Chapter 6:
Recommendations

6

The culmination of the long range planning process is the selection of projects and policies for the transportation network, (i.e. roadway, public transit, and pedestrian/bicycle. Information from the previous chapters, public engagement, stakeholder consultation and the scenario analysis led to the following recommendation that constitute the long range plan for transportation the MACOG Region.

Roadway Transportation Recommendations

The 2045 Transportation Plan recommends a program of projects and strategies intended to reduce existing and projected congestion, support increased mode choice, and address deficiencies within the network. The fiscally reasonable roadway recommendations will improve the existing and future network by upgrading or adding new roadways. A map of the roadway transportation project is shown below and a full listing of the projects can be found in Appendix A.

Implementing these recommendations will help the region achieve the goals, objectives, and performance targets discussed in previous chapters. However, future deficiencies cannot always be precisely or accurately modeled or predicted. Therefore, the 2045 Transportation Plan is a dynamic document, one that will undergo future updates to reflect changing conditions and needs. This is why MACOG continually monitors the transportation network and works to implement short-term improvements.

Active and Public Transportation Recommendations

Our transportation network is more than just roads for vehicles. It also incorporates sidewalks, bike lanes, trails and other facilities for pedestrians, bicyclists, and transit users. The desire for more transportation options continues to grow for both an increasing aging population as well as younger generations. Both these populations value quality places and proximity to community amenities (AARP Public Policy Institute Research Report 2014). Based on changing demographics and development preferences, communities are looking for ways to better accommodate choice in travel options be that walking, biking, or using public transit.

Development preferences are also in support of multi-modal choice as many communities are seeing denser, mix used development in urban cores and downtown areas. Based on MACOG's How We Grow survey, 90% of people support re-development of vacant property versus 35% who would like to see new subdivisions. Additionally, 70% of people prefer residential zoning mixed with commercial development and over 52% support higher density housing such as townhomes and condominiums. In our region, the preference for transportation choice is being supported by the adoption of Complete Streets Policies and multi-modal projects which are meant to accommodate the needs of all users of the roadway network.

- Nearly half of people who participated in MACOG's How We Grow Survey identified the ability to walk, bike or take public transit to daily activities as a top reason for choosing to live in a community.
- Over 90% of people supported transportation investments that make streets complete and functional for all modes of transportation

