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Interim Study Committee on Roads and Transportation

Testimony of

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To the

Interim Study Committee on Roads and Transportation

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Introduction

There are many obvious economic benefits to allowing heavier trucks on our transportation network. As stated in a 2014 JTRP technical report[1], a 5% increase in the GVW (4,000 lbs.) translates into a 7.8% increase in the payload because there is no increase in the tare weight of the vehicle, rather only an increase in the payload. Similarly, increasing the GVW by 8,000 lbs. (10%) increases the payload by approximately 15%. The increased profit from the additional delivered goods per trip typically far exceeds the additional truck operating costs including fuel taxes and the cost of permits. Balancing those economic gains against the cost to build and maintain our state and local infrastructure should be one of our highest priorities.

Understanding the impact of larger, heavier trucks on our local transportation network is made exceedingly difficult due to a lack of research on the effects of heavier vehicles on local roadways. On the state routes where reliable pavement design data is available, we are able to measure the additional cost in construction and maintenance to handle the heavier loads. In a vast majority of the local network, there is little or no pavement design data available, and the task of understanding what our local network can handle looms large. There is hope, thanks to HEA 1001 2016; we do have reliable pavement condition at the local level. For the past three years, Indiana local agencies have been rating the condition of their road and bridge assets. We can report that 90.1% local bridges have an operating rating at or above legal loads. We can also report that all 92 counties, all 120 cities and 347 of the 443 towns have rated their roads and submitted pavement condition data to Indiana LTAP. We can also report that for the first time we have Annual Operation Report data available for all 92 counties and all 56 municipalities that meet the population threshold of greater than 15,000 as required by the Indiana State Board of Accounts. In the previously mentioned 2014 JTRP technical report[1], *Impact of HB-1481 on Indiana's highway revenue generation, asset degradation, modal distribution, and economic development and competitiveness*, it was clear that a lack of available data made it difficult to carry out the cost allocation for local routes. With current pavement data and complete financial accounting of the dollars put forth annually for construction, reconstruction, and preservation, as well as dollars spent on maintenance and repair of our local roads, we may soon see the cost allocation for our local routes.

Indiana has come a long way to having sound data on the local road network, not many states can report to the extend Indiana can, but much work is still yet to be done. Understanding the geotechnical makeup of the local road network and providing research and technical assistance to help local agencies build pavements that meet economic demands should become part of our future mission and goals.

Specific Impacts

Safety

Recent research on the effect of truck size and weight on roadway safety is devoted to the interstate and state network and the characteristics of a large truck in a crash. A transportation research synthesis[2] from the Local Road Research Board in Minnesota does provide some guidance on how to prepare for the impacts of future weight limit increases at the federal or state level. However, there is limited research available that focuses on heavy vehicles at the local level. We have all driven on our local roads, and the safety concerns are sometimes obvious to us. Local roads pass right in front of our homes, our schools, and through the center of town. We are already wrestling with how to move class 7, 5-axle vehicles on our local roads safely. Adding additional weight, which requires increased stopping distance, may only magnify the problem, especially given our traffic control devices like signs are placed for normal stopping sight distances, not those required by heavier trucks. Even our more rural routes face challenges when it comes to class 7, 5-axle vehicles. Rural roads are typically narrow, have limited sight distance at curves, hills, and intersections, and are not geometrically designed or signed for the longer trucks. If you have ever made a right turn, in a semi, on a county road, you are keenly aware of the challenges. Longer trucks tend to off-track around curves and intersections, creating potentially dangerous ruts on the shoulder to other vehicles. These wheel ruts can cause crashes and drainage erosion issues. In addition to increased stopping distance requirements, heavier trucks also take longer to accelerate. In a 2009 study by the FHWA[3], one particular finding revealed the operating environment, including road type and time of day, has a larger effect on crash rates than truck configuration.

