Advancing Digital Construction and Management Systems in Nevada

JULY 2024

Volume 1: Technical Application

NEVADA DOT
SAFE AND CONNECTED

1 Cover Page

Table 1 - Cover Page

Advanced Digital Construction Management Systems Cover Page		
Entity Type	State DOT	
Organization Name	Nevada Department of Transportation	
Project Name	Advancing Digital Construction and Management Systems (ADCMS) in Nevada	
Previously Incurred Project Cost		$0
Future Eligible Project Cost		$0
Total Project Cost (*from all funding sources*)		$3,140,000
ADCMS Program Funding Request		$2,500,000
Non-Federal Share for ADCMS Program Funding Request		$640,000
Total Federal Funding (Including ADCMS Program)		$2,500,000

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2 PROJECT DESCRIPTION

The Nevada Department of Transportation (NDOT) desires to move fully to digital delivery and reap the benefits of going paperless through technology. We have taken the first steps toward digital delivery by building our OpenRoads Designer (ORD) workspace with Bentley, e-ticketing, and investing significantly in creating a central master database in GIS. This project aims to focus all these efforts with additional planning and development to build a digital delivery program at NDOT.

We are currently conducting our first pilot project in ORD. However, our ORD workspace has limited digital delivery capabilities. Design models are not regularly provided to contractors as contract documents, and we seek to provide these models to lower contractor risk and improve bid prices. Currently, a clear separation exists between data use and system integration in planning/design, construction, and asset management. All NDOT Divisions collect and maintain their data without a centralized system to store and share it.

NDOT seeks to establish a robust, statewide digital construction delivery program. This grant application requests $2.5 million as part of the Advanced Digital Construction Management System (ADCMS) Program to fund its "**Advancing Digital Construction and Management Systems in Nevada**" project. NDOT will use the ADCMS funds to:

- Develop a strategic master plan for digital delivery at NDOT that establishes the vision and scope of NDOT's goals
- Further engage with all NDOT Divisions and third-party stakeholders to understand resources, staff, and technology related to digital delivery and set implementable benchmarks
- Further develop NDOT's ORD workspace for digital delivery capability, develop processes and standards, train staff, and test elements in pilot projects
- Leverage NDOT's existing Multi-Application Geographic Information Center (MAGIC) project for a common data environment (CDE)
- Develop a digital twin strategic plan to utilize data in multiple ways through the entire project and asset lifecycle

Ultimately, these ADCMS funds will catalyze the formation of NDOT's digital delivery program, providing the following benefits: promoting collaboration among divisions, establishing a CDE, and maximizing time and cost savings for project construction while minimizing construction impacts. Letters of commitment and support have been obtained from the NDOT Director, the Regional Transportation Commission of Washoe County, and Bentley and are included in **Appendix A**.

2.1 Project Objectives and Goals

The primary objectives of this project are centered around advancing the state of existing data delivery within NDOT, which will achieve a more connected digital infrastructure by enhancing the efficiency and accessibility of data management systems. The objectives align with the following goals of the ADCMS Program:

1. Accelerate adoption of ADCMS throughout the project lifecycle to maximize interoperability with other systems or tools, boost productivity, reduce delays, and enhance safety and quality
2. Promote more timely information sharing among stakeholders and reduced reliance on paper
3. Leverage contractor use of digital technology
4. Develop and deploy peer DOT best practices
5. Increase technology adoption and deployment at NDOT and local government agencies in Nevada by integrating technology into construction contracts
6. Technology training and workforce development
7. Development of guidance to assist in updating state regulations and digital processes
8. Reduction in the environmental footprint of construction projects
9. Enhance worker and pedestrian safety

The project's ability to meet administration goals (safety, climate change and sustainability, workforce development, job quality and wealth creation, and equity) is cited in **Section 5, Responsiveness to Merit Criteria**.