Figure 6-1: Roadway Projects

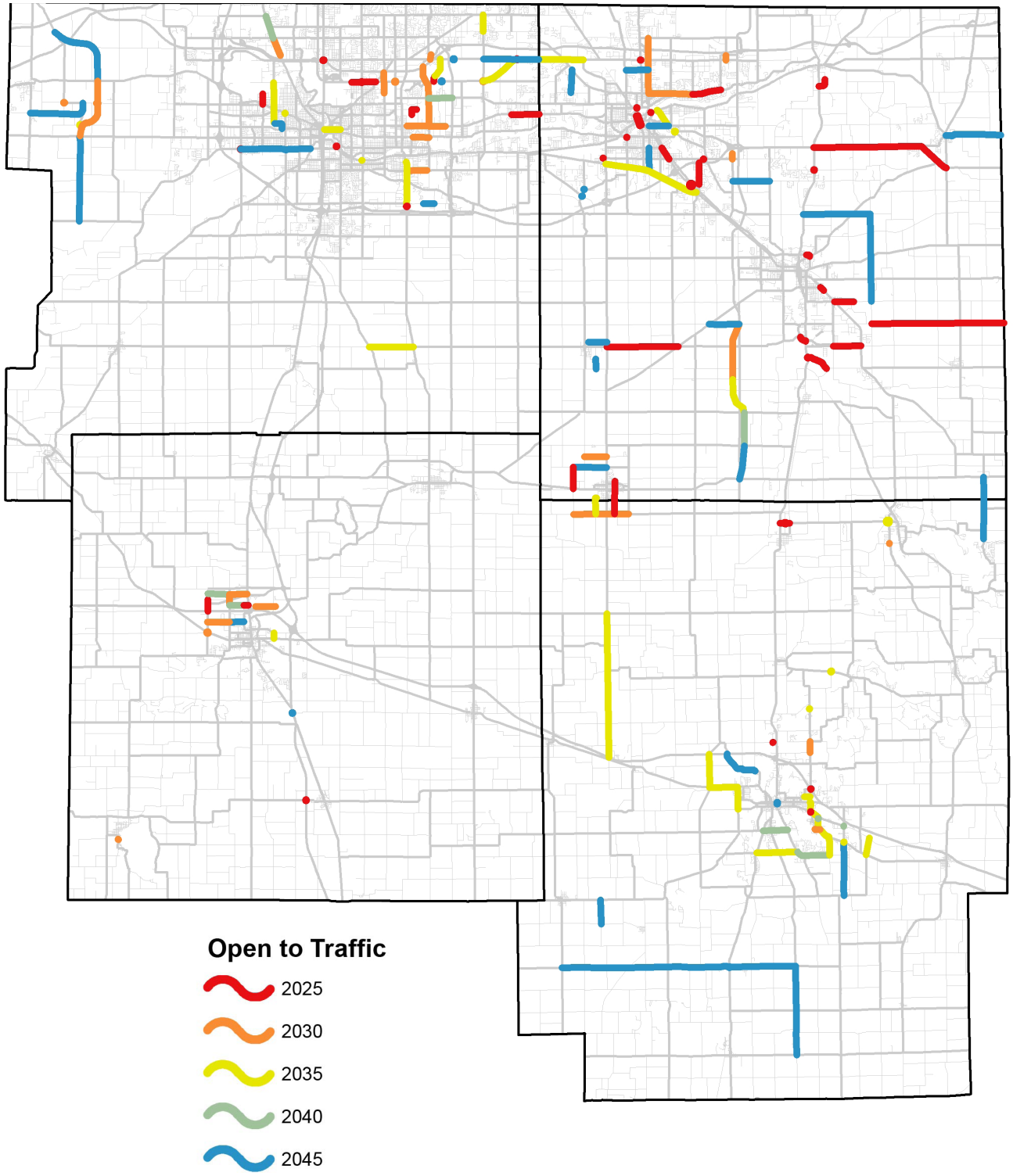
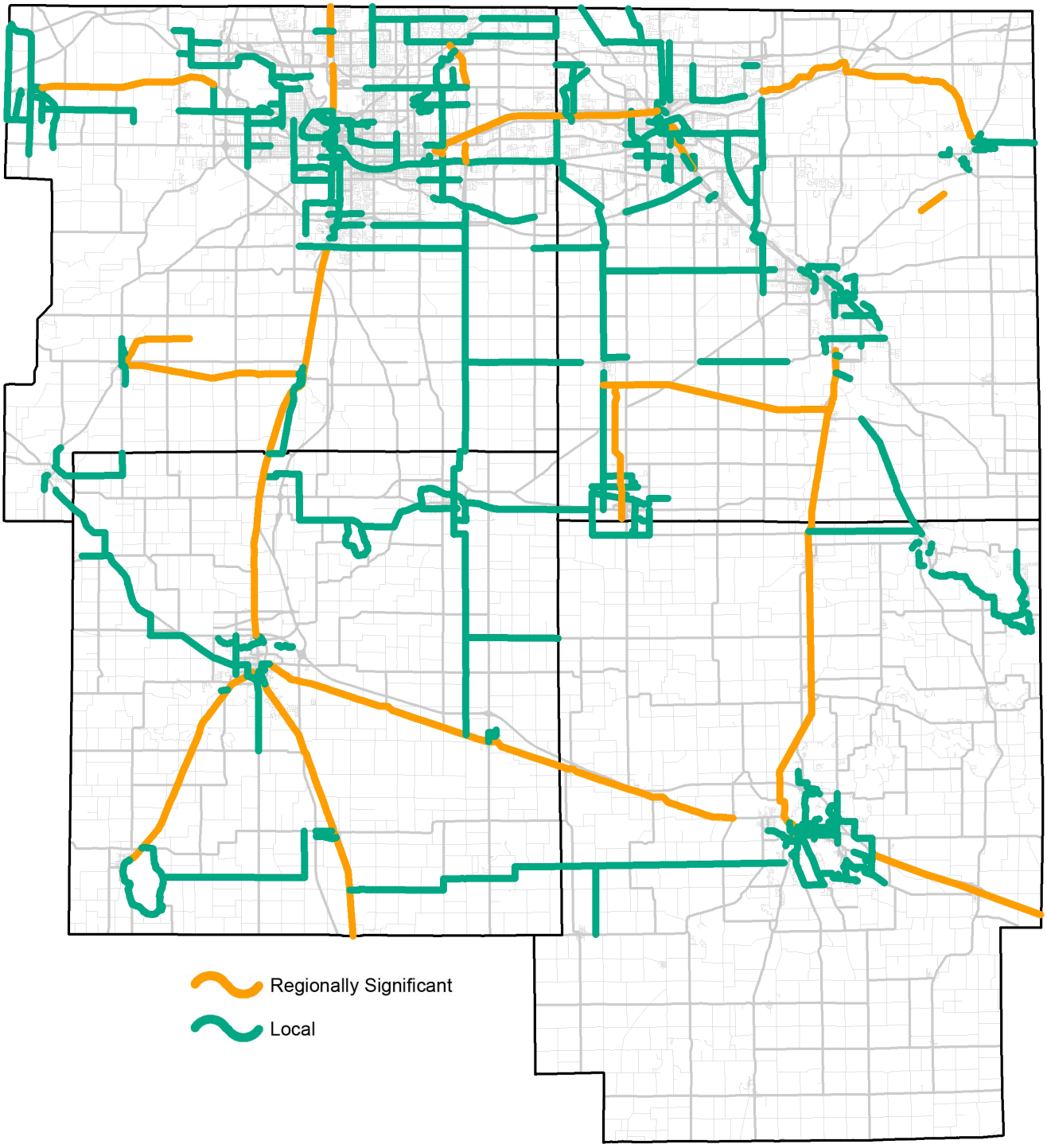


Figure 6-2: Active Transportation Projects



In response to these trends, MACOG has employed numerous efforts focused supporting additional modes of transportation. In July 2016, MACOG adopted the Active Transportation Plan for the region. That plan is intended to identify needs, resources, and strategies to encourage and enhance bicycle, pedestrian, and transit travel within the Michiana region. The intent of the plan is not to secure funding for every project. Instead, the recommendations contained established a shared vision for the region and as a guide for local jurisdictions. A map of the active transportation projects is shown in Figure 6-2 and the full project listing of the Active Transportation Plan can be found in Appendix B.

The public transportation system continues to grow and evolve to meet the needs of the region. On August 20, 2018 the Interurban Trolley and the Transpo, launched the new Yellow Line Mishawaka/Elkhart route. The new route improves regional connections by running between the Interurban Trolley's Transfer Center in downtown Elkhart and Transpo's Mishawaka Transfer Center in downtown Mishawaka. The new route also runs more frequently providing 30 minute headways. In 2019, significant progress was made on the South Shore Line's double track project from Michigan City to Gary, which would cut commute times between South Bend and Chicago to 90 minutes. These improvements are examples of the key policy objectives for public transportation in the region.