Pavements

As stated in the introduction, we do have reliable pavement condition at the local level. From the available data, several facts emerge that may tell us the scope of the impact on our local roads. In our most recent condition report[4], 39% of the county road network is shown to be in poor condition, (Figure 1.1) for our cities 26% is in poor condition, (Figure 1.2) and the towns have 30% in poor condition, (Figure 1.3). To understand the magnitude of these figures, we need to understand the PASER (Pavement Surface Evaluation and Rating) method. Poor roads are defined as roads or road segments rated at a PASER 4 or less. PASER 4 or less are road segments as having visual structural distresses evident in the pavement. These structural distresses include block cracking over 50% of the surface, longitudinal cracking in the wheel path, rutting greater than ½", fatigue cracking or a loss of surface integrity. These pavement segments will benefit from a structural overlay of 2" or more and could include reconstruction with an extensive base repair. From this data, we can imply that roads rated in poor condition will not support the current legal load, let alone overweight loads.

Fair roads are defined as roads or road segments rated at a PASER 5, 6 or 7. PASER 5-7 describe road segments showing signs of aging but are in sound structural condition. These road

segments are candidates for capital preventive maintenance to prevent further deterioration. These road segments are the most concerning because they make up almost half of the local road network. We would need to know if these road segments have a pavement design capacity to withstand additional loading. My fear is that they do not, and could fail prematurely regardless of the preventive maintenance treatment applied.

Good roads are defined as roads or road segments rated at a PASER 8, 9 or 10. PASER 8-10 describe road segments as showing no signs of aging and no visible distress evident in the pavement. These road segments are typically new construction or reconstruction. These road segments are in good condition, but research needs to be done to identify the pavement design capacity to withstand additional loading.

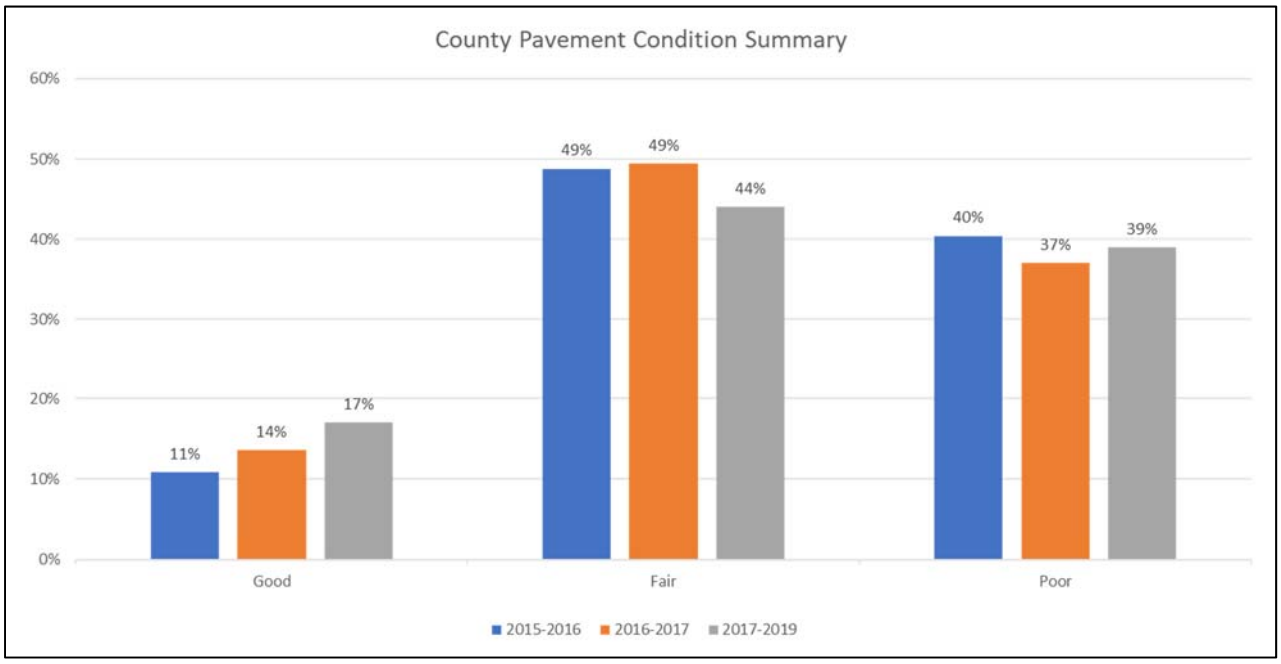

Figure 1.1 County Pavement Condition Summary. (Source: Indiana Local Technical Assistance Program, 2019 Condition Report, County/City/Town.)

