Zavitski et al. 2006).

The American Association of State Highway and Transportation Officials (AASHTO) defines asset management as "a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well-defined objectives" (AASHTO, 2006).

While many definitions of asset management exist with variations in scope and wording, the primary focus of asset management is on strategically maintaining and improving assets at a high-performance level. Even though asset management is not a new concept, adopting an asset management approach often requires a shift from traditional management approaches that typically focus on improving the worst assets first, to a strategically balanced maintenance and rehabilitation approach that simultaneously optimizes asset conditions and expenditures.

Key Principles

Successful asset management systems are founded on key principles upon which performance standards and resource allocations are based. These principles include making decisions based on policies, performance measures, quality information, options and tradeoffs, and results. Doing so creates a proactive rather than reactive approach to asset management. These key asset management principles are defined as (NCHRP, 2006):

Policy Based: Policy based decisions account for specific economic, community, and environmental goals and objectives that reflect desired system conditions such as level of service and safety.

Performance Based: Objectives are translated into measurable performance criteria for regular and strategic use in managing decisions.

Quality Information Based: Options are evaluated using current, credible data that is assessed, analyzed, tracked, and interpreted using appropriate decision support tools.

Options and Tradeoffs Based: Options are analyzed comparatively with a long-term perspective to determine how the allocation of resources across different assets, programs, and years affect the achievement of policy objectives. This approach typically focuses on pavement preservation rather than pavement reconstruction.

Key Components

Transportation asset management systems range in complexity according to need and resources, but focus on applying the correct treatment at the appropriate time to the right asset. In pavement management this is commonly referred to as the "right treatment, right time, right road" philosophy. Asset management systems incorporate such components as goals and objectives, asset inventory, asset valuation, collection and management of asset condition data, performance prediction models, preservation and treatment costs, and economic evaluation strategies for prioritization (Farashah and Tighe, 2014).

Asset management aids in selecting the right treatment at the right time for the right asset.

Benefits

Implementing asset management systems with appropriate components in the context of key principles can provide great benefits to agencies, officials, and users. The main benefit, which is often the primary motivation for implementing asset management systems, is improved asset performance over time. Other benefits include (NCHRP, 2006):

- Improvement of an agency's performance and practices;
- Coordinated activities across different assets (pavement, bridges, signs, culverts, etc.);
- Lower long-term maintenance costs;
- Detailed histories of condition data that provide custom performance prediction models;
- Increased average asset condition across networks;
- Higher levels of service and enhanced safety provided to users;
- Improved communication with managers, elected officials, and the public;
- Increased credibility of and accountability for resource allocation decisions.

Implementation Challenges

While agencies of all sizes can benefit from using asset management plans, implementation is often difficult for smaller agencies due to the expense and workforce required to collect and manage asset condition data; asset management is difficult to financially support when agencies are already hard pressed for sufficient funding to keep up with simply patching potholes (Cambridge Systems Inc., 2005). Some agencies struggle with the concept of spending funds on roads in fair or good condition when they have a substantial number of roads in poor condition. Additionally, many local government operations fall victim to the "squeaky wheel gets the grease" approach to public administration and management, thus addressing the worst roads first. Due to the difficulty of this transition, there has historically been little support for local agencies wanting to implement more advanced asset management systems. To ensure the many benefits associated with implementing asset management principles are not left unclaimed, Indiana LTAP has developed a local agency asset management program to aid in these implementation challenges.

Local Agency Asset Management

Indiana's local road network serves as a vital lifeline by connecting communities, facilitating growth, and enabling the movement of people and goods across the state. As population grows, industries expand, and travel patterns evolve, the demand on the local road network rises. This increase emphasizes the importance of conducting comprehensive transportation planning and programming to ensure safe, efficient, and accessible travel along Indiana's local network.

Indiana has 92 counties, 120 cities, and 447 towns. These local agencies are responsible for the maintenance, upkeep, and safety of 85,954 centerline miles of road as certified by INDOT and 13,173 bridge structures per the NBI which accounts for approximately 89% of all Indiana centerline miles and 70% of all Indiana bridges. The centerline miles included in this report are based on the PASER rated roads submitted to Indiana LTAP in 2023.

Local Agencies are responsible for 89% of all Indiana centerline miles and 70% of all Indiana bridges.

Plan Requirements

To assist with the implementation challenges of asset management and encourage the adoption and utilization of asset management principles and components, Indiana LTAP collaborated with a committee of local public agency, INDOT, and FHWA officials to identify the appropriate components of a local agency asset management plan. The goal of the committee was to set the PAMP requirements so that any city, town, or county agency could complete an approved asset management plan, regardless of the size or technological capabilities of that agency. These requirements were adopted as the minimum standards for local agency asset management with the intention that agencies could further build upon these standards to suit the needs of their respective communities. The requirements identified by the committee include:

1) **Objective and Measures:** This identifies and describes the local agency performance measures, expected level of service, desired level of service, and other related management items as identified by the local agency to describe their PAMP practices and reporting procedures.
2) **Inventory and Condition Ratings:** This includes a complete inventory of assets and condition rating of each road segment including specific road characteristics such as length, width, surface type, functional classification, and number of travel lanes.
3) **5-year plan:** This describes a local agency's network level pavement treatment strategy for the next 5 years that will assist with achieving the identified performance goals and targeted levels of service for the specific local transportation network.

Tables D and E provide a sample local agency pavement asset inventory and 5-year treatment plan, respectively.

Table D: Example Inventory and Condition Data Table

Route ID	Designation	Roadway	From	To	Length In Miles	Width In Feet	# Lanes	Surface Type	Functional Classification	Rating System	Rating 1	Date Rated 1 (Newest)
53408030000000000	484	Jackson St.	Lindsay St.	Leeds St.	0.06	30	2	Asphalt	Local	PASER	4	5/17/2022
53408030000000000	485	Webster St.	Fischer St.	Gerhart St.	0.14	30	2	Asphalt	Local	PASER	3	6/5/2022
53408030000000000	486	Fischer St.	Webster St.	Armstrong St.	0.06	30	2	Asphalt	Local	PASER	7	6/5/2022
53408030000000000	487	Fischer St.	Armstrong St.	Washington St.	0.06	30	2	Asphalt	Local	PASER	4	6/5/2022
53408030000000000	488	Fischer St.	Washington St.	Buckeye St.	0.06	30	2	Asphalt	Local	PASER	4	6/5/2022
53408030000000000	489	Fischer St.	Buckeye St.	Main St.	0.06	30	2	Asphalt	Local	PASER	5	6/5/2022
53408030000000000	490	Fischer St.	Main St.	Union St.	0.06	30	2	Asphalt	Local	PASER	5	6/5/2022
53408030000000000	491	Main St.	Fischer St.	Gerhart St.	0.14	30	2	Asphalt	Local	PASER	4	6/5/2022
53408030000000000	492	Gerhart St.	Buckeye St.	Main St.	0.06	30	2	Asphalt	Local	PASER	3	5/17/2022
53408030000000000	493	Buckeye St.	Fischer St.	Gerhart St.	0.14	30	2	Asphalt	Local	PASER	5	6/5/2022
53408030000000000	494	Washington St.	Fischer St.	Gerhart St.	0.13	48	4	Asphalt	Minor Arterial	PASER	4	6/4/2022
53408030000000000	495	Armstrong St.	Fischer St.	Gerhart St.	0.13	30	2	Asphalt	Local	PASER	5	6/5/2022
53408030000000000	496	Gerhart St.	Armstrong St.	Washington St.	0.06	30	2	Asphalt	Local	PASER	4	6/5/2022
53408030000000000	497	Gerhart St.	Washington St.	Buckeye St.	0.06	30	2	Asphalt	Local	PASER	3	5/17/2022

Table E: Example 5-Year Treatment Plan

Year	Rating	Treatment Used	Estimated Cost per Mile	Estimated Miles	Estimated Cost
2024	6-8	Crack Seal	7,500	20	150,000
2024	5-6	Mill and Overlay - 1.5"	250,000	10	2,500,000
2024	1-4	Reconstruction - Asphalt	1,000,000	6	6,000,000
2025	6-8	Crack Seal	7,500	30	225,000
2025	5-6	Mill and Overlay - 1.5"	250,000	10	2,500,000
2025	3-4	Full Depth Reclamation with Asphalt	750,000	6	4,500,000
2025	1-2	Reconstruction - Asphalt	1,000,000	6	6,000,000
2026	6-8	Crack Seal	7,500	30	225,000
2026	5-6	Chip Seal and Fog	30,000	30	900,000

Since 2016, the number of PAMPs submitted to Indiana LTAP has grown each year as illustrated in Figure F.

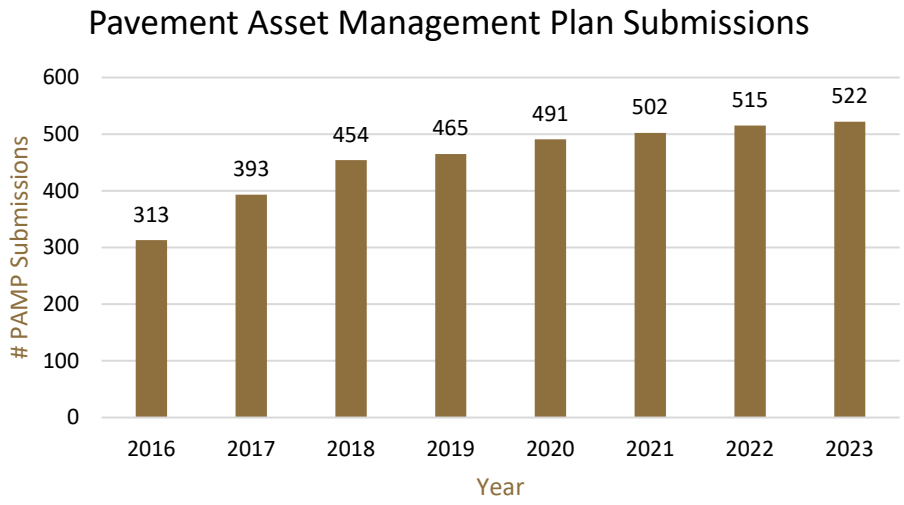

Figure F: Pavement Asset Management Plan Submissions (2016-2023)

The breakdown of PAMPs submitted for the 2023 calendar year with respect to agency and centerline miles is shown in Table F.

Table F: 2023 Pavement Asset Management Plan Breakdown by Agency Type and Centerline Miles

Local Agency Type	Total Number of Agencies	Number of Agencies Submitting Data	Centerline Road Miles Rated
Counties*	92	92	62,976.78
Cities	120	117	16,547.13
Towns	447	313	5,132.32
Total	**659**	**522**	**84,656.23**

**Marion County centerline road miles are included in the Cities centerline road miles rated*

Inventory Data

Centerline mile is a unit of measure of the length of a road facility. It represents the distance from Point A to Point B on a road corridor. Lane mile is a unit of measure that incorporates the length of a road facility and the lane count of that facility. Lane miles are calculated by multiplying the centerline mile (length) of a road by the number of lanes present along that length. For example, Point A to Point B may be one mile in total length with two lanes in each direction for a total of four travel lanes. The centerline mile measure for this facility is one mile while the lane mile measurement is four miles (1 mile x 4 lanes).

Selecting the appropriate surface type is critical when making asset management decisions since these types, ranging from asphalt to concrete to brick to unpaved, can significantly impact the quality and durability of the road segment while also impacting the ease and safety of travel as well as future maintenance requirements.

City and Town Road Inventory

City and town road infrastructure serve a multitude of purposes for a community. Various users of the facility may require specific considerations with a variety of surface types tailored to a specific need or usage demand. Asphalt is the most commonly used surface material due to its availability, durability, smoothness, and economic efficiency. Concrete is also used, especially in some residential, commercial, and industrial areas, where longevity and resistance to weathering is paramount. Occasionally, less traveled roads in more rural areas may use chip seal surfaces or leave the travel way as an unpaved surface due to its cost-effectiveness per use.

Additionally, some cities and towns in Indiana have special surface types such as brick in historic districts or areas with aesthetic considerations. These surfaces add character to the streetscape but may require additional maintenance or preservation activities due to their unique properties. Table G and Figure G represent surface types of 120 cities, 392 towns, and Marion County road data reported through the PAMPs submitted to LTAP from 2016 through 2023.

Table G: City and Town Road Miles by Surface Type

Surface Type	Centerline Miles	% Centerline Miles	Lane Miles	% Lane Miles
Asphalt	20,364.70	91.92%	43,494.22	91.17%
Concrete	1,088.70	4.91%	2,497.03	5.23%
Unpaved	73.87	0.33%	124.48	0.26%
Brick	38.30	0.17%	73.98	0.16%
Chip Seal	159.30	0.72%	321.26	0.67%
Composite	422.10	1.91%	1,182.60	2.48%
Unimproved	7.01	0.03%	12.55	0.03%
Total	**22,153.98**	**100.0%**	**47,706.12**	**100%**

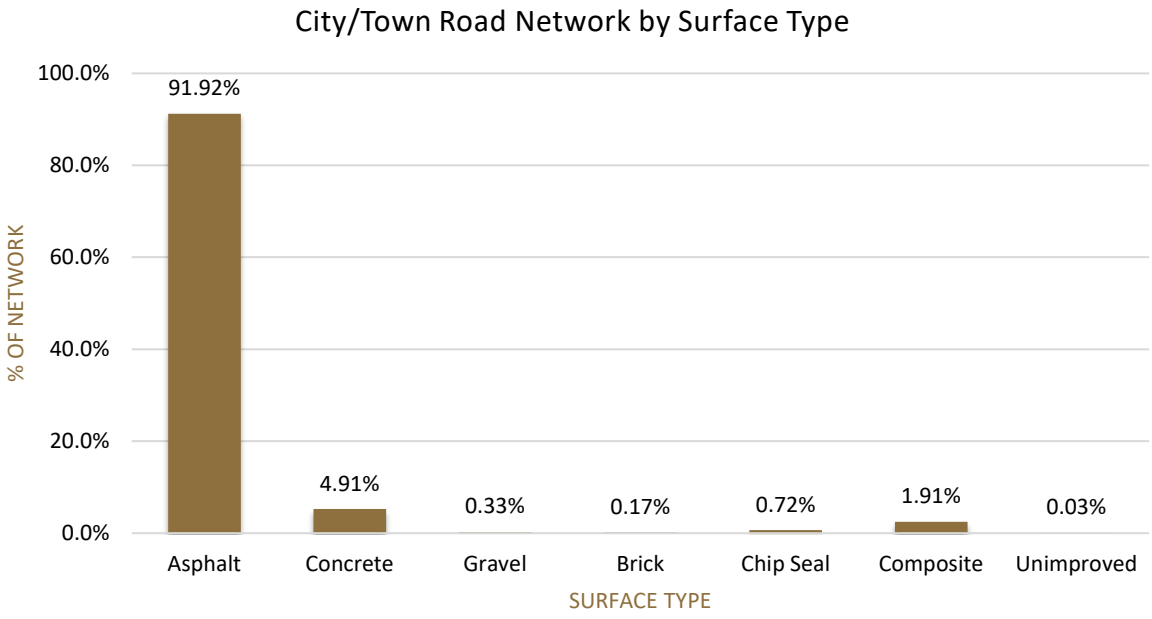

Figure G: City and Town Road Network by Surface Type

County Road Inventory

The county road network plays a pivotal role in the overall infrastructure network, serving as the backbone of transportation connections between communities. As counties strive to optimize local road network investments, a comprehensive understanding of the diverse surface types within the network becomes essential. Table H and Figure H represent surface types of 91 counties from the inventory data that have been submitted to Indiana LTAP from 2016 through 2023. Marion County data is included with the City of Indianapolis data due to its structure of governance.

