

# Research Stage 1 Problem Statement

**PROPOSED TITLE:** Moving Digital Delivery into State of Practice

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## **1. Concisely describe the transportation issue (including problems, improvements, or untested solutions) that Oregon needs to research.**

ODOT has invested significant resources to unify CAD standards and the use of design technology across the Agency. These efforts have been in partnership with technical disciplines, project delivery, and IT staff to improve efficiency, enhance collaboration within the project development process, and realize the full value of this data throughout all phases of the transportation lifecycle. These efforts have already resulted in initiating activities for wider adoption of some technology but have not been able to move our state of practice. We recognize that these new technology initiatives have a high level of complexity and are dependent on having strong executive support and technical leadership to be successful. Currently, there is no central program, policy, or dedicated champion guiding these overall efforts, making it difficult to prioritize and coordinate initiatives, and prioritize investments across the Department.

From our discussions with other State DOTs, we have learned that having a Strategic Plan or Roadmap is very helpful to focus energy and guide activities toward the successful deployment and adoption of digital delivery technology and methods.

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## **2. What final product or information needs to be produced to enable this research to be implemented?**

This effort will inform a path forward as ODOT and our industry navigates a dynamic environment in technology and data management. Some examples of topics that could be researched include: 3D design standards and products across all relevant disciplines, data management and collaboration methods, related organizational structure and responsibilities, as-constructed documentation, design data for asset management, and field technology and data workflows.

The direct outcome will be these three but distinct documents:

1. **A Strategic Plan**, a concise document that establishes the broad goals and strategies that will be pursued to guide ODOT in the effort to modernize and standardize digital work products and workflows. The Strategic Plan will serve as the blueprint to focus the Department on innovative solutions that will modernize and streamline the way we deliver capital improvement construction projects. The Strategic Plan document will establish goals and outcomes as high-level statements of what is going to be accomplished over a specific timeline, including the desired results that will indicate when strategic goals have been achieved. The Strategic Plan will follow a structure that helps describe:
  - The vision – a brief statement describing what the Department aspires to achieve.
  - The mission – a brief statement stating the reason why the digital delivery and data modernization investment is important.
  - SMART Goals
    - Specific desired outcomes that are clearly understood,

- Measurable in a way to quantify progress towards achieving goal,
  - Achievable actions in small manageable pieces,
  - Relevant to a specific strategy with key milestones
  - Timeline for achieving the vision (5-10 year timeline)
2. **A Technology Maturity Assessment Report**, a document that summarizes the current state of practice related to ability to achieve the vision and goals established in the strategic plan. The maturity assessment will use a quantitative scale that can be used as future metrics to report progress and keep the team accountable for achieving the desired outcomes.
  3. **An Implementation Plan**, a document that prioritizes the list of activities to be carried out by ODOT's working groups. The plan will list activities, their dependencies, resource needs, and suggested duration that will enable the working groups to create more detailed action plans and schedule.

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**3. (Optional) Are there any individuals in Oregon who will be instrumental to the success of implementing any solution that is identified by this research? If so, please list them below.**

Name	Title	Email	Phone
Tova Peltz	Chief Engineer	Tova.R.PELTZ@odot.oregon.gov	503.731.3131
David Kim	Statewide Project Delivery Manager	David.KIM@odot.oregon.gov	503.580.8403
Mike Nichols	Engineering Automation Section Manager	Michael.NICHOLS@odot.oregon.gov	971.304.4164

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**4. Other comments:**

This proposal would update and expand on the concepts included in "[Engineering Automation, Key Concepts for a 25 Year Time Horizon](#)" published in 2009 and reported on in the [2020 Status Report](#). The goal is to move ODOT from an FHWA Technology Readiness Level 7 (Prototype demonstrated in operational environment) to Level 9 (Technology refined and adopted) as described [here](#).

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**5. State of Oregon Decision Making Lenses**

State decision making lenses are a part of the state of Oregon's policy structure. State policy and federal policy are not always aligned. The state will prioritize research according to state policy, however ODOT may be required to skip prioritized proposals based on constraints placed on the use of federal funds. If state funds are available ODOT will attempt to fund prioritized research that is deemed ineligible for federal funding.

Please complete the following three sections. Your answers to these questions will be applied on a programmatic basis to support agency decisions. Answering yes to the questions below is not required. Resolving a narrowly focused technical research problem may meet agency needs without answering yes to any of the following questions. The ODOT Research Section will seek a balanced portfolio some projects will answer yes to one of the three categories below (e.g. climate, equity, and/ or safety) and other projects in a different category.

We are looking for an overall program balance and no one project is expected to balance all categories. Generally, a research problem statement is expected to be able to answer yes with clear and verifiable information in only one of the three categories below, some projects may be able to answer yes in two or even three categories. Some projects (i.e. needs focused on specific elements of infrastructure design), may have no 'yes' answers but may still be a high value research need.

## Climate

Oregon recognizes the climate crisis and makes systemic changes to reduce emissions caused by travel. To that end, we seek research that reduces carbon emissions from construction activities and materials, and from maintenance equipment and operations. Oregon envisions a transportation system that is resilient, this means a system that is durable in the face of seismic events and extreme weather to avoid negative impacts, withstand them or bounce back quickly to resume system function. We seek research that improves the ability of the transportation system to adapt or cope with more frequent and extreme weather events. This may include innovations in data and data sharing, construction materials and project design, communication, emergency planning and response, and more. Similarly, we seek research that avoids negative impacts on key habitats and ecosystems that can buffer or reduce damage to infrastructure and improve environmental conditions for wildlife and native vegetation. For definitions and details please review the equity vision, goals, and objectives of the [ODOT Strategic Action Plan](#) and [Oregon Transportation Plan](#).

