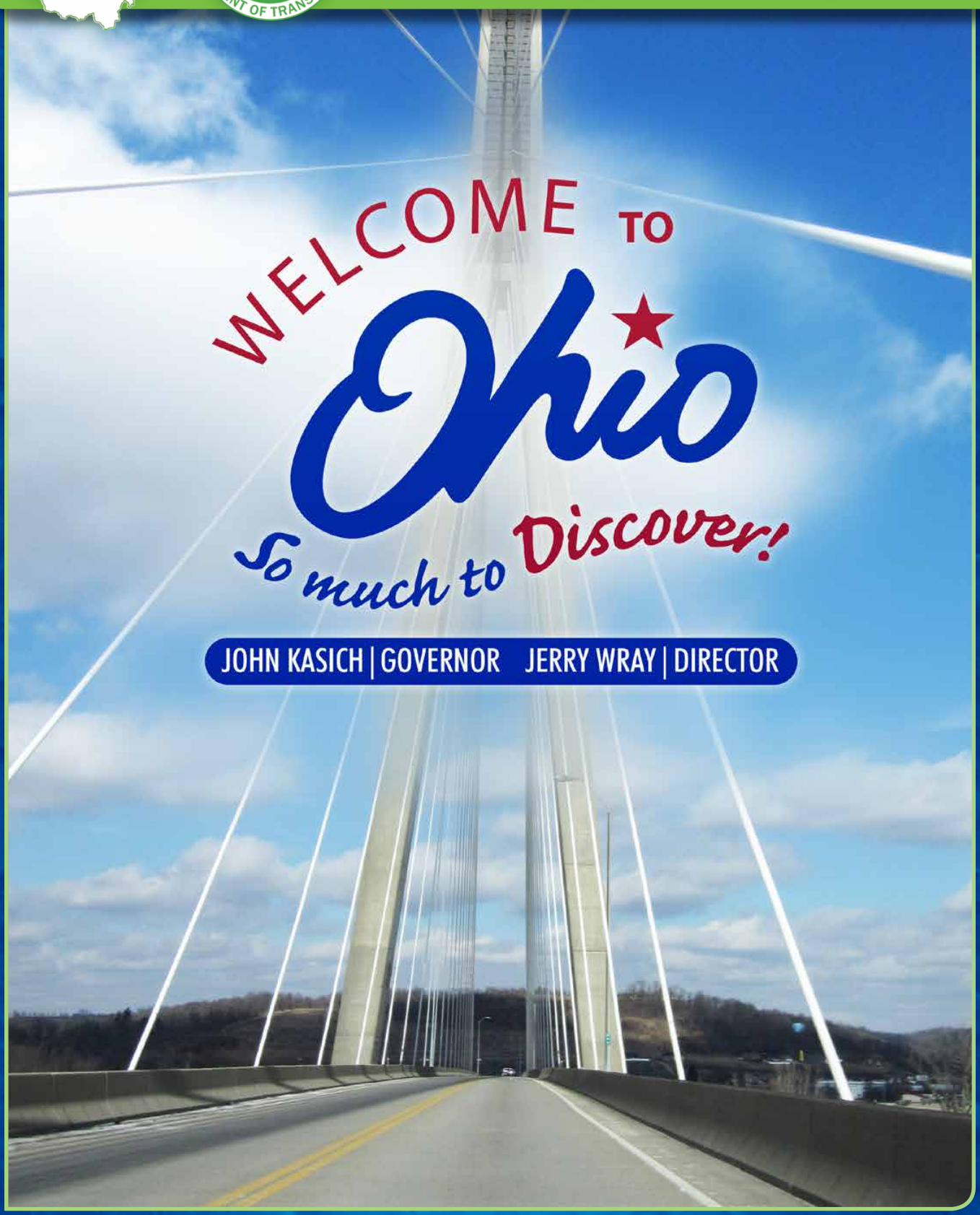
ACCESS OHIO 2040

Ohio Department of Transportation



May 2014

Table of Contents

INTRODUCING ACCESS OHIO 2040

Access Ohio 2040 (AO40) is the State of Ohio's long-range transportation plan. It includes a comprehensive inventory of transportation services and infrastructure, forecasts of transportation demand, asset condition and performance, and an analysis of the trends affecting transportation in Ohio. The Ohio Department of Transportation (ODOT) developed AO40 to ***guide***, ***inform***, and ***support*** transportation policies and investment strategies for the coming years.

AO40 is a vision for Ohio's future transportation system and the steps to accomplish that vision in the years ahead. The plan includes 11 recommendations that will guide ODOT and its partner agencies towards common objectives. The recommendations are the result of technical analyses combined with input from public sector partners and communities throughout Ohio.

AO40 considers Ohio's transportation system through the year 2040. Recognizing that the future is unpredictable, many of the recommendations include both near- and long-term strategies with flexibility to respond to changing conditions. The overall plan will be re-examined every five years to reflect emerging trends.

How AO40 was Developed

AO40 was created from a multitude of discussions and technical analyses, including:

- **Stakeholder participation** – perspectives of the public, transportation partners, and internal experts
- **Plan vision** – goals and objectives developed with stakeholder input
- **Trends analysis** – demographic and economic factors influencing transportation needs
- **Modal analysis** – strengths, weaknesses, and interconnections between transportation modes
- **Financial analysis** – comparison of highway and transit needs against future financial resources
- **State of the system** – summary of trends, modal conditions, and financial outlook
- **Environmental analysis** – social and environmental factors such as accessibility, air, and water quality
- **Corridor analysis** – identification of the critical transportation corridors as well as their functions and conditions

The results of the above efforts are summarized briefly in this document. Full details are available in a series of technical reports listed below. Each report can be found on the AO40 website (www.access.ohio.gov).

- Guiding Principles (Goals & Objectives)
- Setting the Stage
- Ohio Statewide Freight Study
- Passenger Transportation
- Safety
- Security
- Metropolitan Planning Organizations (MPO)
- Finance
- Strategic Transportation System (STS) Corridors
- Mobility and Congestion
- Environmental Overview
- Environmental Justice
- State of the System
- ODOT 2012 Statewide Customer Preference Survey
- Consensus Building Strategies
- Consensus Building Strategies Appendix

Public Outreach and Stakeholder Participation

Stakeholder involvement was critical in the development of AO40. To understand the transportation needs of Ohio's residents and businesses, ODOT used several methods to solicit stakeholder input, such as a Customer Preference Survey, Steering Committee meetings, an internal ODOT Working Technical Group, informational outposts, and websites. Stakeholder involvement also played an important role in the development of the recommendations, which were presented and discussed with a diverse statewide audience. The draft Plan document was available for public review and comment on the project websites and at the informational outposts between November 15, 2013 and December 15, 2013. Comments, and their responses from ODOT, can be found in the Consensus Building Strategies Technical Memorandum and the Consensus Building Strategies Appendix.

The public outreach methods used in the development of AO40 are summarized below.

ODOT 2012 Statewide Customer Preference Survey

ODOT began its stakeholder participation efforts with an ODOT 2012 Statewide Customer Preference Survey given to a random sample of 1,912 households throughout Ohio. At least 150 households were surveyed in each of ODOT's 12 Districts. In addition, 535 community leaders from all over the state volunteered to complete the survey. The results of the survey provided significant direction to AO40 and its future stakeholder involvement efforts. From the survey, ODOT learned Ohioans' top transportation priorities are safety and congestion relief. In addition, the two most important transportation modes to Ohioans are highways and public transportation (transit).

Steering Committee

ODOT assembled a Steering Committee of partners from all around Ohio representing diverse transportation interests. Membership consisted of:

- **County and municipal engineers and planners**
- **Metropolitan and Regional Planning Organizations**
- **Chambers of Commerce**
- **Economic development agencies**
- **Private truck, rail, and maritime freight providers**
- **Transit agencies**
- **Environmental advocacy organizations**
- **Human service agencies and advocates for low-income households**

ODOT used many different methods to collect and analyze stakeholder input, including a Customer Preference Survey, Steering Committee, an internal ODOT Working Technical Group, websites, and informational outposts.

The Steering Committee helped promote the AO40 public involvement effort in their respective communities and provided feedback on plan analyses and recommendations. ODOT met five times with the Steering Committee, including three meetings with the full committee in Columbus and two rounds of regional meetings with smaller groups. ODOT stayed in contact with the Steering Committee and over 500 stakeholders via e-mail updates throughout the development of AO40.

Working Technical Group

A Working Technical Group (WTG) was assembled with ODOT experts on pavement, bridges, transit, maritime, freight, bicycles, safety, Intelligent Transportation Systems (ITS), environment, and operations. The group contributed to AO40 through evaluation of the feasibility of performance targets, assistance with formulating plan goals, and feedback on final recommendations.