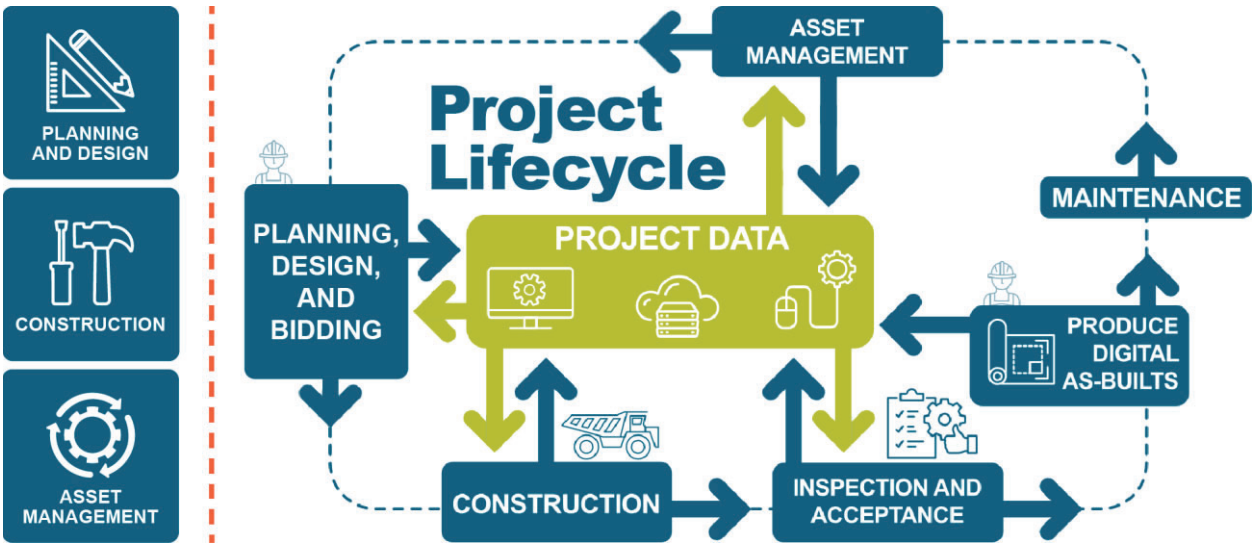


Figure 1 – State of Existing Siloed Data Delivery (Left) and Enhanced Common Data Delivery (Right)

2.2 Project Benefits and Outcomes

Benefits for Nevada will be consistent with those cited in the Federal Highway Administration's (FHWA) *"Advancing Building Information Modeling (BIM) for Infrastructure: National Strategic Roadmap,"* which includes the following project applications:

- Cost and time savings by reducing redundancy in data collection efforts, since data is stored and accessible to the entire Department in a central database
- Ability to track assets through the entire lifecycle, improving the information transfer for operations and maintenance efforts
- Builds efficiency by eliminating redundant data collection and documentation
- More detailed design that improves the ability to convey design intent
- Building consistency in project delivery by establishing a repeatable process
- Provides training opportunities for younger staff to understand project phases
- Improved outcomes in staff recruitment and retention
- Mitigates risks by reducing errors and omissions in construction documents, which results in fewer claims and litigation
- Reduces the amount of construction survey staking required in the field

2.3 Technical and Management Approach

NDOT key personnel described in **Section 3** will manage and work on the following five tasks requested as part of this grant, focusing on the program's short-term (2-4 years) development. Details and milestones are provided in the following subsections:

2.3.1 Task 1: Strategic Plan to Develop Digital Delivery Program at NDOT

Developing a strategic master plan (SMP) for digital delivery to establish the vision and scope of NDOT's goals will be an essential first step for NDOT. The SMP will outline short-term (2-4 years) and long-term (5-10 years) goals. Key scope items for SMP development are provided below:

- **Task 1.1:** Further discovery on NDOT's current conditions for all NDOT areas related to digital delivery, including resources, staff, technologies, etc.
- **Task 1.2**: Further discovery to identify needs, challenges, and input regarding existing conditions and impacts on third parties (e.g., consultants and contractors)
- **Task 1.3:** Develop a vision, scope, and goals for the short-term and long-term
    - Envision what is needed for digital delivery in the main areas of project development, construction, and asset management

    - Develop NDOT mission, core values, strategic goals, and initiatives strategies
    - Prepare an implementation plan to reach the vision
- **Task 1.4:** Identify staff, team, and champions needed to develop and execute a digital delivery program
    - Include stakeholders and the contracting community that will consume the digital contracts
- **Task 1.5:** Peer review visits and partner with agencies such as Utah DOT, Texas DOT, Iowa DOT, and Oklahoma DOT
- **Task 1.6:** Identify key bid items/assets that NDOT wants to track through asset lifecycles
    - Workshop to identify priority assets/bid items
    - Build consensus and define data requirements for design, construction, and asset management
- **Task 1.7:** Establish costs based on a 1-4 year phased schedule
- **Task 1.8:** Identify and outline necessary future planning efforts, including:
    - Communication Plan: Identify key stakeholders; create a website; and prepare conferences, newsletters, and webinars for consensus-building
    - Set Vision for Implementation and Deployment Plan:
        - The plan will address each part of the project lifecycle: planning, design, construction, and asset management
        - Implementation plan will be intended for "core"/primary assets, and the deployment model will be reused on peripheral/secondary assets in future phases
    - Impact Assessment Plan/Gap Analysis:
        - Understand and address impacts to current policies, practices, standards, and procedures
    - Training and Resource Plan:
        - Create a training plan for each aspect of the project lifecycle
        - Create a technical evaluation process to vet what would benefit the digital initiative movement

2.3.2 Task 2: Develop ORD Workspace

The tasks to fully develop NDOT's ORD workspace, from the development of processes and standards to training staff and testing elements in pilot projects, are summarized on the next page:

