



TRANSPORTATION ASSET MANAGEMENT PLAN

July 2017

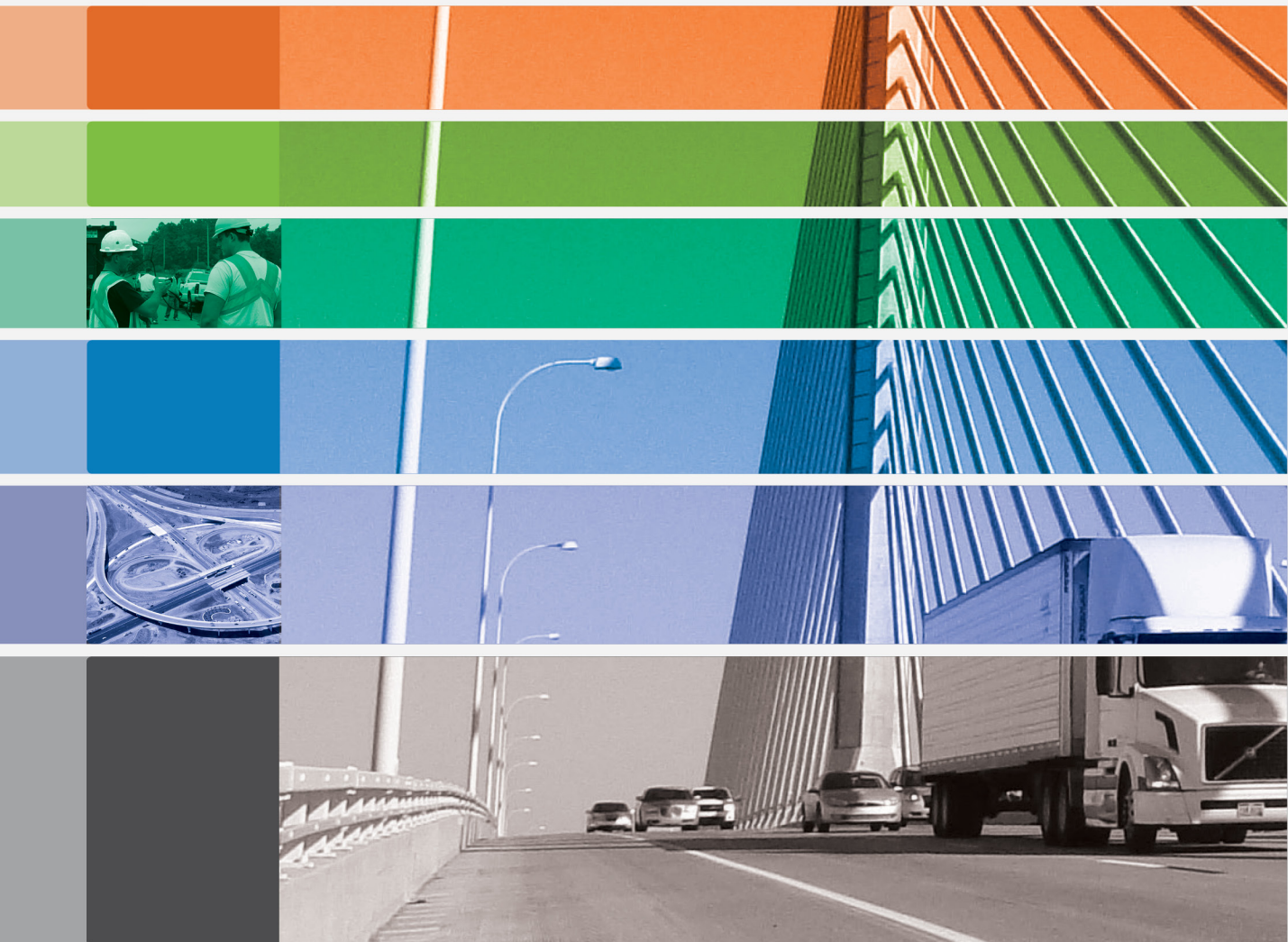


Table of Contents

Executive Summary	1
ODOT’s Experience with Asset Management.....	1
A New Way of Doing Business.....	2
ODOT’s Investment Plans.....	3
Moving Forward.....	5
1.0 Background	6
Building on Experience.....	7
Support for Other ODOT Initiatives.....	8
Aligned With National Efforts.....	9
2.0 Preparing for the Future	10
Organizational Risks	10
Managing Revenue and Traffic Impacts	10
Preserving Workforce Capacity Through Knowledge Management	11
Managing Other Risks	12
The Path Forward.....	12
3.0 Asset Management Approach	13
People	14
Asset Management Leadership Team	14
District Support.....	16
Processes	16
Life Cycle Analysis.....	17
Preservation Strategies.....	18
Work Planning	19
Technology.....	21
4.0 The Asset Management Process	23
Step 1: Maintain Critical Asset Inventories and Condition.....	23
Pavements	24
Bridges.....	28

Culverts	30
Step 2: Establish Performance Targets and Funding Needs..	31
ODOT Targets	31
Federal Targets.....	33
Need-Based Allocations.....	34
Step 3: Develop Work Plans	35
Step 4: Monitor Progress for Continuous Improvement.....	35
Personnel Development and Capacity Building.....	35
Business Process Changes	36
Data Integration and Governance.....	37
Technology and Management Systems.....	38
Step 5: Communicate Strategic Direction and Progress Made	39

5.0 ODOT’s Performance-Based Investment Plan 40

Planned Investment Levels	40
Planned Investment Strategy.....	41
Projected Performance Targets.....	41
Pavements	41
Bridges.....	42
Culverts.....	43

6.0 Summary of Planned Activities and Enhancements 44



Goals for the Transportation Asset Management Plan (TAMP):

- Outline the short- and long-term plans for investments in people, technology, and process improvements.
- Drive investment decisions.
- Hold the agency and its employees accountable.
- Lead to a more reliable, sustainable transportation system.

Executive Summary

The Ohio Department of Transportation (ODOT) manages a large, complex network of highways made up of infrastructure assets, such as pavements, bridges and culverts. One of ODOT's most critical missions is to maintain these assets in a condition suitable to support the economic vitality, safety, and mobility of freight traffic, residents, and travelers who use Ohio's highways. To deliver on this mission, ODOT continuously adapts its business processes to mitigate potential risks to the transportation system. These risks include uncertainties that impact planned investments, such as accelerated deterioration rates due to increased freight traffic or the potential loss of institutional knowledge associated with the significant number of ODOT retirements expected in the next several years. ODOT is facing these risks head on by building on its previous asset management efforts and improving the way it does business: leveraging department-wide collaboration to improve results and ensure a reliable, sustainable transportation system that meets customer needs for the next 6 years and beyond.

ODOT's Experience with Asset Management

For more than 10 years, ODOT has been using asset management principles as the foundation for its data-driven approach to managing the transportation system. Over this time ODOT's investment strategies have steadily improved system conditions to the point that the State's Critical Success Factors for pavement and bridge conditions are currently at or exceeding existing statewide targets.

ODOT's Performance Goals Through 2023



Priority System

- Comprised of interstates and divided highways
- Statewide average rating of **85 or better** (out of 100)



General System

- Comprised of two-lane state-maintained highways
- Statewide average rating of **80 or better** (out of 100)



Bridges

- Average rating of bridge conditions (General Appraisal rating) of **6.8 or better** (out of 9)



Benefits to These Changes:

- More data-driven investment decisions
- Improved consistency in practices across districts
- More cost-effective use of available funds
- Reduction in pavement and bridge life cycle costs

However, ODOT recognizes that the world in which it operates is changing and requires different strategies than those that have worked in the past. In response, ODOT has transformed the way asset management is being applied at the agency, with improved business processes that make the most of new technology and a comprehensive knowledge management strategy that will maximize agency capacity and prepare the workforce for the future.

The development of this TAMP advances ODOT's asset management initiatives and prepares the agency to address the changing environment in which it operates. The TAMP also satisfies new Federal legislation requiring all state DOTs to prepare a risk-based TAMP.

A New Way of Doing Business

The new business processes outlined in the TAMP include the consideration of life cycle planning, an increased use of preservation treatments, and more collaborative and consistent project selection practices. The increased use of low-cost preservation treatments, applied to assets still in good condition, slows the rate of deterioration and lowers the long-term cost of preserving the system. By making these changes, ODOT will redirect an estimated \$300 million towards pavement, bridge, and culvert preservation activities over the next 6 years.

Under the new approach, several key changes will be made to the development of the District Work Plans covering a 6-year horizon.

- District allocations will be based on performance targets established by the Executive Management and candidate projects suggested by ODOT's computerized asset management systems.
- Districts will work collaboratively with Central Office personnel, through the Division of Planning and the Division of Highway Operations, to develop an Annual Work Plan that ensures statewide performance targets will be met.
- Work Plans will reflect better coordination of maintenance and capital activities by combining what had been two separate Work Plans into one. The removal of artificial distinctions between capital and



maintenance will allow Districts more flexibility in addressing asset needs.

The improved business processes will allow the Department to preserve the system at current performance levels with anticipated funding levels. As a result of these and other changes:

- District expenditures will better match statewide priorities.
- Statewide goals will be achieved.
- ODOT will have a more coordinated and collaborative process in place for optimizing investment strategies.

ODOT's Investment Plans

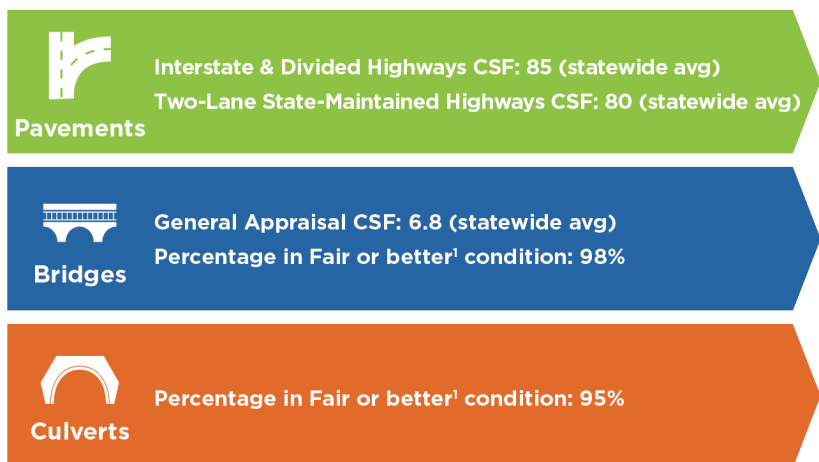
ODOT has already initiated steps to embrace the new business processes, by using its asset condition data to drive investment decisions. For pavements, annual condition assessments are conducted and a Pavement Condition Rating (PCR) is calculated for each roadway segment. Bridges and culverts are inspected regularly and assigned a General Appraisal (GA) rating representing the lowest rated element (e.g. superstructure, substructure, or deck).

To manage the network, performance targets are established for these assets to help ensure that investments are producing tangible results. ODOT refers to its performance targets as Critical Success Factors (CSF).

Critical Success Factors (CSF)

- CSF are used to gauge the state of the transportation system and the quality of the organization.
- ODOT uses regular performance reporting to identify areas of needed improvement and areas of excellence.
- CSF are also used to set goals, adjust priorities, establish best practices, develop policy, and celebrate outstanding achievements.

