



# INDIANA RURAL ROADS AND BRIDGES

The Crumbling Reality and What it Will Take to Mend These Critical Economic Arteries

## EXECUTIVE SUMMARY

Study completed by IU Public Policy Institute  
for Indiana Soybean Alliance and Indiana Corn Marketing Council

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# NEARLY

— that's how much it would cost to bring all of Indiana's rural roads up to an acceptable level and to repair or replace all of Indiana's functionally obsolete or structurally-deficient bridges.

This number is nearly triple the state's financial reserves. It's quadruple the amount of new money legislators injected into the road funding formulas during the General Assembly's 2016 session.

It's an enormous amount of money, yet for a state that rightly calls itself the Crossroads of America, the investment is necessary to ensure Indiana's farmers and all who make a living in agriculture have a route to continued economic strength.

# \$6.4 BILLION

## THE CHALLENGE

### Local road and bridge challenges for agriculture

Farmers and others involved in the \$42.6 billion sector of Indiana's economy (Indiana Business Research Center, 2015) confirmed what the data in this report indicated — they need better roads to more efficiently produce the grain, livestock, and other commodities that literally feed us.

This study found the trends in agriculture that affect the efficient movement of farm equipment from location-to-location and product from farm-to-market, which includes:

- Increasing size of agricultural equipment;
- Movement of product predominantly by truck;
- Increasing weight of agricultural equipment and truck loads, with heavier truck loads possible in the future; and
- Year-round farm-to-market trips (not only at harvest)

Each of these changes are important to the competitiveness of Hoosier products.

Farming and agribusiness focus group participants identified problematic infrastructure issues that have arisen as a result of these trends, and historically challenging infrastructure design and conditions that cost them time and money because of longer farm-to-market routes:

- Roundabouts and curbs
- Rough pavement
- Poor visibility at crossings
- Peaked or troughed crossings and bridges
- Low overpasses
- Narrow roads that make it hard to move farming equipment
- Road width at intersections hampered by signs, utility poles, mailboxes, crops, and trees
- Narrow intersections
- Freeze/thaw and enforcement of frost limits
- Paved roads vs. chip-and-seal vs. gravel vs. dirt
- Drainage around roads
- Conflicts with urban and suburban road users

These stakeholders frequently reported that these issues result in longer trips from farm-to-farm and from farm-to-market — costing both time and money.

## THE NEED

### Road and bridge rehabilitation needs, spending, and funding gap

The research team developed estimates for county road and bridge rehabilitation needs, spending, and the funding gap for 20 years (2016-2035). Estimates are based on data for 16 study counties that are extrapolated to the state.

The strategy employed for establishing costs is based on asset management, often referred to as “doing the right treatment at the right time.” This preferred approach utilizes treatment options to improve and extend the life of capital assets; and is a more effective and economical strategy than the more common “worst first” approach.

For road pavements, the quality goal is to raise and maintain pavements to a PASER<sup>6</sup> (good) across the county network. For bridges, the quality

goal is to address all current structurally deficient and functionally obsolete bridges immediately and to address additional bridges that reach these ratings in the future.

Needs include the costs to address immediate needs to update all infrastructure to the minimum quality level described and total needs to maintain county infrastructure over 20 years (Figure ES1).

The spending gap is reported using three scenarios in which immediate needs are addressed over one, three, or five years. Figure ES1 summarizes the findings for needs, spending, and the funding gap for road and bridge rehabilitation.

\*The Pavement Surface Evaluation Rating (PASER) is a visual method, based on engineering principles, for evaluating the condition of pavement surfaces in an easy-to-learn, time efficient and consistent way. The PASER rating scale is from 1 to 10, with 1 being the lowest (failed) and 10 being the highest (excellent).

# FUNDING STRATEGIES

## Augmented motor fuel taxes

Gasoline and diesel taxes are the primary source of transportation funding in Indiana.

Due to inflation and improved fuel efficiency, these taxes are increasingly inadequate to maintain the transportation system.

The research team provides a forecast of Indiana's fuel tax revenue based on the current policy and three alternative taxation schemes:

1. Indexing to inflation
2. Indexing to inflation and fuel economy
3. A vehicles miles traveled (VMT) fee on vehicles

These projections indicate that by 2035, revenue from fuel taxes will decrease by 41.0 percent under the current taxation scheme (Table ES2). Indexing fuel taxes to inflation results in a decrease in the tax revenue by 12.4 percent. Indexing using only inflation is inadequate to maintain funding (in real dollars) because fuel efficiency outpaces inflation. Indexing fuel taxes to inflation and fuel economy increases the fuel tax revenue by 30.1 percent in 2035. Switching to a mileage fee increases revenue by 22.9 percent by 2035.