Active Transportation Policy Objectives

1. Make improvements to better connect residents and visitors to each of the major communities and destinations within and surrounding the region
2. Improve connectivity between bicycling, walking, public transit and other modes of transportation.
3. Integrate transportation and land use policies to encourage sustainable growth that encourages walking, bicycling, and transit.
4. Form, maintain, and grow public and private partnerships to encourage development and connectivity of active transportation facilities.
5. Create an active transportation network and programs that will make the Michiana region known as a walk- and bike-friendly destination.
6. Work with partners to ensure that outreach efforts have a consistent message to educate community members on safe and courteous walking, bicycling, and driving habits for children and adults.
7. Utilize national best practice guides in network planning, infrastructure design, project management, and maintenance procedure to ensure that facilities provide an accessible transportation network.
8. Work with partners to build awareness about the personal and community benefits and advantages of using active transportation with public transit, especially for everyday trips
9. Promote the accessibility and availability of destinations using active transportation, particularly in areas with a higher demand for walking, bicycling, and public transit.
10. Provide training and best practice information to law enforcement and public officials to enforce and enact pedestrian and bicycling friendly laws and policies throughout the region.
11. Promote the proper use and installation of safety equipment, such as lights, helmets, and reflective clothing.
12. Organize and support programs and events that promote safe active transportation year-round.

Public Transportation Policy Objectives

1. Maintain a state of good repair through proper asset management practices, which will assist in replacing transit vehicles, facilities or equipment that are beyond their useful life as funding becomes available
2. Increase transit ridership by expanding transit coverage, rider accessibility and bus stop proximity.
3. Attract choice riders by increasing route frequency, expanding hours to include weekends and overnight, improving bus stop shelters and benches, reducing travel time, and by making buses safe, clean and comfortable.
4. Increase regional connectivity among the transit providers.
5. Transportation services should be coordinated with all providers (public, human service, and private) to maximize efficiency and utilize all available resources.

Transpo and MACOG are currently considering an updated Comprehensive Operational Analysis (COA). If this is completed, recommendations from the COA that are endorsed and approved will be amended into this plan.

Additionally, MACOG is working to complete an update to the Coordinated Public Transit – Human Services Transportation Plan. Any new recommendations from this plan that are endorsed and approved will be amended into this plan

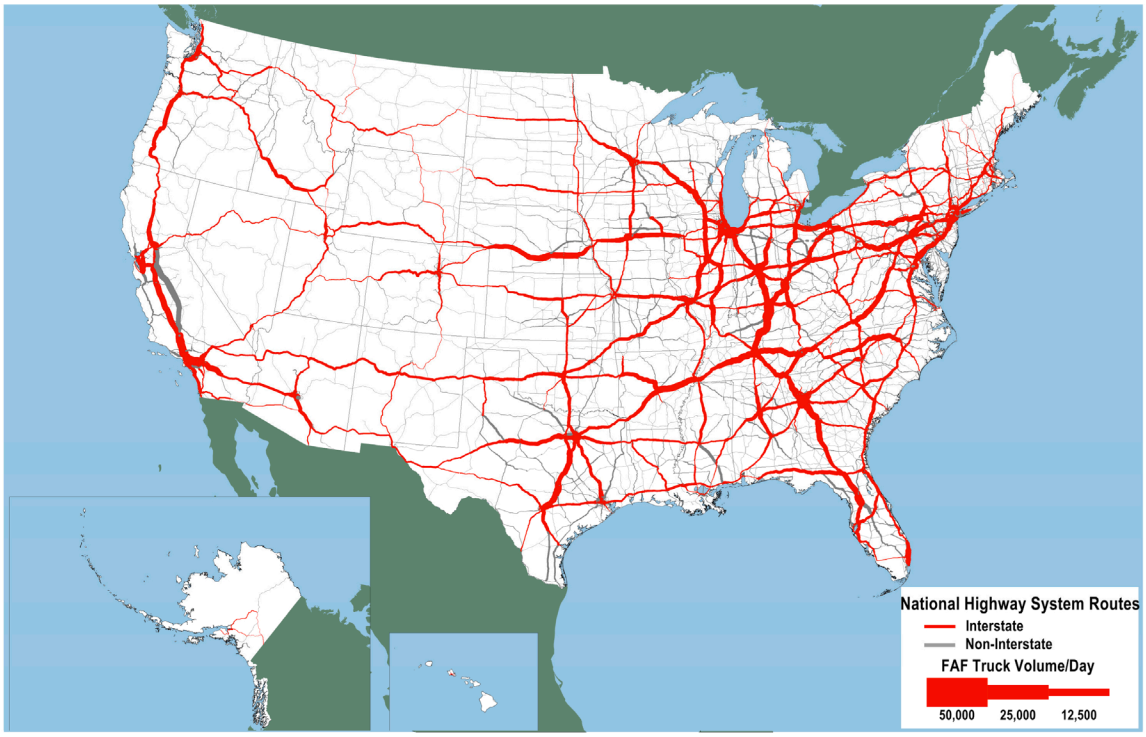
Freight Recommendations

It is anticipated in the Indiana Multimodal Freight and Mobility Plan that, "Indiana's freight flow is projected to continue to grow substantially over the coming decades (close to 60% by 2040)." Therefore, considerations must be made on the potential impacts to our transportation network.

Long-haul freight truck traffic in the United States is concentrated on major routes connecting population centers, ports, border crossings, and other major hubs of activity. Except for Route 99 in California and a few toll roads and border connections, most of the heaviest traveled routes are on the interstate system. By 2040, long-haul freight truck traffic in the United States is expected to increase dramatically on Interstate highways and other arterials throughout the nation. Forecast data indicates that truck travel may reach 622 million miles per day.