Table H: County Road Miles by Surface Type (Marion County data included with Cities/Towns)

Surface Type	Centerline Miles	% Centerline Miles	Lane Miles	% Lane Miles
Asphalt	35,240.79	56.96%	70,580.20	56.29%
Concrete	336.63	0.53%	714.24	0.57%
Unpaved	11,040.12	17.53%	21,469.32	17.12%
Brick	0.92	0.00%	1.84	0.00%
Chip Seal	15,733.56	24.98%	31,379.58	25.03%
Composite	131.59	0.21%	269.66	0.22%
Unimproved	493.17	0.78%	970.36	0.77%
Total	**62,976.78**	**100%**	**125,385.20**	**100%**

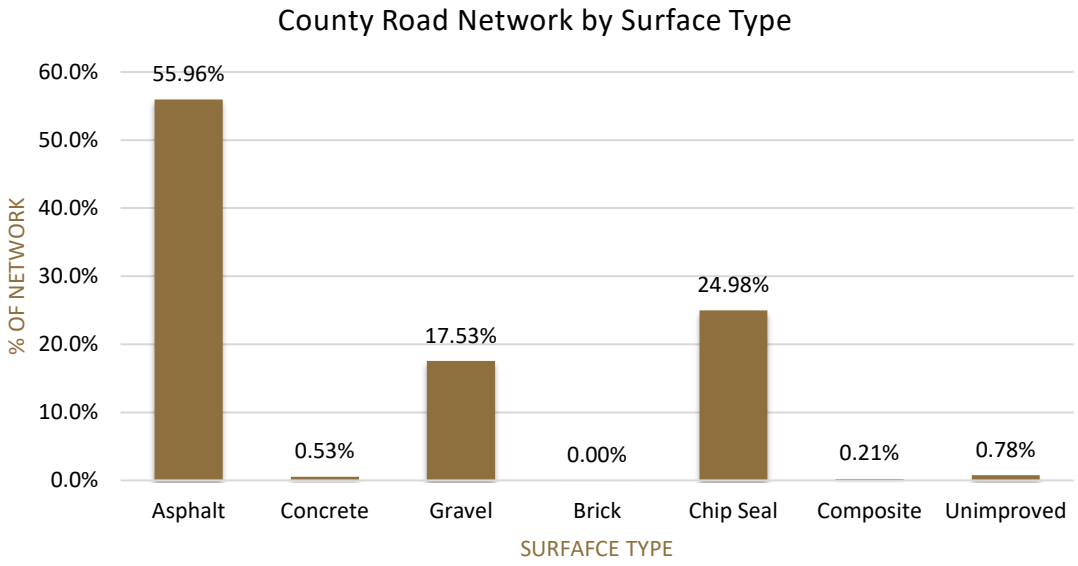

Figure H: County Road Network by Surface Type

Functional Classification

In addition to tangible road characteristics such as length, width, number of lanes, and surface type, local transportation agencies need to consider the functional classification of a road when making asset management decisions. This designation outlines the purpose of the road facility which may impact the treatment, timeline, and appropriate level of service for that facility.

Roads in Indiana are typically classified based on the function and usage of the road segment with respect to the overall transportation network. The functional classification system categorizes these road facilities to help guide planning, funding, and management decisions. The main functional classifications of local agency roads include:

1) **Local Roads:** These roads primarily serve local traffic, providing access to residences, businesses, and other properties within neighborhoods. They are typically low-volume streets with low speeds.
2) **Collector Roads:** Collector roads are either in the major or minor categories and gather traffic from local streets and direct it to arterial roads or highways. They often connect neighborhoods to arterial roads and facilitate movement within suburban areas. Collector roads may have higher volumes and speeds compared to local streets.
3) **Minor Arterial Roads:** Minor arterial roads provide connections between major arterial roads and collector or local roads. They accommodate moderate to high volumes of traffic and may serve as primary routes for travel within cities and towns. These roads often feature higher speeds and may have additional lanes compared to local and collector roads.
4) **Principal Arterial Roads:** Principal arterial roads are key routes within the transportation network, connecting major centers of activity such as commercial areas, employment centers, and interstates. They carry significant traffic volumes and often have higher speeds, multiple lanes and advanced traffic control infrastructure to facilitate efficient movement.

Table I outlines the city and town road system with Table J highlighting the county road system.

Table I: City and Town Streets by Functional Classification

City and Town Roads	Centerline Miles	% Centerline Miles	Lane Miles	% Lane Miles
Principal Arterial - Other	703.38	3.17%	2,379.74	4.99%
Minor Arterial	2,040.01	9.21%	5,282.53	11.07%
Major Collector	1,866.02	8.42%	4,177.20	8.76%
Minor Collector	818.97	3.70%	1,680.90	3.52%
Local	16,725.60	75.50%	34,185.75	71.66%
Total	**22,153.98**	**100%**	**47,706.12**	**100%**

Table J: County Roads by Functional Classification

County Roads	Centerline Miles	% Centerline Miles	Lane Miles	% Lane Miles
Principal Arterial - Other	314.48	0.50%	764.12	0.61%
Minor Arterial	971.56	1.54%	2,010.62	1.60%
Major Collector	6,146.67	9.76%	12,391.87	9.88%
Minor Collector	9,035.76	14.35%	18,009.73	14.36%
Local	46,508.31	73.85%	92,208.86	73.54%
Total	**62,976.78**	**100%**	**125,385.20**	**100%**

Pavement Condition Data

The pavement asset management plans submitted to Indiana LTAP by local units of government primarily use the Pavement Surface Evaluation and Rating (PASER) system or the Pavement Condition Index (PCI) system. For city road reporting, 69% used PASER and 31% used PCI. For town road reporting, 97% used PASER and 3% used PCI. For county road reporting, 94% used PASER and 6% used PCI.

Appendix A contains a description of the PASER condition ratings taken from the publication produced by the University of Wisconsin-Madison. This visual rating system uses surface distresses to assign a rating from 1 to 10 to a road segment, with 10 being the highest or best condition. PASER is widely used by many Indiana local agencies, INDOT, and other states across the country. INDOT approves it as a viable pavement rating system and Indiana LTAP provides training and technical services to help local agencies effectively utilize this pavement condition rating system.

It is important to note that poor roads have a significant range of costs for pavement treatments due to PASER 2 and PASER 1 ratings being considered failed roads. Facilities with these condition ratings require complete reconstruction. This is the costliest form of pavement treatment activities and significantly differs from INDOT asset management approaches due to state policies and thresholds not allowing facilities to get to a failed condition.

For this report, ***only PASER rated roads are included in the data analyses*** based on asphalt, concrete, and chip seal pavements rated in 2023. Unpaved roads are not included.

After condition data were organized and quality checks performed on the submitted PAMPs, the PASER ratings were categorized into Good, Fair, and Poor. These categories indicate the level of work required to support and improve a road asset. Good roads are considered eligible for preservation activities, fair roads are eligible for minor rehabilitation activities, and poor roads are appropriate for major rehabilitation or reconstruction treatments. It is important to note that poor roads have a significant range of costs for pavement treatments due to PASER 2 and PASER 1 ratings being considered failed roads. Facilities with these condition ratings require complete reconstruction, which is the costliest pavement treatment activity. Therefore, asset management strategies and infrastructure investments must be strategically implemented to cost-effectively address poor and failed roads while continuing to support fair and good road conditions.

Table K shows the condition categories by PASER rating value and the corresponding recommended pavement treatment activities.

Table K: Rating Categories and Recommended Treatments

PASER Rating	Condition	Category	Recommended Treatments	Estimated Unit Cost Range ($/mile)
10	Good	Preservation	Crack Seal, Crack Fill, Fog Seals, Asphalt Rejuvenators	$1,000 - $7,500
9				
8				
7	Fair	Minor Rehabilitation	Crack Seal, Chip Seal, Slurry Seal, Cape Seal, Microsurface, Thin Overlay, Mill and Overlay	$25,000 - $70,000
6				
5				
4	Poor	Major Rehabilitation / Reconstruction	Structural Overlay (>2"), Concrete Overlay, Patching and Overlay, Reconstruction, Full Depth Reclamation	$150,000 - $1,500,000
3				
2*				
1*				

**PASER 2 and PASER 1 are considered failed roads and the only viable treatment is reconstruction which is the costliest pavement treatment for a road facility.*

Utilizing condition data and recommended pavement treatments, local agencies are equipped to apply asset management principles to the overall local transportation network to optimize infrastructure investments.

PASER 2 and PASER 1 are failed roads and the only viable treatments is reconstruction which is the costliest pavement treatment for a road facility.

City and Town Road Condition Data

A total of 430 cities and towns submitted a pavement asset management plan in 2023 representing 21,680 centerline miles (including Marion County). This represents 98% of cities and 70% of towns, resulting in a total representation of 96% of the city and town network. Based on the hard surfaced centerline miles rated using the PASER method, the current condition of the municipal road network is 28% Good, 41% Fair, and 31% Poor and is depicted in Table L and Figure I.

Table L: 2023 City and Town Road Conditions

Condition	Centerline Miles	% Centerline Miles	Lane Miles	% Lane Miles
Good	4,180	28%	8,947	28%
Fair	6,103	41%	13,078	41%
Poor	4,727	31%	10,007	31%
7% of City and Town Roads are Failed Roads				

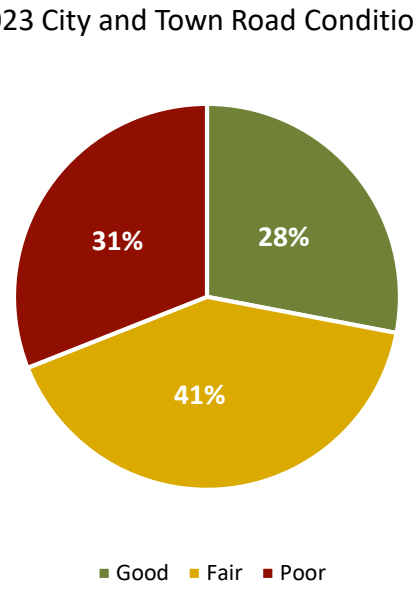

Figure I: 2023 City and Town Road Conditions

This figure appeared earlier in the report (See Figure A).

County Road Condition Data

A total of 92 counties submitted a pavement asset management plan in 2023 representing 62,977 centerline miles with Marion County data included in the city data reported previously. This represents 100% of counties and 99% of total county hard surfaced centerline miles. Based on the hard surfaced centerline miles rated with the PASER method, the current condition of the county road network is 27% Good, 46% Fair, and 27% Poor and is depicted in Table M and Figure J.

Table M: 2023 County Road Conditions

Condition	Centerline Miles	% Centerline Miles	Lane Miles	% Lane Miles
Good	13,009	28%	26,012	28%
Fair	21,686	46%	43,470	46%
Poor	12,595	27%	25,150	27%
7% of County Roads are Failed Roads				

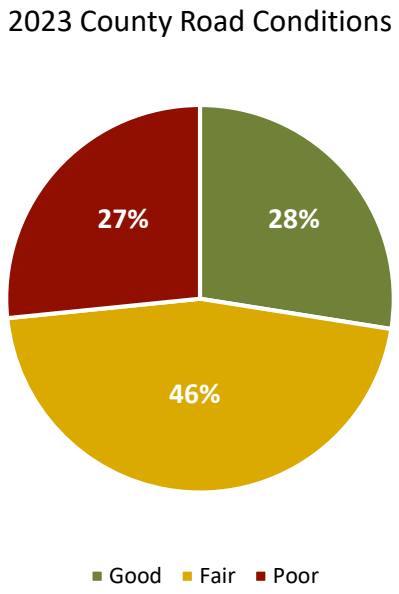

Figure J: 2023 County Road Conditions

This figure appeared earlier in the report (See Figure A).

Local Agency Comparisons

Road condition data comparisons are derived from the 2023 PAMPs submitted to Indiana LTAP that use the PASER system for pavement condition ratings. Data comparisons among local agency types is depicted in Figure K.

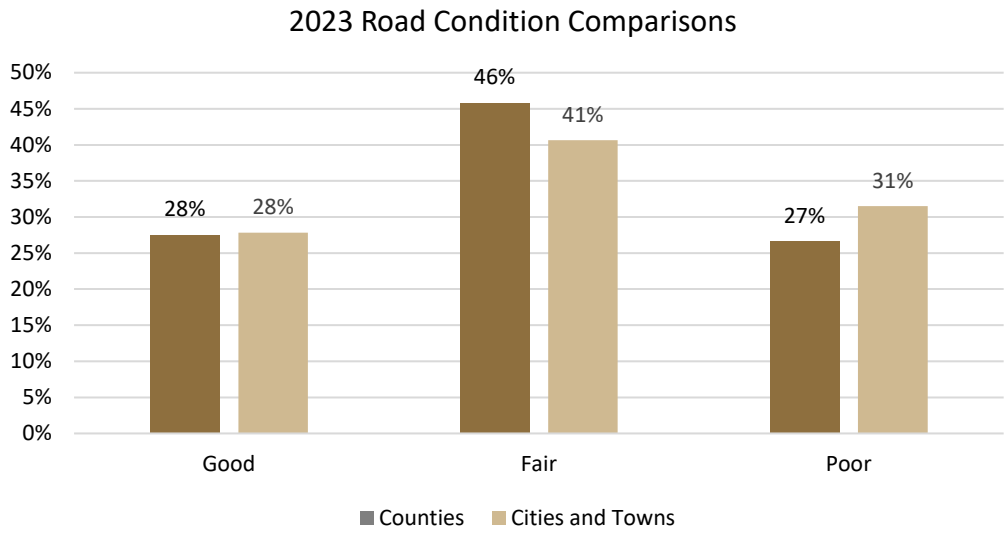

Figure K: Comparison of 2023 Road Condition Across Agency Type

The data in Figure K indicates that the percentage of good pavements across all agency types are the same, meaning that cities, towns, and counties all have the same percentage of their respective networks in good condition. Fair pavements show a larger difference between cities and towns and counties with municipalities having 41% of their network in fair condition compared to 46% in the county network. Poor pavement data indicates that the cities and towns have a larger percentage of their network in poor condition than county agencies. It is important to note that fair roads, if left untreated, will rapidly deteriorate to poor condition facilities and cost significantly more to maintain and improve.