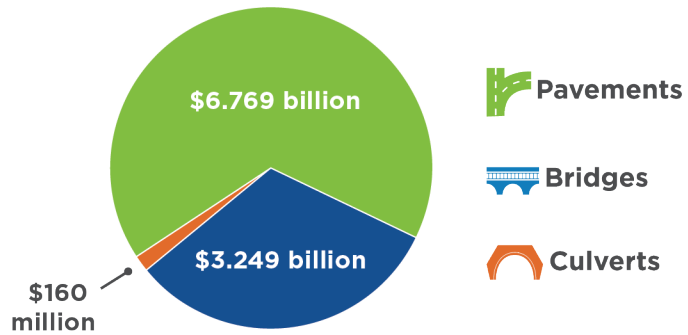
Goals Through 2023



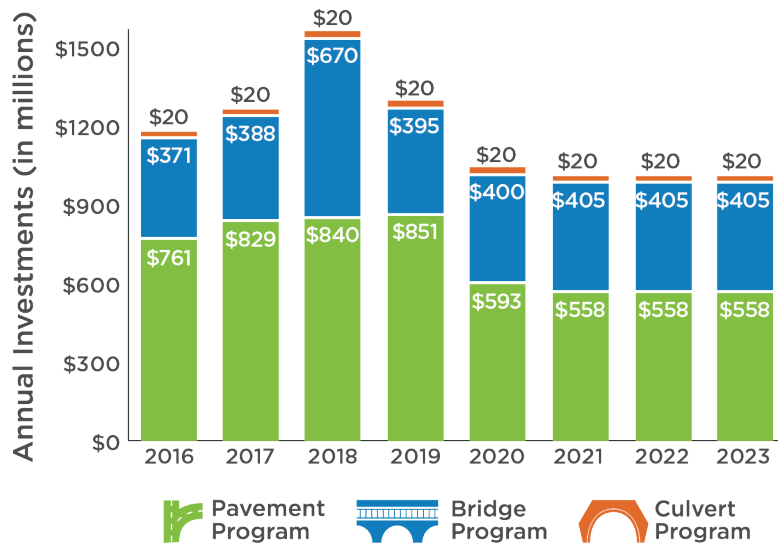
¹Fair or better = General Appraisal rating \geq 5



Projected Investments Through FY2023



Projected Annual Funding Levels



In addition to the CSF for system conditions discussed in this plan, ODOT sets CSF for people, safety, and capital programs. The CSF are bolstered with additional asset management goals to assist in prioritizing investments.

The TAMP documents the preservation strategies, and planned investments that ODOT has developed for the anticipated funding levels to continue to meet or exceed its System Condition CSF through fiscal year (FY) 2023.

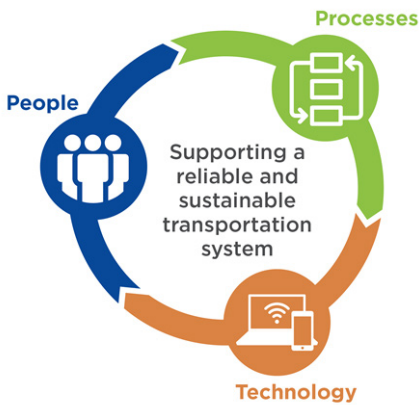


Moving Forward

Achieving the goals outlined in the TAMP requires that ODOT continue to improve its use of performance data to allocate resources in a way that achieves its strategic objectives and manages risks. This will require ongoing investments in the three following areas:

- **People:** Building organizational capacity by developing the skills of ODOT personnel.
- **Business Processes:** Reducing the cost of system preservation through more consistent, data-driven planning.
- **Technology:** Using technology to improve decisions, enhance data integration, and establish data governance standards.

Executive leadership serves an important role in the success of the agency's asset management efforts, setting agency policy, directing funding to meet strategic goals, and supporting the continued investment in people, processes, and technology that support asset management. The Asset Management Leadership Team will guide ODOT's initiatives and ensure that the Department overcomes the risks associated with flattened revenue projections and continues to achieve the agency's goal of "taking care of what we have."



1.0 Background

ODOT operates, manages, and maintains one of the country's largest statewide transportation systems, containing:

- Over 43,000 lane miles of roads, including the 4th largest interstate highway network in the country.
- More than 14,000 bridges.
- Nearly 58,000 culverts.
- Many other assets (such as guardrails, signs, and retaining walls) that keep traffic moving safely.

This transportation system enables people and goods to access the markets, services, and production inputs that are essential to the economic vitality of the State of Ohio. In addition to supporting over 5.5 million jobs in Ohio, 68 percent of the state's freight traffic is carried by trucks that travel on ODOT-maintained roads and bridges, including top exports like crops, vehicles, and plastics. By keeping ODOT's highways safe and accessible, the agency also contributes to the quality of life of its citizens and communities.



60%
of the population
in Canada and the
US lives within a
1-day drive of Ohio.





TAM Principles

1. Policy Driven
2. Performance-Based
3. Evaluates Options
4. Data Driven
5. Transparent



ODOT spends 93% of its capital dollars preserving infrastructure.

To effectively manage its transportation system, ODOT relies on the use of Transportation Asset Management (TAM) principles that emphasize sound investment decisions that preserve system performance at a reasonable cost over its useful life. These principles require:

- Clear objectives.
- A forward-looking approach to identify potential challenges and opportunities.
- The use of data to support decision making.
- Coordination of activities across multiple organizational units (such as Planning, Engineering, Construction, Highway Operations, and Districts).
- Continuous improvement based on lessons learned.

Building on Experience

Asset management principles are evident throughout the ODOT organization. ODOT's Mission Statement acknowledges its commitment to taking care of existing assets and making the system work better, two principles of a TAM approach.

TAM practices have been in place for more than 10 years at the Department. During this time, ODOT has been moving to a more data-focused approach to managing its transportation system. Prior efforts, such as the *Transportation Asset Management Recommendations Report* (2011) and the *TAM Maturity Assessment* (2012), clearly illustrate the Department's ongoing efforts to improve links between data, information, and decisions to guide acceptable transportation asset investments and business process improvements.

The investment strategies employed during ODOT's asset management implementation have steadily improved system conditions to the point that the State's pavements and bridges are currently at, or exceeding, statewide performance targets, which ODOT refers to as Critical Success Factors (CSF). In fact, ODOT spends 93 percent of its time and resources taking care of its existing infrastructure.

The Planning Division is charged with leading the implementation of Asset Management for the Department with guidance from an Asset Management Leadership Team. In 2011, ODOT formally



The TAMP is aligned with other important initiatives, such as:

- Access Ohio 2040
- Statewide Transportation Improvement Program
- Ohio Statewide Freight Plan
- Ohio Strategic Highway Safety Plan
- ODOT Business Plan



adopted a set of recommendations that established the framework for all asset management activities. Several of these recommendations have been implemented, including:

- Establishing strong support from ODOT's Executive Leadership.
- Forming an Asset Management Leadership Team¹ to guide and strengthen the use of asset management principles throughout the organization.
- Developing a risk-based Transportation Asset Management Plan (TAMP).
- Expanding asset inventories.

This deliberate effort to implement asset management has improved ODOT's ability to achieve strategic goals into the future, understand the long-term consequences of investments, evaluate options, and measure performance against risk and cost.

Today, ODOT continues to build on its previous asset management efforts to take advantage of the following:

- The opportunity to build workforce capacity and transfer institutional knowledge through a knowledge management program.
- The use of treatment strategies that lower the life cycle cost of system preservation and enable ODOT to meet system performance targets without increasing budget requirements.
- The availability of new tools and technology to better collect and analyze performance data to make investment decisions.

Support for Other ODOT Initiatives

Asset management is not a separate program area or an independent function within ODOT. Rather, asset management requires coordination between many Divisions such as Planning, Engineering, Construction, Highway Operations, and Districts to

¹https://www.dot.state.oh.us/Divisions/Planning/TechServ/Pages/tam_leadership.aspx



National Goal Areas

- Safety
- Infrastructure condition
- Congestion reduction
- System reliability
- Freight movement and economic vitality
- Environmental sustainability
- Reduced project delivery delays

ensure that the entire organization is working towards common goals as effectively and efficiently as possible.

To help align the organization, ODOT has outlined plans that will enable the agency to meet its long-term objectives. This TAMP reinforces ODOT's focus on the importance of:

- Taking care of what we have.
- Expanding the use of performance management.
- Making greater use of asset management principles and tools for optimized investment decisions.

The planned strategies outlined in this document will lead to more consistency across the system and stronger collaboration within the Department to maximize the effectiveness of each effort.

Aligned With National Efforts

The Moving Ahead for Progress in the 21st Century Act (commonly referred to as MAP-21), which was signed into law on July 6, 2012, established a performance-based Federal highway program, funding transportation programs based on national transportation goals and increased accountability and transparency. The asset management provisions of MAP-21 were perpetuated in the Fixing America's Surface Transportation (FAST) Act of 2015. These acts establish requirements for each state to:

- Develop a risk-based TAMP.
- Report progress in seven national goal areas for performance-based planning.
- Meet minimum condition levels for interstate pavement and bridge conditions on the National Highway System (NHS).
- Meet minimum capabilities for pavement and bridge management systems.

ODOT's asset management efforts to date are enabling the Department to respond to these requirements.



2.0 Preparing for the Future

Transportation asset management has its foundation in performance management and a focus on achieving measurable objectives through sound investment strategies. It requires a forward-looking, continual improvement approach. While asset management has allowed ODOT to achieve its asset condition goals in the past, the practice requires the Department to continually adjust to changing fiscal, legislative, and political environments to ensure that this success will continue.

Key Risks:



Marginal revenue growth



Changing workforce



Extraordinary weather events



Price volatility

Organizational Risks

Modern management practices require leaders to prepare for uncertainties and unplanned events. Risk management - the practice of recognizing, documenting, and managing uncertainty - is an integral component of asset management.

ODOT's Asset Management Leadership Team conducted a risk assessment to identify the most significant risks the Department expects to face over the next several years. The risk assessment recognized the following risks as being most significant to ODOT's ability to meet its asset management objectives:

- The potential impact of projected revenue changes on network conditions over the next several years;
- The likely acceleration in pavement and bridge deterioration with increased truck traffic;
- The expectation of significant staff turnover due to retirements in the coming years and the resulting loss in institutional knowledge;
- The likelihood that ODOT will need to prepare for, and respond to, extraordinary weather events; and
- Inflation rates that diminish buying power and impact the amount of work that can be constructed each year.

Managing Revenue and Traffic Impacts

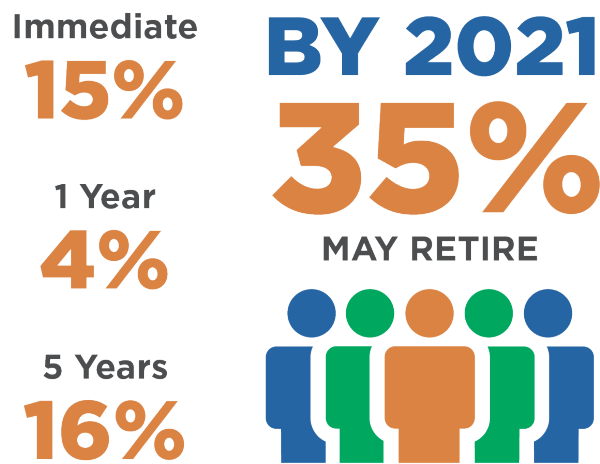
Financial forecasts indicate that there will be slight increases in available revenue levels over the next several years. Since repair costs continue to increase at an average rate of 3.5 percent, funding is not expected to keep pace. As a result, fewer assets (roads, bridges, etc.) can be fixed each year. In



In addition to the funding issues, truck traffic volumes are expected to increase by 67 percent by the year 2040. Increasing truck traffic accelerates the rate at which pavements and bridges deteriorate, necessitating more frequent repairs. In response, ODOT is acting quickly to adopt new, cost-effective strategies that slow system deterioration and allow ODOT to maintain system conditions at current levels with anticipated revenue.