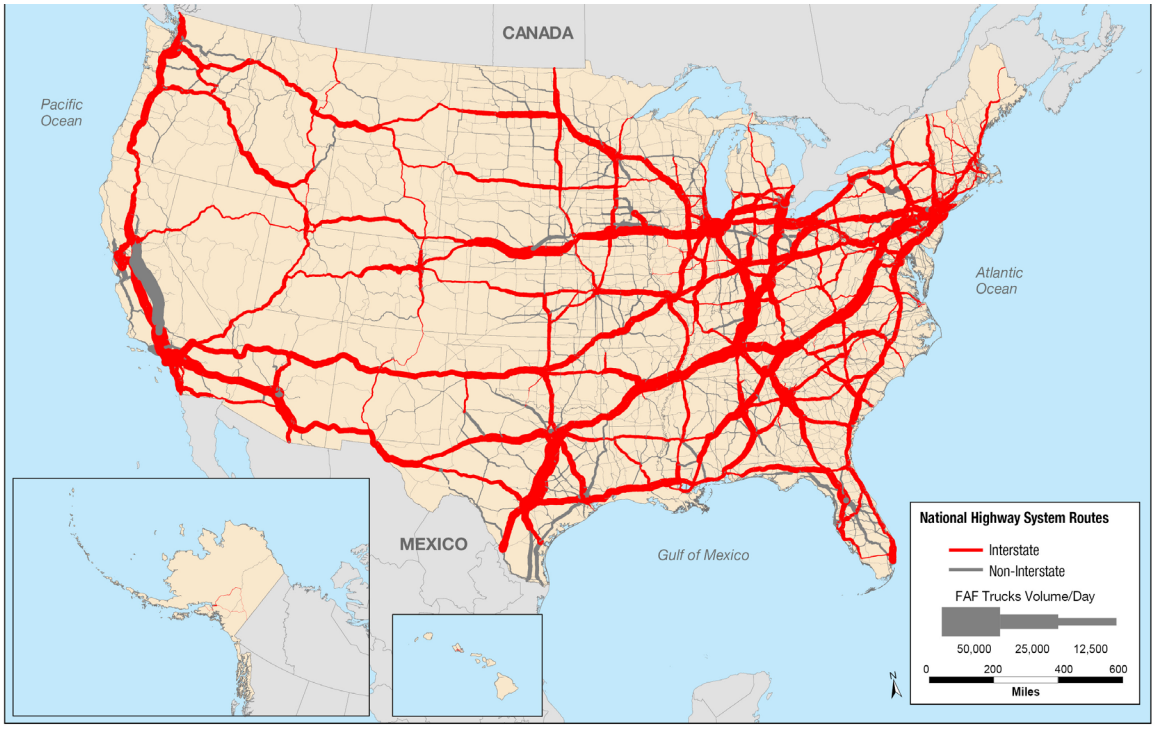
Additionally, congested highways carrying a large number of trucks substantially impede interstate commerce, and trucks on those segments contribute significantly to congestion. Recurring congestion slows traffic on 4,700 miles and creates stop-and-go conditions on 3,700 miles of the NHS that carry more than 8,500 trucks per day. Assuming no change in network capacity, the number of NHS miles with recurring congestion and a large number of trucks is forecasted to increase nearly four-fold between 2007 and 2040. On highways carrying more than 8,500 trucks per day, recurring congestion will slow traffic on close to 7,200 miles and create stop-and-go conditions on an additional 23,500 miles of highways by 2040, see Figures 6-3, 6-4, 6-5 & 6-6. The increased freight traffic and increased congestion will impact the regional transportation network, especially I-80/90, US 31, US 30 and US 20.

Figure 6-3: Average Daily Long-Haul Traffic on the NHS: 2007



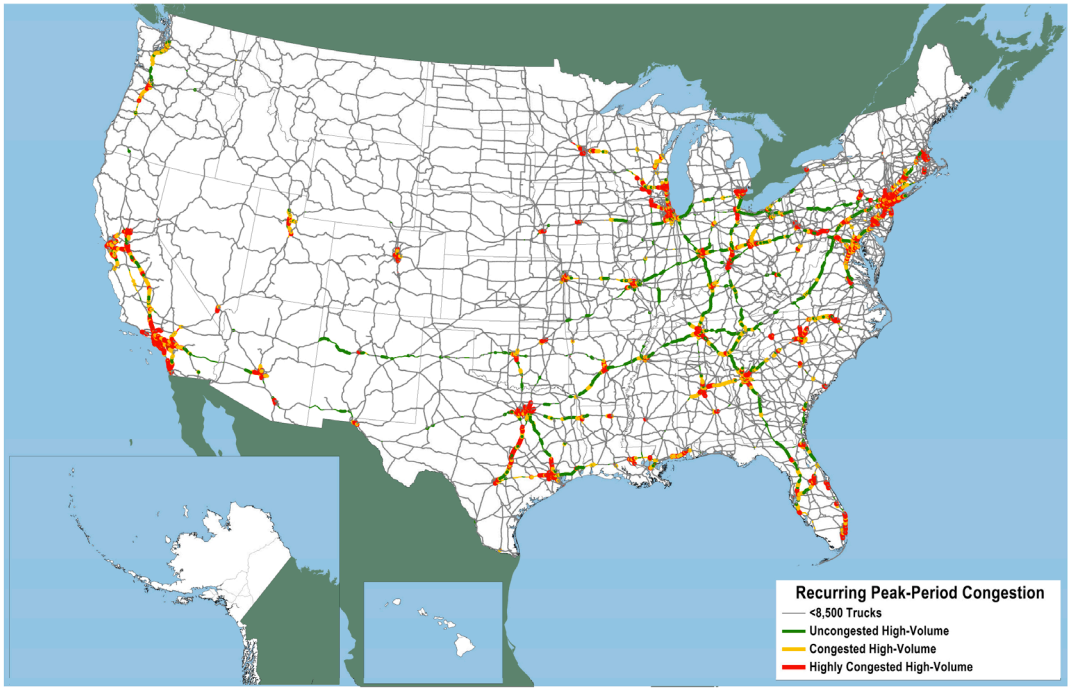
Note: Long-haul freight trucks typically serve locations at least 50 miles apart, excluding trucks that are used in movements by multiple modes and mail.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