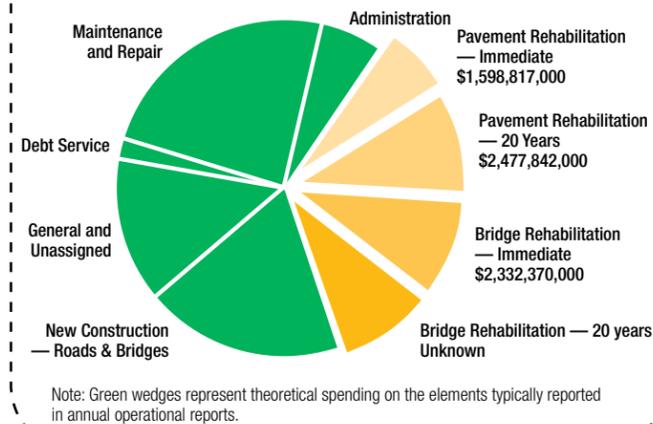
This analysis suggests that indexing fuel taxes to inflation or implementing a VMT-fee would address the challenge of financial sustainability by providing a revenue source that increases at or exceeds the rate of inflation between now and 2035. If Indiana were to enact policies that link fuel taxes to a measure of inflation, state governments would arrest the decreasing purchasing power of their current revenue streams. While the fuel tax would remain constant in real terms, increases in population, real income, which ultimately drives up vehicle miles traveled, will result in increased revenue. However, the issue of increased fuel economy is not addressed by indexing fuel taxes to inflation.

From a revenue perspective, the VMT fee is the only scenario that is sustainable in the long run because it is not linked to fuel economy.

Indexing the fuel tax to inflation does not disconnect the motor fuel tax revenue from the increase in fuel efficiency. In the VMT scenario, the increase in revenue is linked to the number of vehicles on the road and the amount of miles driven.

The politics of adopting a taxing structure that requires the government to monitor driving habits is politically or technologically difficult to achieve in the near term. There also is widespread public opposition to the enactment of a VMT fee, with reasons including that the taxation is unfair to rural drivers, to people who drive more as part of their job, to people who drive fuel-efficient vehicles, and to people who are concerned about privacy issues (Duncan & Graham, 2013).

**FIGURE ES1**  
20-year county road and bridge needs (2016-2035)



**TABLE ES1** 20-year statewide summary of county road and bridge rehabilitation needs, spending and funding gap (2016-2035; 2015 dollars)

		Pavement Rehabilitation	Bridge Rehabilitation	Total Rehabilitation
Paved Mileage/Bridges		56,760	13,090	N/A
Needs	Immediate	\$1.599 billion	\$2.332 billion	\$3.931 billion
	20-year	\$4.077 billion	Immediate + deterioration	\$6.409 billion + bridge deterioration
Annual Spending		\$119.233 million	\$126.050 million	\$245.283 million
Annual Funding Gap (Scenario 1)	Year 1	-\$1.505 billion	-\$2.206 billion	-\$3.711 billion
	Years 2-20	-\$27.411 million	Spending – deterioration	-( \$27.411 million + bridge deterioration gap)
Annual Funding Gap (Scenario 2)	Year 1-3	-\$487.055 million	-( \$651.407 million + deterioration)	-( \$1.138 billion + bridge deterioration gap)
	Years 4-10	-\$33.498 million	Spending – deterioration	-( \$33.498 million + bridge deterioration gap)
Annual Funding Gap (Scenario 3)	Years 1-5	-\$284.753 million	-( \$340.424 million + deterioration)	-( \$625.177 million + bridge deterioration gap)
	Years 6-20	-\$35.791 million	Spending – deterioration	-( \$35.791 million + bridge deterioration gap)

**TABLE ES2** Fuel consumption, tax revenue and tax distributions by scenario (2016-2035; 2015 dollars)

	2016	2035				2035 (Percent Change)			
		Baseline	CPI	CPI-MPG	VMT	Baseline	CPI	CPI-MPG	VMT
Consumption (in million gallons)									
Gasoline	2,995	2,094	2,081	2,064	2,055	-30.1%	-30.5%	-31.1%	-31.4%
Diesel	1,517	1,872	1,871	1,869	1,095	23.5%	23.4%	23.2%	-27.8%
Excise Tax Revenue (in million dollars)									
Total	\$769	\$454	\$674	\$1,001	\$945	-41.0%	-12.4%	30.1%	22.9%
Gasoline	\$530	\$253	\$375	\$555		-52.4%	-29.4%	4.6%	
Diesel	\$239	\$201	\$299	\$446		-15.9%	25.4%	87.0%	
Revenue to state, counties and cities from all sources (in million dollars)									
SHF INDOT	\$592	\$416	\$534	\$709		-29.7%	-9.8%	19.8%	
Counties	\$339	\$237	\$305	\$408		-30.1%	-9.9%	20.3%	
Cities and Towns	\$147	\$138	\$149	\$162		-6.1%	1.0%	10.4%	

Notes:  
1. "All sources" includes gasoline and diesel taxes, Major Moves Draw, permits, sales tax, etc.  
2. All values in 2015 dollars.