Informational Outposts

Informational outposts were established at 40 locations throughout the state, including ODOT District Offices, Metropolitan Planning Organizations (MPOs), Regional Planning Organizations (RPOs), and several transit agencies. Each outpost displayed basic information about AO40. Select locations provided a computer to view additional materials on the AO40 websites, allowing individuals without personal internet access to participate in the development of AO40.

Websites

The AO40 ***Project Website***, www.access.ohio.gov, provided regular updates on the plan's progression. Draft copies of technical memoranda, newsletters, maps, and other materials were posted on the site as they became available. In addition, website visitors were invited to take the ODOT 2012 Statewide Customer Preference Survey.

A ***Public Involvement Website*** provided an interactive forum for participants to leave their ideas and respond to specific questions. These questions were changed on a regular basis throughout the study.

AO40 Vision

The vision of AO40 was driven by six goal areas, developed based upon feedback from the ODOT 2012 Statewide Customer Preference Survey, ODOT technical experts, and the AO40 Steering Committee. The goals are consistent with national and Ohio MPO goals.

The six goals were:

- **Preservation** – Promote cost-effective preservation of multimodal assets
- **Mobility and Efficiency** – Reduce congestion and increase travel reliability
- **Accessibility and Connectivity** – Increase customer access to Ohio's multimodal transportation system and improve linkages between modes
- **Safety** – Continue to improve transportation system safety
- **Stewardship** – Advance financial, environmental, and social objectives for transportation investments
- **Economic Development** – Develop and operate a state transportation system that supports a competitive and thriving economy, attracts new businesses, and provides for predictable freight movements

Objectives were established to define how each goal is to be accomplished. Many of these objectives identify numeric performance targets. Over the next few years, ODOT will collaborate with MPOs and RPOs to assess factors that are influencing the level of performance of various transportation modes, and to refine the performance targets that will be necessary to maintain or improve operational efficiency.

AO40 GOALS

PRESERVATION
Promote cost-effective preservation of multimodal assets

MOBILITY & EFFICIENCY
Reduce congestion and increase travel

ACCESSIBILITY & CONNECTIVITY
Increase customer access to the state's multimodal transportation system and improve linkages between modes

SAFETY
Continue to improve transportation system safety

STEWARDSHIP
Advance financial, environmental, and social objectives for transportation investments

ECONOMIC DEVELOPMENT
Develop and operate a state transportation system that supports a competitive and thriving economy, attracts new businesses, and provides for predictable freight movements

Trends Analysis

In the 10 years since the last update of the statewide long-range transportation plan, Ohio has experienced many changes in demographics, employment, and the use of Ohio's transportation system. Effective transportation decision-making relies upon an understanding of these trends. The *State of the System* Technical Memorandum of *Access Ohio 2040* provides an evaluation of economic, social, land use, and regulatory trends and an analysis of what these trends suggest for transportation within Ohio. This analysis was combined with findings from a modal corridor analysis, a financial analysis, the statewide freight study, and stakeholder input to develop the recommendations presented in this plan.

Other Concurrent Studies

Ohio Statewide Freight Study

The *Ohio Statewide Freight Study,* which was completed in November 2013, developed strategies to achieve the efficient movement of goods and encourage economic development along Ohio's extensive freight network. The study assessed how freight moves within and through Ohio and identified trends in freight volumes, transport modes, and commodities. Findings from the Freight Study were considered in many AO40 analyses.

Ohio Statewide Airport Focus Study

ODOT initiated the *Ohio Statewide Airport Focus Study* in 2012, and anticipates its completion in December 2014. The outcome of this study will provide a comprehensive analysis of Ohio's general aviation airport system and identify capacity shortfalls and overlaps. The study will also make suggestions for allocating funding so that the system can continue to function in a safe and efficient manner. This input will be reflected in future updates of AO40.

Existing Assets

The following provides a snapshot of the various components of Ohio's extensive transportation assets.

Roadways

- **Ohio has 258,774 roadway lane miles and 123,247 centerline miles. ODOT maintains 43,211 lane miles of this network.**
- **Ohio is a home-rule state: municipalities are responsible for all roads within their jurisdiction with the exception of Interstates.**

Bridges

- **Ohio has 44,766 bridges. ODOT maintains the 13,941 bridges that are located on the state's highway system.**
- **Average bridge size is almost 6,000 sq. ft. - a bridge that is two lanes wide by 170 feet long.**

Aviation

- **Ohio has 104 publicly owned airports and seven commercial service airports moving passengers and freight.**
- **Seven major airlines serve Ohio's airports.**
- **Several airports serve an important role in the movement of air cargo, such as the Cincinnati/ Northern Kentucky International Airport (near Ohio's border), which is one of DHL's "super hubs."**

Maritime

- **Ohio has 716 miles of marine highways (M-70 along the Ohio River and M-90 along Lake Erie).**
- **Ohio hosts nine commercial ports on Lake Erie and three public ports on the Ohio River.**
- **Private ports also play a key role in Ohio's maritime transportation network.**

Freight Rail

- **Ohio's freight rail network consists of 35 railroads operating over 5,290 miles of track.**
- **Four railroads are Class I rail carriers: NS, CSX, Canadian National, Canadian Pacific.**
- **Ohio ranks third nationally in rail miles operated (5,338).**
- **Ohio ranks second nationally in the number of intermodal terminals (13).**

Passenger Rail

- **Amtrak provides passenger rail service on three primary passenger intercity routes:**
  - Cardinal: New York City to Chicago (one stop in Cincinnati).
  - Capitol Limited: Washington D.C. to Chicago (stops in Alliance, Cleveland, Elyria, Sandusky, and Toledo).
  - Lake Shore Limited: Chicago to Boston/New York City (stops in Cleveland, Elyria, Sandusky, Toledo, and Bryan).

Public Transit

- **Ohio has 27 urban and 35 rural transit agencies providing 111 million trips in 2011.**
- **Approximately 75 percent of urban transit system ridership occurs in Cleveland, Columbus, and Cincinnati.**

Intercity Bus

- **Ohio has three private intercity bus service providers: Greyhound, Lakefront, and Megabus.**
- **GoBus is a state program using federal rural transit funds 5311(f) that provides three inter-city routes: Athens to Cincinnati, Athens to Columbus, and Athens to Parkersburg.**
- **GoBus ridership in 2012 was approximately 50,000 (an increase of 70 percent over 2011 ridership).**

Bikeways/Pedestrians

- **There are a total of 4,207 lane miles of bikeway facilities (including bike lanes, bike routes, and shared use paths).**
- **There are 2,043 miles of sidewalk on U.S. and State Routes.**

Safety Analysis

AO40 included an analysis of safety conditions for highway, aviation, and rail assets using crash data trends. Safety conditions on highways between 2006 and 2010 improved, with a decrease in total crashes, fatalities, fatal crashes, fatality rate, injury crashes, and injury rate. Total crashes from 2006 to 2010 decreased by approximately 34,000 or around 10 percent. The analysis for train, bicycle, and pedestrian crashes indicated that crash rates have been declining between 2005 and 2010. For aviation, there were 45 fatal crashes resulting in 82 fatalities between January 2006 and January 2012.

State of the System Report

In June 2013, ODOT produced the *State of the System* (SOS) report. The SOS report describes the AO40 plan goals and objectives, inventories the existing conditions of all modes, explains the most important trends impacting freight transportation, specifies future transportation needs by mode, and details expected revenues through 2040.

The following are the main takeaways from the SOS report:

- **Freight volumes are projected to increase by 639 million tons annually by 2040**
- **Truck freight tonnage is expected to increase by 67 percent by the year 2040**
- **Ohio's 13 intermodal facilities support Ohio's $16 billion logistics industry**
- **Ohio's population will remain essentially flat through 2040; however, the average age is increasing**
- **Ohio has the 12th highest transit ridership in the nation and interest in transit continues to grow**
- **ODOT is currently exceeding its goals for pavement and bridge conditions**
- **ODOT anticipates a $14 billion shortfall by 2040 to maintain state highways, bridges, and transit services**

Financial Analysis

AO40 includes a financial analysis to evaluate whether Ohio will have adequate financial resources to accomplish its transportation goals and meet future needs. A 27-year transportation revenue forecast was developed, based on historic trends from ODOT's major revenue sources (i.e., state and federal gas tax and limited federal transit funds). ODOT then compared the revenue forecast with the corresponding financial costs from the modal analysis. The comparison determined that, without additional funding, there will be a $14 billion financial gap between transportation needs and the resources to pay for them. The financial needs for Ohio's state owned highways, bridges, and state-funded transit services from 2014 through 2040 is estimated to total $55 billion. ODOT's total highway and transit revenues for the same time period are projected to be $41 billion.