Figure 6-4: Average Daily Long-Haul Traffic on the NHS: 2040



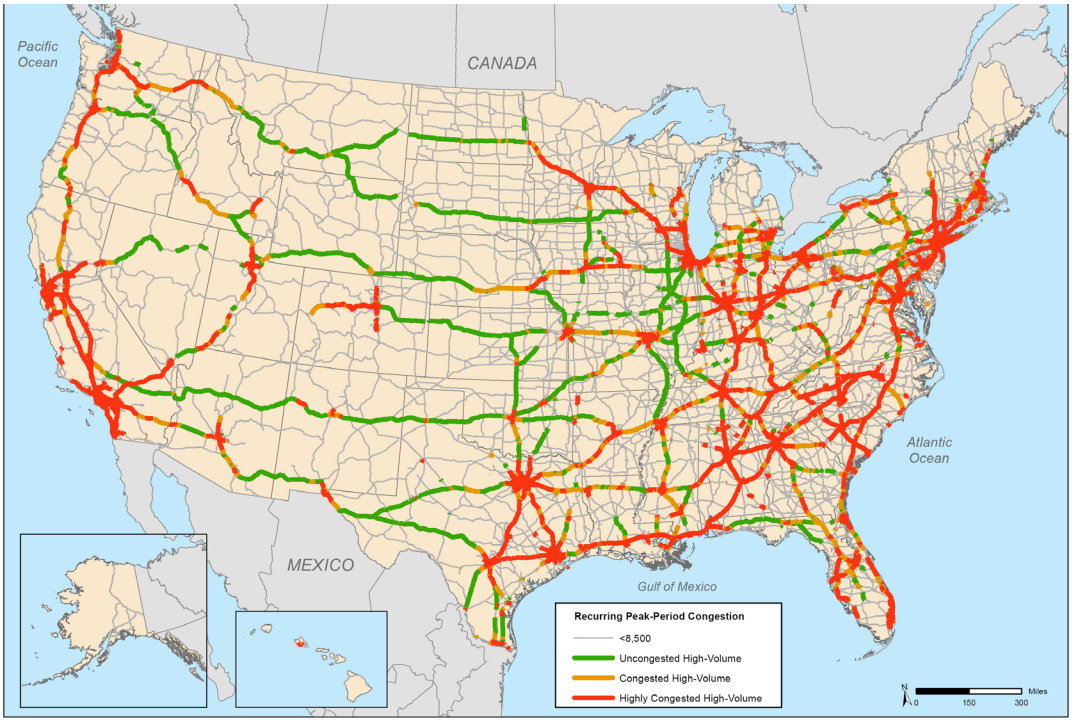
Notes: Long-haul freight trucks typically serve locations at least 50 miles apart, excluding trucks that are used in movements by multiple modes and mail. NHS mileage as of 2011, prior to MAP-21 system expansion.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, *Freight Analysis Framework*, version 3.4, 2013.

Figure 6-5: Peak Period Congestion on High-Volume Truck Portions on the NHS: 2007



Notes: High-volume truck portions of the National Highway System carry more than 8,500 trucks per day, including freight-hauling long-distance trucks, freight-hauling local trucks, and other trucks with six or more tires. Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95. The volume/service flow ratio is estimated using the procedures outlined in the HPMS Field Manual, Appendix N
Source: U. S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System, and Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012

Figure 6-6: Peak Period Congestion on High-Volume Truck Portions on the NHS: 2040



Notes: High-volume truck portions of the National Highway System carry more than 8,500 trucks per day, including freight-hauling long-distance trucks, freight hauling local trucks, and other trucks with six or more tires. Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95. The volume/service flow ratio is estimated using the procedures outlined in the HPMS Field Manual, Appendix N. NHS mileage as of 2011, prior to MAP-21 system expansion.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, *Freight Analysis Framework*, version 3.4, 2013.

Understanding these forecasts and how to address them is critical to the efficiency movement of goods. During the planning process, MACOG consulted with freight stakeholders such as the Conexus North Central Regional Logistics Council (Conexus). Through this consultation a list of priority projects with freight and logistics emphasis were developed. The projects include:

1. Completing US 31 from I-94 and I-96 in Benton Harbor, MI to I-465 in Indianapolis
2. US 30 limited access
3. SR15/CR17 four-lane corridor from the I-80/I-90 Toll Road to US 30 in Warsaw

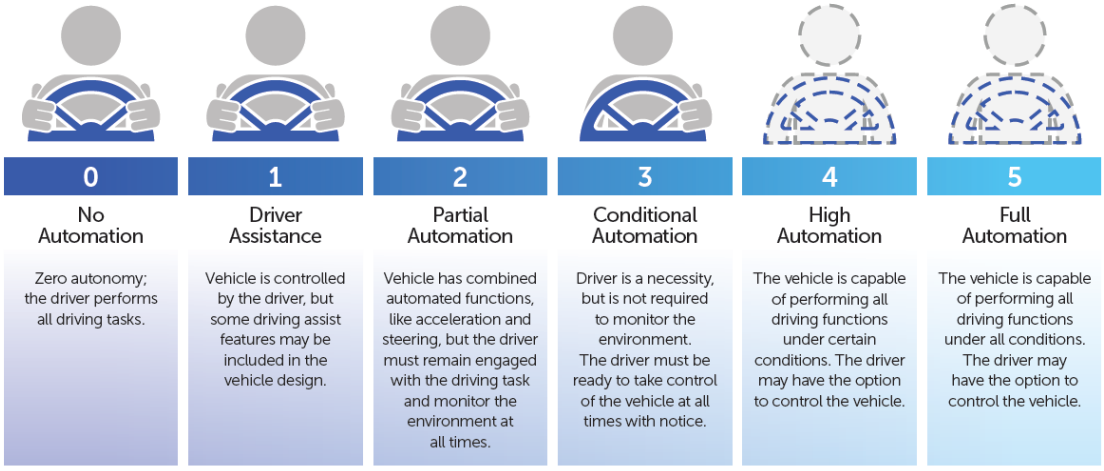
Additionally, MACOG is working to complete a regional Freight Mobility Study in 2020. Any new recommendations from this plan that are endorsed and approved will be amended into this plan