Tables ES3 shows the annual cost per vehicle for 2016, the baseline, and the three scenarios. For cars and light trucks, which constitute the majority of vehicles on the road, gasoline taxes are reduced under the baseline and the CPI scenario. This is because of gains in fuel efficiency. Indexing fuel taxes to both CPI and for fuel efficiency increases gas taxes paid per vehicle increase, but very modestly. For medium- and heavy-duty trucks, fuel efficiency is not improving as much over the projection period so the increases under the CPI-MPG and the VMT scenarios are greater.

**TABLE ES3** Estimated annual fuel tax costs for selected vehicle types (2015 dollars)

Vehicle Type	2016	2035			
		Baseline	CPI	CPI-MPG	VMT
Gasoline Car	\$95.16	\$46.56	\$72.46	\$110.77	\$113.31
Gasoline Truck	\$160.11	\$78.33	\$121.91	\$186.37	\$190.64
Diesel Truck (Light Duty)	\$103.86	\$55.87	\$87.24	\$134.01	\$168.90
Diesel Truck (Freight Heavy Duty)	\$2,073.24	\$1,340.15	\$1,965.60	\$2,900.34	\$2,154.26

Cost per mile decreases for cars and light trucks may be useful in communicating with taxpayers and increasing acceptance of a fiscal solution. For these vehicle types, the cost per mile decreases for all policy scenarios (Table ES4). This is a direct consequence of the increasing fuel efficiency, which outpaces growth in VMT. The cost per driver is decreasing under all tax scenarios and a change in tax rate only affects how much it decreases. The variation across the different tax scenarios is small because taxes are relatively small proportion of the overall cost-per-mile. It is the large amount of fuel consumed (gallons) and miles driven multiplied a few cents in fuel tax or by the VMT fee that makes a big difference in revenue. The fuel efficiency for medium- and heavy-duty trucks; however, is not expected to improve significantly over the projection period and those vehicle owners are affected more by the increase in fuel price than the light trucks and cars.

**TABLE ES4** Cost-per-mile in 2016 and 2035 under various tax scenarios (2015 dollars)

Vehicle Type	2016	2035				2035 (% Change)			
		Baseline	CPI	CPI-MPG	VMT	Baseline	CPI	CPI-MPG	VMT
Gasoline Car	\$0.126	\$0.098	\$0.100	\$0.103	\$0.092	-22.3%	-20.5%	-18.0%	-26.8%
Gasoline Truck	\$0.171	\$0.133	\$0.136	\$0.141	\$0.125	-22.3%	-20.5%	-18.0%	-26.8%
Diesel Truck (Light Duty)	\$0.139	\$0.143	\$0.143	\$0.144	\$0.138	3.1%	3.5%	4.1%	-0.7%
Diesel Truck (Freight Heavy Duty)	\$0.268	\$0.296	\$0.298	\$0.299	\$0.292	10.5%	10.9%	11.5%	8.8%



# FUNDING STRATEGIES

## Local option highway use tax

Local Option Highway Use Tax (LOHUT) has been available to local governments in Indiana since 1980. Counties that adopt this tax must adopt the vehicle excise surtax and the wheel tax. Each of the two components apply to a distinct set of vehicle types.

Fifty-one counties have adopted this tax (LTAP, 2016). In 2016, HB1001 and SB67 allow counties to double the vehicle excise surtax and the wheel tax with the adoption of an approved INDOT transportation asset management plan (AMP).

In addition, municipalities with a population greater than 10,000 are allowed to impose an additional municipal motor vehicle license excise tax and a municipal wheel tax.

Total estimated potential revenue from LOHUT adopted by counties in 2017 is \$217 million and \$108 million with and without AMP, respectively. Projected potential revenue in 2035 is estimated to be \$228 million and \$114 million with and without AMP, respectively. Potential revenues vary across counties.

Because this tool taxes vehicles, more urban and suburban counties can generate more revenue. County-adopted LOHUT revenues are distributed by county government as well as the cities and towns within each adopting county. Potential revenue for LOHUT adopted by cities and town is not estimated here.



# Other LOCAL STRATEGIES

The network of rural roads and bridges under the jurisdiction of county governments and the gap between current and needed funding for rehabilitation are vast.

Clearly, more state support is needed, but funds to address the entire rehabilitation funding gap combined with needs for new infrastructure and maintenance seems unlikely.

In addition, the complex formula for distributing increases to gas tax or a replacement source may not deliver adequate resources to all counties. In light of that, local governments must identify additional local resources, make choices among local needs, and do more to wring additional utility out of all federal, state, and local dollars.

Several local tools are described within the report, including:

- Utilizing debt
- Cost sharing mechanisms
- Planning for infrastructure improvements using asset management or capital improvements planning
- Managing infrastructure inventory using a “fix-it-first” strategy
- Selective reduction of the bridge inventory
- Returning selected paved infrastructure to gravel
- Prioritizing farm-to-market routes
- Aligning land use and transportation planning
- Joint purchasing
- Outsourcing



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