Environmental Overview

The Environmental Overview is intended to inform planning decisions that have the potential to impact Ohio's natural and human resources. This will ensure that Ohio's project development processes comply with the National Environmental Policy Act and related federal regulations. The Environmental Overview includes:

- **An inventory of the major ecological, endangered species, and cultural resources located within Ohio**
- **A review of climate variability and the need to analyze the risk posed to transportation facilities**

ODOT's analysis determined that from 2014 through 2040, without additional funding, there will be a $14 billion financial gap between transportation needs and the resources to pay for them.

Environmental Justice (EJ)

ODOT has a responsibility to ensure, *"The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."* As part of AO40, an analysis of currently committed projects was conducted to assess changes in accessibility between geographic areas of Ohio where concentrations of EJ populations reside versus areas without EJ populations. EJ populations' access to jobs, schools, and health care was analyzed via a three step process: 1) identify affected population concentrations based upon ethnicity and income in roughly 3,600 statewide analysis areas, 2) estimate changes in access for each analysis area that will result from scheduled transportation improvement projects through the year 2040, and, 3) assess whether the impacts are equitable by comparing accessibility changes of areas based upon their EJ population levels. The result of the analysis demonstrated that no statistical or visual evidence was found to suggest a significant difference in changes in access between the EJ and non-EJ populations.

Corridor Analysis

The purpose of transportation infrastructure is to move people and goods. The most significant transportation corridors carry the highest volumes of passengers and the greatest volume and value of freight between the most active population and economic centers. Investments within these corridors provide benefits to the greatest number of Ohio's residents and businesses.

Transportation is about more than just transportation infrastructure. It's about how large numbers of people and goods move from place to place using transportation corridors.

With this in mind, AO40 included an analysis of transportation corridors across the state to identify national and statewide corridors for each mode. The significant facilities for each mode, and connections between them, were combined to create Ohio's Strategic Transportation System (STS). Because each region of Ohio has its own economic emphasis, the STS was divided into five regions largely based on the JobsOhio regions. The five STS regions were then used for regional analysis and stakeholder outreach.

ODOT will use the STS to help target investments and strategies to the transportation facilities most critical to Ohio's success.

Recommendations

Based on the above analyses, AO40 is focused on 11 recommendations reviewed by ODOT's Working Technical Group and the Access Ohio Steering Committee. The remainder of this document outlines the following information for each recommendation:

- **Supporting information** – narrative background behind the recommendation
- **Desired outcome** – specific outcomes/objectives to be achieved within a specified timeframe
- **Cost of implementation** – description of the resources required to implement the outcomes
- **Next steps** – specific actions to be completed in the near future
- **More information** – references to the relevant technical memoranda for each recommendation

RECOMMENDATIONS

RECOMMENDATION: Expand performance management within ODOT by developing additional modal performance measures and expanding ODOT's reporting system. The process and format will need to be able to report data to both the USDOT and in-state stakeholders.

Supporting Information: Measuring performance is critical in nearly every aspect of life. It allows individuals to measure progress towards personal goals and provides organizations a way to quantify the efficiency and effectiveness of policies and actions. Secondarily, performance management provides transparency and accountability for those entrusted with managing community resources. Because Ohio's transportation system is a public resource vitally important to the well-being of all Ohioans, performance management is particularly critical for ODOT. Since the 1990s, ODOT has measured its performance in various areas with Operational Performance Indices (OPIs).

The focus areas of the MAP-21 performance measures are safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduction in project delivery delay.

In December 2011, ODOT implemented performance measures that covered a variety of transportation focus areas including safety, economic development, pavement preservation, and bridge preservation. These performance measures were referred to as Critical Success Factors (CSFs) and were intended to focus ODOT's resources on meeting its primary mission "to provide easy movement of people and goods from place to place." ODOT created an internal reporting process to measure the agency's progress.

Eight months later, on July 6, 2012, Moving Ahead for Progress in the 21st Century (MAP-21) was signed into law and became the first federal surface transportation bill to create a performance based investment framework. The bill mandated state Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) develop performance measures for the multimodal transportation system in their state or region. The focus areas of the MAP-21 performance measures include safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduction in project delivery delay.

PERFORMANCE MANAGEMENT FOCUS AREA		ACCESS OHIO GOAL AREA					
ODOT CSFs	MAP-21	Preservation	Safety	Mobility & Efficiency	Accessibility & Connectivity	Stewardship	Economic Development
Safety	Safety		✓				
Economic development	Economic vitality						✓
Pavement/bridge preservation	Infrastructure condition	✓				✓	
-	Congestion reduction		✓	✓			✓
Travel time reliability/ Snow & ice removal	System reliability			✓			✓
-	Freight movement			✓	✓		
-	Environmental sustainability					✓	
On-time delivery of capital projects	Reduction in project delivery delay					✓	✓

While there is a great deal of similarity between the ODOT CSFs and MAP-21 focus areas, ODOT will need to create additional performance measures, in collaboration with Ohio's planning partners, most notably in the areas of system reliability, freight movement, and environmental sustainability. To facilitate collection and reporting of performance data (and coordination with MPO performance measures), an expanded reporting process and format will be necessary. Similar performance management reporting structures have been established at other DOTs around the country and may serve as an example, thereby reducing the time of development. Development and implementation of expanded performance management within ODOT will promote the advancement of every goal area and objective in AO40.

Desired Outcome: As additional guidance is released by the federal government pertaining to the MAP-21 performance management reporting requirements, ODOT will identify the necessary data elements to measure performance. Within the next two years, ODOT will begin publishing a regular report that documents conditions and trends on Ohio's transportation system. Information derived from the performance management report will be considered as part of ODOT's project selection processes. In the coming years, ODOT will have established a robust performance management process that guides programming of transportation investments based on advanced monitoring and management of operational performance on Ohio's multimodal transportation network.

Cost of Implementation: The major cost drivers of this recommendation include the cost of collecting new data for new performance measures and publishing of reports. At present, it is not possible to estimate data collection costs until all new performance measures have been identified. However, ODOT will make use of existing data collection efforts to the greatest degree possible. All other costs will come in the form of ODOT staff time.

Next Steps:

- **Identify specific reporting requirements and schedules in MAP-21**
- **ODOT will coordinate with MPOs and RPOs on the development of transportation performance measures, as required by federal regulation**
- **Review applicability of ODOT's existing CSF's to MAP-21 requirements**
- **Identify additional performance measures and related data collection needs from completed statewide modal planning studies (e.g. transit, maritime, bicycle/pedestrian, etc.)**
- **Identify internal ODOT staff tasked with compiling and reporting performance data**
- **Develop revised reporting processes and formats**
- **Review project selection processes to appropriately consider performance data**

More Information: *Passenger Transportation* and *Guiding Principles (Goals & Objectives) Technical Memoranda*

RECOMMENDATION: Leverage available resources to maximize transportation investments. Resources include state-owned infrastructure, financial partnerships, higher federal participation rates, and limiting carry-forward balances.

Supporting Information: A primary purpose of AO40 was to evaluate ODOT's financial situation through 2040. Key conclusions from the analysis include identification of funding shortfalls and erosion of ODOT's purchasing power. It is estimated that $55 billion worth of ODOT transportation investments are needed between 2014 and 2040. ODOT, however, is projected to receive only $41 billion in revenue for the same time period based on traditional funding sources. The result is a $14 billion shortfall over the 27-year plan period, inclusive of preservation and improvements to roads, bridges, and public transit.

It is important to note, however, that the above numbers do not reflect the entire Ohio transportation system, but rather only the portions ODOT maintains. The estimated costs of maintaining locally owned roads and bridges are approximately $41 billion. Local revenue for meeting highway and bridge needs varies greatly from one locality to another and is nearly impossible to calculate statewide. However, the collective revenue statewide is estimated to be significantly below the need.

Needed investments for Ohio's public transit systems were also quantified. The majority of Ohio's transit systems' revenue is provided directly from the Federal Transit Administration (FTA) and local revenue sources. Review of Ohio's 62 transit agencies' planning documents revealed $15 billion in transit needs. (Due to a lack of available data, needs for rail, maritime, bicycle/pedestrian, and aviation infrastructure were not calculated as part of the AO40 financial analysis.)

To address all of Ohio's transportation needs, ODOT, Ohio MPOs, and local agencies will need to employ an array of strategies to close the projected funding gap. Recommended strategies include:

- **Leveraging state-owned assets such as:**
  - The Ohio Turnpike – Leverage future toll collections to generate new bond revenue
  - Intelligent Transportation System – Leverage system to make better use of available capacity on Ohio's highway system and reduce need for system expansion
- **Partnering with local governments to pair state and local financial resources to stretch agency budgets and complete transportation improvements that may otherwise go unconstructed**
- **Utilizing new funding provisions in MAP-21, which allows state DOTs to use higher federal participation rate to fund freight enhancement projects on the state's freight network**
- **Minimizing unspent transportation funds so that funds are not carried over at the end of each fiscal year (further eroding the purchasing power of those funds)**

Development and implementation of strategies to leverage available resources will promote the advancement of every goal area and objective in AO40.