Preserving Workforce Capacity Through Knowledge Management

The risk assessment also recognized impending workforce changes that will require multiple knowledge management strategies to mitigate the potential loss of workforce capacity. Current projections indicate that 35 percent of ODOT's existing workforce will be eligible to retire by 2021. ODOT's asset management approach relies on knowledge management planning, succession planning, and training to address this risk.



Because of the anticipated workforce changes, ODOT has taken steps to develop a Knowledge Management Plan that guides the workforce-development and knowledge-transfer efforts necessary to ensure the continued implementation of the new business process improvements. The Asset Management Leadership Team is directing this effort to ensure that the future workforce has the requisite skills and expert knowledge to continue meeting the needs of the traveling public. The plan involves clarifying the roles of staff in the District and Central Office, conducting training, and



preserving institutional knowledge through the use of information technology.

Managing Other Risks

The risk assessment identified several other risks associated with inflation and unexpected events such as flooding. The new business processes outlined in this TAMP will enable ODOT to better manage and mitigate these risks. ODOT can't stop these events from occurring, but by building awareness of these risks, ODOT can identify investment strategies that will reduce the impact if they do occur. The TAMP includes strategies that will enable ODOT to proactively reduce the likelihood that the transportation system will be severely impacted if these types of events transpire.

The Path Forward

To address these and other risks, ODOT is building on its asset management efforts and improving the way it does business: leveraging department-wide collaboration to improve results and ensure a reliable, sustainable transportation system. Specifically, ODOT is employing the use of TAM principles to guide investment decisions. These principles rely on the use of performance data to optimize investments and implement more accountable and transparent decision-making.

As outlined in this TAMP, ODOT has developed an asset management approach that employs new and refined business processes to drive ODOT's 6-year plan for managing investments in its roads, bridges, and culverts. By changing the way ODOT conducts business, an estimated \$300 million will be redirected towards pavement, bridge, and culvert preservation activities over the next 6 years.

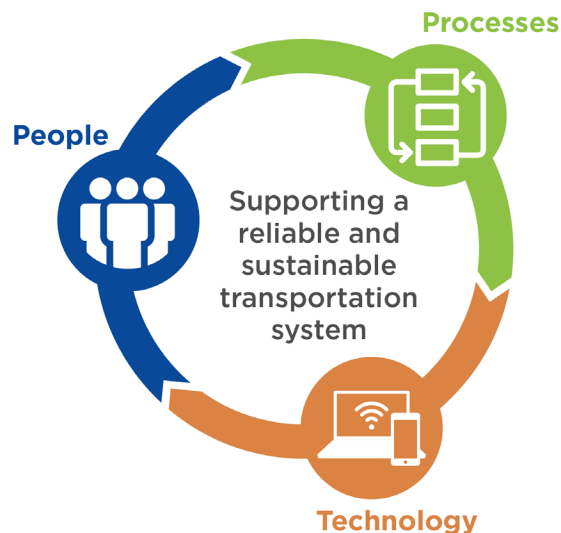
Together, these changes will help preserve ODOT's \$115 billion investment in its highway assets and ensure that its strategic objectives for a more reliable, sustainable transportation system are met.



3.0 Asset Management Approach

ODOT considers asset management to be more than just big data and computer programs. It also includes strategies for integrating ODOT's **people**, **processes**, and **technology** into a performance-based investment plan with an end goal of a reliable and sustainable transportation system. This section outlines the changes that will be implemented to:

- Provide ODOT employees with the training and tools needed to be successful in their jobs.
- Update business processes to foster greater statewide consistency, help ensure statewide goals are achieved, reduce costs, ensure accountability, and better coordinate capital and maintenance activities.
- Expand the use of technology to evaluate investment options and improve system performance.



These changes will allow ODOT's people, processes, and technology to work together to address system needs, overcome risks, improve efficiency and accountability, and meet the agency's strategic objectives. Planned enhancements in each of these areas are discussed later in the TAMP and are summarized in Section 6, *Summary of Planned Activities and Enhancements*.





People

Every ODOT employee has a role in the agency's success at implementing asset management. For this reason, ODOT's asset management approach focuses on building the skills necessary to navigate the business process and technology changes that are underway, and transferring institutional knowledge from one generation to another. To guide its efforts in this area, ODOT has developed a Knowledge Management Plan to meet the agency's changing needs and a Communication Plan that explains why the changes are being made.

To illustrate the importance of ODOT's personnel in navigating the changes outlined in the TAMP, the significant roles of the Asset Management Leadership Team and District personnel are highlighted below. A summary of other roles and responsibilities in support of asset management, including the creation of a Communications Team to support these and other implementation and outreach efforts, is presented in Section 6, *Summary of Planned Activities and Enhancements*.

Role of the Asset Management Leadership Team

The Asset Management Leadership Team was created to guide the implementation of asset management throughout ODOT and to monitor progress at each step in the process. The Team is charged with developing the TAMP and overseeing the implementation of the organizational changes needed to achieve ODOT's strategic objectives.

The Asset Management Leadership Team is made up of representatives from all of the major business units in both the Central and District Offices, and is connected to the policy level of the organization through its Executive-level members. Its objectives are to:

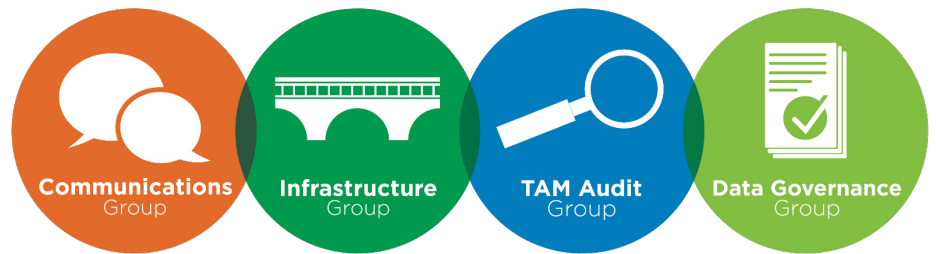
- Maintain and implement plans and business processes to support TAM activities.
- Communicate TAM activities to the Executive levels to foster implementation or awareness.
- Establish data governance and data collection standards.



- Facilitate knowledge transfer and collaboration among the business units represented on the team.
- Engage in the solicitation and promotion of best practices.
- Promote TAM benefits and uses throughout ODOT and with external partners.
- Promote training opportunities to support ODOT's TAM activities.

The work of the Asset Management Leadership Team is supported through the activities of various subgroups. In addition to the Communications, Infrastructure, and TAM Audit Groups, a Data Governance Group was added to provide additional support to the Asset Management Leadership Team.

Asset Management Leadership Team



Comprised of Central Office and District personnel

Communicates TAMP messages throughout all levels of ODOT and externally

Designs and implements communication plans for ODOT's strategic direction and measures its effectiveness

Comprised of Central Office and District personnel

Provides oversight during the development of the Work Plan

Ensures business needs of Planning, Operations, Engineering, Construction, and other functions are represented in all aspects of TAM activities

Comprised of Central Office and District personnel

Oversees all asset data collection requirements

Ensures data governance and collection standards are in place for any asset data collected by the Department

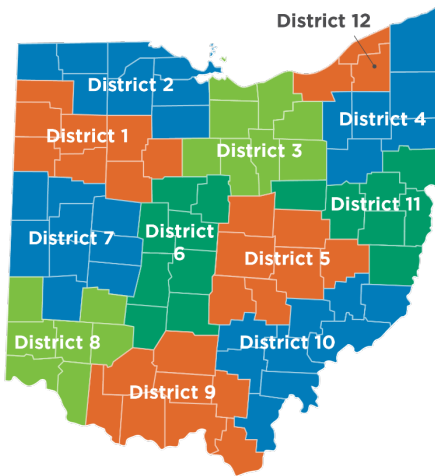
Comprised of Central Office and District personnel

Sets agency data standards

Develops data governance and data collection standards for all asset data collected by the Department



ODOT District Map



Role of the ODOT Districts

The Districts have a crucial role in the implementation of the changes outlined in the TAMP. District personnel have direct, regular interactions with the public and a first-hand knowledge of what's happening on ODOT-maintained roads, bridges, and culverts. District participation is integral to the development and implementation of asset management principles. Involvement of District staff helps to ensure that ODOT's planning efforts result in practical, cost-effective Work Plans that provide the best possible return on investment². Districts can also work together to share observations and best practices to help ODOT continue to improve system performance.

District personnel can help ensure the TAMP's success by:

- **Managing strategically.** District Work Plans establish the link between statewide asset management strategies and what projects are delivered.
- **Keeping watch.** District personnel serve as the eyes on the road, letting others know where conditions pose a concern and making sure quality work is being done.
- **Leading up.** District personnel share observations and best practices with other Districts and the Department.
- **Preparing roads for paving.** District personnel ensure surfaces are ready to pave with replaced culverts and other necessary pre-surfacing repairs.
- **Adjusting to new practices.** District personnel recognize everyone's contributions to achieving the long-term, big picture plan of taking care of ODOT's transportation system.

Processes

ODOT's past investment strategies and asset management practices have been very effective at improving the condition of the state-maintained pavements and bridges.

² For more on the process of developing work plans, see page 20



Over the years, ODOT has been continuously improving its business processes and analytical capabilities to better manage its transportation system. However, in light of the identified risks, significant change is needed for ODOT to continue its success in a changing world. The investment strategies and corresponding changes to the existing business processes outlined in the TAMP continue ODOT's efforts to use performance data effectively to allocate resources, achieve strategic objectives, and manage risk.

The Asset Management Leadership Team is responsible for reviewing and improving planning and programming practices to ensure that resources are being used as efficiently and effectively as possible. The Team's work in this area showed that transformational changes could be made by modernizing ODOT's Work Plan development process to consider life cycle costs, emphasize the use of cost-effective preservation treatments, and implement more collaborative and consistent procedures.

Life Cycle Planning

Using an analysis of all costs over the life of its pavements and bridges, the Asset Management Leadership Team has made a business case for long-term financial investments that will reduce the life cycle cost of maintaining ODOT's assets while maintaining system performance.

To develop its new investment strategies, ODOT performed life cycle planning for pavements and bridges. Using asset condition data and predictive models, ODOT analyzed the impacts of increasing the use of properly-timed preservation treatments to extend asset service life. For pavements, the analysis was based on treatment strategies and performance data from ODOT's pavement management system. For bridges, the analysis used data from its bridge inspection database and projected deterioration rates.

For both pavements and bridges, the life cycle planning showed that the life extension provided by a long-term commitment to timely preservation delays costly replacements and reduces life-cycle costs. The results showed that if just 5 percent of the National Highway System (NHS) bridges were to receive an appropriate preservation treatment annually, up to \$50 million could be reallocated across the system to maximize service life. For pavements, the analysis showed that if half of the low-volume roads

Reducing overall life cycle costs of maintaining pavements, bridges, and culverts requires:



Increased preservation activities

A unified approach to maintenance and capital planning





Pavement Preservation Treatments

- Crack sealing
- Chip seals
- Microsurfacing
- Thin Overlays
- Underdrain cleaning



Bridge Preservation Treatments

- Sealing of bridge decks
- Cleaning bridges
- Sweeping



Culvert Preservation Treatments

- Debris removal
- Erosion protection

eligible for preservation were addressed with a chip seal rather than an overlay, at least \$75 million could be reallocated to other parts of the highway system each year.

In today's dollars, it would cost nearly \$115 billion to replace the pavements, bridges, and culverts that ODOT maintains. By investing regularly in certain low-cost preservation treatments, the value of these assets is preserved and the cost of maintaining system conditions is reduced, because costly repairs and replacements are needed less frequently. Preserving the condition of the highway system so fewer assets have to be replaced is an important objective for the investments included in the TAMP.