Connected and Autonomous Vehicles

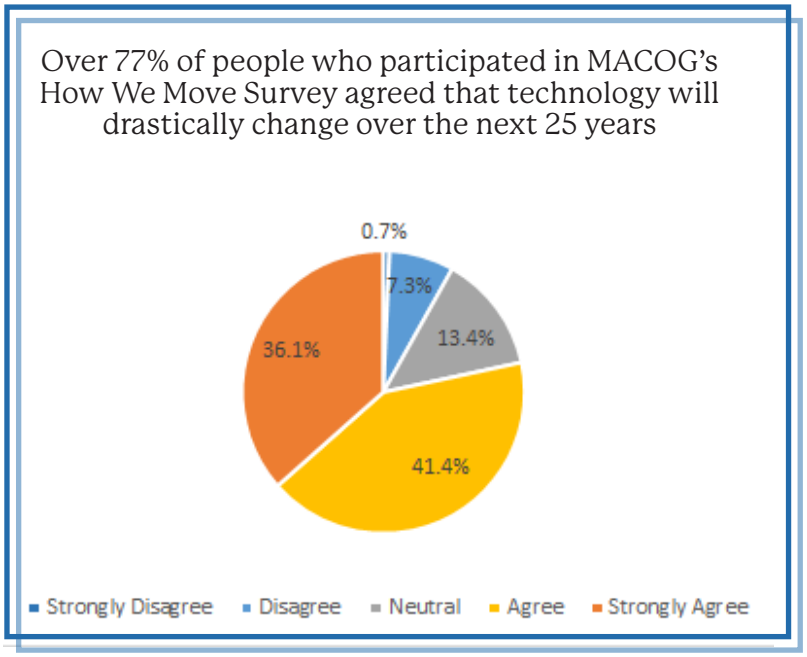
With the adoption and utilization of new technologies, our transportation system is expected to experience significant change in the coming decade. Most significant of these technologies includes Connected and Autonomous Vehicles (CAVs), increased adoption of electric vehicles (EVs), and ridesharing and other Mobility as a Service (MaaS) models such as Lyft, Uber, as well as scooters and bike sharing. The continuing development of these technologies and services will play a considerable role in the future of mobility for people and freight, and as such should be considered in on-going planning efforts in the region.

The U.S. Department of Transportation defines vehicle automation as vehicles that have some control functions that are safety-critical, such as steering, throttle, and breaking. There are six levels of vehicle automation that are depicted below. Connected vehicles refer to those that can communicate with other vehicles or devices along the roadway, while autonomous vehicles are those that can maneuver without driver assistance.

Figure 6-7: Vehicle Automation



Source: U.S. Department of Transportation, Automated Driving Systems 2.0, A Vision for Safety



The availability and prevalence of CAVs may require changes to transportation law, policies, current infrastructure design, and access management. While traffic may flow more efficiently with the presence of CAVs, the change in Vehicle Miles Traveled (VMT) could either increase or decrease due to a variety of factors such as mode shifts, impacts on development and commuting patterns, as well as accessibility to non-drivers.

Currently, the impact of CAVs is largely unknown due to their limited deployment in testing locations. To better understand the range of uncertainty, MACOG worked with RSG to develop three (3) CAV/MaaS modeling scenarios, which will better inform future planning as this technology advances. To view the scenarios, see Appendix I.

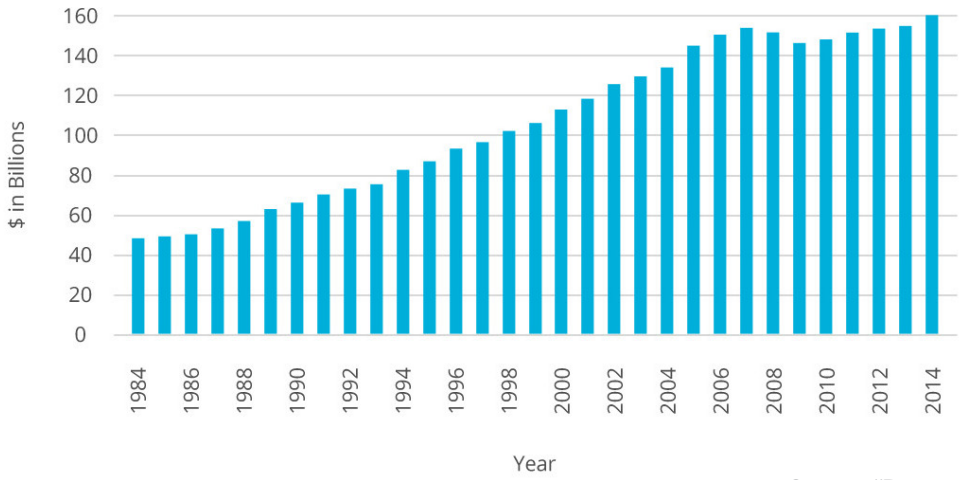
CAVs are just one form of Intelligent Transportation System (ITS) technology. ITS represents the use of technology to modernize the transportation system and created a safer and more efficient transportation network. MACOG is working to completed an update to the ITS Architecture Plan, and any recommendation made will be amended into this plan.

Aging Infrastructure

Given traffic forecasts and the information presented in Chapter 3: Transportation Network, maintaining and modernizing the region's transportation network is not only critical to the local economy but also the national economy. One challenge is that our nation's infrastructure is aging; especially considering the Interstate system was primarily created in the 1950's under the Eisenhower administration.