Desired Outcome: Within the next two years, ODOT intends to expand programming practices that leverage local funding participation, develop policies to limit the amount of transportation funding that can be carried forward from

one fiscal year to the next, and complete a state freight plan making ODOT eligible to fund freight projects with higher federal participation rates. By the year 2020, ODOT intends to generate $2 billion in new revenue from leveraging state owned assets and $5 billion by the year 2040.

Cost of Implementation: The costs to leverage state-owned assets and complete a state freight plan have already been expended as consultant studies were initiated in 2012. The cost of developing new internal policies will come in the form of ODOT staff time.

Next Steps:

- **Continue coordination with Ohio Turnpike and Infrastructure Commission (OTIC) to use bond revenue to fund transportation needs**
- **Continue to develop ODOT's Division of Innovative Delivery to promote leveraging of ODOT owned assets**
- **Identify needed freight projects to fund with higher federal participation rates**
- **Task ODOT's Capital Programs Committee to develop appropriate carry-forward limits for ODOT's capital programs**
- **Task ODOT's Capital Programs Committee to expand capital partnering policies that also consider local economic distress and project benefits**

More Information: *Finance Technical Memorandum* and *Ohio Statewide Freight Study*

RECOMMENDATION: Assist the Joint Legislative Task Force in its investigations and remain engaged in the national dialogue on transportation funding. In addition, ODOT should investigate the feasibility of constructing active transportation and demand management (ATDM) solutions in Ohio and continue to monitor economic trends and compare them to the base assumptions made in the AO40 financial analysis.

Supporting Information: As noted in the Leveraging Resources recommendation, a primary function of AO40 analysis is to evaluate ODOT's financial situation through 2040. Key conclusions from the analysis include identification of funding shortfalls and erosion of ODOT's purchasing power. An estimated $111 billion worth of statewide transportation improvements (inclusive of state, local, and transit systems) are needed between 2014 and 2040. However, revenue for the same time period based on traditional funding sources is anticipated to be well short of the $111 billion. The anticipated shortfall for ODOT alone is estimated to be at least $14 billion over the 27-year plan period.

AO40 identified an estimated $111 billion of statewide transportation needs (inclusive of state, local, and transit needs) between 2014 and 2040. However, revenue for the same time period based on traditional funding sources is anticipated to be well short of that. The anticipated shortfall for ODOT alone is estimated to be at least $14 billion over the 27-year plan period.

Ohio is not alone in its anticipated shortfall for transportation funding. Nearly every state in the nation is facing similar trends because the economic forces at work are driven by the national and global economy. The two primary economic drivers include construction cost inflation (largely due to energy prices) and a flattening of gasoline and diesel consumption (due to higher prices and an increase in the fuel efficiency of the U.S. automotive fleet).

The recent economic trends noted above were considered in the AO40 financial analysis. However, due to the long range planning horizon of 2040, AO40 has also considered more historical funding trends over the last couple of decades, which generally show lower construction inflation and general growth in fuel consumption and revenue. While the financial analysis presented in AO40 is a balance of short term and long term trends, the long term trends were weighed more heavily in the analysis. Therefore, the AO40 financial analysis was built on the following key assumptions:

- **A 1 percent annual growth in state gas tax revenue**
- **A 3 percent annual growth in federal gas tax revenue**
- **ODOT operational costs are assumed to remain flat through 2040**
- **Construction inflation was set to the consumer price index rate of 2.5 percent annually**

Whether more recent or long-term historical trends bear out in the coming years, ODOT, MPOs, Ohio local governments, and the entire nation are facing a transportation funding shortfall. The shortfall for ODOT is measured in tens of billions of dollars. The cumulative funding shortfall faced by local governments and transit agencies in Ohio is also measured in the tens of billions. Based on the magnitude of these shortfalls, it will be impossible for Ohio to make up the difference without new, innovative funding streams. Nearly every other state in the nation (if not all) is facing transportation shortfalls that cannot be addressed by leveraging existing resources alone.

The challenge has been how to create a new and fair transportation funding paradigm. At present, there are a variety of approaches being taken by the states. Some states are not taking any action, waiting for the federal government to create a national solution. Other states are investigating various proposed new revenue sources such as increasing gas tax rates, increasing the state sales tax, or creating new mileage-based user fees.

One innovative approach that many states have already implemented are Active Traffic and Demand Management (ATDM) solutions. ATDM solutions involve dynamic management, control, and influence of travel demand, traffic demand, and traffic flow. An example of an ATDM is charging a user fee (or toll) for vehicles using specific lanes of a highway. The fees can be adjusted based on a number of factors including time of day, congestion on the highway, and number of passengers in a vehicle. The fees generated by ATDM solutions are generally used to repay construction costs.

Ohio's approach to the transportation funding shortfall has been set by the state legislature which created a six-member Joint Legislative Task Force on ODOT Funding in 2013. The Task Force consists of three members of the House Finance and Appropriations Committee and three members of the Senate Transportation Committee. The Task Force is charged with examining the funding needs of ODOT. The Task Force must issue a report containing its findings and recommendations by December 15, 2014.

Desired Outcome: Within the next year, ODOT will have a clearer understanding of the potential for implementing ATDM solutions in Ohio. In addition, ODOT will be available to work with the Joint Legislative Task Force to investigate more sustainable revenue sources. In the coming years, ODOT's revenue will be balanced with the transportation system needs, as identified by ODOT's performance management process.

Cost of Implementation: The cost of performing an ATDM feasibility study for Ohio is estimated to be $2 million. Implementing the remaining recommendations will come in the form of ODOT staff time.

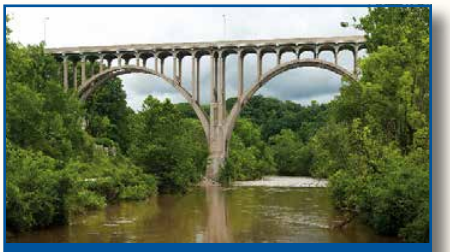
Next Steps:

- **Assist the Joint Legislative Task Force in its investigations of ODOT funding**
- **Attend national forums on transportation funding and follow developments in other states**
- **Initiate an ATDM solutions study for Ohio to investigate the potential of leveraging revenue from new capacity adding highway projects**
- **Annually monitor and report on trends that affect ODOT revenue such as fuel consumption and construction inflation**

More Information: *Finance* and *Setting the Stage Technical Memoranda*

RECOMMENDATION: Continue to develop asset management tools within ODOT and integrate them into the project selection and maintenance processes. ODOT should be measuring, tracking, and making decisions based on system conditions.

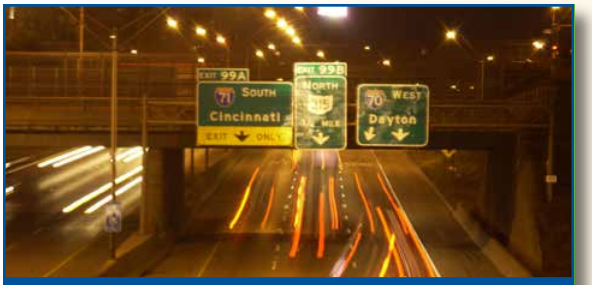
Supporting Information: Travel mobility for people and goods throughout Ohio is facilitated by an extensive roadway and bridge network. The network is comprised of 123,247 roadway centerline miles, 258,773 lane miles, and 44,766 bridges. Ohio's status as a home-rule state assigns ownership and maintenance responsibilities for roadways and bridges to both ODOT and local governments. On the roadway network, ODOT owns and maintains the entire Interstate system and U.S. and State Routes outside of municipalities. This represents 17,270 centerline miles (14 percent) and 43,211 lane miles (16.7 percent). However, ODOT maintained roadways accommodate 57 percent of the state's total vehicle miles of travel. For the bridge network, ODOT owns or maintains 13,941 bridges (32 percent). State maintained bridges span more than 104 million square feet of deck area, which account for 66.1 percent of all deck area within the state of Ohio. Municipalities, counties, and townships own and maintain the balance of the state's roadway and bridges.



Maintaining and improving Ohio's roadway and bridge assets is a core ODOT function and a major component of AO40 planning analysis.