Fair roads, if left untreated, will rapidly deteriorate to poor condition and will cost significantly more to maintain and improve.

To examine specific agency comparisons, or to analyze the change in condition ratings over time for a specific agency, visit the Indiana LTAP Local Road and Bridge Dashboard website (www.purdue.edu/inltap).

City and Town Comparison by Population

In this category, PASER rating and condition categories are compared for cities and towns with a population of 10,000 or below with those whose population are above 10,000. This population designation was chosen due to the local matching requirements for CCMG being 25% for cities and towns less than 10,000 and 50% for cities and towns of 10,000 or more. Figure L is a comparison of Good, Fair, and Poor condition categories based on this population difference.

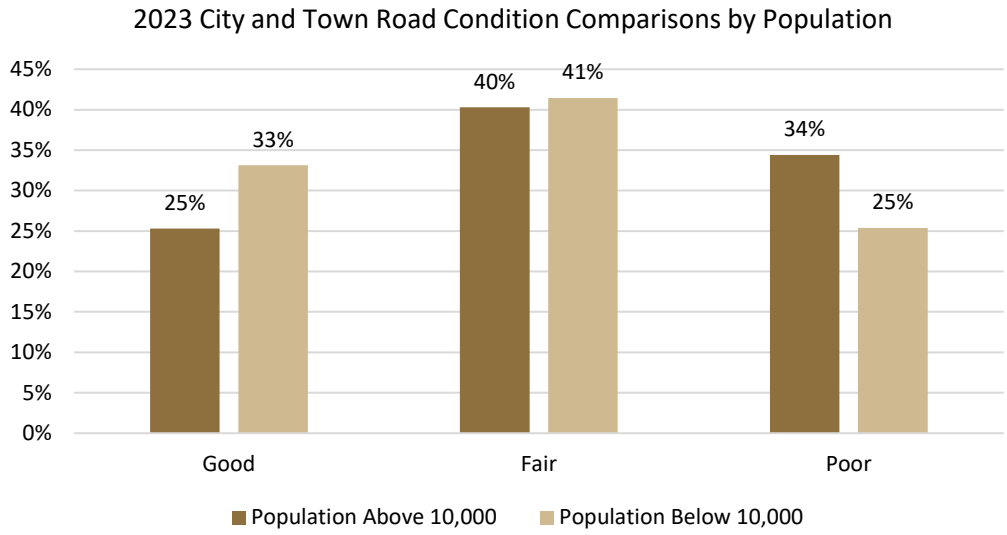

Figure L: 2023 City and Town Road Condition Comparison by Population

In general, the data indicates that roads in cities and towns with a population of less than 10,000 are in better condition than pavements in cities and towns with populations greater than 10,000. This is based on the higher percentage of the smaller cities and towns network in good condition and lower percentage of the smaller cities and towns network in poor condition. This is a shift from 2016 when larger population cities and towns had fewer poor roads (26% for larger cities/towns compared to 30% for smaller cities/towns). One factor that may have contributed to this shift is the implementation and utilization of the CCMG program by smaller communities with a lower matching requirement resulting in greater access to financial assistance. The percentage distribution of good condition roads remains similar to 2016 conditions with larger cities and towns having 13% good roads in 2016 and smaller cities and towns having 17% good roads in 2016.

Cities and towns with populations less than 10,000 tend to have roads with better conditions than cities and towns with populations above 10,000.

County Comparison by Population

In the county category, PASER rating and condition categories are compared for counties with a population of 50,000 or less to those greater than 50,000. This population designation was chosen due to the local matching requirements for CCMG being 25% for counties less than 50,000 population and 50% for counties of 50,000 or more. Figure M is a comparison of Good, Fair, and Poor condition categories for counties with populations of 50,000 or less and those greater than 50,000.

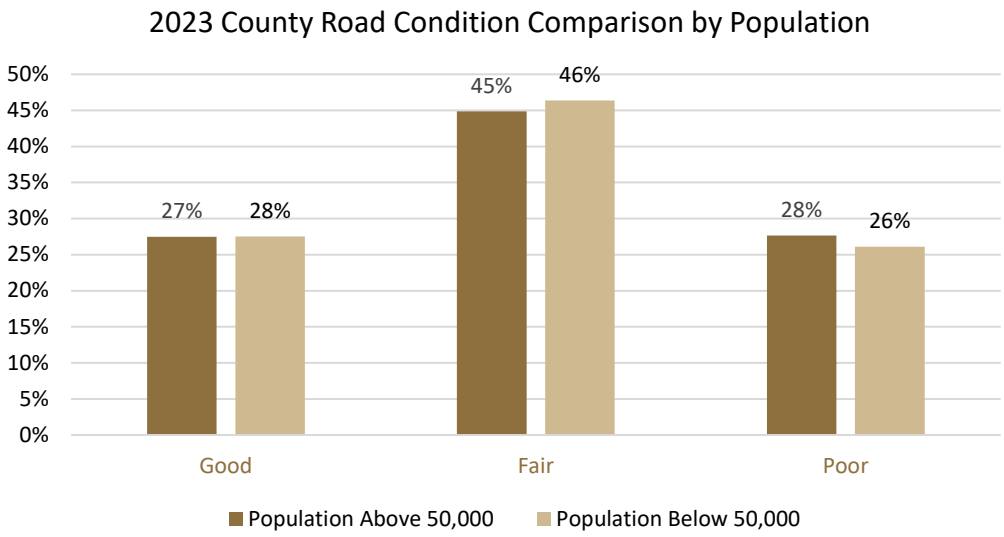

Figure M: 2023 County Road Condition Comparison by Population

The data in the figure above indicates that counties, regardless of population, tend to have similar road conditions among their networks. Good condition pavements and poor condition pavements account for approximately 55% of the overall county network with the remaining 45% in fair condition. This is a shift from 2016 when larger counties, with a population greater than 50,000, had more good roads, more fair roads, and less poor roads than smaller counties. As noted earlier, one factor that may have contributed to this shift is the implementation and utilization of the CCMG program by smaller counties with a lower matching requirement resulting in greater access to financial assistance.

Counties, regardless of population, tend to have half of their network in either good or poor condition with the remaining half in fair condition.

Historical Road Conditions

Historical road condition data aids in the analysis of the local transportation network over time to further identify and evaluate contributing factors that may have impacted the overall local network. It also provides valuable input for budget allocation and resource planning of local agencies by analyzing past preservation and rehabilitation expenditures and its impact on road conditions. Through this process, local agencies can develop more accurate budget forecasts, justify funding requests, optimize resource allocations, and adjust preservation and rehabilitation strategies.

City and Town Historical Road Conditions

Figure N depicts the change in pavement conditions for cities and towns from 2016 to 2023. As illustrated, good pavements are trending in a positive direction with an increase of 12% since 2016. Poor pavements, however, have also increased slightly, from 26% to 31%, resulting in a 5% change from 2016. To fully understand the municipal network, the fair pavements must also be analyzed. Since 2016, the municipal network has decreased its fair condition roads from 58% to 41%, a change of 17% overall. Based on this information, city and town roads have improved since 2016, with more fair pavements transitioning to good condition than poor condition. However, with a slight increase in poor roads since 2016, additional analysis may be required to identify if other municipal needs are impacting the optimization of asset management strategies to fully maximize the municipal road network.

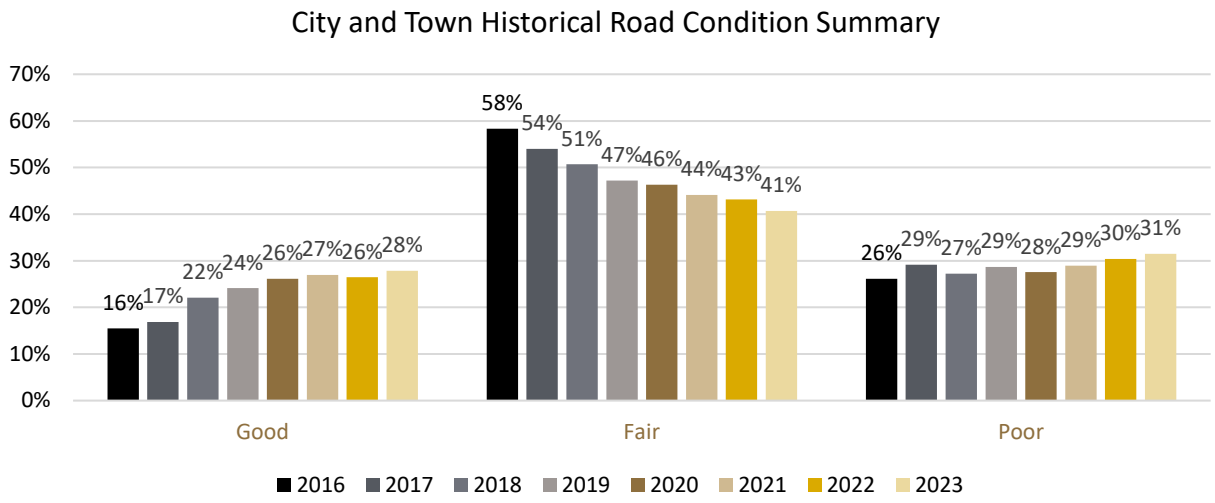

Figure N: City and Town Historical Road Condition Ratings

This figure appeared earlier in the report (See Figure C).

County Historical Road Conditions

Historical trends for the county road network are illustrated in Figure O. This information indicates that the county road network has been improving over the past seven years with good pavements increasing by 17%, fair pavements decreasing by 3%, and poor pavements decreasing by 13%. Based on this information, the county road network has benefitted from the increased investment in local transportation facilities with the data supporting a substantial increase in good roads and significant decrease in poor roads in 2019, which aligns with the increase in gas tax funding in 2018.

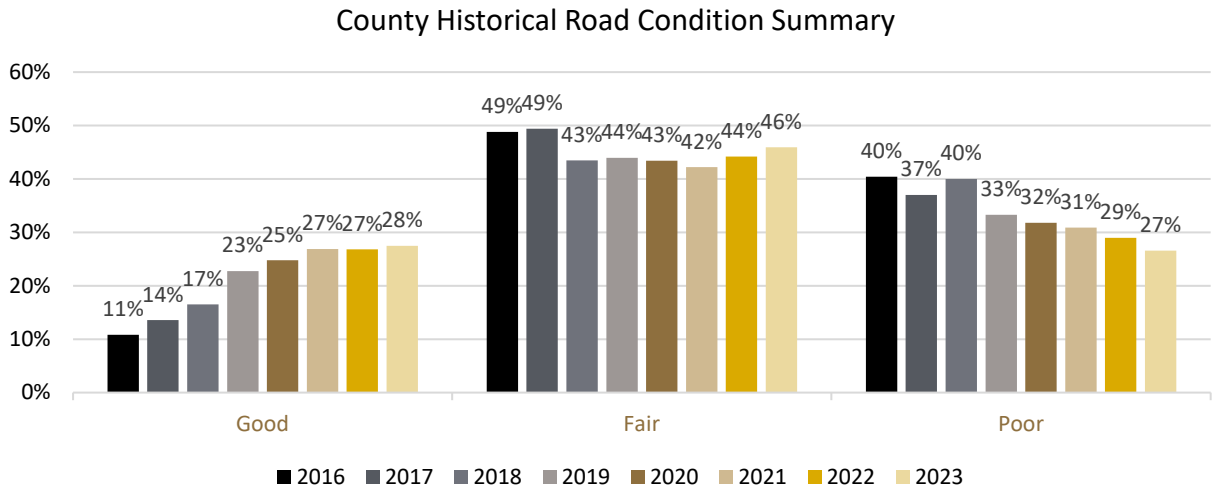

Figure O: County Historical Road Condition Ratings

This figure appeared earlier in the report (See Figure D).

Functional Classification Conditions

As described earlier, the functional classification of a road facility is a key factor when optimizing preservation and rehabilitation strategies. These classifications designate the importance of a road facility within the overall transportation network, allowing local agencies to appropriately allocate resources and plan for grant funding opportunities. Figure P illustrates the condition of city and town roads by functional classification with the percentage of poor pavements around 30% for each functional classification.

While cities and towns have a similar condition distribution among each functional classification, counties appear to have placed a priority on principal arterial road facilities with only 8% of those roads in poor condition compared to 30% in poor condition for local roads. Figure Q illustrates the distribution of condition ratings among the different functional classification types for the county road network.

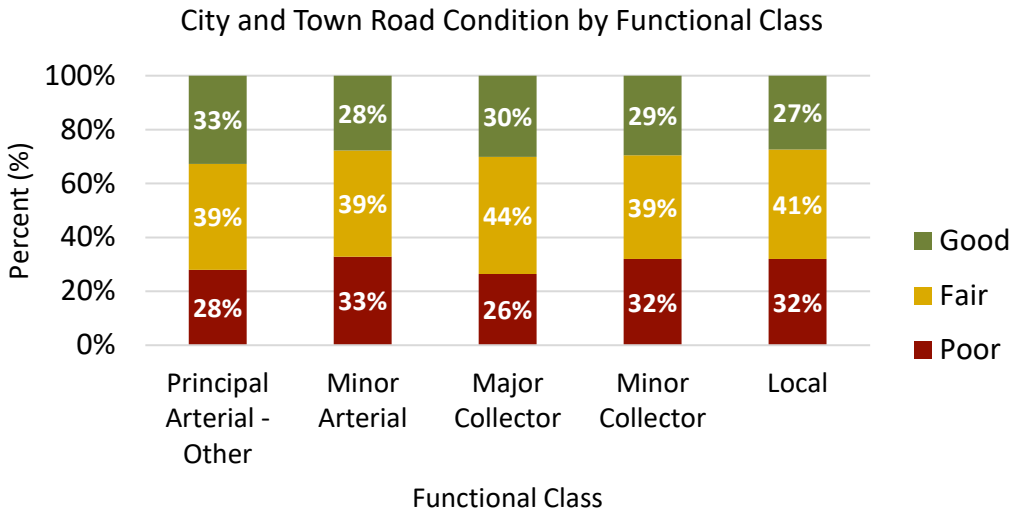

Figure P: City and Town Road Condition by Functional Classification

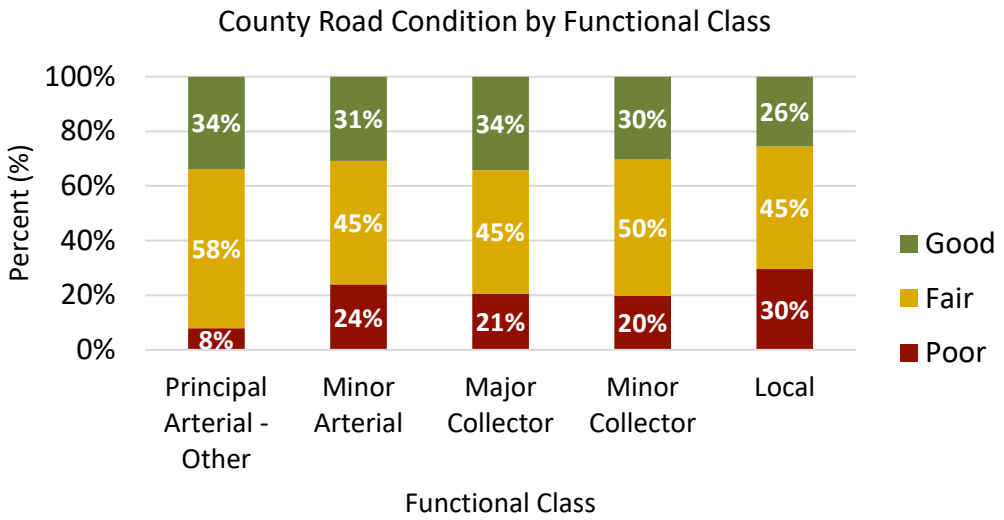

Figure Q: County Road Condition by Functional Classification

The distribution of condition ratings among the different functional classification types highlights the difference in preservation and rehabilitation strategies for the county network, with an emphasis placed on roads with increased traffic volume and importance of connectivity versus a more distributed approach as demonstrated by city and town agencies. This distribution difference could have contributed to the increase in poor condition roads in the city and town network if infrastructure investments were distributed evenly across the network rather than optimizing investment based on condition and pavement treatment types.