- **Task 2.1:** Build a strong foundation for digital delivery in design with workspace and training
    - Evaluate a limited number of projects, starting with a few assets in the beginning, such as signs (asset management, metadata) and earthwork (3D break lines)
    - Roll out ORD on all projects (digital delivery focus not implemented on all projects; keep it small to start)
    - Workspace needs to consider the entire lifecycle
        - Model development standards
        - Level of development identified
            - 3D modeling/break lines as a deliverable (3D break line clean-up tools and training)
        - Develop metadata for critical/key bid items/assets (builds on strategic planning efforts)
            - Use signs as the asset to test by integrating new statewide LiDAR sign data
            - Include a pilot project to test data in full lifecycle
        - Roadway Template Development: Leverage the work NDOT has already completed with Bentley
- **Task 2.2:** Build a digital delivery toolbox to include: file naming convention standards, deliverables list, 3D model curation process, digital signing, and sealing (coordinated with the State Board of Engineers); create a Computer-Aided Design (CAD) validation and conversion tool (line type, weight, color, level); and outputs to Geographic Information Systems (GIS) and other open data formats to facilitate a future path for interoperability with asset management, construction, and other business systems

2.3.3 Task 3: Additional Digital Delivery Program Development

This task builds on Tasks 1 and 2 with more standards, process development, and additional pilot projects.

- **Task 3.1:** Test workspace elements in pilot projects
- **Task 3.2:** Quality Control (QC) process development
    - Leverage other states' work
    - Digital delivery QC process and checklists
- **Task 3.3:** Standards, specifications, and process development
    - Leverage information already completed in other states
    - Create new specifications needed for digital delivery

    - For example, digital delivery training bid item: train contractors and NDOT construction crews on implementation
  - Revise existing specifications to meet digital delivery needs such as pre-construction survey and construction survey (subsurface utilities and digital as-built collection of assets)
- **Task 3.4:** Training for staff
- **Task 3.5:** Iterative pilot projects
  - Start with small projects and build up to larger projects
  - Pilots should have a small, well-defined scope
  - Pilots need to be highly focused on digital delivery scope and outcomes; each pilot should build on lessons learned and allow training of new staff
- **Task 3.6:** Feedback, revisions, and updates to workspace, processes, and standards based on pilot implementation (several iterations in program development)
- **Task 3.7:** Program dashboard tracking to communicate results of the monitoring plan

2.3.4 Task 4: Digital Delivery Program Management with MAGIC Project for CDE

NDOT intends to leverage its existing MAGIC project, currently being led by NDOT's GIS and information technology (IT) team, to develop a CDE based on the following subtasks:

- **Task 4.1:** Digital delivery program and team to become key stakeholders and advisors to the MAGIC project
- **Task 4.2:** The MAGIC team is to complete the following as project scope of work:
  - Evaluate CDE
  - Enhance data literacy within design and construction through coordination with the digital delivery team
  - Conduct software investigation to evaluate potential platforms for NDOT including GIS Feature Manipulation Engine (FME) to translate data between software platforms
- **Task 4.3:** Meet often on the progress of both digital delivery and MAGIC projects
- **Task 4.4:** Convey the data and software needed based on other planning efforts for design, construction, and asset management

2.3.5 Task 5: Develop a Digital Twin Strategic Plan

As a long-term (5-10 year) goal, we intend to develop a digital twin strategic plan as we consider future phases of digital delivery so that data can be utilized in multiple ways through the entire project and asset lifecycle process. To accomplish this, NDOT will undertake these subtasks:

- **Task 5.1:** Develop NDOT mission, goals, and initiatives to develop a digital twin
- **Task 5.2:** Further develop CDE by documenting protocols for future CDE use; utilize data from the MAGIC project; leverage ORD capability to add attribution to design elements to move data from projects to a CDE; pilot Trimble construction tools to capture enterprise construction data for inclusion in a CDE; utilize CDE to enhance asset management workflows and processes; and build FME tools to translate between software platforms as needed to support a CDE
- **Task 5.3:** Digital twin focus areas could include data governance, business architecture, coordination/collaboration, automation, sustainability, scalability, and risks/mitigation
- **Task 5.4:** Further expand pilots to explore digital twin and evaluate the use of digital replicas as a source of authoritative information for decision-making; determine what assets to collect as pilots and expand data governance framework to other pre-construction tools

2.4 Monitoring Plan

To monitor project progress and outcomes, the NDOT team will first determine the baseline for the metrics listed below to measure improvements due to digital delivery as they relate to the project goals. Metrics to be assessed include:

- Number of stakeholders, consultants, and contractors engaged, and number of meetings for ADCMS activities reported yearly
- Number of project team (NDOT, consultants, and vendors) hours for the ADCMS grant, reported monthly
- Number of training, peer exchange, and workforce development opportunities, including hours spent developing and conducting training with NDOT staff, design consultants, and contractors, reported yearly
- Number of new positions related to ADCMS efforts, reported yearly
- Number of environmentally sensitive areas impacted by construction, reported yearly
- The number of work zone incidents, reported yearly
- Cost savings due to project delivery timeframes, reported yearly
- Congestion due to work zones, reported yearly

