ODOT Digital Delivery Gap Assessment Executive Summary

OKLAHOMA Transportation

In 2020, ODOT renewed its focus on being an efficient, innovative, customer-driven organization that is committed to modernizing its processes and breaking down silos.

After seeing demonstrations by other states on their digital delivery progress, ODOT set out to implement a digital delivery program that optimizes digital workflows, improves digital file management, evaluates current practices, and brings welcome technological advancements to future projects.

ODOT defines digital delivery as "an approach to the project delivery processes that utilizes digital data to design, construct, inspect and maintain physical transportation assets." This approach facilitates the use of new workflows and processes that apply technology, software, and hardware to deliver infrastructure projects. The mission and vision of ODOT's digital delivery program are listed to the right.

ODOT management is committed to funding the digital delivery program. In August 2023, ODOT submitted for an Advanced Digital Construction Management Systems (ADCMS) grant from the Federal Highway Administration (FHWA) to subsidize the program. In November 2023, FHWA awarded ODOT with over $3 million in federal assistance with ODOT providing over $1 million in state funds to support the establishment and implementation of the program. Federal assistance will greatly help expedite the timeline of the program's implementation and will help build out critical components of the Program.

What follows is a high-level look at the proposed digital delivery program, its implementation roadmap, challenges the program faces, and recommendations for achieving implementation.

VISION

The vision describes the world that organizations seek to create through the work of the mission. The world that we want to create through our work is:

Digital delivery standards and optimized workflows adopted and implemented, increasing value throughout the transportation infrastructure lifecycle.

MISSION

The mission of an organization articulates the purpose of the organization and defines the work that it will do to fulfill this purpose. The mission of this group is:

Leading efforts to advance and connect digital resources that facilitate data-driven decision making and maximize the values of the transportation infrastructure lifecycle.

GOALS FOR ACHIEVING THE VISION

1. Develop standardized and accessible digital delivery processes, guidance documents, training, and tools to support all project development functions by all stakeholders.
2. Implement digital technologies throughout the project lifecycle, to create high quality, data rich models, and capture historical, present, and future data through our project deliverables.
3. Develop and implement new information management processes that capture construction inspection data and utilize asset information from all projects to improve asset management systems.
4. Establish practices to manage the pace of change with the current and future workforce through technology training and workforce development.

Overview

ODOT's digital delivery program includes eight key components, shown in Figure 1.

The program began in 2022, when ODOT assembled an internal team to oversee the program and hired a team of consultants to assist with the development of a comprehensive digital delivery plan. An organization chart of the program's leadership team is shown below in Figure 2.

Digital delivery implementation is complex and requires new technology, new methods and new processes, as well as a robust change management plan. To navigate these complexities, these groups established a high-level, phased roadmap that will prepare ODOT to achieve statewide digital delivery adoption by the end of 2027, with full implementation extending beyond 2027. This roadmap is shown below in Figure 3.