5a. Will addressing the transportation issue identified as a need in Question 1 develop, or **validate methods for the estimation, measurement, or monitoring** of transportation generated greenhouse gases (GHG)?

☐ Yes

☒ No

☐ Unsure

5b. If climate or GHG is not the focus of this **transportation issue** identified in this problem statement, will the research apply a GHG analysis to transportation infrastructure, planning, operations, maintenance, or materials?

☐ Yes

☒ No

☐ Unsure

5c. Will addressing the **transportation issue** include development or testing of construction practices, methods, or materials to establish potential reductions in greenhouse gas emissions?

☐ Yes

☒ No

☐ Unsure

5d. Will solving the **transportation issue** in question 1 study or support the reduction of vehicle miles traveled and single occupancy vehicle travel or support transition to electric vehicles (or other types of zero emission vehicles) or low-carbon alternative fuels?

☐ Yes

☒ No

☐ Unsure

5e. Will the solving the **transportation issue** in question 1 lead to work that will support, measure, or monitor, transportation system resilience in response to expected climate events, effects, or natural disasters in general?

☐ Yes

☒ No

☐ Unsure

5f. Will solving the **transportation issue** in question 1 lead to work that may result in better

environmental conditions for wildlife and native vegetation?

☐ Yes

☐ No

☒ Unsure

5g. If you answered yes to any of the climate questions above or can provide alternative details related to climate, please provide additional information:

### Equity

Equity can have many dimensions and impacts relating to communities and transportation. It is important that problem statement proposals clearly explain the equity dimensions or impacts being examined. Oregon commits to social equity in the OTP, specifically to *improve access to safe and affordable transportation for all, recognizing the unmet mobility needs of people who have been systemically excluded and underserved. Create an equitable and transparent engagement and communications decision-making structure that builds public trust.* We seek research that studies elements of this goal or applies analysis to specific transportation topics to ensure the resulting research recommendation is consistent with agency equity goals. For definitions and details please review the equity vision, goals, and objectives of the [ODOT Strategic Action Plan](#) and [Oregon Transportation Plan](#).

5h. Is the **transportation issue** identified as a need in Question 1 specifically focused on transportation equity?

☐ Yes

☒ No

☐ Unsure

5i. If the **transportation issue** is not focused on transportation equity, will the primary topic be assessed for equity benefits or impacts within the research project?

☐ Yes

☐ No

☒ Unsure

5j. Is the implementation of potential findings from this research likely to directly involve participation from an identified group that would benefit from an equitable process or outcome?

☐ Yes

☐ No

☒ Unsure

5k. Is the intended final product or information expected to support ODOT's equity efforts (Including but not limited to supporting one of the equity related objectives of the [ODOT's Strategic Action Plan](#) or [Oregon Transportation Plan](#)) ?

☐ Yes

☐ No

☒ Unsure

5l. If you answered yes to any of the equity questions above or can provide alternative details related to equity, please provide additional information:

### Safety

Research outcomes may include interventions and countermeasures to prevent or reduce the frequency of crashes or other causes of transportation-related injury or death; or may include measures to reduce severity of injury (including prevention of death) after a crash or other injurious event. For definitions and details please review the equity vision, goals, and objectives of the [ODOT Strategic Action Plan](#), [Oregon Transportation Safety Action Plan](#) and [Oregon Transportation Plan](#).

5m. Will solving the **transportation issue** in question 1 support improving **safety culture** for either transportation workers or the traveling public?

☒ Yes

☐ No

☐ Unsure

5n. Will the solving the **transportation issue** support improving safety through **healthy and livable communities**?

☐ Yes

☐ No

☒ Unsure

5o. Will solving the **transportation issue** support improving safety through using **best available technologies**?

☒ Yes

☐ No

☐ Unsure

5p. Will solving the **transportation issue** support improving safety through **communication and collaboration**?

☒ Yes

☐ No

☐ Unsure

5q. Will solving the **transportation issue** support improving safety through **investing strategically**?

☒ Yes

☐ No

☐ Unsure

5r. If you answered yes to any of the safety questions above or can provide alternative details related to safety, please provide additional information:

Using digital delivery directly improves safety by making highly relevant and accurate data available to all appropriate users, greatly reducing the need for field investigations, duplication of work, improving conflict detection in design rather than during construction, and providing tools and data to encourage collaboration during all phases of transportation projects using state of the practice methods and technology through a plan for strategic investment.

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## 6. Corresponding Submitter's Contact Information:

Name:	Alexa Mitchell
Title:	Enterprise Digital Delivery Services Director
Affiliation:	HDR, Inc.
Telephone:	602.245.7056
Email:	Alexa.Mitchell@hdrinc.com

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## 7. ODOT Sponsor Contact Information (Required if Submitter is not an ODOT employee)

Name:	Christopher Harris
Title:	Automation Engineer
Crew Number:	7962
Telephone:	503.302.9390
Email:	Christopher.harris@odot.oregon.gov

This form is not a grant application or contract document. Please do not include proprietary information on this form. Once this form is received ODOT may revise and publish the problem statement. If selected, ODOT will assign investigator(s) of the department's choosing to conduct research.