- The number of assets tracked through pilot measures by project
- Development of a biannual report on project progress, including key wins, setbacks, and resolutions

3 PROJECT TEAM

NDOT has established a project team of DOT staff and consultants to develop a successful implementation program. Scott Hein will fulfill the role of **Executive Director** and will be responsible for global oversight of the digital delivery program, including funding and NDOT direction. The Digital Delivery **Project Manager** role will be fulfilled by David Fox, overseeing coordination efforts and directing task managers for each workgroup. David has worked at NDOT for 18 years and has invested the last 10 years in envisioning a digital delivery program at NDOT by learning about the software, tools, and progress of other states. He has been the project manager or a key stakeholder in the associated readiness projects described in **Section 4**. Organizing around major workgroup initiatives will drive the program to action by including the major internal stakeholders in the **Program Leadership Group**, as shown in **Figure 2**. Program workgroups will be led by partnerships between NDOT staff and subject matter expert (SME) consultants. The level of effort for key leads is shown in **Figure 2**. This level of effort is planned to continue for the four years of the grant. Scott and David will work with the program leadership group to determine their level of effort for each of the four years at the start of the grant.

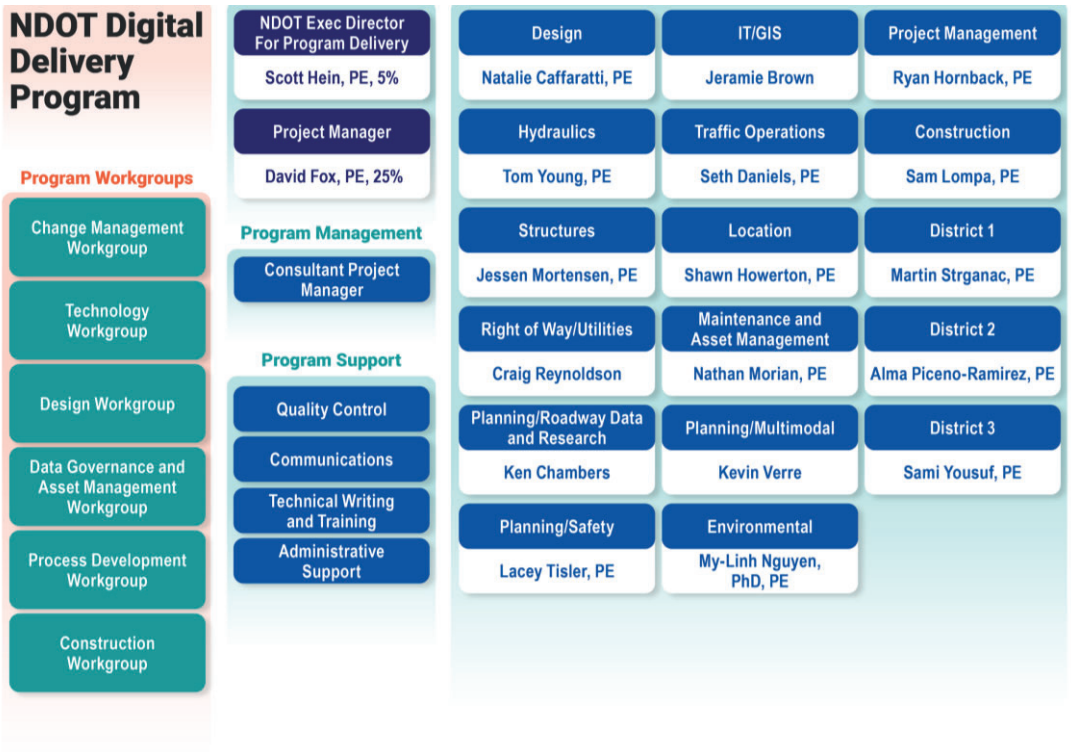


Figure 2 – Project Team Organizational Chart

4 PROJECT READINESS

The information presented in this section describes the project's readiness to deploy tasks and provides information about how this project aligns with past and current NDOT projects and programs.

4.1 Technical Feasibility

This section details both completed elements and those in progress by NDOT in support of advancing a digital delivery program.

4.1.1 Needs-Based Planning and Implementation

NDOT is committed to advancing digital delivery with a needs-based vision. As part of this project, NDOT has conducted initial interviews to assess each division through the project's lifecycle to identify needs that can be solved by digital delivery. The NDOT team has also collaborated on planning efforts with key stakeholders such as local contractors, the American Council of Engineering Companies (ACEC), local agency partners, and other state DOTs to understand needs and lessons learned. Each internal and external stakeholder has different needs for advancing digital delivery. NDOT will continue to build consensus with these partners for systems and processes that are effective and efficient for all.