FIGURE 1. DIGITAL DELIVERY PROGRAM COMPONENTS

FIGURE 2. DIGITAL DELIVERY ORGANIZATION CHART

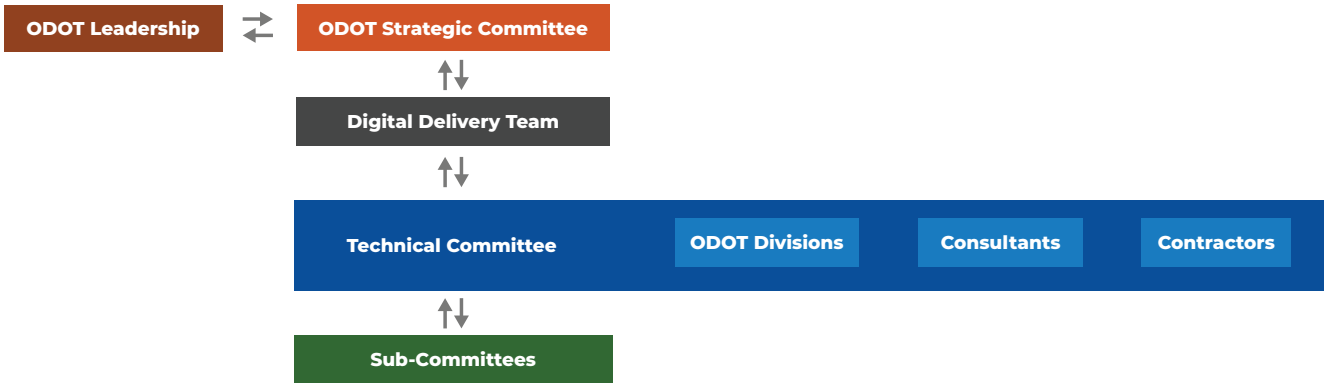
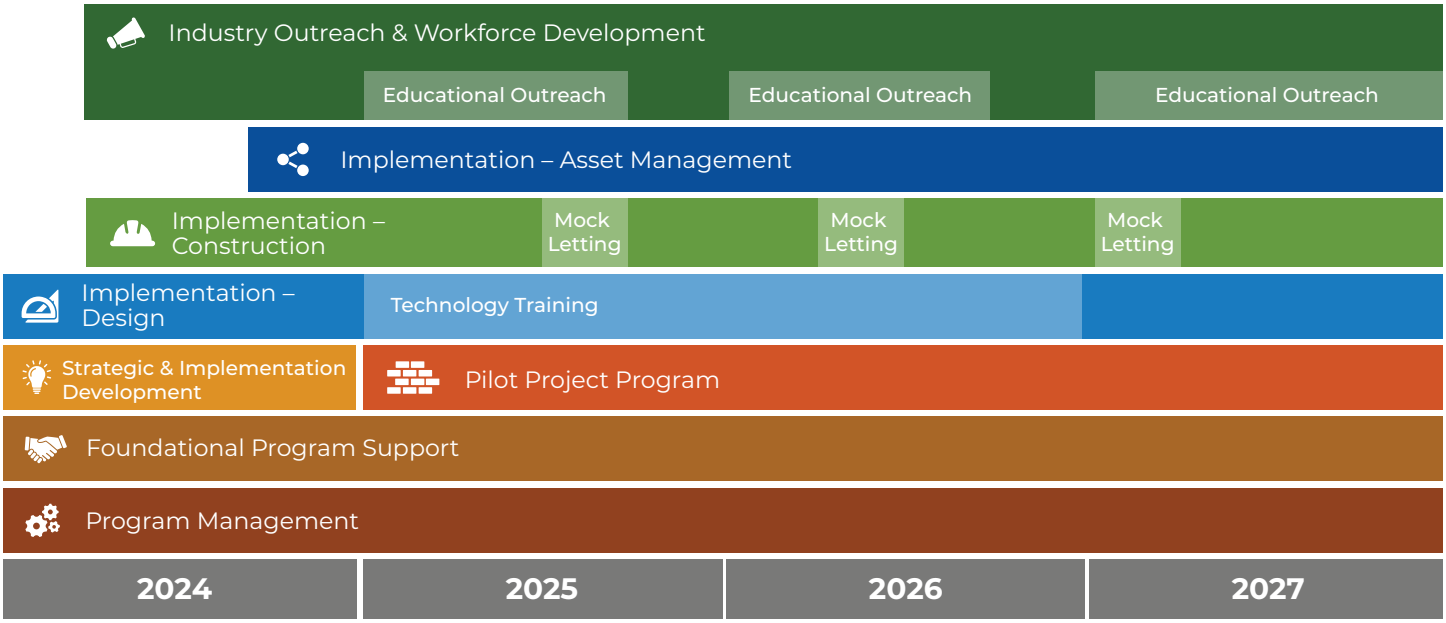


FIGURE 3. DIGITAL DELIVERY ROADMAP



Digital Delivery Readiness

One of the key pieces to developing a digital delivery strategic plan is to assess an organization's needs, desires and its current state of maturity. The first step is to collect data and information through surveys and interviews.

ODOT consultants HDR, Freese & Nichols, Garver and Jacobs measured the agency's digital delivery readiness through extensive data collection and interviews with ODOT leadership, personnel and stakeholders.

INDUSTRY SURVEYS

In April and May 2023, a series of industry surveys explored ODOT stakeholders' and partners' current understanding and utilization of digital delivery. The purpose of the industry engagement survey was to provide insight into their current knowledge and usage of digital delivery on projects. The purpose of the ProjectWise survey was to assess the industry's understanding of document management system (DMS) and file-sharing procedures. Stakeholders for the surveys included internal ODOT staff in the Central and District Offices, consultants, and contractors.

Following the surveys, in-person and virtual interviews were conducted with stakeholders to gain additional insight on current design and construction practices, the current interoperability of ProjectWise, and contractor best practices utilizing digital delivery workflows and technology.

ODOT stakeholder interviews were conducted with 21 technical groups and teams in Central Office and the eight District offices. ProjectWise interviews were conducted with 14 groups comprised of ODOT staff and industry partners such as AOGC and ACEC. Contractor interviews were conducted virtually with five contractors that ranged from newer, smaller companies to large, multi-state companies.

The initial information from the surveys and interviews helped frame the industry, ProjectWise, contractor, and overall readiness assessments.

INDUSTRY ASSESSMENT

The industry has been shifting to model-based design and digital delivery for more than a decade. While there are numerous advantages to using digital delivery workflows, there is still hesitancy regarding their application to design and construction projects. The current assessment of ODOT's staff and consultants has identified a number of opportunities and improvements on implementing digital delivery categorized by people, processes, data, and technology.

There is a desire to implement digital delivery, but there needs to be transparency in the program and communication regarding transformation efforts. Data requirements and standards for project lifecycle tasks need to be established and equitable training needs to be provided to all stakeholders. Empowering champions throughout the agency and industry will be crucial to the overall adoption of digital delivery but will take time to achieve.