Maintaining and improving Ohio's roadway and bridge assets is a core ODOT function and a major component of the AO40 planning analysis. The AO40 analysis demonstrated that 97 percent of the ODOT maintained roadway system has a good or acceptable pavement condition rating. However, the analysis may not provide a complete picture of the health of ODOT maintained pavements, since the current measures only consider surface conditions. Modern Pavement Management Systems (PMS) utilize more detailed pavement condition and life cycle data to optimize project selection and treatments. ODOT has been working to establish and implement a PMS. To date, the system is still being integrated into the Department's pavement project selection and treatment decision-making processes.

Assessing the conditions of ODOT maintained bridges was another primary component of AO40. The condition of ODOT maintained bridges was analyzed based on sufficiency ratings. Sufficiency ratings are a Federal Highway Administration (FHWA) formula to assess a bridge's ability to remain in service. The formula to calculate bridge sufficiency includes factors for structural condition, bridge geometry, and traffic considerations resulting in a number value between zero and 100 (with zero being an unusable structure and 100 being a new structure). Bridges with ratings less than 50 may need replacement or major rehabilitation. The AO40 sufficiency rating analysis demonstrated that 77 percent of ODOT maintained



ODOT has established a statewide Transportation Asset Management committee to develop a framework for a centralized asset inventory database.

bridges (7,788) have a sufficiency rating of 80 or higher, while less than 2 percent (161) have a rating below 50.

Similar to pavements, ODOT is in the process of establishing a comprehensive Structure Management System (SMS) for Ohio's bridges. Phase 1 of the SMS will provide state of the art bridge system conditions data in Ohio. Phase 2 will incorporate engineering principles to analyze bridge conditions and determine optimal maintenance strategies to preserve Ohio bridges. Again, similar to pavements, the SMS is still being integrated into ODOT's project selection processes. Phase 1 is currently being developed with Phase 2 coming in the future.

In addition to pavement and bridge assets, ODOT has established a statewide Transportation Asset Management (TAM) committee to develop a framework that will allow for the establishment of a centralized asset inventory database for all other assets (e.g. signs, signals, barriers, pavement marking, right of way, etc.) maintained by ODOT. The TAM database will support investment decisions and both quantitatively and qualitatively demonstrate the return on asset investments.

Desired Outcome: In the coming years, ODOT will have modernized pavement and bridge management systems that will be incorporated into ODOT's performance management processes. In addition, ODOT will continue to develop a TAM framework that will manage other facets of Ohio's transportation system. By 2020, ODOT intends to provide access to its asset management systems to other transportation planning agencies like MPOs and RPOs. Finally, by 2040, ODOT will have a TAM framework and extensive asset databases integrated into its performance management processes.

Cost of Implementation: The cost to develop pavement and bridge management systems has already been expended as these efforts were previously initiated. The cost of developing TAM framework will come in the form of ODOT staff time.

Next Steps:

- **Complete ODOT PMS and BMS**
- **Populate PMS and BMS databases**
- **Complete development and implementation of phase 2 of the BMS to allow for bridge condition analysis**
- **Review project selection and maintenance processes to appropriately consider TAM data**

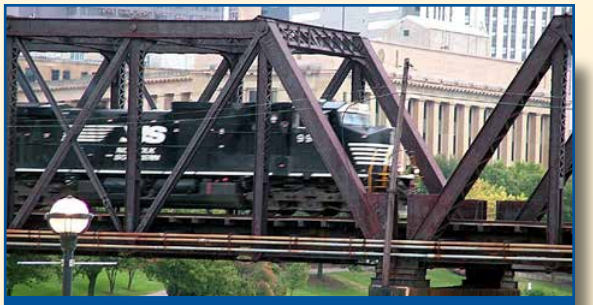
More Information: *Passenger Transportation Technical Memorandum*

RECOMMENDATION: Conduct more detailed studies of the two-lane corridors on Ohio's freight network to identify needed operational improvements, including expansion of infrastructure to collect travel time data. In addition, the capabilities of the state's highway information system (OHGO) should provide live data feeds to business logistic systems.

Supporting Information: The current federal transportation legislation, MAP-21, has a variety of provisions to promote freight movement and performance with the goal of enabling the U.S. to better compete in the global economy. To that end, MAP-21 encourages state DOTs to develop freight networks, identify "Critical Rural Freight Corridors," and develop plans to improve the movement of freight on highways in their respective states. To incentivize DOTs to develop a freight plan and network, MAP-21 also includes provisions allowing higher percentages of federal funding (95 percent for interstate and 90 percent for non-interstate) on projects that enhance freight movement on the state's identified freight network.

In Ohio, the timing of MAP-21 was fortuitous. ODOT had previously launched two statewide planning efforts that gave Ohio a leg up on meeting the freight requirements of MAP-21. These included efforts to produce a Statewide Freight Study and AO40. Both of these efforts were coordinated, providing a larger audience and platform for the results of the freight study. For example, the MAP-21 freight network identified by the freight study was incorporated into a broader network of strategic multimodal transportation corridors in Ohio called the Strategic Transportation System (STS). The STS is a key product of AO40 and a primary tool for coordinating transportation investments between state, regional, and local transportation agencies. By including the freight network in the STS, the state freight network will receive heightened focus in Ohio.

Development of the freight network in Ohio was accomplished through extensive analysis of freight movement and interviews with key freight stakeholders. Through this process, ODOT became aware of the acute need for businesses and industry in Ohio to predict travel times for raw materials and finished products. Maintaining low inventories and just-in-time-delivery gives businesses a competitive advantage. Therefore, reliable and predictable travel times become critical to retaining and growing jobs in Ohio.



ODOT became aware of the acute need for businesses and manufacturers in Ohio to predict travel times for raw materials and finished products.

The growing level of importance of two-lane highways for freight movements is a recent development in Ohio. This means that freight bottlenecks will likely begin appearing in new locations.

In addition, ODOT learned that critical freight movement is occurring on select portions of Ohio's two-lane highway system. Market pressures to deliver freight by the fastest, most reliable means has led businesses to route freight onto roadways that best meet their needs. As a result, several two-lane highways in Ohio function as critical truck routes. Therefore, Ohio's freight network not only includes four-lane highways, but several strategic two-lane highway corridors as well.

Ohio truck freight tonnage is predicted to increase by 67 percent by 2040. ODOT has studied and identified freight bottlenecks on Ohio's four-lane priority system for many years. The growing importance of two-lane highways for freight movement is a recent development. This increased use of the two-lane system, coupled with the overall increase in truck freight volumes, means that freight bottlenecks will begin appearing in new locations. ODOT will expand its analysis of freight bottlenecks to include operational analyses of the two-lane freight network.

ODOT maintains a highway information system known as OHGO, which provides travel speeds on Ohio's major highways in several urban areas of the state. OHGO's information is becoming increasingly critical to Ohio businesses that need access to real time travel information, preferably as a direct feed into their logistics systems. Not only do businesses need direct access to OHGO travel time data, they need information on highway corridors not previously covered by OHGO. Providing data for all of Ohio's freight network is critical to Ohio businesses and jobs.

Desired Outcome: Within the next year, ODOT, in coordination with the respective MPOs and RPOs, will launch a detailed pilot study on selected two-lane corridors of the STS to identify and prioritize needed operational improvements. Identified improvements will be further coordinated with regional and local transportation agencies. Based on the results of the pilot study, additional studies will be performed on other two-lane corridors. In the longer term, ODOT will work to publish travel speed data for the entire freight highway network in Ohio as a direct data feed.

Cost of Implementation: The cost of performing detailed needs studies on the two-lane components of the STS will depend on the results of the pilot study. The cost of the pilot study is estimated to be in the range of $200,000 - $500,000. The cost of expanding OHGO coverage to the entire freight network and providing a direct data feed is not known.

Next Steps:

- ❑ **Promote the new strategic transportation system with ODOT Districts as well as regional and local transportation agencies**
- ❑ **Coordinate with ODOT's planning partners on the two-lane corridor pilot study**

More Information: *Ohio Statewide Freight Study* and *Strategic Transportation System (STS) Corridors Technical Memorandum*

RECOMMENDATION: Perform a Statewide Transit Needs Study to capture the transit needs and performance in Ohio. This recommendation will feed into the Performance Management recommendation because a major component of this study will be identifying public transit performance measures.

Supporting Information: One of the first products from AO40 was the ODOT 2012 Statewide Customer Preference Survey. The survey was performed to understand the transportation preferences of Ohio's transportation system users. Based on the results of the survey, ODOT learned the two most important transportation modes were highways and public transit.

The transit analysis in AO40 was based on available transit data and focused on projecting costs for two scenarios: maintaining existing services and enhanced services. The costs for maintaining existing services were forecasted using existing transit budgets and assuming some minor increases in costs through 2040. Costs for enhanced services were forecasted using local transportation plans. If the region lacked specific planned enhancements some minor increases were assumed.