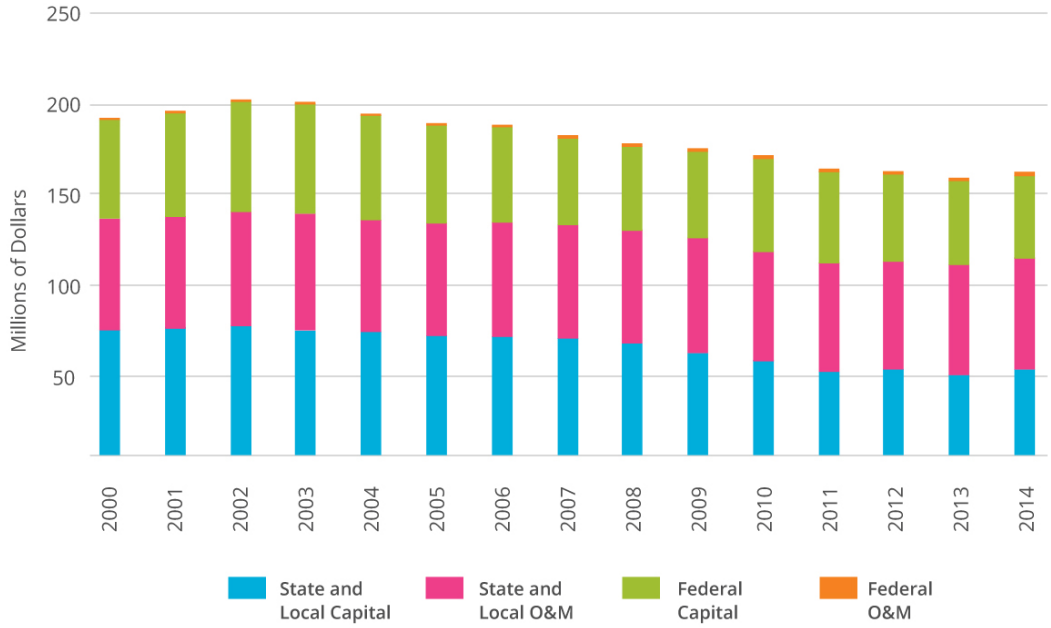
Every four years, America's civil engineers provide a comprehensive assessment of the nation's major infrastructure categories in the American Society of Civil Engineer's Report Card for America's Infrastructure. Using a simple A to F letter grade format, the Report Card provides a comprehensive assessment of current infrastructure conditions and needs, both assigning grades and making recommendations for how to raise the grades. These grades are assigned based on: capacity, condition, funding, future need, operation and maintenance, public safety, resilience, and innovation.

Figure 6-8: Total Cost of Congestion (2014 Dollars)



Source: "Report Card"

Figure 6-9: Public Spending on Highway Infrastructure



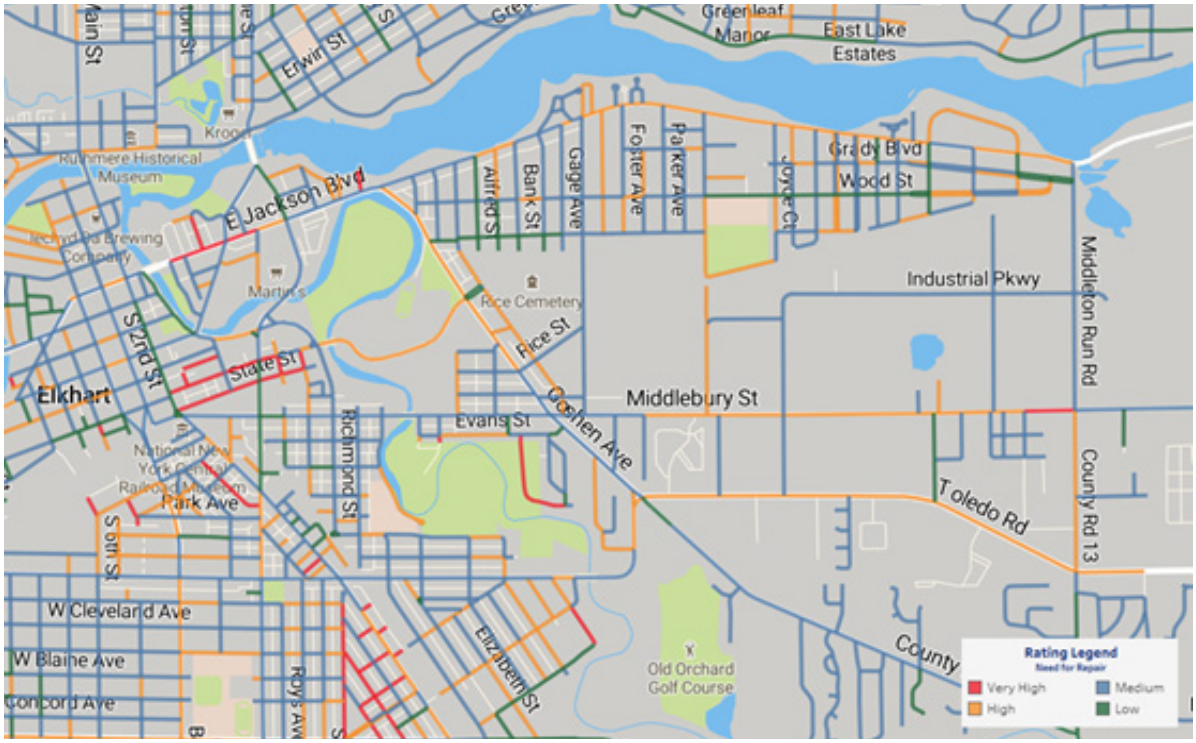
Source: "Report Card"

Since 1998, the grades for our nation's infrastructure have been near failing, averaging only Ds, due to delayed maintenance and underinvestment across most categories. America's cumulative GPA for infrastructure dropped to a D in the 2017 Report Card. The grades in 2017 ranged from a B for rail infrastructure to a D- in transit.