NDOT is committed to ensuring that planning is ahead of action and that the rollout of pilots is simple and focused. The NDOT team has learned from other partners that pushing a pilot project too quickly and with too much scope is less effective. **Pilots should have a small, well-defined scope with specific outcomes.**

4.1.2 Moving to ORD

NDOT is working to move to the next version of MicroStation, ORD, which can create a workspace to tie bid items and other metadata into the model. NDOT has worked with Bentley in the initial workspace development. The workspace contains templates and features capable of 3D modeling **but lacks the metadata to track assets through design, construction, and asset management**. It also lacks the metadata to eventually become paperless and use the model as a legal document (MALD).

4.1.3 Investment in Trimble Equipment

NDOT has invested in specialized survey equipment, business center elements, and scanning tools. NDOT staff are in the process of being trained in how to use these new tools. **NDOT desires to use these new tools to their fullest potential and leverage them to use design data seamlessly and create as-builts that can be used in a CDE.**

4.1.4 Paperless Construction Management

NDOT established e-Construction and e-Ticketing workflows to eliminate paper, but construction data is not connected to pay items and asset management systems.

4.1.5 MAGIC Project

NDOT is implementing a project called MAGIC (Multi-Application Geographic Information Center), which aims to incorporate data from various divisions and agencies into a master database. The result of this project will include:

- Establishing the IT infrastructure to support an Esri®-based geospatial data warehouse
- Integrating existing business systems via web services and extraction-transformation-loading (ETL) processes
- Developing new or enhanced spatial applications using GIS data
- Establishing business and reporting workflows
- Providing in-depth training and a wide range of detailed documentation for agency stakeholders
- Leveraging location-referenced transportation asset data for specific application development
- Integrating geospatial data and web services across systems to utilize enterprise data
- Assisting NDOT in establishing governance procedures for business processes and data

The MAGIC project is running on a five-year schedule and will close out year two in December 2024. **NDOT will leverage the efforts of the MAGIC Project for the development of a CDE.** MAGIC funds pertinent to the digital delivery program expended at the start of the ADCMS will be considered NDOT's match funds, further referenced in **Volume 2**. The benefit of the MAGIC project will be the development of a CDE that can be used to implement digital delivery.

4.1.6 LiDAR Data for All Signs

NDOT completed a statewide LiDAR sign inventory project in July 2024. Signs are not currently tracked in the asset management system, so they would be an ideal asset to pilot digital delivery by leveraging the new comprehensive data and developing metadata to pilot through the lifecycle process. Data includes Manual on Uniform Traffic Control Devices code, dimensions, location, pole type, and panel condition.

4.2 Project Schedule

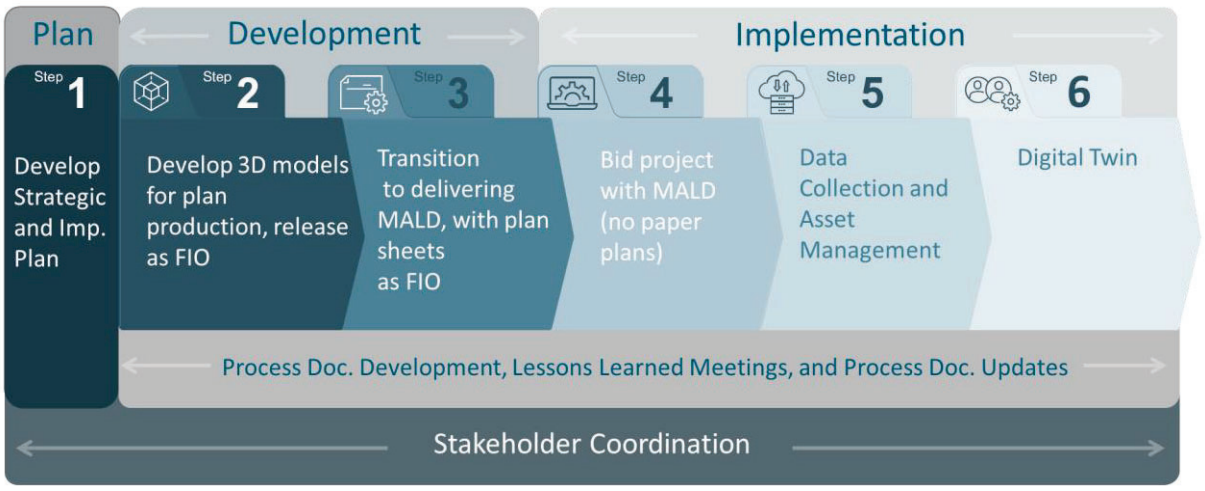
If awarded the ADCMS Grant, NDOT will procure an SME consultant team to support, facilitate, and complete the project scope. Due to fiscal constraints, if the grant is not awarded, NDOT will look to complete the SMP and prepare for future ADCMS opportunities. **Table 2** shows the proposed project schedule. While some activities will happen simultaneously, the pilot projects will influence the final schedule.