While the methodology employed in AO40 was sufficient for developing the macro-level fiscal analysis that was needed for capturing existing services, the methodology was not sufficient for capturing the actual transit needs of Ohioans. Since transit was the second most important transportation mode to Ohioans, ODOT desires to develop a methodology that can capture the actual needs for each transit agency. In addition, ODOT wants to develop performance measures and promote efficiencies for each type of transit service (i.e., urban or rural, fixed route, deviated route, or demand response).

The transit data summarized and presented in AO40 represent a beginning, rather than an end.

In short, the transit data summarized and presented in AO40 represent a beginning to studying transit needs in Ohio, rather than an end. This data is the first step and the technical foundation for a follow-up study to better capture the actual transit needs and performance in Ohio. In addition, the Ohio Mobility Improvement Study (2012), which looked at how the State of Ohio efficiently and effectively provides basic mobility needs to the elderly, as well as people with low incomes and/or disabilities, should be considered when attempting to quantify transit needs in Ohio.

Desired Outcome: In November 2014, ODOT will complete a Statewide Transit Needs Study to supply both ODOT and local decision-makers with the data and analysis to make effective and informed decisions. The recommended Statewide Transit Needs Study will provide the necessary information and rationale to identify and advance projects to meet future transit needs across the state. Significant stakeholder and public involvement efforts will be undertaken as part of the study. ODOT will work with MPOs and transit agencies to establish performance measures for every transit system in Ohio that will guide transit funding decisions.

Cost of Implementation: The cost of performing a Statewide Transit Needs Study is estimated to be between $1 million and $1.5 million. The study will determine the cost to address future transit needs across the state.

Next Steps:

- **Complete the Statewide Transit Needs Study and develop innovative funding solutions by November 2014**
- **Incorporate the findings of the Statewide Transit Needs Study into the next statewide long-range transportation planning process**

More Information: *Passenger Transportation Technical Memorandum*, *Statewide Transit Needs Study* and the *Ohio Mobility Improvement Study*

RECOMMENDATION: Complete a Statewide Climate Variability Study and evaluate its impact on Ohio's transportation infrastructure. This recommendation is related to the recommendation that discusses Leveraging Resources, because both feed data and resources into the decision-making process to improve project selection, which is the ultimate goal.

Supporting Information: Using the past several decades of regional climate data to guide infrastructure design and investments may no longer be reliable for future plans. Climate variability will affect transportation primarily through increases in several types of weather events including (but not necessarily limited to) extended periods of hot weather, precipitation events, and drought and land subsidence. The impacts will vary by mode of transportation and region of the state, but they will likely be widespread and costly in both human and economic terms. In addition, impacts will require significant changes in the planning, design, construction, operation, and maintenance of transportation systems.

Ohio's infrastructure will be most affected by the climate variability that causes environmental conditions to extend outside the range for which the system was designed.

Ohio's infrastructure will be affected most by the climate variability that causes environmental conditions to extend outside the range for which the system was designed. As climate variability affects transportation, it will be important to understand how transportation infrastructure may be impacted over the short- and long-term. Addressing climate variability requires an examination of plausible future scenarios, an understanding of how those scenarios impact the transportation system, and a long-term perspective for determining and implementing the capacity to deal with uncertain and changing information.

A Statewide Climate Variability Study will help ODOT identify transportation infrastructure that is most sensitive to weather events, actions that can be taken to adapt transportation facilities to the effects of climate variability, and the operational actions needed to preserve transportation mobility when an event occurs.

Desired Outcome: Within the next two years, ODOT will complete a Statewide Climate Variability Study that will enable ODOT to proactively and efficiently plan, design, construct, operate, and maintain transportation infrastructure across the state. By 2040, ODOT's program will be developed with climate variability elements factored into the design, construction, and maintenance of our program. The areas of the state most affected by weather events will have been identified and any future projects within these areas will have climate variability mitigation built into their basic project design.

Cost of Implementation: The cost of performing a Statewide Climate Variability Study is estimated to be between $250,000 and $500,000. The study will calculate the cost to address vulnerable transportation infrastructure and modify planning, design, construction, operation, and maintenance of sensitive infrastructure across the state.

Next Steps:

- ❑ **Conduct a Climate Variability Study**
- ❑ **Implement the study's recommendations**

More Information: *Environmental Overview Technical Memorandum*

RECOMMENDATION: Coordinate efforts with local jurisdictions to designate Ohio's U.S. and State Bike Routes (SBRs). In addition, ODOT will develop protocols and a statewide database/ warehouse for bicycle count data. Finally, as U.S. and SBRs are officially designated, ODOT will perform bicycle counts on bicycle routes co-located on state owned highways. This recommendation is connected with the Planning Partnerships recommendation because it is contingent on the relationships ODOT has with local agencies.

Supporting Information: Interest in active forms of transportation, like bicycling, has steadily grown in recent decades. Interest has become more pronounced in light of recent economic and health-related trends. Due to the speeds at which bicycles travel, the majority of trips are short distances. This makes consideration for bicycle transportation predominantly a local or regional concern. As a result, communities around the state have developed local and regional bicycle plans and policies to accommodate bicycle transportation. ODOT also created its own policies governing when and how to accommodate bicycling on state-owned highways, in accordance with local plans.

As a statewide agency, ODOT's role is to focus on statewide or inter-regional transportation in a manner that complements local transportation planning. Accordingly, ODOT's role in bicycle planning is to develop statewide or inter-regional bicycle routes in a manner that is consistent with local bicycle plans. To that end, ODOT has set out to identify a national and statewide bicycle route network, analogous to the interstate and state route system of highways. This will be the first statewide bicycle network developed for Ohio.

AO40 has set out to identify a national and statewide bicycle route network, analogous to the interstate and state route system of highways.

The first step in developing a statewide bicycle network was to adopt the national bicycle corridors developed by the American Association of State Highway and Transportation Officials (AASHTO). AASHTO has developed a national corridor plan for numbered U.S. bicycle routes (USBR) connecting states throughout the country. These proposed corridors are 50-mile bandwidths where the route could be placed. Individual state DOTs have helped propose the actual routes for both roadways and off-road bikeways. Five USBR corridors pass through Ohio. ODOT has endeavored to identify routing for USBRs, subject to coordination with MPOs, RPOs, and numerous local jurisdictions across the state.

Next, several SBRs that supplement the USBRs and provide connections to the 17 metropolitan centers across the state were identified. All the proposed national and statewide bicycle routes were developed simultaneously using the same process. Roads were evaluated using geographic information system (GIS) data to approximate their suitability for bicycling. Roadway suitability was determined by reviewing a number of factors such as pavement condition, shoulder width, and vehicular traffic volumes.

Further analysis of bicycle suitability is possible only after additional data is gathered on bicycle usage. This would include collecting bicycle traffic counts, establishing consistent methods for collecting these counts, and developing/maintaining a historical bicycle count database. At present, ODOT does not have any of these items. Without bicycle count data, more advanced bicycle planning is not possible to identify or prioritize bicycle accommodation needs.

Desired Outcome: Within the next two years, ODOT will coordinate with local governments to designate a USBR 50 and submit the final routing to AASHTO. In addition, ODOT will develop a protocol for performing bicycle counts and a statewide bicycle count database. By 2020, ODOT will work with MPOs, RPOs, and local governments to complete the designation of the remaining USBRs in Ohio, in the following order: USBR 21, 25, 30, and 40. By 2040, all SBRs will be designated.

Cost of Implementation: The cost of coordinating and designating U.S. and SBRs, developing a count protocol for bicycle traffic, and creating a statewide bicycle count database will come in the form of ODOT staff time.

Next Steps:

- **Create Bicycle/Pedestrian Coordinator roles in each of ODOT's 12 District offices to work with ODOT's Statewide Bicycle/Pedestrian Coordinator**
- **ODOT's Bicycle/Pedestrian Coordinators, along with statewide planning staff, will coordinate with local jurisdictions to field verify the proposed routing for U.S. and SBRs**
- **Develop bicycle count protocols in coordination with Ohio's MPOs and RPOs**
- **Develop and create a statewide database/repository for bicycle count data**

More Information: *Passenger Transportation Technical Memorandum*

RECOMMENDATION: Continue to foster existing partnerships with regional and local transportation planning agencies.

Supporting Information: Ohio has an extensive multimodal transportation system that is owned and maintained by an interconnected combination of state and local governments and private industry transportation stakeholders. Identifying and prioritizing needed investments, and balancing investments among transportation modes, requires ongoing collaboration among the wide variety of public and private transportation stakeholders. Additionally, strong interagency partnerships are essential to ensure that Ohio's transportation planning programs coordinate the development of statewide and regional visions. These regional visions help provide for a multimodal transportation system that is safe and operationally efficient.