Preservation Strategies

Preserving highway assets through long-term financial investments in timely preservation activities is similar to investments individuals make in car maintenance to preserve the car's value and keep it in working condition.

Small, planned investments in maintenance save money in the long run.

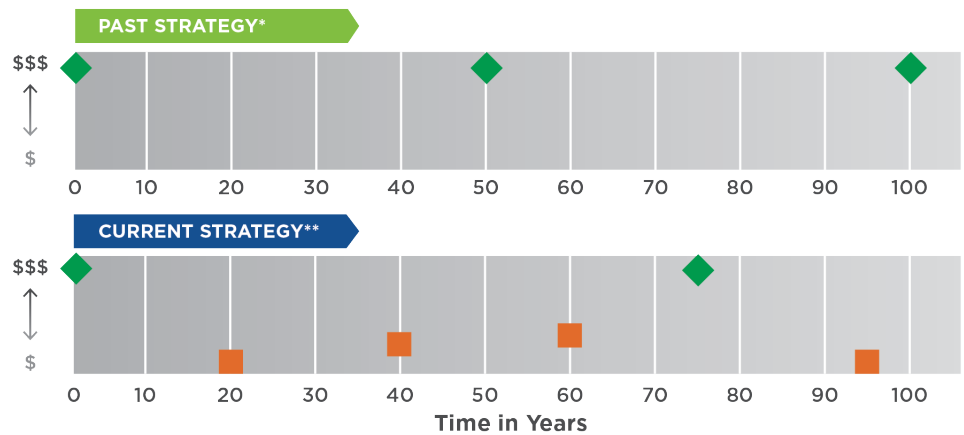


Similar to maintaining vehicles with properly-timed oil changes and tune-ups, a long-term strategy based on routine, low-cost preservation treatments is a cost-effective way to maximize the service lives of highway assets. For pavements, bridges, and culverts, the strategy requires the regular application of preservation treatments that delay the need for more costly rehabilitation and replacement.



Timing of these treatments is critical to the success of the long-term preservation strategy, since these treatments must be applied before significant deterioration has occurred. The following figures illustrate how the new preservation strategies differ from the typical strategies used in the past. Over the analysis period, the preservation strategy is significantly less expensive than the traditional strategy, even though the asset receives more frequent treatments. When considered over an entire network, these savings quickly become significant.

Bridge Preservation Strategies

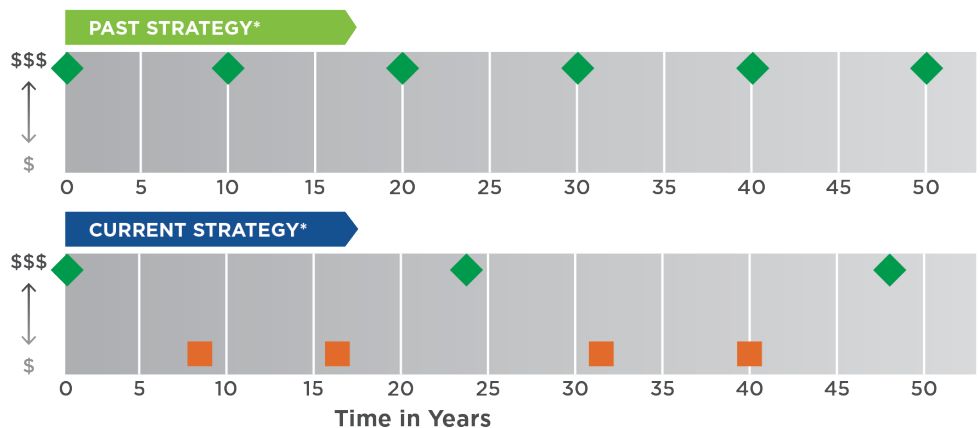


- Preservation treatments: 20 years = \$29k per bridge
40 years = \$110k per bridge | 60 years = \$149k per bridge
- ◆ New or replaced bridge | \$1.9 million

*Past strategies do not include preservation; only routine maintenance amounting to \$2.5k per bridge per year.

**Current strategies include treatments like bridge deck sealing and bridge washing.

Pavement Preservation Strategies



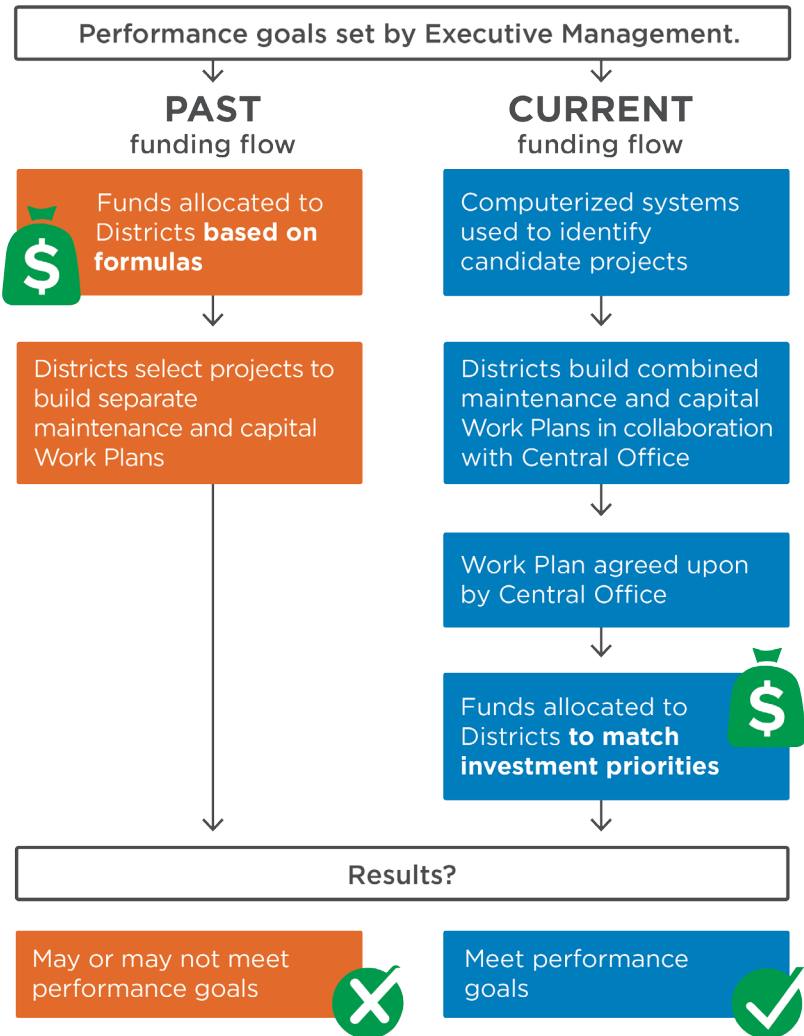
- Chip Seal/Microsurfacing/Thin Overlay | \$40-80k per lane-mile
- ◆ Mill/Overlay with pre-overlay repairs | \$250-\$350k per lane-mile

*In both strategies, crack sealing is performed on a 2-3 year cycle.



Work Plan Development

The investment strategies outlined in this document are based on ODOT’s implementation of coordinated business processes that strengthen the emphasis on asset management principles and tools.



They reflect an increased use of preservation treatments to slow the rate of deterioration, and the implementation of new processes that are more optimized, streamlined, and collaborative. The figure above illustrates the significant differences between ODOT’s current business processes and the way planning and programming were historically performed.

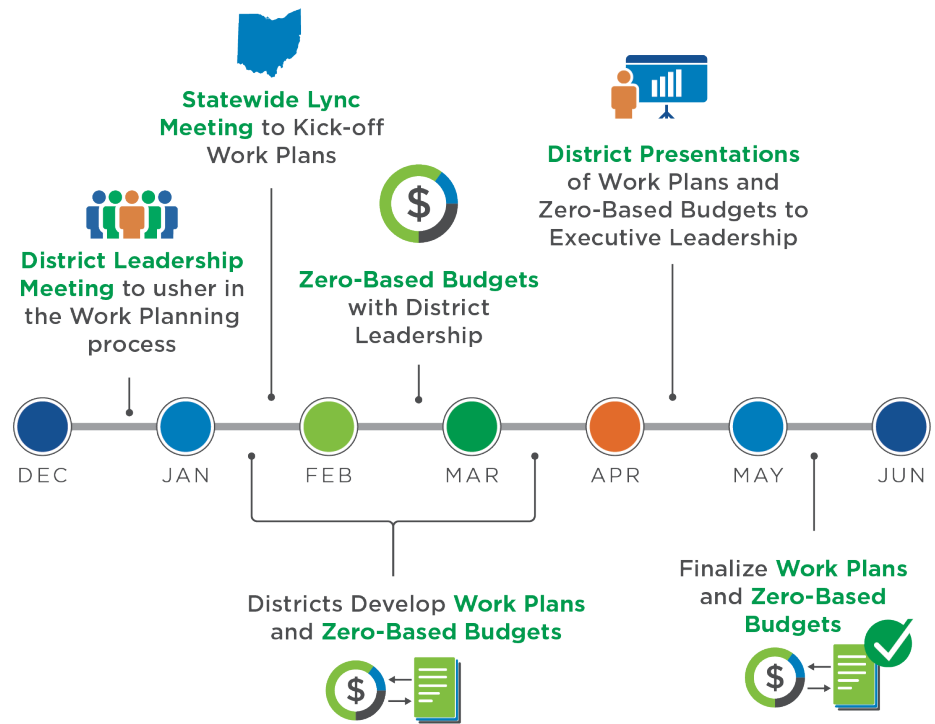


Overall, changes to existing planning and programming activities include:

- Using performance data to guide funding allocations.
- Fostering more consistency across Districts.
- Coordinating District work activities to ensure statewide performance goals are met.
- Increasing the use of low-cost maintenance treatments.
- Removing artificial distinctions between capital projects and maintenance activities.
- Selecting preservation activities through collaborative efforts with Planning and Highway Operations

An example work-plan-development calendar is provided below.

Annual Fiscal Year District Work Plan Calendar





TIMS TRANSPORTATION
INFORMATION
MAPPING SYSTEM

Better Data. Better Decisions.

Technology

Historically, ODOT has used performance measures to establish funding levels needed to achieve CSF for desired pavement and bridge conditions and to track accomplishments. Going forward, an important part of ODOT's asset management practices will be the additional use of performance data and computerized management systems to analyze treatment strategies and optimize the use of available funding on a statewide basis.

Both life cycle and comprehensive work planning require integrated management systems supported by high-quality data. ODOT has applied considerable resources to this issue, and has already produced tools like its Transportation Information Mapping System³ (TIMS), which help planners, engineers, and executives access and manage key asset, safety, and operational data in an integrated map-based format. The data integration efforts that have enabled TIMS will underpin all future management system implementations.

ODOT has also implemented computerized management systems to store asset data and evaluate investment options. ODOT uses a state-of-the-art pavement management system called TIMS for its pavement network and plans on implementing a new bridge management software program over the next several years. ODOT is also implementing comprehensive maintenance management processes that are currently being linked to the agency's asset management program.

New technology is also impacting the way data is collected and treatments are applied. Improvements in material specifications and construction material properties are just two examples of technology advancements resulting in better-performing preservation treatments.

3

<https://www.dot.state.oh.us/Divisions/Planning/TechServ/Pages/tims.aspx>



4.0 The Asset Management Process

ODOT's TAMP will be executed through a five-step business process, represented in the figure below. This process leverages ODOT's technology advancements and life cycle planning results to provide ODOT staff with a consistent, data-driven approach to make decisions on capital and maintenance investments.