Road Funding

A key component to any asset management plan is the ability to communicate the plan and the resources required to achieve designated goals and objectives. To calculate the financial need for a multi-year infrastructure program, numerous factors need to be considered, with strategic management decisions made, in order to appropriately identify the required level of funding. These factors include the type and condition of the asset, desired level of service to be achieved and supported, estimated deterioration rate of the asset, and estimated cost of available treatments. Using this information, life cycle costs for each facility can be estimated across the entire network over a specific period of time (e.g., 5, 10, or 20 years).

To estimate local road funding needs over the next ten years, the current condition data of local agency pavements are utilized from the 2023 asset management plans submitted to Indiana LTAP. Due to the variability in unit costs from agency to agency for various pavement treatments, estimated funding calculations are presented separately for cities/towns and counties, then combined to present the total financial need from a local transportation network perspective.

The following estimates provide the total financial resources needed to address preservation, rehabilitation, and reconstruction needs for local agency pavements. It is important to note that the financial need in the following sections do not include the additional funds required for design engineering, construction engineering, right-of-way acquisition, permitting, or any required utility relocation costs. ***The estimates provided in this report are for construction costs only***. Additionally, these estimates do not include added capacity projects or new road corridors, both of which are essential to a local community's development and growth. Only existing road facilities with existing road configurations are included.

Estimates do not include added capacity projects or new road corridors, both of which are essential to a local community's development and growth.

Financial Need

The financial need of the local agency network is estimated using a combination of the most common and suitable pavement treatments for each condition category (PASER 1-10) with appropriate treatments selected to provide the longest estimated extended life at the lowest treatment cost. These treatment types were derived from the 5-Year Treatment Plans as submitted by cities, towns, and counties with their pavement asset management plans. Table N provides a range of estimated costs per mile depending on the selected treatment type appropriate for the corresponding pavement condition category (PASER 1-10).

Table N: PASER Condition Pavement Treatment Types

This table appeared earlier in the report (See Table K).

PASER Rating	Condition	Category	Recommended Treatments	Estimated Unit Cost Range ($/mile)
10	Good	Preservation	Crack Seal, Crack Fill, Fog Seals, Asphalt Rejuvenators	$1,000 - $7,500
9				
8				
7	Fair	Minor Rehabilitation	Crack Seal, Chip Seal, Slurry Seal, Cape Seal, Microsurface, Thin Overlay, Mill and Overlay	$25,000 - $70,000
6				
5				
4	Poor	Major Rehabilitation / Reconstruction	Structural Overlay (>2"), Concrete Overlay, Patching and Overlay, Reconstruction, Full Depth Reclamation	$150,000 - $1,500,000
3				
2*				
1*				

**PASER 2 and PASER 1 are considered failed roads and the only viable treatment is reconstruction which is the costliest pavement treatment for a road facility.*

These unit costs were derived using INDOT average unit prices and vetted through a committee of local transportation agency practitioners from across the state. A range of costs are given due to the variability in unit prices from treatment to treatment and agency to agency.

There are approximately 11,600 miles of unpaved local roads in Indiana requiring an investment of $35M per year to preserve current conditions.

It is important to note that 18% of the county road network consists of unpaved roads. These assets require routine maintenance to preserve the condition of the unpaved facility by performing activities such as road grading to ensure proper cross slope for drainage, applying dust control suppressants for safety, applying new aggregate for road stability, and clearing ditches and culverts for proper roadside drainage. To obtain estimated costs for maintaining these facilities, a survey of county highway officials was conducted. Based on these responses, it is estimated that unpaved roads require an investment of $3,000 per year per mile to preserve existing conditions and could cost upwards of $7,000 per mile to improve roads in poor condition. Due to the lack of statewide unpaved road condition data for local agency assets, this report will not include estimates to improve unpaved facilities. Cost estimates will only be included to preserve the current unpaved road network at $3,000 per mile. This accounts for approximately $35M per year for county road funding needs.

Preserve Network Conditions

It is essential to identify an optimized asset management approach that preserves the good condition roads, rehabilitates the fair condition roads, and strategically addresses the poor and failed roads. Applying a "worst-first" approach by setting a target to only address poor or failed roads is not a sustainable asset management practice due to the level of investment required for these road facilities. If this type of approach was implemented, then all available funding would go towards a few poor or failed roads while roads in good and fair condition would deteriorate at an exponential rate, thus sacrificing preservation activities and decreasing the overall condition of the local road network.

If the network improvement strategy does not add more than 74,000 years of life back into the paved network, the overall condition of the network will decline.

To properly estimate the investment level required to preserve the current local transportation network, a "mix of fixes" asset management strategy is utilized, including the most common pavement treatments applied by Indiana local agencies as reported in their 5-Year Treatment Plans. To project future costs of pavement treatments, an annual inflation index of 2.5% was used, which is consistent with INDOT inflation modeling.

To optimize the "mix of fixes" asset management strategy, four key performance measures were evaluated which include 1) added service life, 2) average PASER rating, 3) percentage of poor roads, and 4) percentage of failed roads. To accurately describe these performance measures, it must first be explained that every year, each mile of a local road loses one year of life. With approximately 74,000 miles of local paved roads (including cities, towns, and counties), the local transportation network loses 74,000 years of service life every year. This means if the network improvement strategy does not add more than 74,000 years of extended life back into the pavements (referred to as added service life), then the overall condition of the network will decline.

"Mix of fixes" asset management strategy selects the right treatment for the right road at the right time.

Optimizing the network strategy equates to increasing the added service life of the network (adding more years back into the network than was lost), increasing the average PASER rating of the network, decreasing the percentage of poor roads, and strategically reconstructing roads that have failed.

Based on these performance criteria, the appropriate asset management strategy used to preserve the current local agency network involves prioritizing preservation and rehabilitation activities over the next six years with a shift to the prioritization of preservation and reconstruction activities in Years 8, 9, and 10. This approach results in adding years of life to the local paved network, increasing the overall average PASER rating of the local paved network, and strategically prioritizing the reconstruction of failed roads. Table O outlines the investment level required to preserve network conditions over the next ten years.

Table O: Annual Local Paved Road Funding Required to Preserve Network Conditions over 10-Years

Annual Local Paved Road Funding Required to Preserve Network Conditions over 10-Years		
Agency	**Annual**	
City/Town	$	625,000,000
County	$	600,000,000
Total	**$**	**1,225,000,000**

The paved road funding estimates provided in Table O for cities/towns and counties are the levels of investment required to achieve the same critical targets for the four performance measures listed previously. The discrepancy in funding amounts is attributed to the current network condition for cities/towns versus counties. As described in the previous section, city/town pavement assets have a higher percentage of roads in poor condition than its county agency partners. Due to a different "starting point" in pavement condition distributions, the funding level required to preserve network conditions for cities/towns is greater than the projected level of investment needed for counties.

An annual investment of $1.23B is required to preserve the local paved road network condition over the next ten years.

Figures R and S visually depict the change in network conditions for cities/towns and counties if the investment level of $1.23 billion per year over ten years ($625M/year for cities/towns and $600M/year for counties) is achieved. A comparison of the two graphs confirms the need for more funding on the city/town network for this asset management strategy due to the higher percentage of poor roads which require costlier pavement treatments as opposed to the county network where less costly treatments are required to preserve and improve the higher percentage of good and fair roads.

Overall, the "mix of fixes" asset management strategy that prioritizes preservation and rehabilitation activities in Year 0 through Year 7, with a shift to prioritizing preservation and reconstruction activities in Years 8, 9, and 10, produces the most optimized approach for the overall local paved road transportation network to meet the essential performance targets of adding years of life into the network, reducing the percentage of poor roads, and strategically addressing failed pavements.

Improving poor condition roads to good condition roads require significantly more investment than improving fair condition roads to good condition roads.

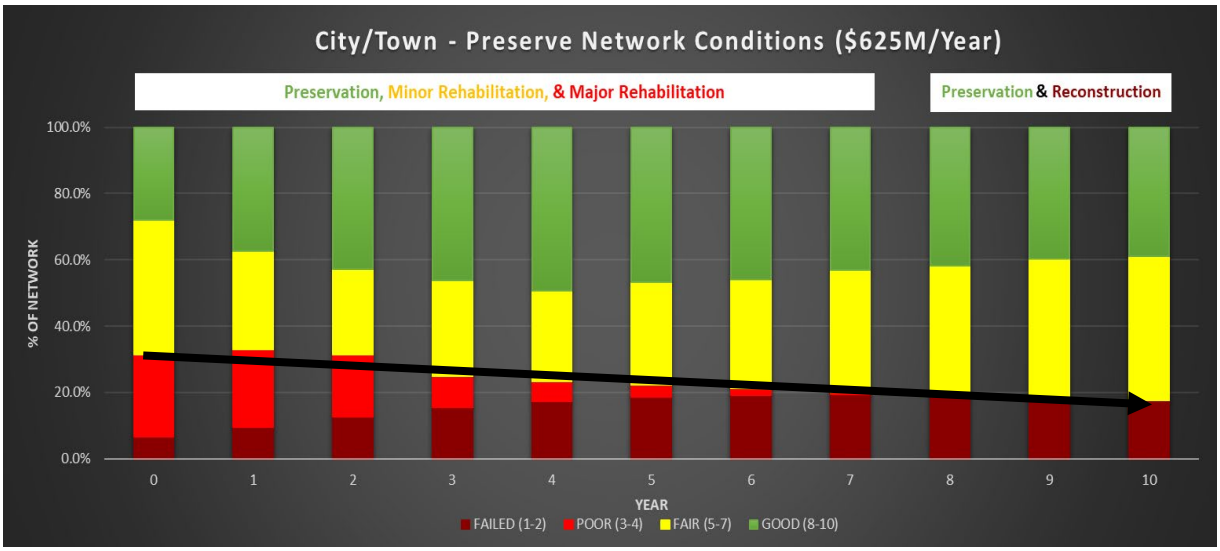

Figure R: City/Town Change in Network Condition at Preserve Network Conditions Investment Level

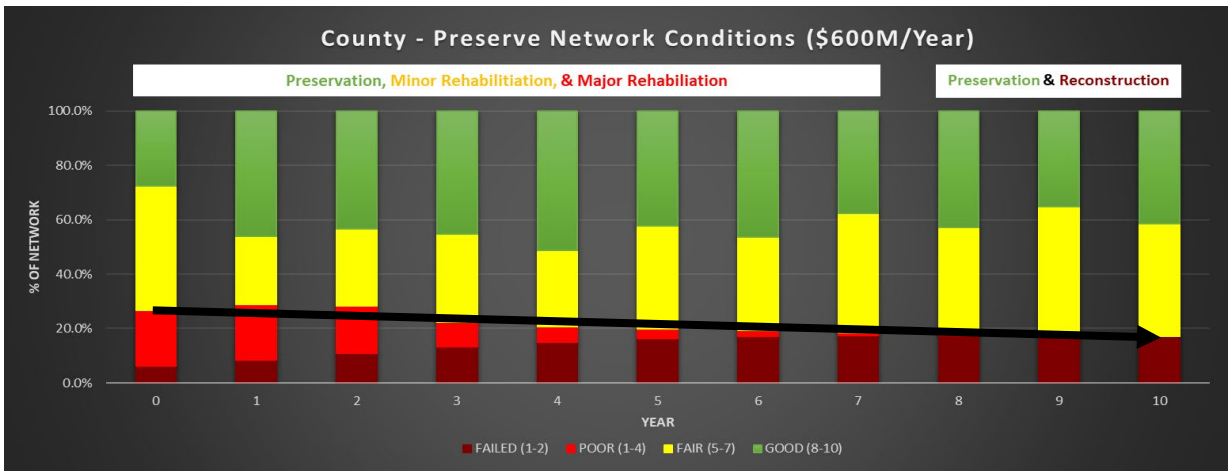

Figure S: County Change in Network Condition at Preserve Network Conditions Investment Level

An investment below the $1.23 billion per year threshold is estimated to further decrease the overall condition level of the local paved road network, resulting in a loss in service life, decrease in the average PASER rating of the network, and increase in failed roads. It is important to note that failed roads are those assets that garner the most attention from the traveling public and significantly impact the vitality of our communities. These failed pavements create substantial safety concerns such as poor drainage that can lead to ponding of water and hydroplaning of vehicles, deep potholes that require increased maintenance resources and can create hazardous travel conditions resulting in property damage or injury, and failed road subbases that can create sinkholes, landslides, and other critically-damaging impacts to the facility and its users. Additionally, these assets are the costliest assets to maintain and improve, thus further exacerbating the funding resources needed at the local level.

An investment below $1.23B per year over the next 10 years could result in one or more of the essential performance measures not being achieved for the local paved network.

Improve Network Conditions

To improve network conditions and address failed roads earlier in the network strategy, an annual investment of $2 billion is required over the next ten years. This level of investment balances the performance of the four evaluation criteria highlighted previously (added service life, average PASER rating, percentage of poor roads, and percentage of failed roads) and is projected to reduce the percentage of poor roads on the local network to less than ten percent while raising the average PASER rating of the network to a fair condition. Table Q highlights this investment from city/town and county perspectives.