Collaboration with regional and local governments occurs through the ODOT statewide transportation planning program, as well as through a variety of capital funding programs available to Ohio local governments. ODOT works with its principal regional planning partners ((Metropolitan Planning Organizations (MPOs) and Regional Planning Organizations (RPOs)), throughout the planning process to align investment priorities. MPOs and RPOs provide forums for collaborative transportation decision-making among regional stakeholders, including local governments, public transit operators, freight operators, citizens, and state DOT representatives. A core function of the MPOs and RPOs is to identify optimal transportation investments needed to advance the regional economic, social, and natural environments. A principal outcome of the MPO and RPO planning programs is to align transportation project investment needs with available financial resources.

Ohio MPO and RPO geographies collectively encompass 75 percent of the state's roadway lane miles, 90 percent of the businesses, and 88 percent of the population, making partnerships between these agencies and ODOT critical. ODOT and Ohio MPOs and RPOs communicate with one another as federal funding is allocated to transportation improvement projects throughout these regions of the state. ODOT Districts work closely with MPOs to initiate projects by sharing project management duties.

While MPOs have been partnering with ODOT for several decades, RPOs are newly designated rural transportation planning agencies. In 2013, five multi-county rural planning agencies covering a total of 34 counties were designated as RPOs, tasked with preparing the first transportation plans for their regions. The RPOs are also establishing themselves as a transportation resource for their

In 2013, ODOT initiated a new transportation planning program focused on the rural regions of Ohio. Five RPO agencies covering 34 counties are preparing the first transportation plans for their regions.

member governments. A principal RPO resource function is to provide their local governments with information regarding transportation improvement funding opportunities. ODOT is helping to facilitate conversations between RPOs and MPOs, to foster information sharing and further strengthen statewide transportation partnerships.

Continued interagency collaboration throughout the state will be critical in the coming years to ensure that the goals and priorities of various regions of the state complement one another. Working together in partnership will lead to transportation investments that have synergistic effects, compounding the benefits of transportation projects and programs around the state, and enhancing the state's economic prosperity and residents' quality of life.

Desired Outcome: Strengthen relationships with existing transportation partners to provide enhanced collaboration between state, regional, and local transportation agencies. This includes working with MPOs and RPOs to establish statewide transportation goals and performance measures over the next few years.

Cost of Implementation: The cost of fostering partnerships with regional and local governments will come from federal Metropolitan Planning funds for MPOs and State Planning and Research (SPR) – Part 1 funds for RPOs (along with a 10 percent state match and 10 percent local match). Additional costs will come in the form of ODOT staff time.

Next Steps:

- ❑ **ODOT will continue to support and participate in Ohio's MPO and RPO transportation planning programs**

More Information: *Metropolitan Planning Organizations (MPO) Technical Memorandum*

RECOMMENDATION: Incorporate the Strategic Transportation System (STS) into ODOT's project selection processes for programs that make transportation investments above and beyond a state of good repair. In addition, consider the STS in the development of performance targets for various types of transportation facilities.

Supporting Information: ODOT, along with counties, townships, and municipalities, owns, operates, and manages a vast multimodal transportation network. These facilities support passenger and freight movement and are vital assets to citizens and businesses in the state of Ohio. With Ohio's status as a home-rule state, Ohio law provides counties, townships, and municipalities the authority to develop and implement their own transportation plans. This creates challenges in developing statewide transportation plans with consistent goals, objectives, and policies for the entire transportation system. In developing AO40, ODOT addressed these challenges by using a corridor analysis approach to evaluate the performance of Ohio's modal transportation facilities. The focus of the corridor approach was to identify and analyze the most significant corridors to Ohio. Each transportation corridor was analyzed using three basic factors: traffic volume, classification, and connectivity.

The STS becomes the tool that allows state, regional, and local transportation agencies to prioritize and coordinate additional discretionary transportation investments for those facilities that will provide the greatest return.

Significant transportation corridors were stratified into different categories. Four general categories of corridors were developed:

- **National Corridors -** connect large metropolitan areas in Ohio and adjacent states. These corridors support heavy passenger traffic and are important to the national economy as they carry large volumes of freight both inside and outside Ohio.
- **Statewide Primary Corridors -** connect metropolitan areas within Ohio. They are important to the statewide economy as they carry freight between regions of the state. These corridors have some national travel, but are predominately used for intra-state passenger and freight trips.
- **Statewide Secondary Corridors -** connect people and goods within and between regions of the state. They have some national and statewide travel but are predominantly used for shorter, intra-regional trips.
- **Local Corridors -** have lower traffic volumes and provide connectivity between other corridors and local destinations.

By combining all national and statewide corridors from each mode, the STS was created. These facilities carry the largest passenger and freight volumes and provide the greatest connectivity between the modes and various regions within the state. Simply put, the STS is the backbone of Ohio's transportation system (see page 29 for the STS map).

All of Ohio's vast network of modal transportation systems are important and need to be kept in a state of good repair. However, the transportation facilities that make up the STS carry even greater importance. The STS becomes the tool that allows state, regional, and local transportation agencies to prioritize and coordinate additional discretionary transportation investments for those facilities that will provide the greatest return.

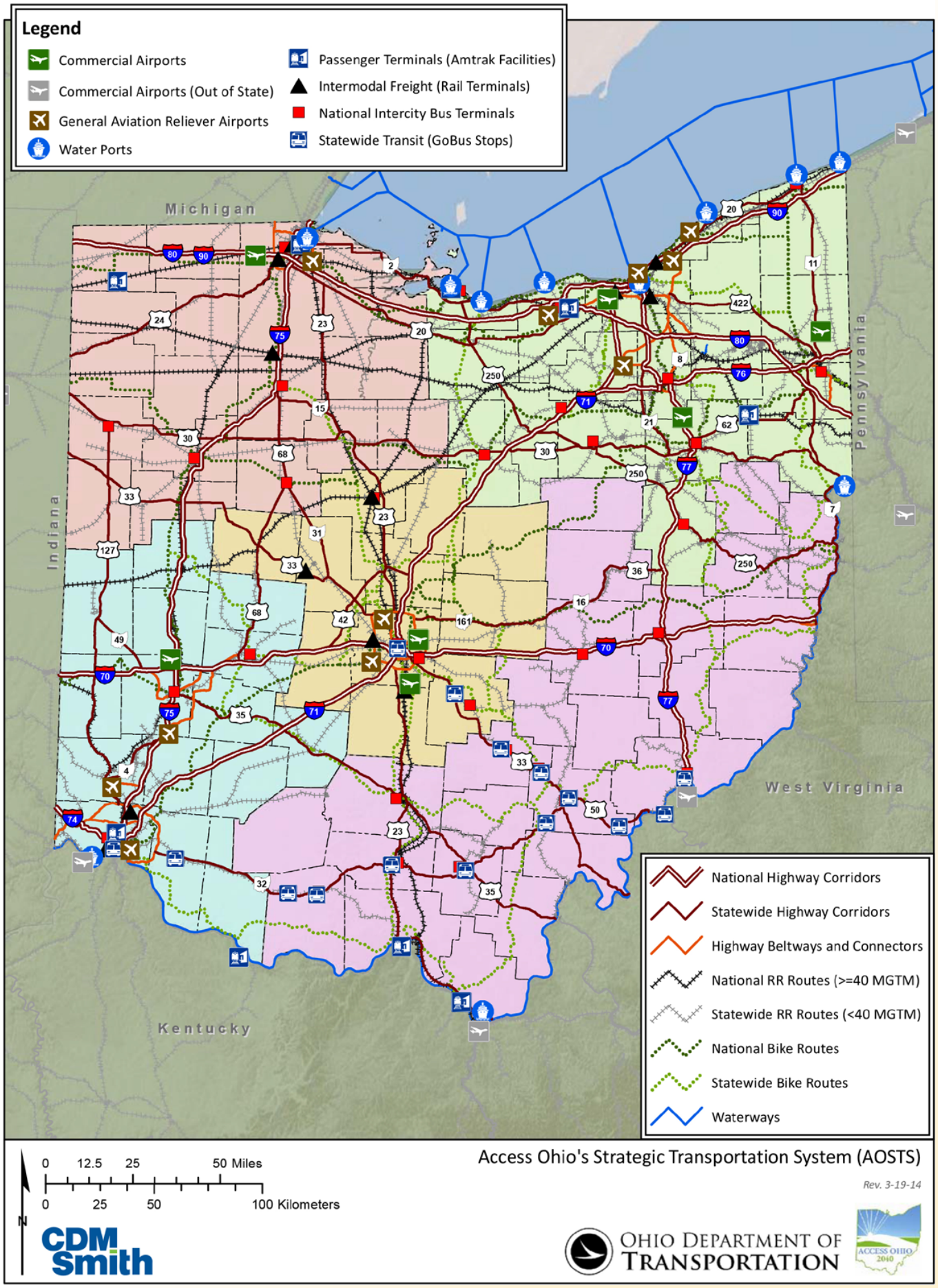
Desired Outcome: In the coming years, the STS will become a tool that state, regional, and local transportation agencies use to prioritize and coordinate additional discretionary transportation investments.