Moreover, 42% of America's major urban highways remain congested, creating 6.9 billion hours of delayed traffic (42 hours per driver), creating a waste of 3.1 billion gallons of fuel, and costing $160 billion of lost time and wasted fuel combined (Figure 6-8). While these costs continue to increase the U.S. has been underfunding its highway system for years (Figure 6-9), resulting in a $836 billion backlog of highway and bridge capital needs.

The Report Card's recommendations to raise the grade: are first to, increase funding from all

Figure 6-10: 2018 PASER Evaluation Sample



Source: MACOG

levels of government, fixing the Federal Highway Trust Fund by raising motor fuels taxes, tackle congestion through policy and technology, prioritize maintenance to maximize the lifespan of roads and the creation of a miles based user fee. With a lower grade than the 2013 report, it is clear that we have a significant backlog of overdue maintenance across our infrastructure systems, a pressing need for modernization, and an immense opportunity to create reliable, long-term funding sources.

In light of the aging infrastructure, effective and efficient strategies need to be implemented. A transportation asset management policy can be implemented by a stepped process developed by the Local Technical Assistance Program (LTAP) at Purdue University. When executed consistently, these steps have proven to enhance infrastructure maintenance, give a more robust knowledge based on budget, and further help plan for infrastructure expansion. The steps in the process are as follows:

- Step 1 - Know what you have by building an asset inventory
- Step 2 - Assess current conditions by consistently rating your assets
- Step 3 - Set the targeted level of service by evaluating what can be achieved with available funding
- Step 4 - Develop a program by identifying the projects and treatments that make the most sense.
- Step 5 - Report the results in a 5-year asset management plan

The State of Indiana requires communities to employ the Pavement Surface Evaluation and Rating (PASER) system to maintain up-to-date assessments. This system is based on a scale from 1-10 that can be translated into the severity of work needed to be performed on any given roadway segment. Observing and scoring roadway segments is the beginning to understanding how the infrastructure deteriorates. As an example, cracking in a block formation at the edge of shoulders indicates water seepage under the base of the road coming from the pavement edge where traffic may travel more frequently when the shoulders are narrow. When left unchecked this deterioration will continue to work its way into the base, creating more cracking into gradually smaller and smaller

Figure 6-11: Degradation Curve of Different Types of Fixes

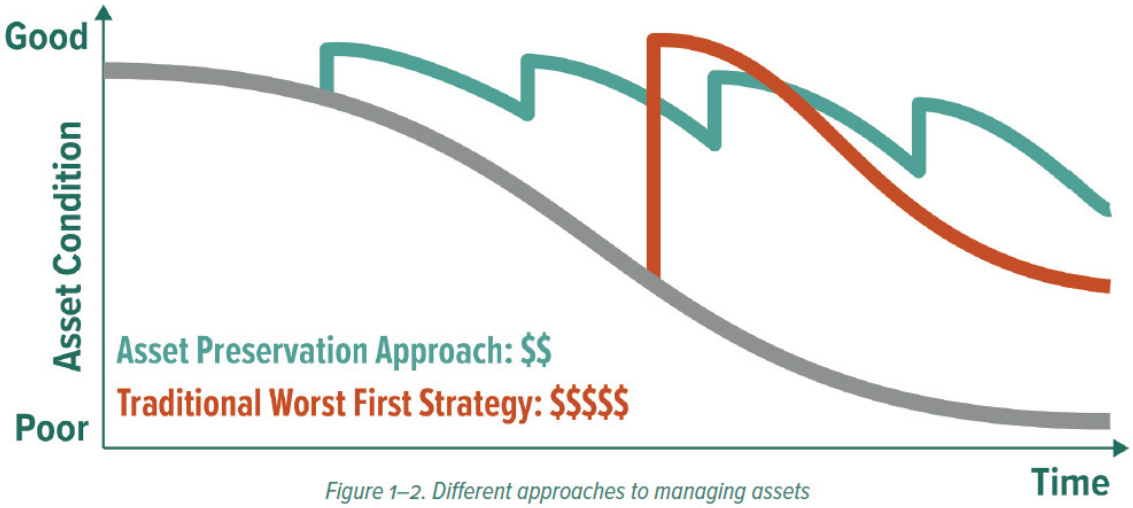


Figure 1–2. Different approaches to managing assets

Source: LTAP, Indiana Local Roads, 2017

blocks. This will then eventually will creep toward the centerline of the road as water has more cracks to seep through.

Once a community has a system in place for rating their roads, analysis can be performed on what type of fix will best solve issues and maintain the integrity of a roadway for longer periods. Above, in Figure 6-11, is what is known as a degradation curve. The image shows two different types of roadway fixes occurring at different points in time for different dollar amounts. The traditional method shows a reconstruction project in orange, when its condition has lost much integrity. While this fix brings the roadway back to its former state, one might note that the asset preservation approach, in green, is cheaper and maintains the roadway at a higher rating for longer. To preserve roadways for a sustained period of time a mix of fixes can be employed, such as crack sealing, micro surfacing, chip sealing, etc. These are less expensive than a full depth reconstruction or even milling and resurfacing that in turn preserves more lane miles of roadway.

Therefore, asset management is an essential tool that brings together planning, construction, maintenance, and operation to improve performance of the transportation network. Extending the life of a road or bridge can be a complex, but by balancing the expensive capital improvements with the less expensive preventative treatments, overtime the region may see funding cover more lane miles. MACOG will continue to support and assist communities in collecting asset data and establishing asset management plans.