Table 2 – Project Schedule

Project Task	Time Frame
Procure Consultant Team	Year 1 (2025, 1st Quarter)
Task 1: Strategic Plan to Develop Digital Delivery Program at NDOT	Year 1 (2025)
Task 2: Develop ORD Workspace	Years 1-2 (2025-2026)
Task 3: Additional Digital Delivery Program Development	Years 1-4 (2025-2028)
Task 4: Digital Delivery Program Management with MAGIC Project for CDE	Years 1-3 (2025-2027)
Task 5: Develop a Digital Twin Strategic Plan	Year 4 (2028)

4.2.1 Phased Approach to Digital Delivery at NDOT

A phased approach is proposed to successfully implement a statewide digital delivery program, as shown in the graphic below (**Figure 3**). The grant-funded portion of the project will focus on planning and development to identify implementation needs. Once a pilot has proven capable of handling small, focused assets, the processes developed will be leveraged for other critical assets. The digital delivery development will be done iteratively through focused pilots.



FIO – For Information Only; MALD – Model as a legal document

Figure 3 – Phased Approach to Digital Delivery

4.3 Project Risks and Mitigation Strategies

Potential risks and mitigation strategies foreseen by the NDOT team are summarized in **Table 3**.

Table 3 – Project Risks and Mitigation Strategies

Risk	Mitigation Strategies
Statewide Deployment	Leverage lessons learned and best practices from other DOTs through peer exchanges, employ consultants with prior experience and develop a focused planning scope before statewide implementation.
Data Management	Focus on the entire project lifecycle, start small, and grow. Digital delivery needs to involve all data users in the lifecycle and start with specific items such as signing, as it is not yet tracked, is typically impacted on every project, and is visible above the ground. Lessons learned focusing on a few bid items will inform other needed bid items and be built out as the program matures.
Translation across Software	Have a vision for being software agnostic. Standards/documented repeatable processes are necessary to mitigate the silo part of the lifecycle and software.
Rapid Technology Advancement	Continue to follow software trends and advancements by creating a technology evaluation process to vet what would be helpful and what would not be.
Design Reviews	Plan replacement requires new tools and clean standardization of CAD elements and QC plans. The project scope creates these standards and implements training and tools, such as a CAD validation and conversion tool.
Coordination with Third Parties	Recognize stakeholder partners who need to be involved from the beginning. These should include design consultants, contractors, local agencies, and utilities. Engage actively with ACEC, Associated General Contractors of America, and Metropolitan Planning Organizations (MPOs).
Signing and Sealing MALD	Coordinate peer review from other states and the Nevada Board of Professional Engineers. Focus on the level of model development needed for digital delivery by developing model standards. Digital delivery does not always mean model only. Other documents, standards, and tables will support the model and the metadata within the model elements.
Organizational Change Management	Develop documents, standards, training, conferences, videos, webinars, newsletters, websites, etc. Engage with leadership, champions, and stakeholders.
Pilot Projects Overwhelming to Stakeholders	Start small and build. Pilots should have a small, well-defined scope and focus highly on the outcomes. From each pilot, incremental feedback, revisions, and updates to workspace, processes, and standards will be completed before the next pilot. Several iterations will be required for program development.

5 Responsiveness to Merit Criteria

Table 4 describes the NDOT team's response to the ADCMS grant merit criteria and how this project aligns with administration goals. These criteria will guide the project's vision and goals in the planning and evaluation documents.

Table 4 – NDOT's Response to Criterion

Evaluation Factor	How NDOT Project Meets Criteria
Criterion #1 – Technical and Management Approach	
1. Builds upon an existing framework or is identified as a need in existing data plans.	Building on the already underway MAGIC project, the ADCMS will strengthen data governance, formalize the data lifecycle and management for projects, improve data architecture and integration, and improve data collaboration and quality.
2. Outcome will fill a critical need for the organization and support future phases of the proposed project or subsequent projects.	A critical need that will be fulfilled is improved data integration and centralization, process standardization, better coordination between divisions, and improved survey and mapping for the full lifecycle.
3. Staff assigned to the project have related expertise and experience.	NDOT has put together a dedicated team of champions in each discipline of the project lifecycle and will bring on SME consultants with expertise in planning and implementation for digital delivery at other DOTs.
4. Staffing structure is adequate.	Staff will balance the diversity of the project lifecycle internally, with consultants, and with third-party stakeholders. Each staff member is assigned specific responsibilities to ensure that the initiative is a team effort being directed by an Executive Project Director and a dedicated Digital Delivery Project Manager.
5. Applicant has the commitment and resources to fully implement the project.	NDOT is fully committed to a digital delivery program and will allocate the required resources to reach the project objectives, including the 20% match requirements through the funding already allocated to the MAGIC project.
6. Risks understood and mitigation strategies are comprehensive and implementable.	Project risks and mitigation strategies have been identified as described in **Section 4.3**.
Criterion #2 – Promotes Efficient Information Sharing Among Stakeholders	
1. Promotes efficiencies and will result in time savings during project development or construction.	Removes inefficiencies in transferring data between design and construction by sharing data.