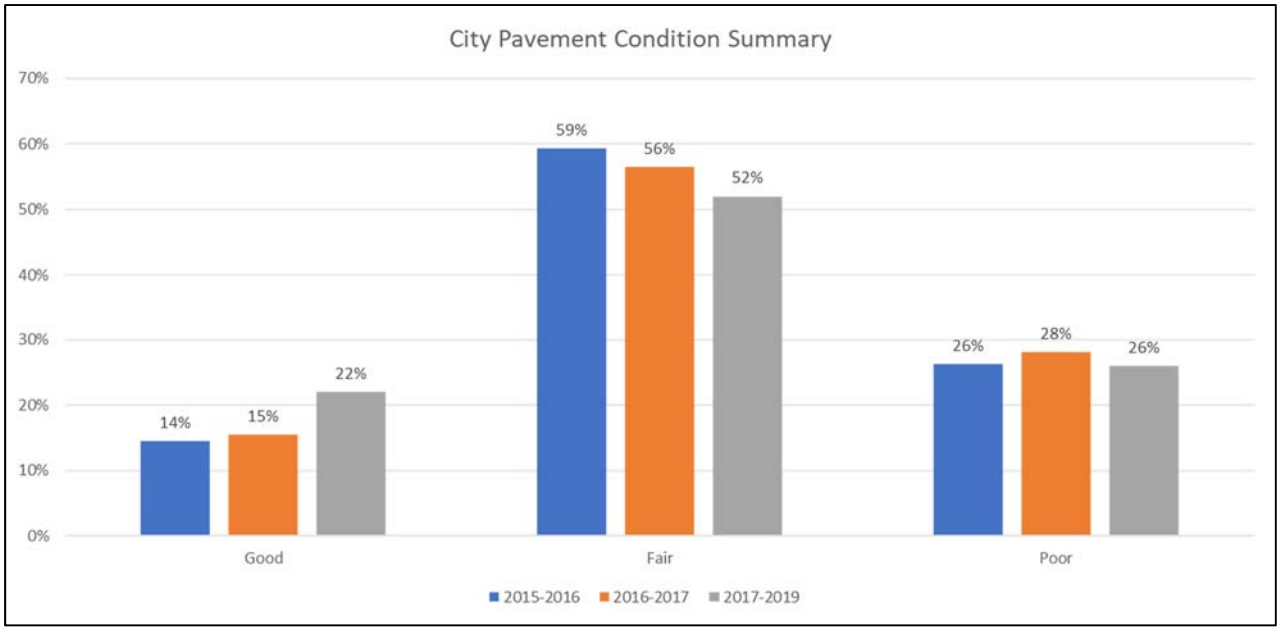

Figure 1.2 City Pavement Condition Summary. (Source: Indiana Local Technical Assistance Program, 2019 Condition Report, County/City/Town.)