Table Q: Annual Local Paved Road Funding Required to Improve Network Conditions over 10-Years

Annual Local Paved Road Funding Required to Improve Network Conditions over a 10-Year Period		
Agency	**Annual**	
City/Town	$	900,000,000
County	$	1,100,000,000
Total	**$**	**2,000,000,000**

This level of investment adds more life into the network than is lost each year and allows local agencies to aggressively target failed roads in Year 6, while continuing to preserve good and fair condition road segments. Figures V and W visually depict the change in network conditions for cities/towns and counties over ten years at the level of road investment required to improve network conditions for cities/towns and counties, respectively.

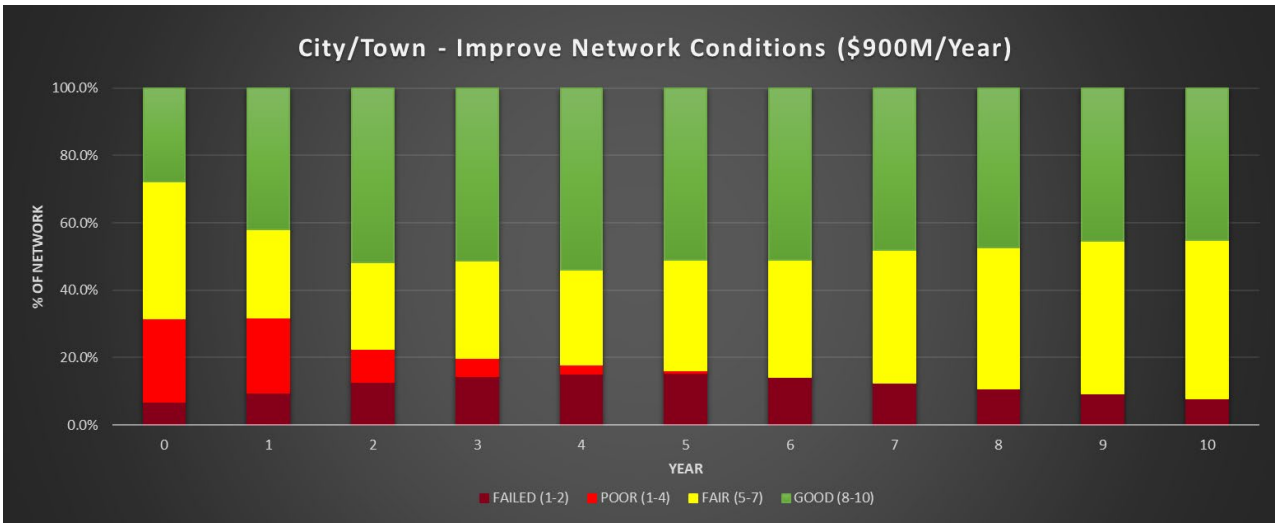

Figure V: City and Town Change in Network Condition at Improve Network Conditions Investment Level

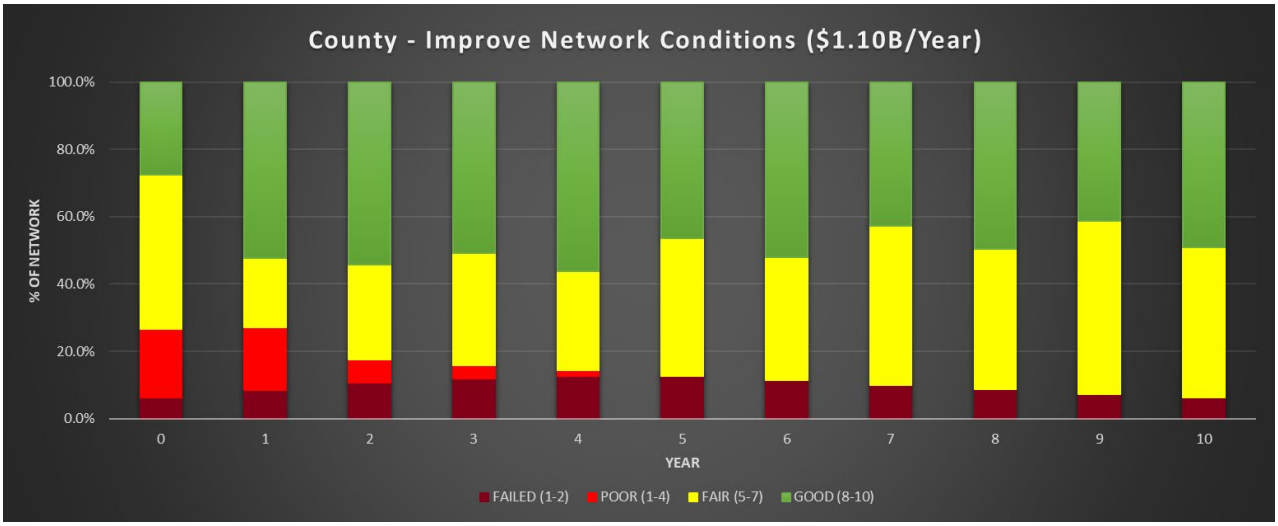

Figure W: County Change in Network Condition at Improve Network Conditions Investment Level

Eliminate Poor and Failed Roads

To improve the local paved network to closely resemble INDOT's strategy of reducing poor roads and not allowing roads to get to a failed state, an investment of $2.65 billion per year over the next ten years is required. This strategy will ensure that failed roads are addressed across Indiana's cities, towns, and counties and will assist in balancing the condition level discrepancy among the local road network and state road network. Table P highlights this investment from a city/town perspective and county perspective.

Table P: Annual Local Paved Road Funding Required to Eliminate Poor and Failed Roads over 10-Years

Annual Local Paved Road Funding Required to Eliminate Poor & Failed Roads over a 10-Year Period		
Agency	**Annual**	
City/Town	$	1,150,000,000
County	$	1,500,000,000
Total	**$**	**2,650,000,000**

Figures T and U show the change in condition rating over time to eliminate all poor and failed roads by Year 10 if the corresponding level of investment is achieved for cities/towns and counties, respectively.

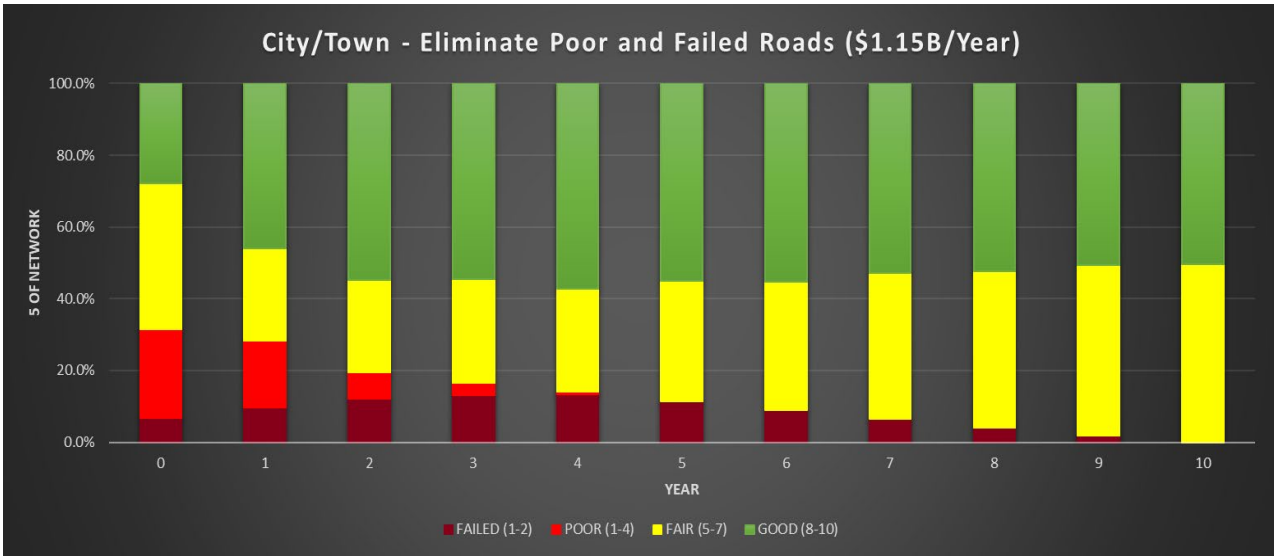

Figure T: City/Town Change in Network Condition at Eliminate Poor and Failed Roads Investment Level

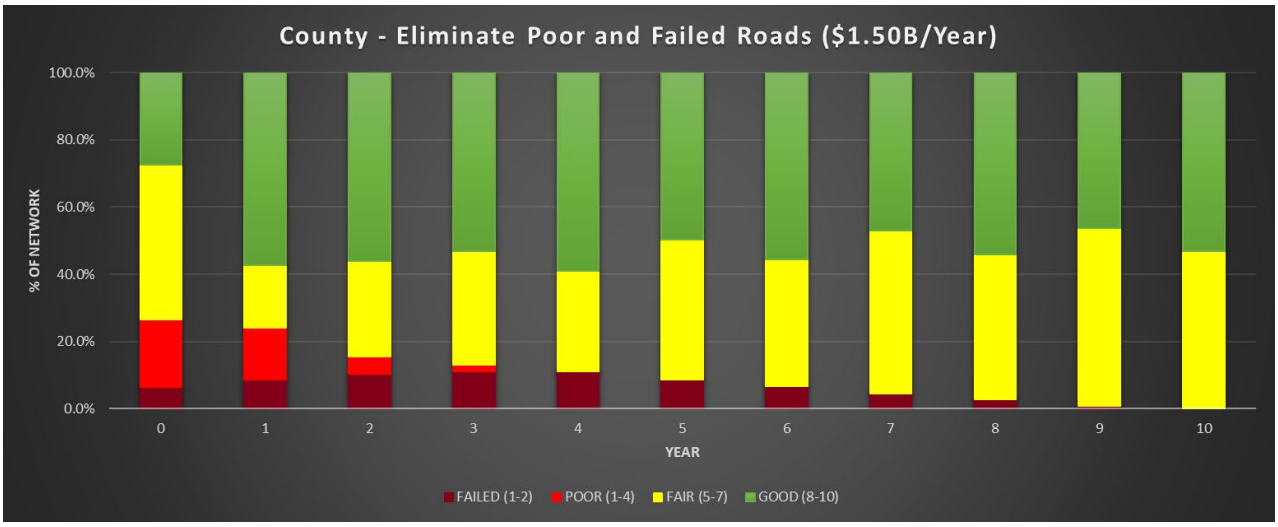

Figure U: County Change in Network Condition at Eliminate Poor and Failed Roads Investment Level

Sound asset management strategies coupled with defined network priorities aid in the development and execution of local transportation improvement activities and corresponding resource needs.

It is noted that the cost to eliminate poor and failed roads for cities/towns ($1.15B/year) is less than the cost to eliminate poor and failed roads for counties ($1.50B/year) over the ten-year period. This trend is different than the trend to preserve network conditions where cities/towns had a higher annual cost to meet essential performance measures. The reason for this change in financial need is due to the distribution of fair condition roads and good condition roads on the city/town network versus the county network. The asset management strategy required to eliminate all poor and failed roads for the county network involves allowing some good condition roads to fall to fair condition while the city/town network has an asset management strategy that keeps the distribution between good and fair roads consistent in the latter years. For both the city/town and county network, the same performance measure outcome was targeted (eliminate poor and failed roads) but the strategies to achieve this performance measure varied based upon the respective network conditions, functional classifications, and viable pavement treatment types. Thus, direct comparison of one local agency to another, or one type of agency to another, can be challenging due to differences in network composition, existing condition distribution, and targeted network outcomes. This highlights the importance of sound asset management strategies and the impact that chosen priorities can have on the level of resources required.

Range of Local Paved Road Investments

To assist with identifying the most appropriate and sustainable local road investment target, a summary of the range of investment levels presented along with their corresponding impacts to the local network performance measures is provided. The performance measures included in this examination include 1) added service life, 2) average PASER rating, 3) percentage of poor roads, and 4) percentage of failed roads. A fifth comparison criteria, start to reconstruct failed, is also included. This value represents the earliest period that the local agency network is able to markedly and sustainably target failed roads. The current level of investment reported in local fiscal year 2023 (which includes supplemental local investment) yielded performance values that fail to achieve a sustainable local paved network. These performance values included adding 73,936 years of life to the local paved network resulting in an average PASER of 5.92, a network condition distribution of 29% poor, with 21% of the network remaining in a failed state at Year 10. Any future investment should strive to outperform these current investment performance values in order to avoid losing ground on the improvements made to the local network as a result of previous infrastructure funding legislation. Table R (next page) offers a range of investments for the local agency network to sustain and build upon the successes of previous infrastructure funding.

Table R: Range of Performance Measure Values at Various Network Investment Levels

Investment Levels	Annual Local Paved Road Investment Need over 10-Years			Performance Measure Value at Year 10				
	City/Town	County	Total	Added Service Life	Avg. PASER	% Poor	% Failed at Year 10	Start to Reconstruct Failed
Preserve Network Conditions	$ 625,000,000	$ 600,000,000	**$ 1,225,000,000**	83,498	6.37	Less than 20%	17%	Year 8
Improve Network Conditions	$ 900,000,000	$ 1,100,000,000	**$ 2,000,000,000**	97,565	7.02	Less than 10%	7%	Year 6
Eliminate Poor & Failed Roads	$ 1,150,000,000	$ 1,500,000,000	**$ 2,650,000,000**	106,730	7.5	0%	0%	Year 5

Preserve Network Conditions – this network strategy adds years of service life, reduces the percentage of local roads in poor condition to less than 20% of the network, but does not address enough failed roads to "move the needle" on the local network

Improve Network Conditions – this approach adds additional years of service life to the network, further reduces the percentage of poor roads, and addresses failed roads earlier in the network strategy

Eliminate Poor and Failed Roads – this network strategy eliminates poor and failed roads in the local network over a ten-year period

Investments for cities/towns and counties are highlighted separately with the total annual investment and impact on performance measures representing the local paved road network for cities/towns and counties collectively. As illustrated, to expedite the reduction of failed roads in the local network, an investment nearly twice that of preserving network conditions is required. The level of investment to improve network conditions represents the financial support required to add service life into the network, reduce the percentage of poor roads to below 10 percent, and expedite the ability to address failed roads earlier in the network strategy. This approach allows local agencies to aggressively address failed roads in Year 6 while continuing to preserve road facilities that are in good and fair condition.

At the current level of investment, 29% of the local paved network will remain in poor condition while 21% will be in a failed state at Year 10.

Using this information, decision-makers can balance the investment needs and desired performance values to strategically select the most viable opportunity to preserve and improve the local paved road network.