Step 1: Maintain Critical Asset Inventories and Condition

Quality data is foundational to asset management. ODOT has maintained an inventory of pavement and bridge assets for years and is adding other highway assets to the inventory on a regular basis. This initial TAMP focuses on pavements, bridges, and culverts since they represent three assets that are critical to system performance and characterize the largest share of ODOT's \$115 billion investment in its transportation system.



ODOT's Assets

Tier 1

- Pavements
- Bridges
- Culverts
- Barriers/Guardrails
- Overhead Signs
- Post Construction Best Management Practices

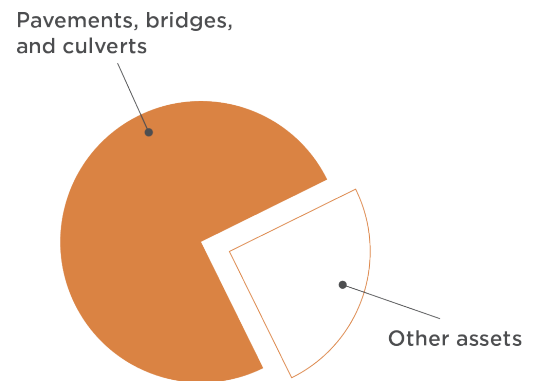
Tier 2

- Lighting
- Retaining Walls
- Curb Ramps
- Geotechnical

Tier 3

- Signals
- Ground Mounted Signs
- Pavement Markings
- Noise Walls
- Sidewalks

Collectively, the value of our pavements, bridges, and culverts dominates the value of all transportation assets maintained by ODOT.



ODOT has taken a risk-based approach to developing asset inventories, meaning that Department staff prioritized its assets based on their importance to achieving Departmental goals. Tier 1 assets were identified as being the most critical, including pavements, bridges and culverts. Inventories for assets in tiers 2 and 3 will be developed as needed, or as resources allow.

In addition to building asset inventories, ODOT regularly collects information about the condition of these assets. This has allowed the Department to:

- Identify and prioritize needs.
- Establish performance targets.
- Monitor accomplishments.
- Communicate with outside stakeholders.
- Show that available funding is being used wisely.

ODOT's new business processes rely on the use of asset condition data to accomplish these same goals, as well as to quantify needs, support allocations, optimize investments, and support more accountability and transparency in decision making.

Pavements

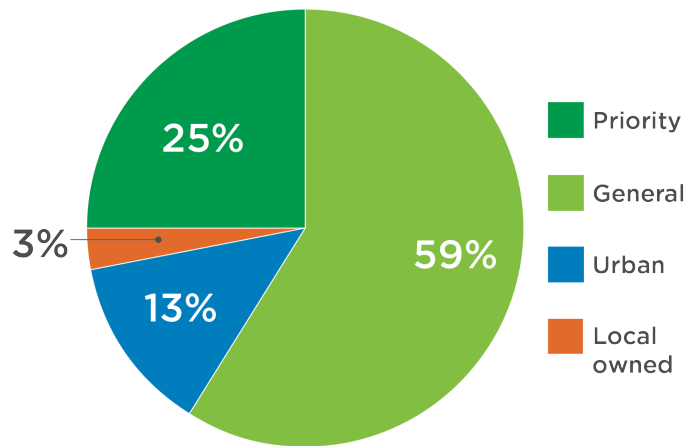
ODOT is responsible for nearly 50,000 lane miles of roads divided between three systems: Priority, General, and Urban. ODOT is responsible for maintaining Priority and General System roadways, which total over 43,000 lane miles. The Priority System carries the highest traffic volumes since it is made up of Interstates and multilane divided highways. The General System is the largest of the three systems by



mileage. It includes all of the two-lane state-maintained highways. The Urban System includes any U.S or state highways that fall within the jurisdiction of a local agency with a population of 5,000 or more. Since Ohio is a “home rule” state that promotes governance at the local level, the maintenance of Urban routes is ultimately the responsibility of the municipalities. However, through its collaboration with its Local Partners, ODOT participates in the investments towards the local system.

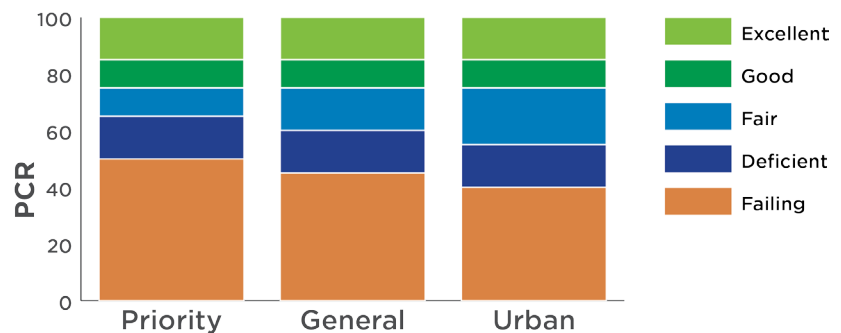
Pavement conditions are monitored using a 100-point Pavement Condition Rating (PCR) in which a score of 100 represents the condition of a new road. PCR considers

Pavement Inventory



surface distresses, such as cracking, as well as ride quality to provide a comprehensive rating of pavement condition. The chart below demonstrates how the numeric PCR ratings correlate to a typical user’s perception of quality. ODOT measures the average pavement conditions for all Priority, General, and Urban routes each year and compares conditions to the Critical Success Factors to gauge statewide system quality and set investment priorities.

PCR Condition Levels

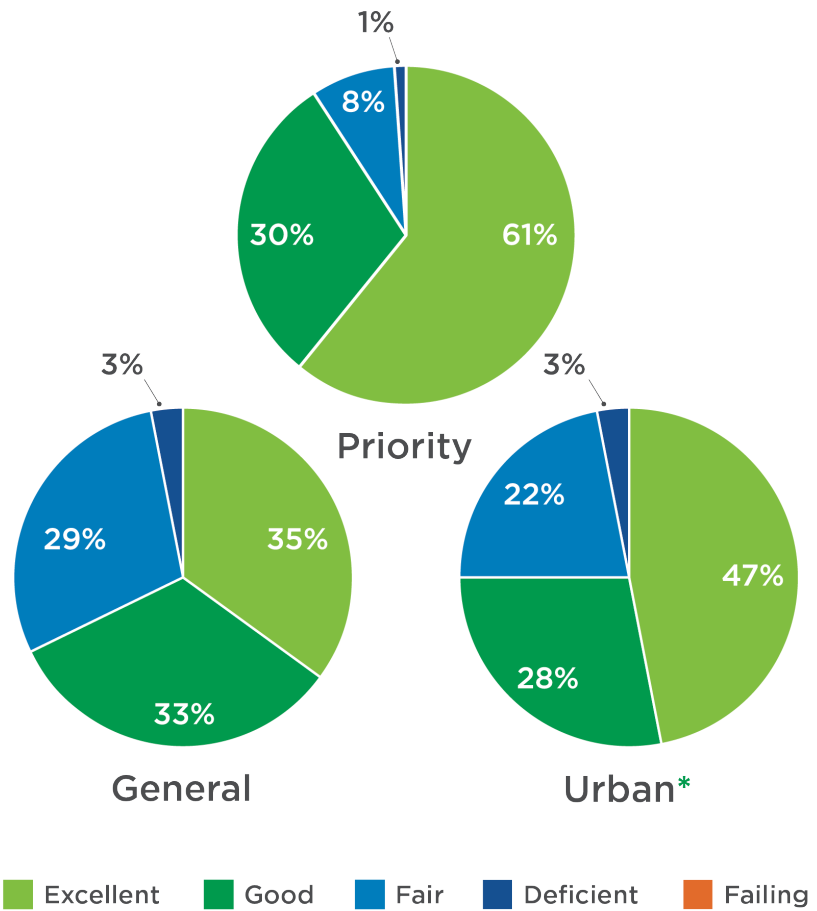




*As a **home rule** state, the maintenance of the Urban System is ultimately the responsibility of the Local Government.

ODOT participates with its Local Partners in the investments towards the local system.

Pavement Condition Across Systems

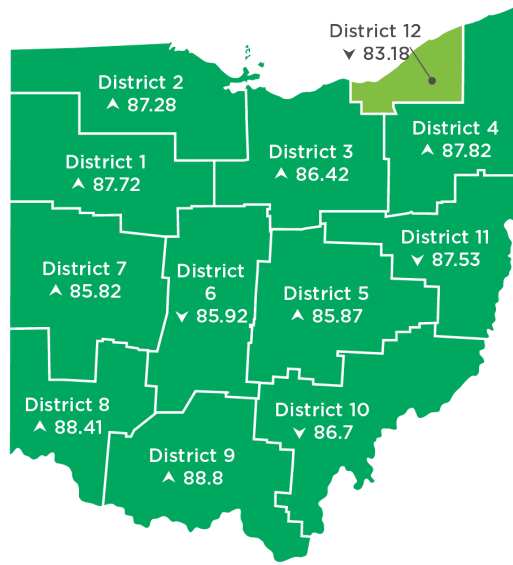


The information is published quarterly and presented in ODOT’s Critical Success Factor Dashboard⁴. Maps are also prepared for each District showing their average PCR scores to illustrate progress towards targeted statewide conditions. The pavement program is established from a statewide optimization analysis; therefore, there are some Districts with scores above the target and others with scores below the target. However, on a statewide basis, ODOT is currently meeting or exceeding its targets for the Priority and General Systems.

4

<http://www.dot.state.oh.us/policy/ODOTStrategicPlan/Documents/FY%2016%20Q1%20CSF%20Dashboard.pdf>





Priority System

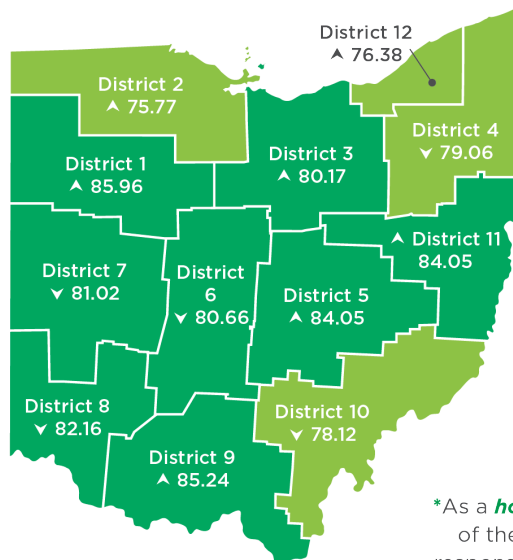
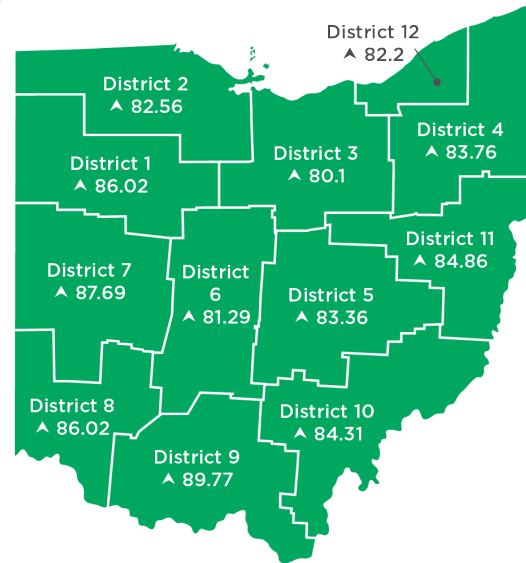
State Goal: 85
State Total: 86.4

- Meets Goal
- Does Not Meet Goal
- ▲ 1-Year Trend Up
- ▼ 1-Year Trend Down

General System

State Goal: 80
State Total: 84.2

- Meets Goal
- Does Not Meet Goal
- ▲ 1-Year Trend Up
- ▼ 1-Year Trend Down



Urban System*

State Goal: 80
State Total: 79.7

- Meets Goal
- Does Not Meet Goal
- ▲ 1-Year Trend Up
- ▼ 1-Year Trend Down

*As a *home rule* state, the maintenance of the Urban System is ultimately the responsibility of the Local Government.