Table 4 – NDOT's Response to Criterion (continued)

Evaluation Factor	How NDOT Project Meets Criteria
Criterion #2 – Promotes Efficient Information Sharing Among Stakeholders	
2. Will eliminate or substantially decrease the use of paper documentation.	The vision of this project is to deliver projects without paper by using a MALD.
3. Will improve information sharing and the likelihood it will result in improved decision making when issues arise during project development or construction.	The project is dedicated to sharing project data more seamlessly throughout the entire lifecycle, which will lower risk and improve decision-making by improving designs and information for the contractor.
4. Will provide benefits to both project owners and contractors in either time or cost savings.	Limiting risks and improving the contractor's ability to bid more accurately and competitively results in cost savings for both NDOT and the contractor.
Criterion #3 – Accelerate Technology Adoption and Deployment	
1. Creates a process that can be utilized by other transportation organizations.	MPOs will be key stakeholders. The data tools are intended to be agnostic so that other agencies can leverage the lifecycle data's input and output.
2. Process enhancement can be utilized by other entities without the need for significant capital investment.	MPOs will be key stakeholders. The data tools are intended to be agnostic so that other agencies can leverage the input and output of the lifecycle data by including AutoCAD and GIS as data platforms, which are the most common design tools for third-party stakeholders.
3. Process enhancements address missing electronic data connections identified by multiple organizations.	This project aims to incrementally close the data gap at NDOT between design, construction, and asset management.
4. Results in an open data format or eliminates the need for data conversion for use by other software/data systems.	The MAGIC project will focus on a CDE in GIS that makes data available on the most common platform for transferring data to many sources.
5. Improves budgeting or cost control.	Reducing risks and associated contingencies will reduce project costs and improve budget planning.
Criterion #4 – Safety	
1. Eliminates or mitigates the amount of time workers are in hazardous situations (e.g., work zones) gathering data adjacent to active roadways.	Creating survey/location data that is common between design and construction will reduce the time workers are surveying construction.

Table 4 – NDOT's Response to Criterion (continued)

Evaluation Factor	How NDOT Project Meets Criteria
Criterion #4 – Safety	
2. Reduces the time a work zone needs to be in place.	This project would provide more streamlined construction times due to more accurate data and fewer errors discovered in the field, reducing construction durations and limiting work zone needs.
3. Improves quality and timeliness of information to the public, thereby making travel through a work zone safer.	Creating a better connection between design and construction will significantly reduce construction risks and improve communication of designs to contractors, resulting in improved construction quality and timeliness.
Criterion #5 – Workforce Development, Job Quality, and Wealth Creation	
1. Provides training on new technology to the workforce and increases workforce skillsets.	Training designers, inspectors, and contractors to use new tools and processes will be critical to project success and improves workforce skills. Training for processes, pilots, and software will be incremental for the most significant and implementable impacts.
2. Workforce skills obtained as a result of the proposed project are transferable to other career paths.	Learning digital delivery as a construction worker can prepare them for a white-collar job in architecture and engineering or construction management.
Criterion #6 – Environment, Climate Change and Sustainability, and Equity	
1. Reduced right of way for project construction.	3D models will be more accurate, and right-of-way data will be a crucial asset incorporated into the common data platform, helping designers avoid right-of-way impacts more accurately.
2. Communication of environmental and equity commitments made during preliminary design.	Digital designs can be used as a tool when conducting stakeholder engagement, especially with the underserved Spanish-speaking community in Nevada. Models can better convey impacts and benefits.
3. Identification and avoidance of environmentally sensitive areas.	Environmental avoidance areas will be a key data asset incorporated into the common data platform, thereby helping designers be more accurate in identifying and avoiding environmentally sensitive areas early in the design process.
4. Reduced work zone congestion.	This project would provide more streamlined construction times due to more accurate data and fewer errors discovered in the field. This would decrease construction times, thus reducing the duration of construction and work zone congestion.
5. More efficient utilization of construction equipment, requiring fewer machine hours of operation.	This project lays the groundwork for future projects to provide 3D models that can be automatically processed by contractor equipment, thereby increasing efficiency and reducing machine hours.