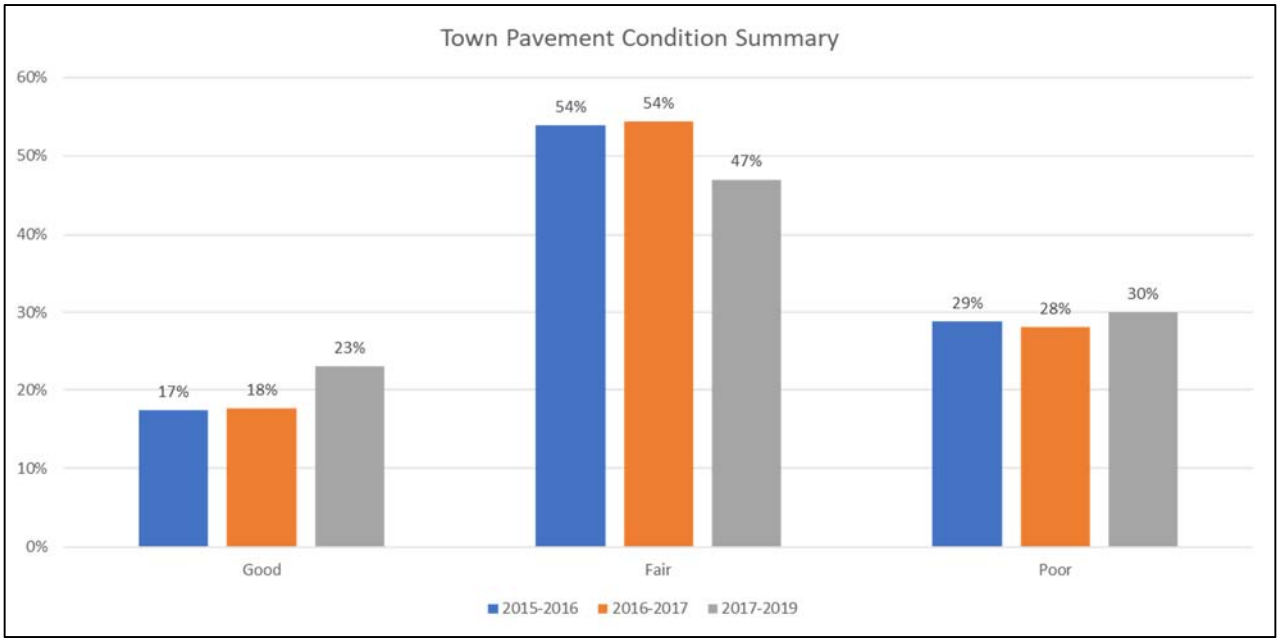

Figure 1.3 Town Pavement Condition Summary. (Source: Indiana Local Technical Assistance Program, 2019 Condition Report, County/City/Town.)

Bridges

In our most recent condition report[4], the overall county average sufficiency rating is 81.8 with 6% of local bridges in poor condition. In the data found in the NBIS database, Item 70 shows that 90.1% of the local bridges in Indiana have an operating rating at or above legal loads, there are 1,247 bridges over 150' long, and the average age is almost 44 years. What is not evident in the available data is to what extent above legal loads the local bridge network can withstand.

Conclusion

An increase in weight and frequency of trucks traveling on our local roads will create unique challenges for our county and municipal transportation managers. Our next steps could include a study of the vehicle classification data and average annual daily traffic counts across our local road network. We could also study existing pavement design data on our rural and urban roads. Providing recommended pavement design data and cost analysis could aid in implementation on the local network. Additionally, we should assist local road managers in identifying safe and sustainable routes for the industry, connecting the local network to the state network.

Understanding the concepts of transportation asset management should be considered when addressing large complex transportation problems. The concepts of asset management help us to identify an asset, inventory it, assess its condition, determine its value, forecast its deterioration, and develop plans to improve it. This may be the best path forward to providing the local road user and the road owner the road network that they both deserve.

[1.] Everett, S. R., Athigakunagorn, N., Woldermariam, W., Varadarajan, V., Arman, M., Roshandeh, A. M., Gkritza, K., Labi, S., & Sinha, K. C. (2014). Impact of HB-1481 on Indiana's highway revenue generation, asset degradation, modal distribution, and economic development and competitiveness (Joint Transportation Research Program Publication No. FHWA/IN/JTRP-2014/14). West Lafayette, IN: Purdue University. http://dx.doi.org/10.5703/1288284315514

[2.] Local Road Research Board Minnesota Department of Transportation. *Benefits and Costs of Increasing Truck Load Limits: A Literature Review.* TRS 1503 Published January 2015. Retrieved from https://lrrb.org/media/reports/TRS1503.pdf.

[3] FHWA 2009. *Highway Safety and Truck Crash Comparative Analysis, Comprehensive Truck Size and Weight Limits Study, Final Draft Desk Scan.* Washington, DC: U.S. Department of Transportation, Federal Highway Administration. Retrieved from http://www.ops.fhwa.dot.gov/freight/sw/map21tswstudy/deskscan/safety_dksn.pdf

[4] Indiana Local Technical Assistance Program. *2019 Condition Report.* West Lafayette, IN: Retrieved from https://docs.lib.purdue.edu/inltappubs/