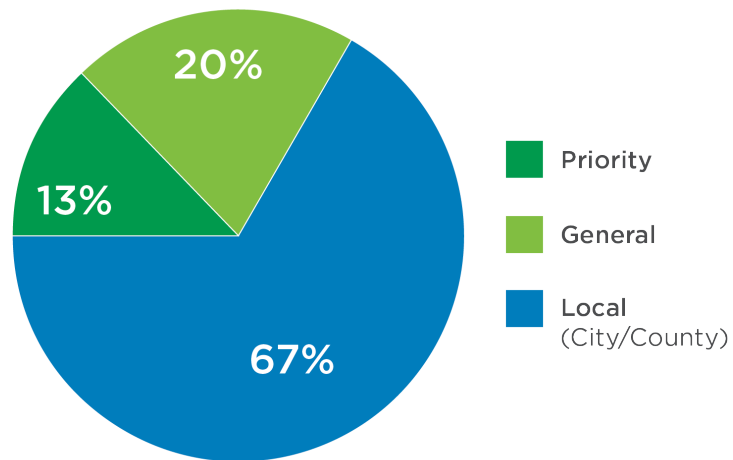
ODOT participates with its Local Partners in the investments towards the local system.



Bridges

Ohio has nearly 45,000 bridges. ODOT is responsible for maintaining over 14,000 of these bridges on the Priority and General systems.

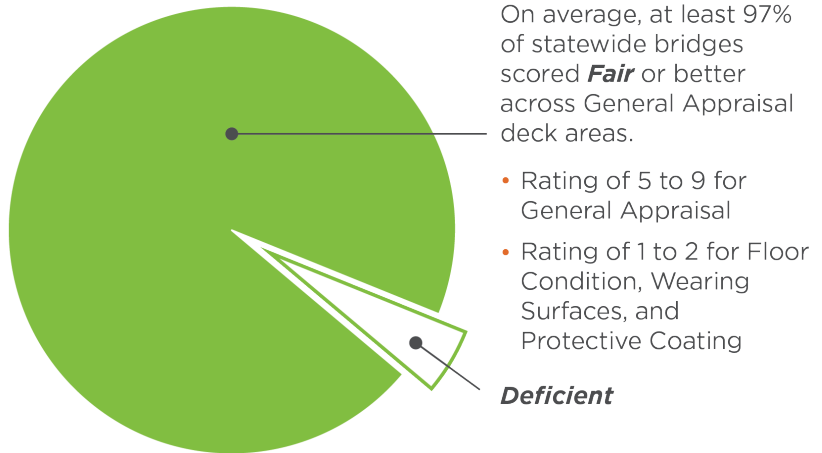
Bridge Inventory



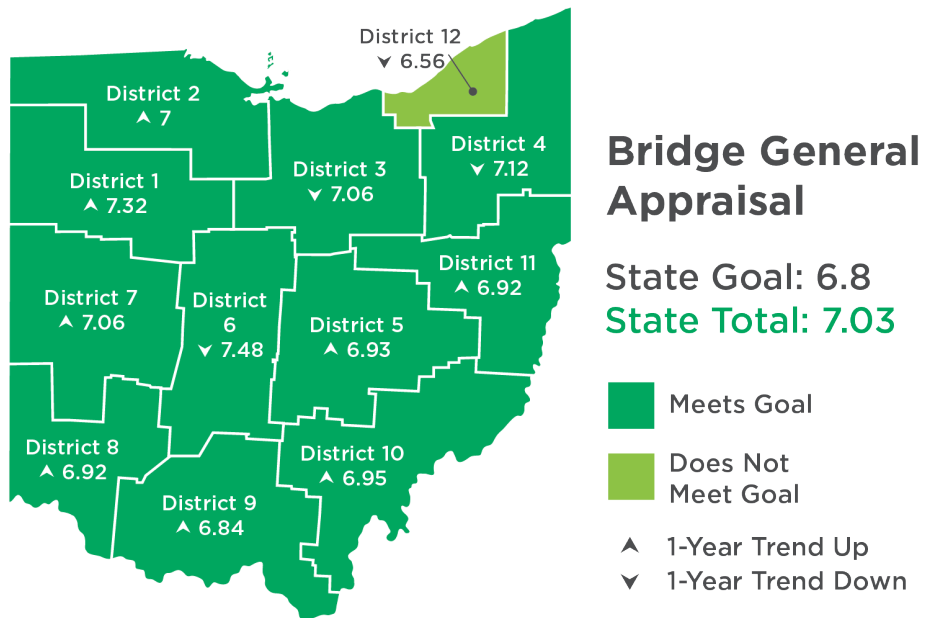
The bridge inventory includes all bridges and large culverts with a span greater than or equal to 10 feet. ODOT inspects its bridges annually. Each inspection provides a rating for the major elements of the bridge (superstructure, substructure and deck) on a 0 to 9 scale, with 9 representing an element in *Excellent* condition and 0 representing a *Failed* element. Any element rated below 5 is considered *Deficient*. To provide an overall assessment of bridge condition that takes all three elements into account, the lowest rating from these primary elements is reported. The same overall assessment is reported as the General Appraisal (GA) rating, which is a rating ODOT has been using for years. In addition to these primary condition ratings, some bridges require more detailed inspections if they have fracture-critical members, underwater components, or are considered to be complex structures. On a statewide basis, more than 97 percent of the bridges maintained by ODOT are in *Fair* or better condition (GA of 5 to 9).



Bridge Conditions



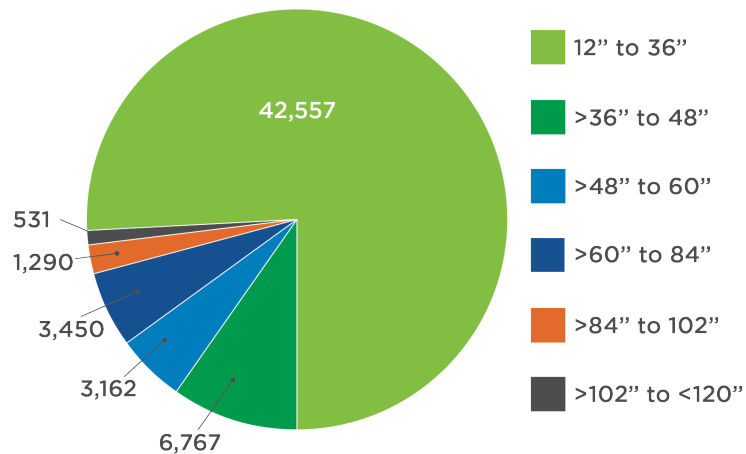
The Critical Success Factor used to manage bridges is a statewide average GA rating of 6.8 out of 9. ODOT is currently exceeding this target. Weighted Average GA ratings for each District are shown in the map below to demonstrate progress made toward targeted statewide conditions.



Culverts

ODOT is responsible for nearly 58,000 culverts. These include drainage features that cross the highway centerline and have a span less than 10 feet. The culvert inventory also includes storm sewers with a diameter of 36 inches or more. ODOT is in the process of completing its culvert inventory and has been implementing statewide inspections to enable more effective culvert management.

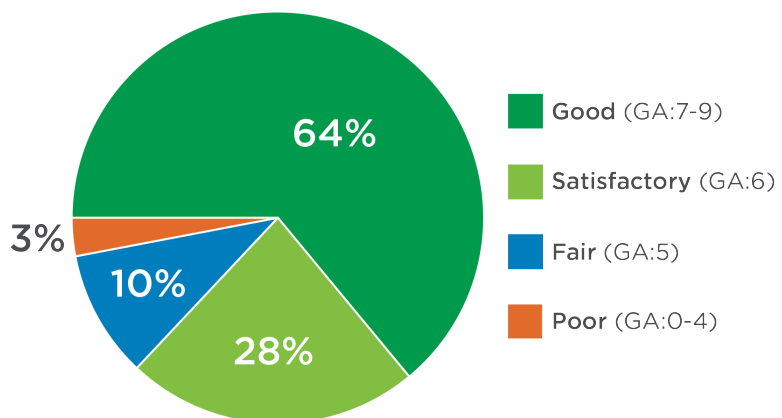
Culvert Inventory



Note: This chart reflects data collected to date, representing approximately 80% of the total inventory

Culverts are rated using a GA rating similar to the one used for bridges. As with bridges, a culvert with a score of 5 or more is considered to be in *Fair* or better condition. The frequency of culvert inspections ranges from 1 to 10 years based on the size of the culvert and its condition.

Culvert Conditions



Note: This chart reflects data collected to date, representing approximately 80% of the total inventory





Critical Success Factors (CSF)

- CSF are used to gauge the state of the transportation system and the quality of the organization.
- ODOT uses regular performance reporting to identify areas of needed improvement and areas of excellence.
- CSF are also used to set goals, adjust priorities, establish best practices, develop policy, and celebrate outstanding achievements.

Step 2: Establish Performance Targets and Funding Needs

To manage the program and monitor progress, ODOT is subject to two different sets of performance targets.

ODOT uses its Critical Success Factors for maintaining system conditions and gauging the quality of the organization. These targets help track and report progress, both internally and to outside stakeholders. In addition, the Critical Success Factors help to identify areas of needed improvement and areas of excellence. They provide the tools needed to set agency goals, adjust priorities, establish best practices, develop policies, and celebrate outstanding achievements.

Additionally, the MAP-21 and FAST Acts set minimum performance targets for interstate pavements and bridges that carry the NHS.

ODOT Targets

ODOT's Critical Success Factors for pavements and bridges were established using existing inventory and condition data while taking into account anticipated revenue, public expectations, and ODOT's own stewardship responsibilities. Over the last few years, ODOT has made consistent progress at meeting or exceeding its Critical Success Factors for pavement and bridge conditions. There are currently no performance targets for culverts since the inventory is not yet complete.

ODOT's existing Critical Success Factors for pavements and bridges are shown in the following table. By adopting the business process changes outlined in the TAMP, ODOT expects to be able to continue to achieve its pavement and bridge performance targets over the next 10 years.



Asset Type	Performance Measure	Critical Success Factor
Pavements		
Priority Systems	Weighted average Pavement Condition Rating (PCR) on a 0 to 100 scale.	85
General System		80
Urban System		80
Bridges		
General Appraisal	The statewide average GA, weighted by deck area.	6.8

Since bridges vary in size and consist of several components, the Office of Structural Engineering has established the internal performance targets shown in the table below to ensure that the statewide Critical Success Factor for bridges is met.

Internal Performance Measures for Bridges		
Asset Type	Performance Measure	Performance Target
General Appraisal	Percent of bridges in Fair or better condition. For the GA, this means a rating between 5 and 9 (on a 0 to 9 scale). For the other substructures, ratings of 1 or 2 indicate Fair or better condition (on a 0 to 4 scale).	98%
Floor Condition		97%
Wearing Surfaces		97%
Protective Coating		90%



Federal Targets

The MAP-21 and FAST Acts set minimum condition levels for NHS bridges and interstate pavements, and require states to set performance targets for pavements and bridges on the National Highway System⁵ (NHS). While the legislation establishes these requirements, rules were established in 2017 that define the performance measures for minimum conditions and the process for setting the state targets. The work ODOT has done to prepare this TAMP will allow the agency to quickly establish acceptable targets prior to the required reporting date. Each of the three performance requirements are described below.