Local Road Funding Sources

Cities, towns, and counties utilize many diverse sources of funding for highway and street department responsibilities. Dedicated funds represent funding sources that are strictly used for local highway and street department needs and are both state-generated and locally-generated. There are also additional funding mechanisms at the municipal and county level that may be utilized to supplement road funding needs to achieve an agency's targeted or desired levels of service and performance measure values.

The following sections provide an overview of state-generated dedicated local road funding, locally-generated dedicated local road funding, and the gap in road funding investments based on the financial needs outlined previously. It should be noted that the term "fiscal year" refers to the state government fiscal year of July through June. The term calendar year is used to reference the local government fiscal year of January through December.

State-Generated Dedicated Local Road Funding

The Motor Vehicle Highway (MVH) Account has historically been the largest, most stable, and most flexible revenue source for local highway and street departments. It has been used to support infrastructure and construction costs in addition to administrative expenses, facility and equipment costs, winter maintenance operations, and workforce development initiatives. These funds are derived through gas tax revenues and are distributed based on prescribed formulas as outlined in state law (IC 8-14-1-3). Over the years, funding mechanisms, distribution formulas, and allowable uses of these funds have been modified in an effort to support and achieve improved infrastructure network conditions at both the state and local levels.

In 2017, legislation was passed to increase the Indiana gas tax rate to support the need for increased infrastructure funding at both the state and local level. This change yielded an overall increase in MVH revenues from 2017 to 2018. To ensure the additional revenue generated through the gas tax increase was used to support infrastructure and construction costs, legislation was also passed at this time which restricted 50% of local MVH distributions to be used for this purpose. A third modification to the MVH account reflected in revenue amounts beginning in 2018, involves the change of distribution percentages between state and local agencies from 53% INDOT and 47% local in 2017 to 62% INDOT and 38% local in 2018. The impact of these legislative actions is reflected in Figure X.

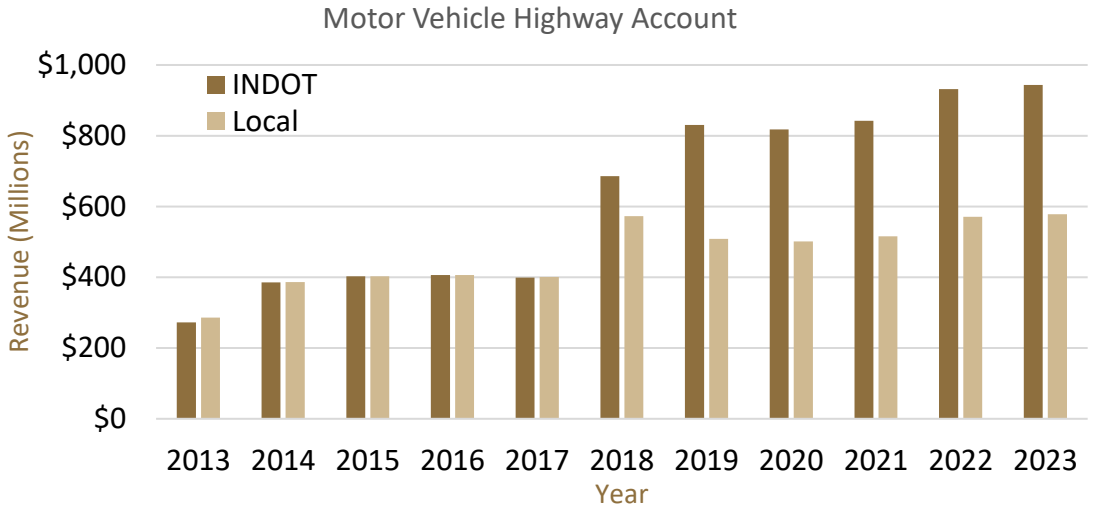

Figure X: Local and State Motor Vehicle Highway Account Distributions

Other sources of state-generated dedicated road funds include the Local Road and Street (LRS) Fund and the Local Road and Bridge Matching Grant Fund (commonly referred to as the Community Crossings Matching Grant fund). Similar legislative changes were made to the LRS distribution percentages at the same time as the MVH funding changes resulting in the local share decreasing from 45% in 2017 to 37% in 2018 and the INDOT share increasing from 55% to 63% from 2017 to 2018.

Revenues from the gas tax rate increase is reflected in 2018 along with the distribution changes between INDOT and local agencies.

To assist with local transportation funding needs, the state legislature established the Local Road and Bridge Matching Grant fund (CCMG) which is funded by revenues generated through electric vehicle registration fees, hybrid vehicle registration fees, a state transportation improvement registration fee, and a percentage of the gas use tax. This funding mechanism has added an additional opportunity for local agencies to receive revenue assistance to aid in the construction, reconstruction, rehabilitation, and preservation of local transportation infrastructure. Figure Y shows the CCMG funding awarded each year according to INDOT since the program's inception in 2016.

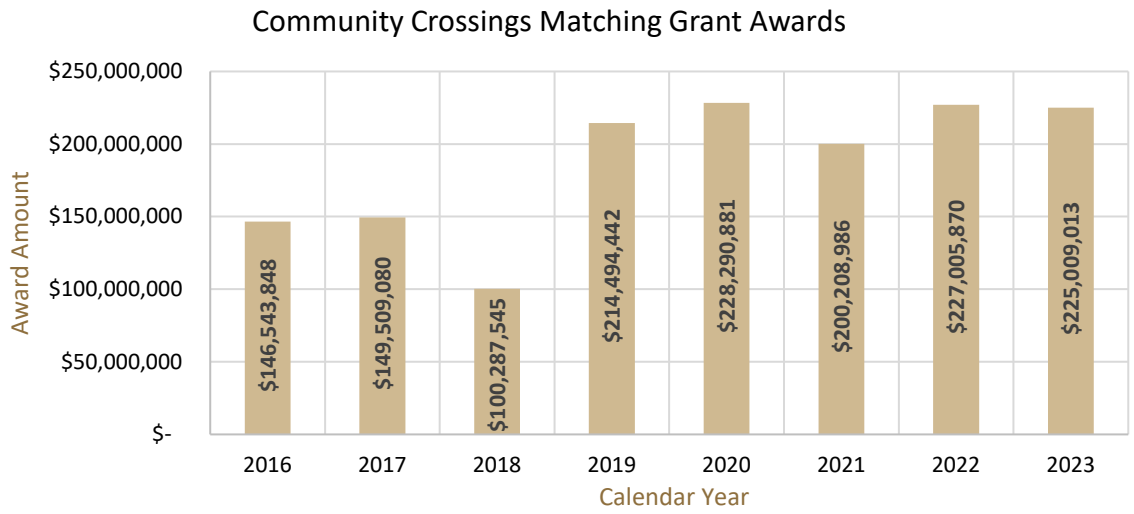

Figure Y: CCMG Awards per Calendar Year

Aggregating the impacts of road funding modifications and reviewing the data provided by the Auditor of the State, local units of government have experienced an increase in state-generated dedicated local road funds from $374 million in 2013 to $949 million in 2023, of which $225M can be attributed to the Community Crossing Matching Grant program in 2023. It is important to note that CCMG funds are a grant-based program with local agencies applying through a competitive grant process to secure up to $1 million (there is a pilot program in 2024 that has temporarily increased the cap to $1.5 million) in funding for a calendar year of which a local matching component is required. Other funding sources such as MVH and LRS are dedicated funds that are distributed monthly based on prescribed formulas that considers population, road miles, and motor vehicle registrations (IC 8-14-1-3 and IC 8-14-2-4).

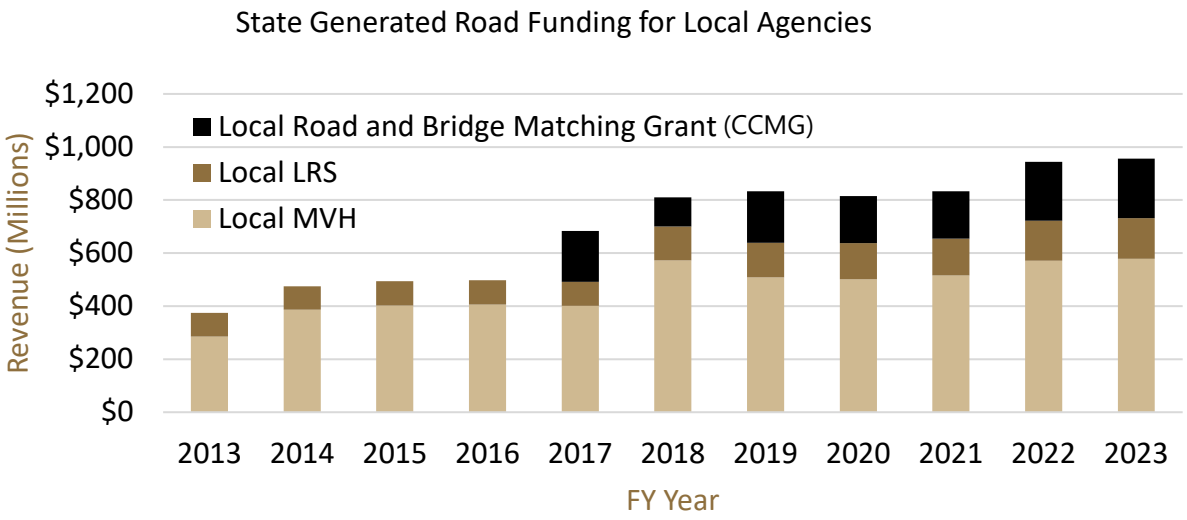

Figure Z: State Generated Road Funding for Local Agencies

Locally-Generated Dedicated Local Road Funding

The only locally-generated dedicated road funds available to counties and certain municipalities is through the adoption and implementation of a local wheel tax and excise surtax, also referred to as the Local Option Highway User Tax (LOHUT). In 1980, the Indiana General Assembly signed into law a method for local agencies to raise tax revenue for the construction, reconstruction, repair, or maintenance of county, city, and town roads within each jurisdiction. Only county units of government could establish this tax, with the county-adopted wheel tax and excise surtax generating funds through local vehicle registration fees. This revenue is then shared with municipalities within the county based upon the prescribed distribution formula as outlined in Indiana law (IC 6-3.5-5-14) which takes into consideration population and road miles of each jurisdiction.

Over the last several years, changes to the Indiana Code regarding local wheel tax and excise surtax have been made. These changes are summarized below.

2014 – The Indiana Code was changed to allow a Local Income Tax Council to be able to adopt a local wheel tax and excise surtax. Previously, it was only the County Council who had this authority. Whoever adopts the tax ordinances is the only entity who can rescind or change it.

2015 – The Indiana Code was revised to add "Motor Driven Cycles" (mopeds) to be one of the vehicle classifications that would be required to pay the Excise Surtax. The Excise Surtax was also changed to allow variable rates between the cars, trucks, motorcycles, and motor driven cycles.

2016 – The Indiana Code was revised to increase the rates for counties that had an approved asset management plan. This increase allowed the rates to be doubled to $50 or 20% for Excise Surtax and $80 for the Wheel Tax. Also, changes allowed municipalities that had a population greater than 10,000 to be able to adopt a city-specific Excise Surtax and Wheel Tax.

2017 - The Indiana Code was revised to decrease the population requirement from 10,000 to 5,000 for municipalities to be eligible to adopt the city-specific Excise Surtax and Wheel Tax.

These changes allow municipalities with a population greater than 5,000 to adopt a municipal ordinance for a local wheel tax and excise surtax to assist with collecting locally-generated road funding from city residents to maintain and improve city street networks (IC 6-3.5-11). Additionally, legislative changes included provisions that raised the maximum allowable rates for wheel tax and excise surtax amounts for units of government that had an approved asset management plan.

Currently, 54 of the 92 eligible counties and 14 of the 124 eligible municipalities have instituted a local option highway user tax (LOHUT) which includes both the wheel tax and excise surtax local funding mechanisms. Table S provides the maximum statewide LOHUT value (reflecting the changes in the maximum allowable rates per the 2016 legislation) compared to the actual LOHUT amounts collected in 2022 as reported in the Indiana Handbook of Taxes, Revenue, and Appropriations.

Table S: Maximum and Actual (2022) Statewide Wheel Tax and Excise Surtax Values

Agency	Estimated Maximum Value	2022 Actual Receipts	Estimated Available Capacity
County-wide	$366,000,000	$106,548,731	$259,000,000
Municipalities > 5,000	$92,000,000	$16,211,000	$76,000,000
Total	**$458,000,000**	**$122,759,732**	**$335,000,000**

Based on the prescribed distribution formula for LOHUT revenues, it is interesting to note that counties with a population of 50,000 or more would receive an average of 48% of the revenues generated through the wheel tax and excise surtax compared to counties less than 50,000 population who would receive an average of 83% of the collected LOHUT revenues.

Locally-Generated Supplemental Local Road Funding

In addition to the state-authorized wheel tax and excise surtax (LOHUT) local revenue mechanism, local agencies also supplement their dedicated road funding with other locally-generated funds. Some commonly used funds to help support highway and street department needs include local general fund appropriations, rainy day transfers, local option income tax, tax increment financing, and river boat or gaming revenue, to name a few.

Local Road Funding Receipts

Local road sources of funding are reported annually to the Indiana State Board of Accounts (SBOA) through the Annual Operations Report (AOR) for Highway and Street Departments. The AOR is required for all 92 counties and all municipalities with a population greater than 15,000. The number of municipalities that meet this reporting requirement is sixty. Although there are 567 city and town governments, the 60 agencies with a population greater than 15,000 represent 65% of the total city and town road network.

The dedicated road funding sources and amounts listed in Table T for calendar year 2023 were obtained from a variety of sources including the Indiana Tax Handbook, Indiana State Auditor's Office, and Indiana State Board of Accounts. Locally-generated supplemental funding is summarized statewide and is depicted in Table T as '*Other Local Funds'* as reported to the Indiana State Board of Accounts through the Annual Operations Report for Highway and Street Departments.

Table T: Local Road Funding Receipts (FY2023)

Local Agency Fiscal Year 2023			
Dedicated Revenue Source	**City/Town**	**County**	**Total**
Local Road & Street (LRS)	$ 74,748,811	$ 78,254,175	$ 153,002,985
MVH Restricted	$ 93,004,853	$ 192,431,314	$ 285,436,167
MVH Unrestricted	$ 93,004,853	$ 192,431,314	$ 285,436,167
Local Road and Bridge (CCMG)	$ 142,992,978	$ 82,016,036	$ 225,009,013
County Wheel Tax	$ 39,630,512	$ 66,918,219	$ 106,548,731
Municipal Wheel Tax	$ 16,211,000	-	$ 16,211,000
Total Dedicated Funds	**$ 459,593,007**	**$ 612,051,058**	**$ 1,071,644,063**
Supplemental Revenue Source	**City/Town**	**County**	**Total**
'Other Local Funds'	$ 1,002,086,350	$ 576,224,245	$ 1,578,310,595
Total Dedicated + Supplemental Funds	**$ 1,461,679,357**	**$ 1,188,275,303**	**$ 2,649,954,658**

As illustrated, local agencies have supplemented their road funding needs with over half of the reported local receipts for road funding coming from '*Other Local Funds.'* This is a concerning statistic as it indicates that local agencies are using emergency funds, such as rainy-day funds, to shore up the shortfall in dedicated local infrastructure funding, which is not a sustainable solution.