Cost of Implementation: The cost of incorporating the STS into project selection processes and consideration of system performance targets will come in the form of ODOT staff time.

Next Steps:

- ❑ **Incorporate the STS into the project selection process for ODOT programs**
- ❑ **Consider the STS in development of performance targets for various types of transportation facilities**

More Information: *Strategic Transportation System (STS) Corridors Technical Memorandum*


Legend
Commercial Airports
Commercial Airports (Out of State)
General Aviation Reliever Airports
Water Ports
Passenger Terminals (Amtrak Facilities)
Intermodal Freight (Rail Terminals)
National Intercity Bus Terminals
Statewide Transit (GoBus Stops)
Michigan
Indiana
Pennsylvania
West Virginia
Kentucky
National Highway Corridors
Statewide Highway Corridors
Highway Beltways and Connectors
National RR Routes (>=40 MGTM)
Statewide RR Routes (<40 MGTM)
National Bike Routes
Statewide Bike Routes
Waterways
0 12.5 25 50 Miles
0 25 50 100 Kilometers
N
CDM Smith
Access Ohio's Strategic Transportation System (AOSTS)
Rev. 3-19-14
OHIO DEPARTMENT OF TRANSPORTATION
ACCESS OHIO 2040

RECOMMENDATION: Address the list of regional transportation needs (RTNs) based on condition, demographic, and economic data along with stakeholder input and additional statewide studies.

Supporting Information: As documented in the Asset Management recommendation, Ohio is fortunate to possess an established multimodal transportation system. The quantity and quality of transportation infrastructure in Ohio provides a decidedly better quality of life and gives Ohio a competitive advantage in attracting and retaining jobs and businesses. However, Ohio's vast and complex transportation system also poses tremendous maintenance challenges to transportation agencies around the state. While every element of the transportation system is important, some elements are more important than others. Similarly, while every identified transportation need is an opportunity to benefit Ohio, some transportation needs possess greater opportunity. Given ODOT's role to focus on statewide and inter-regional transportation, AO40 has undertaken the task to identify the greatest transportation needs/opportunities across the state.

Different regions of Ohio have different transportation assets, geographies, demographics, and economies, and therefore different transportation needs.

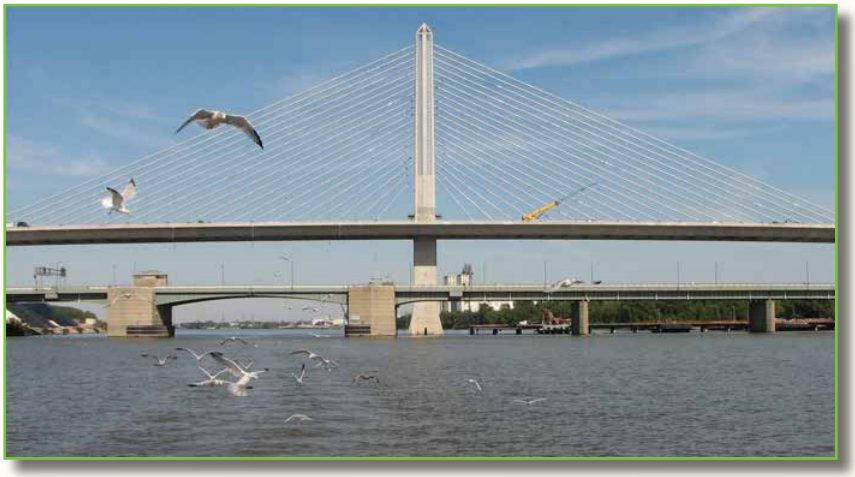
To gain a thorough understanding of Ohio's greatest transportation needs through the year 2040, an analysis of current system performance by mode is required. The results of the performance analysis must then be understood through the lens of how the transportation system will be used in the future. What do users of the transportation system want? What are the key existing transportation assets? What demographic and economic trends will shape future demand and use of the transportation system?

As the AO40 team began to address these questions, it became clear that the answers would not be consistent across the state. Different regions of Ohio have different transportation assets, geographies, demographics, and economies, and, therefore, different transportation needs. AO40 would need to consider these differences in its analyses to draw meaningful conclusions about the greatest transportation needs throughout Ohio.

To address these issues, AO40 divided the state into five regions largely based on the JobsOhio network regions. The five regions cover the northwest, northeast, southwest, southeast, and central regions of the state. To understand the complete picture of each region, the AO40 team developed separate documents called Regional Profiles. Each profile documents the following information:

- **The region's STS**
- **Existing transportation system assets and conditions in the region**
- **The current and projected future demographics for the region**
- **The major economic drivers of the region**
- **A list of the regional transportation needs (RTNs)**

While the RTNs for each region are multimodal, it is important to understand that the modal needs analysis approach was not identical for each mode. The analysis approach varied by mode for two primary reasons: first, each mode has unique attributes that make it distinct from all other modes, and second, the AO40 team had varying amounts of data with which to perform a needs analysis. The analysis approach, by mode, is as follows:



Highway: ODOT has a wealth of data on the state highway network. Consequently, ODOT was able to perform extensive analysis on current pavement and bridge conditions, existing and future congestion, and safety. Thresholds were established for each analysis to identify highway needs. Identified needs were then added to the RTN list of each regional profile.

Rail: Rail lines are privately owned and operated. Therefore, ODOT does not have access to the proprietary data that would normally be considered when evaluating needs. Providing ODOT with complete performance data could give a railroad's competitors an unfair advantage. Therefore, for the purposes of the needs list on each profile, the rail needs were limited to upgrading the capacity of short-line rails to carry an industry standard load of 286,000 pounds. Moving forward, ODOT will work with the Ohio Rail Development Commission (ORDC) to obtain more detailed, but non-proprietary, information from Ohio's railroad companies in order to better assess rail needs in Ohio.

Transit and Aviation: The infrastructure for transit and aviation require more detailed study and analysis before needs can be fully understood. A Statewide Transit Needs Study is one of the other recommendations of AO40, and a statewide aviation study (referred to as the Ohio Airport Focus Study) is underway with completion scheduled for the summer of 2014. Therefore, for the purposes of the RTN list on each regional profile, transit needs were limited to providing operational assistance to agencies with total annual ridership over one million passengers, and aviation needs were not listed. The needs lists will likely change once these studies are complete.

Bicycle: The infrastructure for the bicycle network will require more development before detailed analysis can be performed. Specifically, the proposed U.S. and state bicycle routes need to be officially designated and usage/count data collected before meaningful analysis and needs can be determined. As a result, the RTN list for each regional profile does not contain any bicycle needs due to lack of data. However, the proposed national and state bicycle routes have been included on the STS for each region.

Maritime: Ohio's maritime infrastructure includes both public and privately owned assets. Some maritime needs were identified as part of the Statewide Freight Study. Other maritime needs will require a more detailed statewide study. As a result, the RTN list for each regional profile does include needs for dredging and lock restoration/replacement.

Desired Outcome: By 2040, ODOT intends to address all of the transportation needs on the regional profiles or partner with the appropriate agencies to facilitate meeting the needs.

Cost of Implementation: The cost of addressing the transportation needs for each region cannot be calculated without scoping and programming scores of capital projects, which is beyond the scope of AO40. AO40 has focused on identifying regional needs, but not identifying possible or preferred solutions (i.e., projects).

In addition, AO40 has attempted to identify a comprehensive list of Ohio transportation needs for all modes, to the extent possible with available information. In many cases, the listed needs extend beyond ODOT's jurisdictional authority to fund. The needs list on each regional profile does not explicitly or implicitly obligate ODOT to provide funding for needed improvements.

Next Steps:

- ❑ **Complete modal statewide studies for railroad, transit, aviation, and maritime**
- ❑ **Update the needs list for each region based on the results of modal statewide studies**

More Information: *Regional Profiles; Strategic Transportation System (STS) Corridors Technical Memorandum*

Photos courtesy of

KYOVA Interstate Planning Commission; Cover, 8, Back Cover

Ohio Department of Transportation; pages 1, 2, 3, 4, 5, 6, 7, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 30, 31, 32

ingimage; page 3

Dreamstime; pages 3, 11, 31

Ohio Turnpike; pages 10, 31

Ohio Statehouse Photo Archive; page 14

Licking County Area Transportation Study (LCATS); page 21

OKI Regional Council of Governments; page 30

WWW.ACCESS.OHIO.GOV