Minimum Pavement Conditions: in addition to setting federal condition targets, state DOTs are required to have no more than 5 percent of their interstate pavements in *Poor* condition. According to the draft MAP-21 rules, pavements are determined to fall into a *Good* or *Poor* category based on defined metrics for smoothness (in terms of the International Roughness Index), percent cracking, rutting (asphalt pavements only), and faulting (concrete pavements only). ODOT anticipates that less than 5 percent of its interstate pavements will be in *Poor* condition during the period covered in the TAMP.

Minimum Bridge Conditions: State DOTs are also required to have no more than 10 percent of NHS bridges, by deck area, in *Deficient* condition. As described in the published rules (23 CFR Part 490), performance targets for NHS bridge conditions will be reported in terms of the National Bridge Inspection (NBI) Rating, which is the same as the General Appraisal rating that ODOT uses. For Federal reporting purposes, a bridge is considered to be in *Good* condition if the deck, superstructure, and substructure are all rated in *Good* condition (NBI Rating of 7 to 9). Federal reporting requirements consider a bridge to be in *Deficient* condition if either the deck, superstructure, or substructure have an NBI rating of 4 or lower. ODOT anticipates that less than 10 percent of its bridges will be in *Deficient* condition during the period covered in the TAMP.

State Targets: In addition to the minimum condition requirements, state DOTs are required to establish 2- and 4-year

⁵ The National Highway System is designated by FHWA to include: interstates, principal arterials, the strategic highway network, major strategic highway network connectors and intermodal connectors. This designation is independent of ODOT's designation for Principal, General, Urban, or Local.



statewide performance targets for Interstate and non-Interstate NHS pavements, and all bridges on the NHS, using performance measures defined in 23 CFR Part 490. State DOT targets are expected to align with performance projections in the state's TAMP. Now that the rules are finalized, ODOT will begin working on the required targets in accordance with the rules.

Need-Based Allocations

The new asset management business process has led to changes in the way funding allocations to the Districts are made.

In the past, the Central Office used funding allocation formulas to determine the budget that would be available to each District. This included funding for capital projects, such as pavement resurfacing and the rehabilitation or replacement of culverts and bridges, along with a maintenance allocation to cover routine maintenance activities such as crack sealing, drainage repair, and guardrail repair.

Once the funding allocations were made, Districts had the flexibility to determine how much of the budget to use for pavements and bridges, and how best to use the funding to accommodate program needs and fluctuations in a given year. Districts developed an Annual Work Plan to coordinate the capital and maintenance work they expected to complete with the funding provided. Performance targets were used to hold Districts accountable for the decisions that were made.

Under the new business process, funds are allocated to the Districts to match statewide performance targets and investment priorities based on candidate projects suggested by ODOT's computerized management systems. As described in Section 5 of this Plan, Districts are also held accountable for utilizing the funding as recommended by asset management systems. For instance, the pavement projects in a District's Annual Work Plan are expected to match at least 75 percent of the recommendations from the pavement management system. The new process makes better use of data and technology to support ODOT's performance-based decision making than in the past.



Step 3: Develop Work Plans

ODOT has made significant changes to the way that Annual Work Plans are being developed by the Districts.

In the past, once funding allocations were made, the Districts developed separate Work Plans for the capital and maintenance work they expected to complete. Under the new approach, key changes will be made to the development of the Work Plans.

- Districts will work collaboratively with Central Office Planning and Operations personnel to develop an Annual Work Plan that ensures that statewide performance targets will be met.
- Work Plans will reflect better coordination of maintenance and capital activities. The removal of artificial distinctions between capital and maintenance will allow Districts more flexibility in addressing asset needs over the entire service life.

As a result of these changes, District expenditures will better match statewide priorities, statewide goals will more likely be achieved, and ODOT will have a more coordinated and collaborative process in place for optimizing investment strategies. This, in turn, will allow the Department to reduce the annual costs associated with system preservation and improve consistency in practices across Districts.

Step 4: Monitor Progress for Continuous Improvement

Asset management is not a static process. Implementation requires continual monitoring, analysis, and improvement. The success of the TAMP relies on continued efforts in the four areas described below. A summary of the actions that will be taken is provided in Section 6, *Summary of Planned Activities and Enhancements*.

Personnel Development and Capacity Building

ODOT employees have a vital role in implementing the changes outlined in the TAMP, requiring a skilled workforce committed to seeing ODOT succeed in taking better care of its existing transportation assets. This has led to the





The Knowledge Management Plan is designed to ensure that:

- Employees are prepared to identify when actions are needed
- Share what they've learned with others.

development and implementation of a Knowledge Management Plan intended to help employees develop the skills necessary to support ODOT's initiatives and to better transfer knowledge within the organization as employees retire. The Knowledge Management Plan is designed to ensure that employees are prepared to identify when actions are needed and share what they've learned with others.

ODOT has already initiated a number of activities to build agency capacity to ensure the success of this TAMP. In 2015, ODOT sponsored a peer exchange with speakers from leading DOTs in pavement and bridge preservation brought in to share best practices with District personnel. Since then, ODOT continues to enhance the skills of District personnel so they can assume responsibility for improving the performance of preservation treatments.

Business Process Changes

Efforts to reduce the overall life cycle cost of maintaining pavements, bridges, and culverts require the increased use of preservation activities and a more unified approach to maintenance and capital planning. This has led to the business process changes described in the TAMP. The implementation of the business process changes included activities to:

- Implement planned business process changes, including the development of District Work Plans that combine capital and maintenance improvements and adhere to life cycle strategies.
- Develop and implement a Communication Plan that informs internal and external stakeholders of the planned changes.
- Establish an ODOT Transportation Asset Management Policy that communicates the importance of the activities outlined in the TAMP throughout the agency.
- Continue to identify and implement improvements that are targeted at lowering the total life cycle cost of asset preservation through proactive measures such as:
 - Developing and implementing guidance and training to improve the construction quality of preservation treatments.
 - Reviewing preservation treatment specifications at least annually to identify changes that extend treatment performance and promote good practices.



- Monitoring analysis models to ensure that predicted conditions match field performance.

Data Integration and Governance

The foundation of ODOT’s performance-based analysis approach is the availability of reliable asset data. Because of the importance to its business processes, ODOT has taken steps to manage its asset data to ensure that that data is complete, current, and is collected consistently across the state. ODOT’s TAM Audit Group, a subset of the Asset Management Leadership Team, is responsible for ensuring the availability of data collection and governance standards for all asset data collected by the Department.



Comprised of Central Office and District personnel

Comprised of Central Office and District personnel

Oversees all asset data collection requirements

Sets agency data standards

Ensures data governance and collection standards are in place for any asset data collected by the Department

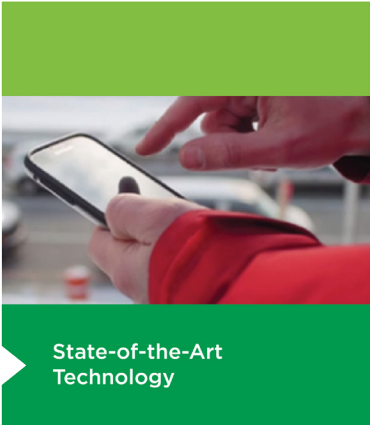
Develops data governance and data collection standards for all asset data collected by the Department

ODOT has established a Data Governance Group under the Asset Management Leadership Team that is in the process of establishing a data governance framework with standards for each piece of data.

Having access to data is also important and ODOT is proud of its Transportation Information Mapping System (TIMS) that serves as an integrated data portal for entering or accessing asset data using a map interface. Through this easy-to-use portal, ODOT employees have easy access to the information they need to make better decisions.

In addition, a strong partnership is needed between the Asset Management Leadership Team and the Data Business Owners to ensure that the data collected for asset management purposes meets Federal and State requirements while serving the needs of the Department.





Technology and Management Systems

In addition to the need for quality data, ODOT's management strategies depend on the availability of analysis models and computerized tools to effectively evaluate the long-term impacts of investment options. ODOT currently uses a state-of-the-art pavement management system for managing its pavement investments and is in the process of linking its new maintenance management processes, which include maintenance work planning and reporting, to its asset management program.

Within the next few years, a new bridge management system will be implemented for improving the analysis of bridge and major culvert investment options. The bridge management system will also be linked to the asset management program, leading to fully integrated asset management analysis capabilities. In addition, the statewide culvert inventory will be completed and the analysis of smaller culvert investment needs will be incorporated into the maintenance management process.

ODOT is also implementing a TAM Decision Support Tool (TAM_DST), which is a business intelligence data analytic tool. This tool will further leverage the data available to support asset management by generating reports and other outputs that facilitate effective investment decisions.

Technology is expected to play an important role in future data collection efforts, especially as ODOT expands its asset management program to include other assets. Methods of automatically tracking asset inventory and performance information will be explored so that data collection can be done quickly and with greater reliability. Technological enhancements that improve the efficiency of operations, such as e-construction efforts, are also being explored.

ODOT is also incorporating improvements in technology into its design and construction practices to ensure that planned preservation treatments perform as expected. This includes activities such as developing improved asphalt-binder specifications for emulsions that will lead to better performing pavement treatments. Another practice consists of investigating improved material properties to expand the use of preservation treatments in order to address a broader range of pavement and bridge conditions.





Step 5: Communicate Strategic Direction and Progress Made

Internal and external stakeholders have a vested interest in ODOT's success. In many instances, they also have a role in making that success a reality. Therefore, it is essential that ODOT communicate plans for moving forward to all stakeholders and garner their understanding of, and support for, the changes ahead.

To that end, a Communication Plan has been developed to engage employees and partners. The Communication Plan was launched in 2015 and includes a video describing ODOT's asset preservation strategy, a web page for downloading information, a PowerPoint presentation that can be used to share the message with stakeholders, and a Fact Card that summarizes key points.

The Communication Plan focuses on the three-pronged approach outlined in this TAMP:

- Using state-of-the art technology for better decision-making, including the use of computerized management systems that objectively predict asset needs.
- Aggressively applying asset preservation treatments to get out in front of problems before they occur.
- Improving collaboration in the way ODOT manage its assets that result in better, timelier decisions and more consistency across Districts.

Over the next 2 years the plan will be refined based on feedback from key Department staff to build an understanding of ODOT's asset management efforts and help ensure ODOT's continued success.



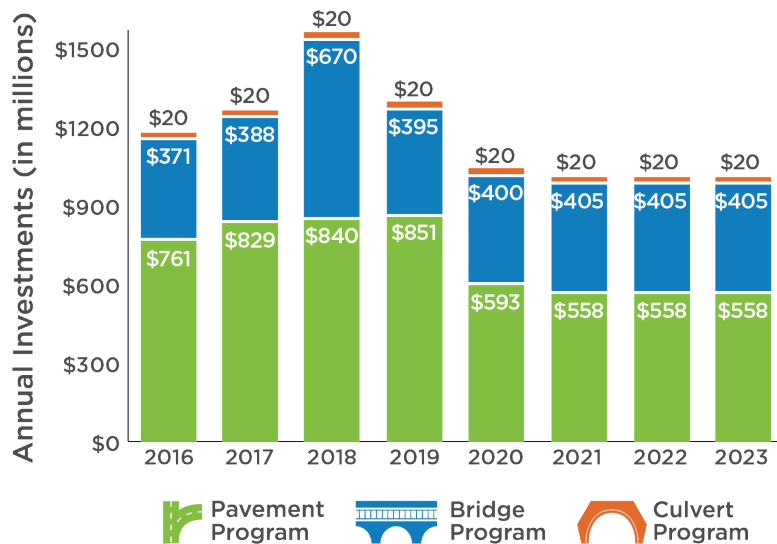
5.0 ODOT's Performance-Based Investment Plan

With the implementation of the changes to its business processes, ODOT can work within the anticipated funding levels over the next several years and still preserve the condition of the system. The changes outlined earlier, particularly in regards to the increased use of preservation treatments, will allow ODOT to reduce the rate of asset deterioration and make more cost-effective use of the available funding. Additionally, the changes being made to coordinate the District Work Plans will foster a more consistent statewide approach to meet targeted conditions.