Over half of the reported receipts for local road funding come from other local sources, indicating that local agencies are using emergency funds to shore up infrastructure funding shortfalls.

Additionally, it is important to note that MVH Unrestricted funds are commonly utilized for street and highway department operations such as administrative expenses, facility and equipment costs, and winter maintenance operations. This amount ($285,436,167) as represented in Table T accounts for 27% of the total dedicated road funding receipts and aligns closely with INDOT's FY24 estimated expenses of 24% for operational and administrative needs (INDOT, 2023).

Gap in Dedicated Local Road Funding

To identify the annual gap in road funding for the local road network over a ten-year period, the receipts identified in Table T on page 49 are compared to the range of financial investments outlined in Table R on page 42. The receipts from *'Other Local Funds'* are not included in this analysis as these are not dedicated local road funding mechanisms. Receipts collected in the MVH Unrestricted category for local units of government are not included as dedicated funding due to the need to utilize those funds for operational and administrative needs as outlined previously. Additionally, this analysis does not include any federal-aid funds that are granted to local units of government through the INDOT-administered federal aid program due to these projects serving as added-capacity or new road construction. This report focuses solely on ***existing infrastructure*** in its current state without accounting for growth or added capacity needs at the local level. Only dedicated local road funding sources for existing local infrastructure are included (MVH-R, LRS, CCMG, and wheel tax/excise surtax). Costs to preserve local unpaved roads as discussed on page 33 of $35M per year are included in the local road need gap analysis with the results presented in Table U.

To preserve network conditions for the local road network, an annual funding gap of $474M is estimated.

To eliminate all poor and failed roads on the local road network, a funding gap of $1.90B is estimated.

Table U: Gap in Dedicated Local Road Funding for Various Investment Levels

Annual Gap in Dedicated Local Road Funding for Various Investment Level Needs*			
Investment Level	**Local Road Need**	**Dedicated Funding (MVH-R, LRS, CCMG, wheel tax/excise surtax)**	**Local Road Funding Gap**
Preserve Network Conditions	$ 1,260,000,000	$ 786,207,896	**$ (473,792,104)**
Improve Network Conditions	$ 2,035,000,000	$ 786,207,896	**$ (1,248,792,104)**
Eliminate Poor & Failed Roads	$ 2,685,000,000	$ 786,207,896	**$ (1,898,792,104)**

**This table represents road funding gaps only. Inclusion of bridge funding needs is outlined in Table FF on page 59.*

Depending on the targeted investment level, a shortfall of $474 million to $1.90 billion is estimated each year over the next ten years for the local road network. This does not account for added capacity projects or new road corridor projects that may be required as communities grow and development occurs. This funding gap analysis only addresses existing local infrastructure in its current use and capacity and includes only the current available dedicated local funding for construction, reconstruction, and preservation activities. It should be noted that if every eligible local agency implemented the wheel tax and excise surtax (LOHUT) at the maximum allowable rates to capture the estimated capacity of $335M per year, as described previously in Table S on page 48, a shortfall in dedicated local road funding of $625M per year would remain to preserve local network conditions.

If every eligible local agency implemented LOHUT at the maximum allowable rates to capture the estimated capacity of $335M per year, a shortfall in dedicated local road funding of $652M per year would remain to preserve local network conditions.

Bridge Condition Data

Indiana counties are responsible for inspecting, maintaining, rehabilitating, and replacing bridges on county, city, and town roads and streets. Based on the 2023 National Bridge Inventory (NBI) maintained by the FHWA, there are 13,173 bridges in the Indiana local agency network. The definition of a bridge for the purposes of this inventory is a structure that has a span of 20 feet or longer. These bridges are federally-required to be inspected on a 24-month maximum interval and the condition ratings are recorded in a statewide database that is then reported to FHWA by INDOT. The total number of local agency bridges in Indiana represent approximately 32.6 million square feet of bridge deck area, with the average age of a local Indiana bridge being 46 years. The average age of local Indiana bridge when it is replaced is 70 years, as reported in 2005 by Indiana LTAP (LTAP, 2005). The most common bridge type in the local agency network is the prestressed concrete bridge which represents 45% of the network. Prestressed concrete bridges most commonly include adjacent box beams, spread box beams, and "I" beams. There are approximately 4,200 prestressed adjacent box beam bridges in the local network. Table V depicts the distribution of bridge types in the local bridge network.

Table V: Local bridge types

Concrete	26%
Steel	21%
Prestressed concrete	45%
Wood/timber	6%
Masonry	<1%
Aluminum, cast iron, wrought iron	3%

The most common local agency bridge type is the prestressed concrete bridge.

The condition of these bridge structures is reported in terms of good, fair, or poor and is based on the Federal Highway Administration (FHWA) Computation Procedure for the Bridge Condition Measures publication. The NBI condition data reports the condition of a bridge in terms of elements including deck, superstructure, and substructure. If the bridge structure is a culvert, then a culvert rating is given.

In general terms, the term *deck* represents the riding surface of a bridge, the term *superstructure* represents the support elements immediately beneath the driving surface, and the term *substructure* is the foundation and supporting posts and piers of the bridge. The good, fair, and poor reporting system uses the lowest rating of these elements and reports the bridge as either poor (condition rating 1-4), fair (condition rating 5-6), or good (condition rating 7-9). Figure AA illustrates the condition rating of the local bridge network as reported in 2023.

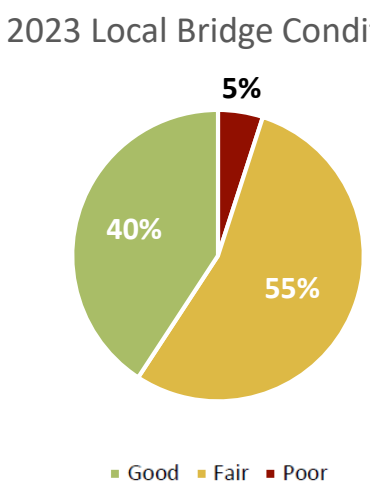

Figure AA: 2023 Local Bridge Condition

This figure appeared earlier in the report (See Figure B).

To understand the history of local bridge structures in Indiana, refer to Figure BB. Data from 1993 is highlighted in red as a comparison of condition trends over the past thirty years. For local bridges, the number of poor condition bridges are decreasing, however, there is a significant increase in fair condition bridges that corresponds to the decrease in good condition bridges. If the fair bridges are neglected, significant future investment will be required as they will quickly fall into the poor category.

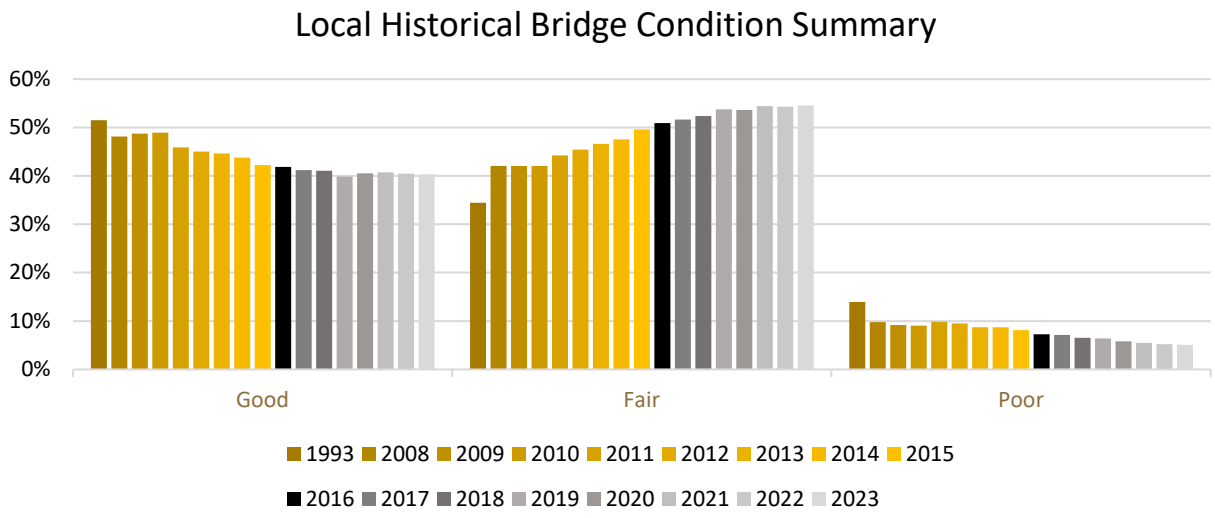

Figure BB: Historical Trends in Local County Bridge Conditions

This figure appeared earlier in the report (See Figure E).

In addition to condition rating, bridges that are load restricted or closed to traffic are also reported as such. In Indiana, there are 1,851 local bridges that are either closed or have a reduced load capacity, which significantly limits the ability of the traveling public to fully utilize these facilities. Another notable item of consideration is if the bridge is classified as scour critical. On the local agency network, there are

395 bridges that are considered either scour critical or have unknown foundations. This is an essential element of consideration since bridge scour is one of the most common causes of bridge failures in the United States (USDA, 1998).

It is 50% less expensive to make a fair bridge a good bridge than to make a poor bridge a good bridge.

There are numerous factors that contribute to the rate at which a bridge deteriorates. The bridge type is a major factor as well as the function of the road corridor and the number of de-icing salts and chemicals utilized on the bridge deck. These chemicals can adversely affect the concrete, steel beams, and steel reinforcement within and beneath the bridge deck. Bridge preservation and routine bridge maintenance activities contribute to the increased lifespan of a bridge and the safety of those utilizing the facility. Based on the NBI data, the average age of an Indiana local bridge is approximately 46 years, with 2,163 local bridges in Indiana that are older than 70 years.

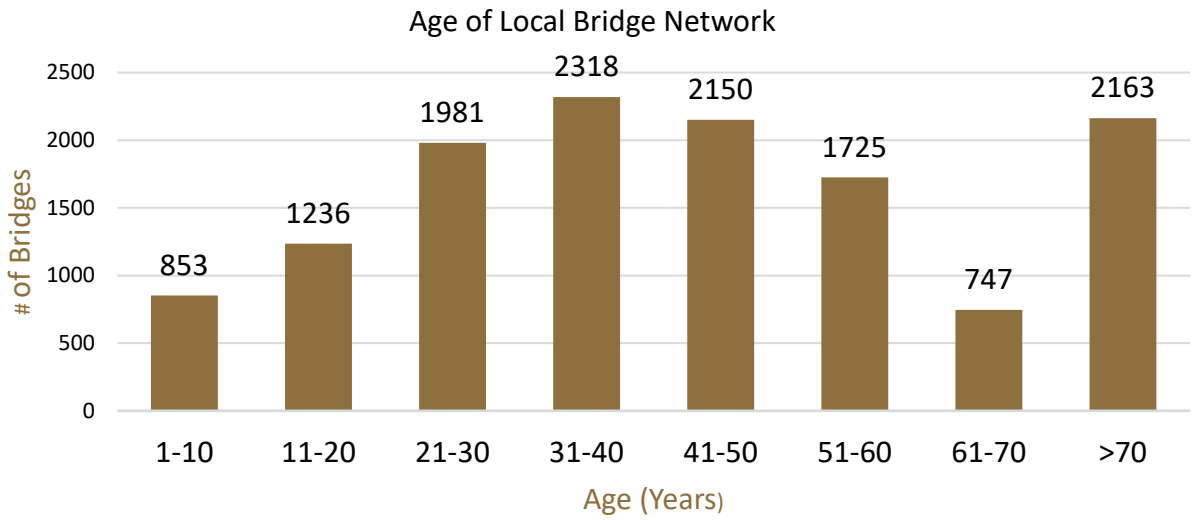

Figure CC: Age of the Local Bridge Network

With the average lifespan of a bridge structure of 70 years, the local bridge network statewide would need to replace 188 bridges per year, or 1,880 bridges per decade, to keep up with this service life. For the last 20 years, the number of bridges that have been replaced is well below the pace needed to maintain the service life of the local bridge network. Factors that may have contributed to this lapse include increased bridge construction costs and the lack of sufficient dedicated funding for these projects.

The average age of a local bridge in Indiana is 46 years with 16% of the local bridge network age 70 years or older.

Bridge Funding

Local agencies can utilize dedicated transportation funding sources such as MVH, LRS, and CCMG for bridge infrastructure projects in addition to establishing a cumulative bridge fund under the authority of a county agency as outlined in IC 8-16-3. With a cumulative bridge fund in place, the county executive is then responsible for providing funds for all bridges within the county, including those in municipalities, with the exception of bridges that are on the state highway system. According to the Annual Operation Reports (AOR) submitted to Indiana State Board of Accounts (SBOA), county agencies collected approximately $67 million in cumulative bridge funds in calendar year 2023.

Financial Need

To determine the financial need of the local agency bridge network, costs were identified for replacement and rehabilitation activities. To determine the replacement cost of a local bridge, four variables were included: 1) unit cost of bridge work, 2) new bridge expansion factor, 3) estimated amount of approach work, and 4) unit cost of approach work. When a bridge is replaced along a road corridor, it is common for the asphalt or concrete approaches leading up to the bridge to require reconstruction. This is included in the estimated amount of approach work. To determine the cost for each variable, county bridge replacement projects that were bid through the INDOT portal between January 2023 and May 2024 were analyzed and averaged to determine the unit cost of bridge work of $400 per square foot. Since older bridges were built to different standards and are typically smaller than is required by current bridge design standards, a bridge expansion factor was calculated. This expansion factor was estimated by synthesizing the average bridge deck growth by bridge deck area and was found to be 75% of the existing bridge deck area. The average length of approach work along a road facility to address required changes in horizontal alignment, vertical alignment, and guardrail runout lengths is estimated to be 800 feet for a bridge replacement project with an average unit cost of $800 per linear foot. Table W summarizes the estimated unit costs and calculation variables for a county bridge replacement project.