APPENDIX A: LETTERS OF COMMITMENT AND SUPPORT

Docusign Envelope ID: 4801B2AB-4DA6-455F-8EE5-B72B1714716D

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
1263 S. Stewart Street
Carson City, Nevada 89712

JOE LOMBARDO
Governor

TRACY LARKIN THOMASON, P.E., PTOE, CPM
Director

July 24, 2024

The Honorable Pete Buttigieg
Secretary of the US Department of Transportation
1200 New Jersey Avenue SE
Washington DC, 20590

RE: ADCMS in Nevada Program: Application for ADCMS Grants Program

Dear Secretary Buttigieg:

We at the Nevada Department of Transportation (NDOT) are excited to begin the path to formally develop a digital delivery program as part of the Advancing Digital Construction and Management Systems (ADCMS) grant. This formalization will use other significant investments that the Department has made and focus them through planning, development, and pilot projects to incrementally build our program in collaboration with other Nevada stakeholders such as contactors and local agencies. We look forward to the benefits that digital delivery will bring to our planning, design, construction, and asset management divisions including:

- Mitigate risks by reducing errors and omissions in construction documents, which results in fewer claims and litigation, and lower bids
- Cost and time savings by reducing redundancy in data collection efforts with data stored and accessible to the entire Department in a central database, faster cost estimation and plan production, and faster construction with increased workforce utilization
- Build consistency in project delivery by establishing a repeatable process
- Provide training opportunities for staff to understand different project phases
- Improve outcomes in staff recruitment and retainage
- Track assets through the entire lifecycle, improving the information transfer for operations and maintenance efforts

We will be able to commit the following resources to support this project:

- Leadership and staff time for program development and deployment
- Continued investment into the program and resources needed
- Partnership between all NDOT divisions and districts for a united effort

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- Coordination and peer exchanges with DOTs that are further along in deployment of digital delivery for more efficient implementation at NDOT.

If you require any further information, please feel free to contact me at (775) 888-7440.

Sincerely,

DocuSigned by:
Tracy Larkin Thomason
832931E930B041F...

Tracy Larkin Thomason, P.E., PTOE, CPM
Director
Nevada Department of Transportation

Bentley
Advancing Infrastructure

Bentley Systems, Incorporated
685 Stockton Drive
Exton, Pennsylvania 19341-1151, USA

July 25, 2024

The Honorable Pete Buttigieg
Secretary, U.S. Department of Transportation
1200 New Jersey Avenue, S.E.
Washington, DC 20590

Dear Secretary Buttigieg:

I am writing to express our support for Nevada Department of Transportation's (NDOT) Advanced Digital Construction Management Systems (ADCMS) grant application to support their digital delivery program. Bentley Systems, Inc. (Bentley) is honored to partner with NDOT on this important digital delivery transition project to enhance transportation infrastructure and improve the design and construction processes through more advanced systems in Nevada.

Through NDOT's Agreement with Bentley, we will provide the innovative software technologies, services, and subject matter experts needed to integrate our technical strengths and support services with NDOT's project team to achieve their desired outcomes. This will include supporting the OpenRoad Designer Workspace development, including:

- Roadway template development
- Metadata application for key assets
- Training
- Pilot project support
- Other software support as needed

Bentley Systems, Inc. (Nasdaq: BSY) is the infrastructure engineering software company, providing innovative software to advance the world's infrastructure sustaining both the global economy and environment. We employ more than 5,000 colleagues and generate annual revenues of more than $1.2 billion in 172 countries. Our industry-leading software solutions are used by professionals, and organizations of every size, for the design, construction, and operations of roads and bridges, rail and transit, water and wastewater, public works and utilities, buildings and campuses, mining, and industrial facilities.

Thank you for your leadership and commitment to the transportation industry across the United States and and the critical funding states need to truly move forward in their digital transformations. This will help with economic development, project throughput, and workforce development in each at a critical time for our country. We offer our support for your favorable consideration of this grant application.

Sincerely,

William T. Panos
Senior Director

REGIONAL TRANSPORTATION COMMISSION
Metropolitan Planning • Public Transportation & Operations • Engineering & Construction
Metropolitan Planning Organization of Washoe County, Nevada

July 26, 2024

The Honorable Pete Buttigieg
Secretary of the US Department of Transportation
1200 New Jersey Avenue SE
Washington DC, 20590

RE: ADCMS in Nevada Program: Application for ADCMS Grants Program

Dear Secretary Buttigieg:

We at the Regional Transportation Commission of Washoe County (RTC) are supportive of the Digital Delivery Program development at the Nevada Department of Transportation (NDOT) as part of the Advancing Digital Construction and Management Systems (ADCMS) grant. For many years, we have collaborated with NDOT to advance system operations, implement innovative technologies, and collaborate on the construction of key transportation infrastructure.

RTC met and discussed the program initiatives, outcome, and schedule on July 17th. We recognize that the planning and development of digital delivery will have a significant benefit to planning, design, and construction across the State and look forward to being a key stakeholder in providing feedback and partnership to the efforts in the program.

For the NDOT ADCMS Program, our agency will:

- Provide support by helping the NDOT team understand RTC's needs and solutions that can be provided by digital delivery;
- Provide feedback on planning and implementation documents, development, and pilots to help create processes that other transportation organizations can utilize without significant capital investments; and
- Support the increase of technology adoption and deployment at NDOT and local government agencies in Nevada by integrating technology into construction contracts.

We will be able to commit staff time as resources for project development and deployment to support this project.

We look forward to a successful partnership.

Sincerely,

Bill Thomas, AICP
Executive Director
Building a Better Community Through Quality Transportation