Planned Investment Levels

Implementation of the Asset Management processes documented in this TAMP will allow the agency to maintain its system condition targets with the amount of revenue anticipated over the next 6 years. The figure below shows the anticipated investment levels in pavements, bridges and culverts that will allow ODOT to achieve its Critical Success Factors for these assets. These numbers assume an inflation rate of 3.5 percent annually.

Projected Annual Funding Levels



Over a 10-year period, ODOT expects to invest a total of \$8.519 billion to preserve, improve, and replace pavements, and \$4.059 billion to preserve, improve, and replace state-



maintained bridges. A total of \$200 million is expected to be invested in culvert preservation during this period.

Planned Investment Strategy

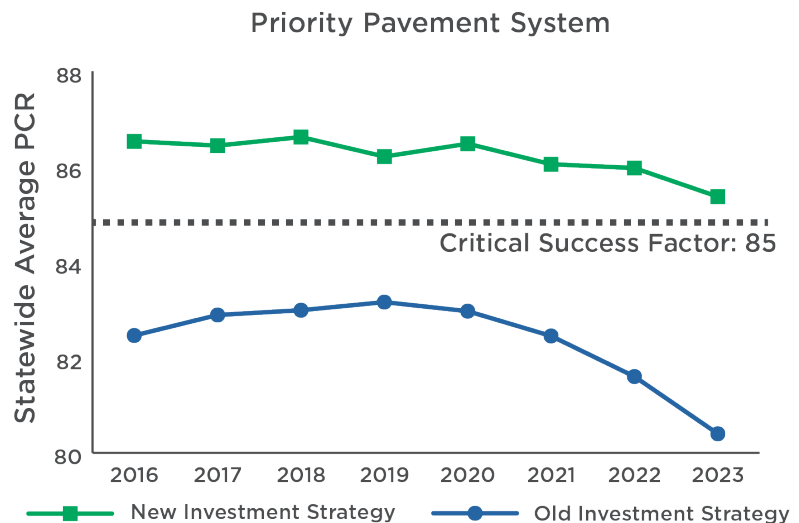
Since 2015, ODOT's project selection process has been largely driven by the information provided by its asset management systems, enabling the Department to optimize its preservation investments.

ODOT began phasing in new requirements for the development of District Work Plans that combine Capital and Maintenance projects in fiscal year 2016. At that time, Districts' Work Plans were required to match 25 percent of the lower cost treatments (such as chip seals and microsurfacing) recommended by the pavement management system. For future fiscal years, 2017 and beyond, District Work Plans will be required to match 75 percent of the pavement management system recommendations for these treatments.

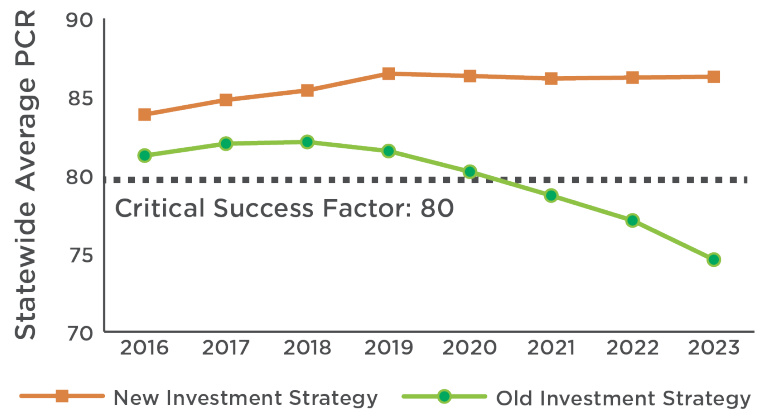
Projected Performance Targets

Pavements

As shown in the graphs below, implementing the planned investment strategy outlined in this TAMP will allow ODOT to achieve its targeted Critical Success Factors for pavements over the next 6 years. Based on projections from the pavement management system, ODOT expects to achieve an average statewide PCR of 86 on the Priority System and 86 on the General System by 2023 using the new asset management process.



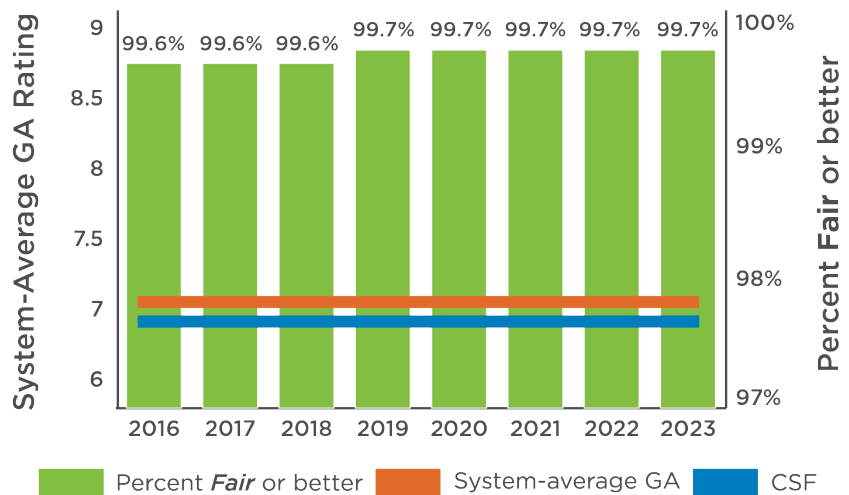
General Pavement System



Bridges

Using data from its bridge inspection database and projected deterioration rates, ODOT analyzed the impact of various investment strategies and budget levels on future conditions. The results demonstrated that the combination of planned investment levels and increased use of preservation treatments on bridges is expected to improve conditions. Based on this analysis, ODOT will continue to surpass its statewide average GA goal of 6.98 over the next several years. The improved conditions will lead to nearly all state-maintained bridges in *Fair* or better condition during this time period.

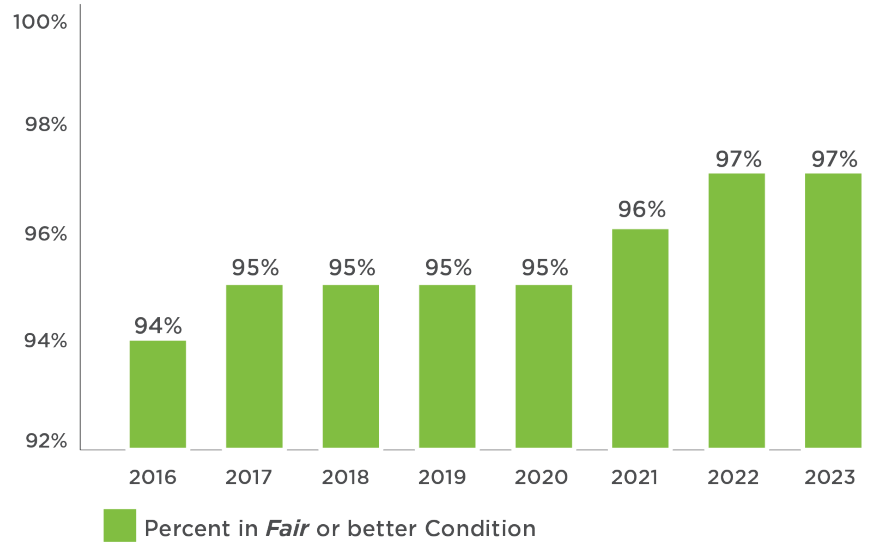
Projected Bridge Conditions by Deck Area



Culverts

Although there has been no target established for culverts in the past, the projections indicate that approximately 97 percent of the small culverts will be in *Fair* or better condition by 2023, in terms of GA rating.

Culvert Conditions Over Time



6.0 Summary of Planned Activities and Enhancements

Achieving the goals outlined in the TAMP requires that ODOT continue taking steps to effectively use performance data to allocate resources in a way that achieves strategic objectives and manages risks. As discussed earlier in the TAMP, ODOT’s planned activities and enhancements are organized into the four following areas:

- Personnel Development and Capacity Building.
- Business Process Changes.
- Data Integration and Governance.
- Technology and Management Systems.

The table below summarizes the activities and enhancements that are planned and identifies the responsible party and the targeted completion date. The Asset Management Leadership Team will guide these initiatives and ensure that the Department stays on task and meets its objectives.

Activity	Responsible Party	Target Date	Status
Personnel Development and Capacity Building			
Develop and implement a Knowledge Management Plan	Asset Management Leadership Team	2018	Ongoing
Apply skills and knowledge to continually improve the performance of preservation treatments	All Districts, with Training and Guidance by Central Office		Ongoing
Business Process Changes			
Merge capital and maintenance activities into a single District Work Plan	Planning Division		Completed



Activity	Responsible Party	Target Date	Status
Establish a Communications Team to lead the development of a Communications Plan	Asset Management Leadership Team		Completed
Develop and implement a Communications Plan <ol style="list-style-type: none"> 1. Develop and launch a communications toolkit with external stakeholders 2. Initiate implementation activities outlined in the Communication Plan 3. Monitor accomplishments and lessons learned and make adjustments as necessary 	Communications Group		<ol style="list-style-type: none"> 1. Completed 2. Ongoing 3. Ongoing
Establish an ODOT Transportation Asset Management Policy	Executive Leadership	October 2017	
Develop and implement guidance to improve the construction quality of preservation treatments	Pavement Engineering Structural Engineering Highway Operations Construction		Ongoing
Review preservation treatment specifications at least annually to identify changes to extend treatment performance and promote good practices	Pavement Engineering Structural Engineering Highway Operations		Ongoing



Data Integration and Governance

Continue efforts to evaluate data collection priorities and ensure that data collection standards are in place	TAM Audit Group		Ongoing
Develop and implement a data governance plan	Data Governance Group	July 2017	
Strengthen the partnership between the Asset Management Leadership Team and the Division of Opportunity, Diversity, and Inclusion to support American Disability Act (ADA) requirements.	Asset Management Leadership Team		Ongoing

Technology and Management Systems

Complete the integration of the maintenance management processes into the Department's asset management program	Highway Operations Technical Services Planning Operations	October 2017	
Establish a historical bridge database containing reliable data	Structural Engineering	October 2017	
Create prediction models for bridges	Structural Engineering	October 2018	
Implement new bridge management software that is integrated into the existing asset management processes	Structural Engineering	October 2018	



Technology and Management Systems

Complete the statewide culvert inventory	Hydraulic Engineering	June 2017	
Continue to add enterprise-level asset inventories	Asset Management Leadership Team		Ongoing
Implement an asset management decision-support tool for cross-asset planning.	Asset Management Leadership Team	January 2018	
Connect the recommendations from the cross-asset planning tool (TSMO) with the TAMP.	Asset Management Leadership Team	June 2018	
Explore opportunities for using technology to improve data collection activities and improve organizational efficiency	TAM Audit Group		Ongoing
Identify and implement opportunities to incorporate new means, methods, treatments, specifications and technology into the construction of preservation treatment strategies	Pavement Engineering Structural Engineering Hydraulic Engineering Highway Operations Construction		Ongoing
Connect the TAM Decision Support Tool with the TAMP		June 2018	

For additional information, please visit: transportation.ohio.gov/AssetManagement