Table W: Estimated Bridge Replacement Unit Costs*

Bridge Unit Cost	$400/ ft^2
New Bridge Deck Growth	75%
Average Approach Work Replacement	800 ft
Approach Unit Cost	$800/ft

**These costs include estimated construction costs only. They do not include any small structure (<20 ft span) replacement costs, design fees, construction inspection costs, or right-of-way easement or procurement costs.*

Rehabilitation costs were estimated based on the bridge deck area using a unit cost that is 28% of the estimated reconstruction costs (Sinha, 2005). The approach work associated with rehabilitation projects is less than that required for replacement projects with an estimated length of 100 feet. The unit cost for this work remains the same at $800 per linear foot. Table X summarizes the estimated unit costs and calculation variables for a county bridge rehabilitation project.

Table X: Estimated Bridge Rehabilitation Unit Costs*

Bridge Unit Cost	$112/ft^2
Average Approach Work Rehabilitation	100 ft
Approach Unit Cost	$800/ft

**These costs include estimated construction costs only. They do not include any small structure (<20 ft span) replacement costs, design fees, construction inspection costs, or right-of-way easement or procurement costs.*

To determine the cost of replacement and rehabilitation for the local bridge network over the next 10 years, a network perspective was used considering bridge condition ratings and bridge age criteria. The bridge ratings are based on the four critical elements of a bridge including the substructure (foundation of the bridge), superstructure (elements supporting the deck), deck (driving surface of the bridge), and culvert conditions. The bridge age criteria have a threshold of 50 years due to asset management strategies that are implemented by local agencies and INDOT.

There are 2,363 local network bridges greater than 50 years old that need replaced.

From a network perspective, the above-mentioned criteria were used to evaluate if a bridge structure is a suitable candidate for replacement or rehabilitation. Bridges older than 50 years use a separate set of evaluation criteria for the critical bridge elements than those structures that are less than 50 years old. This asset management strategy is utilized to prevent older bridges (50 years or older) from having a superstructure replacement conducted that will outlast its substructure, thus underutilizing critical bridge funding. Based on these criteria, the local bridge network contains 2,363 bridges that are greater than 50 years old that are recommended for replacement and 746 bridges that are less than 50 years old that need replacement. Tables Y and Z provide information on the replacement criteria used for this analysis with Table AA outlining the criteria used to determine the number of bridges requiring rehabilitation activities.

Table Y: Replacement Criteria

Replacement Criteria Bridges ≥ 50 Years Old		
Element	**Condition Rating**	**Total Bridges**
Substructure <=	6	**4,980,790 ft^2 2,363 bridges**
Superstructure <=	5	
Substructure <=	6	
Deck <=	5	
Culvert <=	5	
Substructure <=	5	

Table Z: Replacement Criteria

Replacement Criteria Bridges < 50 Years Old		
Element	**Condition Rating**	**Total Bridges**
Substructure <=	5	**1,263,658 ft^2 746 bridges**
Superstructure <=	5	
Substructure <=	5	
Deck <=	5	
Culvert <=	5	
Substructure <=	5	

Table AA: Rehabilitation Criteria

Rehabilitation Criteria Bridges < 50 Years Old		
Element	**Condition Rating**	**Total Bridges**
Substructure >=	6	**1,511,190 ft^2 598 bridges**
Superstructure <=	5	
Substructure >=	6	
Deck <=	5	

To encapsulate the entirety of the local bridge program, bridge preservation treatments were also evaluated for all bridges that did not fall within the bridge replacement or bridge rehabilitation categories over the next 10 years. Specifically, bridges that qualify for a thin polymer overlay to seal the bridge deck and prevent salt and water from accelerating deterioration were included. Table BB outlines the estimated ten-year bridge investment need for the local bridge network including the costs of bridge replacement, bridge rehabilitation, and bridge preservation activities.

The local network has 746 bridges less than 50 years old that need replaced and 598 bridges less than 50 years old that need significant rehabilitation.

Table BB: Estimated Total Local Bridge Need over the next 10-Years*

Replacement	$4,570,089,421
Rehabilitation	$378,803,496
Preservation	$125,096,961
Total Local Bridge Need	**$5,073,989,878**

**These costs include estimated construction costs only. They do not include any small structure (<20 ft span) replacement costs, design fees, construction inspection costs, or right-of-way easement or procurement costs.*

The total cost of $5.07 billion is in 2024 dollars and does not include the impact of inflation. To annualize this financial need and estimate the inflationary impacts on construction activities, the estimated annual bridge cost highlighted in Table CC includes a 2.5% inflation factor for the next 10 years with a distribution of the total replacement, rehabilitation, and preservation work spread out evenly over the decade.

Table CC: Total Annualized Local Bridge Investment Need per Treatment Type*

Replacement	$	522,200,000
Rehabilitation	$	43,300,000
Preservation	$	14,300,000
Total Annual Local Bridge Need	**$**	**579,800,000**

**These costs include a 2.5% inflation factor during the ten-year period which is consistent with INDOT inflation modeling.*

This network strategy aims to reduce the number of bridges that are over 70 years of age, reduce the number of poor and fair bridges, and increase the service life of local agency bridges while simultaneously lowering the life cycle cost of the local bridge network. Thus, critical bridge funding may be invested to optimize the serviceability, safety, and operation of the local bridge network.

The local bridge network annual investment need over the next 10 years is estimated at $580M per year.

Gap in Dedicated Local Bridge Funding

The only dedicated local bridge funding available statewide is the cumulative bridge fund as outlined in IC 8-16-3. This fund allows a county unit to levy a tax not to exceed ten cents ($0.10) on each one hundred dollars ($100) of assessed valuation of all taxable personal and real property within the county. While the mechanism allows for dedicated local bridge funding to be generated locally, it should be noted that this tax levy is included in the maximum levy calculation for the local unit of government, meaning that other tax levies within that governmental unit (such as public safety) can be impacted or can impact the ability to generate cumulative bridge fund revenue.

As reported in the Annual Operations Reports submitted by local units of government to the Indiana State Board of Accounts, counties received approximately $67 million in cumulative bridge funds in 2023. This amount is well below the $580 million annually required investment level for bridge preservation, rehabilitation, and reconstruction needs. Thus, an annual funding gap of $513M is estimated for local bridge needs statewide.

An annual local bridge network funding gap of $513M is estimated over the next ten years.

Due to the current reporting requirements for local infrastructure investments, it is difficult to distinguish funds expended on road projects versus those expended on bridge projects. It is likely that dedicated road funding sources such as MVH, LRS, and CCMG funds were also utilized for local bridge needs, which is allowable under state law.

Summary

The local transportation network has improved over the past several years due to the increased utilization of asset management principles coupled with the increased financial investment in local transportation infrastructure. The next ten years provides another challenging era of transportation investment and prioritization to support these improvements and continue to better serve the citizens of Indiana's local communities.

Table DD summarizes the annual local road funding need at various levels of investment over the next ten years with costs to preserve unpaved local roads ($35 million per year) included in the county need.

Table DD: Estimated Local Road Funding Need Over a Ten-Year Period

This table appeared earlier in the report (See Table A).

	Annual Local Road Investment Need over 10-Years		
Investment Levels	**City/Town**	**County**	**Total**
Preserve Network Conditions	$ 625,000,000	$ 635,000,000	**$ 1,260,000,000**
Improve Network Conditions	$ 900,000,000	$ 1,135,000,000	**$ 2,035,000,000**
Eliminate Poor & Failed Roads	$ 1,150,000,000	$ 1,535,000,000	**$ 2,685,000,000**

These investment levels represent a network analysis approach that focuses on a "mix of fixes" to preserve good condition roads, rehabilitate fair condition roads, and strategically reconstruct failed pavements. The various targets of investment include preserving network conditions, improving network conditions, and eliminating poor and failed roads on the local network. *Preserving network conditions* is the amount needed to support the current local infrastructure network in its current state. Any investments below this threshold will likely result in a deteriorating local road network. *Improving network conditions* investment level aims to improve the local network by adding years of life to the assets, reducing the percentage of poor roads in the network, and tactically addressing failed road segments earlier in the network strategy. *Eliminating poor and failed roads* closely resembles INDOT's strategy of reducing poor roads and not allowing road facilities to get to a failed state of PASER 1 or PASER 2. Costs included in this analysis represent ***construction costs only*** for the existing local transportation network. No design engineering, right-of-way acquisition, utility relocation, permitting, construction inspection, or other ancillary costs are included. Additionally, added capacity projects and new corridor investments are not included.

It should be noted that if current funding levels remain stagnant through the next decade of infrastructure construction, reconstruction, and preservation activities, it is estimated that the overall condition of the local road network will drastically decline, thus negating the positive progress made by the state legislature and local officials over the past decade.

In addition to the local agency road network, financial investments are also needed to preserve, rehabilitate, and replace critical bridge infrastructure on the local system. Currently, the average age of a local Indiana bridge is 46 years, with 2,163 local bridges that are older than 70 years. In order to properly address these facilities, significant investments are required over the next decade. Table EE summarizes the annualized investments required to address these local bridge structure needs utilizing

a 2.5% inflation rate and applying asset management principles that are consistent with INDOT modeling and management practices.

Table EE: Total Annual Local Bridge Investment Need per Treatment Type

This table appeared earlier in the report (See Table B).

Replacement	$ 522,200,000
Rehabilitation	$ 43,300,000
Preservation	$ 14,300,000
Total Annual Bridge Need	**$ 579,800,000**

With a majority of local infrastructure funding used interchangeably on road and bridge assets, the financial need for local roads and bridges are aggregated into a comprehensive comparison of need versus available funding to highlight the estimated gap in funding for Indiana's local road and bridge assets over the next ten years. The available funding includes dedicated funding sources for infrastructure use such as MVH restricted, LRS, CCMG, wheel tax and excise surtax funds, and cumulative bridge funds. Also included in the gap analysis is the cost to preserve the 11,600 centerline miles of unpaved roads, primarily on the county road network, at a cost of approximately $35M per year. Table FF outlines the gap in investment for the local agency network at varying levels of performance.

Table FF: Annual Local Funding Required for Construction, Reconstruction, and Preservation Over a Ten-Year Period

This table appeared earlier in the report (See Table C).

Annual Local Funding Required for Construction, Reconstruction, & Preservation over a Ten-Year Period					
Investment Levels	**Local Road Need**	**Local Bridge Need**	**Total Local Network Need**	**Available Dedicated Funding***	**Funding Gap**
Preserve Network Conditions	$ 1,260,000,000	$ 579,800,000	**$ 1,839,800,000**	$ 853,217,940	**$ (986,582,060)**
Improve Network Conditions	$ 2,035,000,000	$ 579,800,000	**$ 2,614,800,000**	$ 853,217,940	**$ (1,761,582,060)**
Eliminate Poor & Failed Roads	$ 2,685,000,000	$ 579,800,000	**$ 3,264,800,000**	$ 853,217,940	**$ (2,411,582,060)**

**Available dedicated funding includes MVH-R, LRS, CCMG, wheel tax/excise surtax, and cumulative bridge. MVH Unrestricted is not included due to other street and highway department responsibilities.*

If all eligible counties and municipalities instituted the wheel tax and excise surtax at the maximum allowable rates to obtain the estimated available capacity of $335M annually, a deficit of $652M per year would remain to preserve local road and bridge network conditions as identified in Table FF.

Indiana local agencies need $987M to $2.41B in additional road and bridge funding annually to preserve and improve the local transportation network.

It is important to note that while road and bridge construction costs are a large component of the financial need at the local level, other expenses associated with this work such as design engineering, right-of-way acquisition, permitting, and construction inspection are not included in the above figures. Additionally, this analysis did not account for road and bridge projects that add capacity or are new corridors, which support the growth and vitality of Indiana's local communities. Bridge structures less than 20 feet in span length are not included, nor are essential safety items such as signage, drainage, mowing operations, ADA compliance, pavement markings, and guardrails. Lastly, other expenses that support the operation, administration, winter maintenance, equipment/fleet, and workforce development of local street and highway departments are not considered in this report.

This report reflects construction costs only, which represents a fraction of the total need. Inclusion of additional financial needs such as safety, ADA compliance, drainage, winter maintenance, fleet, workforce development, administration, and operations are required to provide a comprehensive needs assessment for the local transportation network.

Overall, the data in this report demonstrates the proficiency of Indiana's local transportation professionals to be good stewards of the resources provided to maintain and improve the local road and bridge network. Continued support of these efforts will allow Indiana to remain a leader in local transportation asset management, thus supporting Indiana's proper status as the Crossroads of America.

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Appendix A

Asphalt Pavement PASER Condition Table

Wisconsin Transportation Information Center. *PASER Manual*. 2002

Rating system

Surface rating	*Visible distress**	*General condition/ treatment measures*
10 Excellent	None.	New construction.
9 Excellent	None.	Recent overlay. Like new.
8 Very Good	No longitudinal cracks except reflection of paving joints. Occasional transverse cracks, widely spaced (40' or greater). All cracks sealed or tight (open less than ¼").	Recent sealcoat or new cold mix. Little or no maintenance required.
7 Good	Very slight or no raveling, surface shows some traffic wear. Longitudinal cracks (open ¼") due to reflection or paving joints. Transverse cracks (open ¼") spaced 10' or more apart, little or slight crack raveling. No patching or very few patches in excellent condition.	First signs of aging. Maintain with routine crack filling.
6 Good	Slight raveling (loss of fines) and traffic wear. Longitudinal cracks (open ¼"– ½"). Transverse cracks (open ¼"– ½"), some spaced less than 10'. First sign of block cracking. Sight to moderate flushing or polishing. Occasional patching in good condition.	Shows signs of aging. Sound structural condition. Could extend life with sealcoat.
5 Fair	Moderate to severe raveling (loss of fine and coarse aggregate). Longitudinal and transverse cracks (open ½" or more) show first signs of slight raveling and secondary cracks. First signs of longitudinal cracks near pavement edge. Block cracking up to 50% of surface. Extensive to severe flushing or polishing. Some patching or edge wedging in good condition.	Surface aging. Sound structural condition. Needs sealcoat or thin non-structural overlay (less than 2")
4 Fair	Severe surface raveling. Multiple longitudinal and transverse cracking with slight raveling. Longitudinal cracking in wheel path. Block cracking (over 50% of surface). Patching in fair condition. Slight rutting or distortions (½" deep or less).	Significant aging and first signs of need for strengthening. Would benefit from a structural overlay (2" or more).
3 Poor	Closely spaced longitudinal and transverse cracks often showing raveling and crack erosion. Severe block cracking. Some alligator cracking (less than 25% of surface). Patches in fair to poor condition. Moderate rutting or distortion (greater than ½" but less than 2" deep). Occasional potholes.	Needs patching and repair prior to major overlay. Milling and removal of deterioration extends the life of overlay.
2 Very Poor	Alligator cracking (over 25% of surface). Severe rutting or distortions (2" or more deep). Extensive patching in poor condition. Potholes.	Severe deterioration. Needs reconstruction with extensive base repair. Pulverization of old pavement is effective.
1 Failed	Severe distress with extensive loss of surface integrity.	Failed. Needs total reconstruction.

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