PROJECTWISE ASSESSMENT

ODOT's current DMS environment was not initially set up to promote digital delivery processes in data-sharing and workflows. The assessment was conducted to identify the gaps within projects and the distribution of project information with stakeholders. The major categories of the assessment were focused on project structure, file discovery, user management, interoperability, and support.

One finding indicated that not all parties on a project are allowed ProjectWise access. This limits the ability of the DMS to function as a single source of truth. It is recommended by the industry that all project participants have secure and appropriate access to assigned work areas in ProjectWise. Additional recommendations are focused on expanding ProjectWise to become a common data environment for project information that will meet the goals of the digital delivery initiative.

CONTRACTOR ASSESSMENT

The construction industry has used various technologies and 3D models to construct projects for decades. Contractors in the state are excited about adopting open data standards and cloud-based collaboration tools for an increase in communication and productivity. Through the assessment, the team found that overall, the contractors are supportive of digital delivery and implementing the necessary technology to utilize data from project teams.

One prevalent issue identified is the inconsistency in plan information, file formats, and document availability. There is a desire for consistent and easy-to-access project deliverables in a standardized manner. This will require extensive training and communication, as well as uniform data and standards developed by ODOT.

ODOT READINESS ASSESSMENT

The FHWA Organizational Digital Delivery assessment tool was chosen to measure ODOT's maturity and readiness for implementing digital delivery. The assessment focuses on six planning elements: Strategy, Digital Delivery Use Cases, Processes, Data, Technology, and People. These primary planning elements contain subcategories that are measured using a scoring scale from zero to five, where zero is the least mature of all levels.

The planning elements are used to critically compare ODOT's established practices against the desired target goal. It was assumed the optimal maturity for the elements could be achieved during the multi-year roadmap ending in 2027. This target is considered short-term and will be reevaluated periodically and adjusted to target longer-term goals in the future.

STRATEGY

Refers to the enterprise strategy of the organization as a success factor.

DIGITAL DELIVERY USE CASES

Refers to the complexity of use cases ODOT may want to implement.

PROCESSES

Refers to the amount of preparation to define processes to support the digital delivery use cases ODOT wants to implement.

DATA

Refers to the data requirements to support use cases previously defined.

TECHNOLOGY

Refers to the technologies available to ODOT to support the milestone deliverables and data requirements necessary throughout project development.

PEOPLE

Refers to the change management, training, competencies, and staff needed to successfully implement digital delivery throughout the agency.

Based on the assessment, ODOT's current digital delivery readiness scored 25 out of 100 possible points. By following the defined digital delivery roadmap, ODOT's maturity can increase to 72 out of 100 by the end of 2027. To reach full digital delivery maturity of 100 points, an agency must optimize each of the six planning elements and subcategories. A summary of ODOT's digital delivery readiness scores is in the table below.

Digital Delivery Planning Element	Element Subcategories	Current Level (2023)	Short-Term Target Level (2027)	Full Maturity
Strategy	**5** Organizational Mission and Goals; Digital Delivery Vision and Objectives; Management Support; Digital Delivery Champion; Digital Delivery Committees	14	23	25
Digital Delivery Use Cases	**2** Project Use Cases; Organizational Use Cases	0	6	10
Processes	**2** Project Processes; Organizational Processes	0	4	10
Data	**3** Model Element Breakdown Structure (MEBS); Level of Development (LOD); Level of Information Need (LOIN)	0	9	15
Technology	**2** Software; Hardware	4	8	10
People	**6** Roles and Responsibilities; Organizational Hierarchy; Education; Training; Industry Receptiveness; Change Readiness	7	22	30
Totals	**20**	**25**	**72**	**100**

TOP FINDINGS

- Obtaining project data is inconsistent among ODOT's eight districts. All ODOT divisions work independently of each other and store data in different places, such as ProjectWise, local servers, external hard drives, or hard copies.
- ODOT employees are concerned about how digital delivery will impact individual business groups and stakeholders.
- Processes for delivering plan-based products have not been adapted to enable a transition to digital delivery.
- Field Districts are limited in their knowledge and use of technology in the field. Staff will need extensive training and support on any new technology and processes.
- ODOT does not have an agency-wide strategic data business plan to govern data, nor agency-wide data management goals or protocols.

TOP RECOMMENDATIONS

- Develop and implement a program with a phased approach that provides digital processes and tools to support project development throughout the project lifecycle.
- Assess current hardware and software found in multiple design departments and district offices against industry trends. Evaluate the need to upgrade or adopt new technology to meet the future needs of the department.
- Define roles and responsibilities for project development and construction delivery staff related to digital delivery.
- Create a detailed training plan that addresses general digital delivery education, procedures, and technology applications for specific tasks for all operating units.
- Continue developing a communication plan to keep internal and external stakeholders informed and create a change management plan that will build agency-wide acceptance for digital delivery.
- Establish digital delivery as a stakeholder to a future data governance committee.