



March 11, 2022

Stephanie Pollack,
Deputy Administrator,
Federal Highway Administration
Washington, DC 20590

Dear Deputy Administrator Pollack:

Thank you for this opportunity to provide input on FHWA's implementation of the Infrastructure Investment and Jobs Act (IIJA).

Enactment of the IIJA presents a historic opportunity to modernize the nation's infrastructure and improve how we design, build, operate, and maintain it. We share FHWA's goals that the IIJA fund highway projects that are innovative, safe, sustainable, resilient, and equitable.¹

The digitization of infrastructure design, construction, operations, and maintenance is critical for achieving these important outcomes. More widespread use of digital design and construction tools for Federal-aid highway projects will increase the number of projects completed for every dollar spent, improve quality, speed up project delivery, reduce waste, build infrastructure that mitigates and is more resilient to climate change, and help address historic inequities.

Autodesk is a leading developer of digital design and construction software for the architecture, engineering, and construction industries. This software is used by state departments of transportation (DOTs), transit agencies, airports, water utilities, and other infrastructure owners across the country, and by engineering and construction firms of all sizes to deliver more efficient, innovative, and sustainable projects.

As examples, Tennessee DOT requires use of digital construction management technologies on highway and bridge projects to reduce paper, house documents in a centralized location, track requests for information (RFIs), project issues, and plan revisions, and ensure teams can seamlessly collaborate from any location using the same project documents and data.² Michigan DOT estimates it has saved \$12 million and

¹ https://www.fhwa.dot.gov/bipartisan-infrastructure-law/building_a_better_america-policy_framework.cfm

² <https://www.tn.gov/tdot/tdot-construction-division/transportation-construction-division-resources/plangrid.html>



eliminated 6 million pieces of paper annually by using electronic document storage for its \$1 billion construction program. Digital tools have also reduced Michigan's average contract processing time from 30 to three days.³ Caltrans used digital construction management technology to streamline project delivery and save time and money on the Highway 99 Realignment in Fresno, CA.⁴ Virginia DOT is increasing its use of cloud-based construction management tools, including inspections, document management and collaboration between design, project management and construction personnel to deliver projects on-time and on-budget.⁵

Large infrastructure projects require close coordination among and between multiple public and private sector stakeholders, which is vastly improved by digital collaboration tools. When the COVID-19 pandemic hit, this technology allowed teams to continue collaborating remotely and move infrastructure projects forward. Accelerated adoption of these tools will prepare the infrastructure sector to be more resilient to disruptions in the future.

While the benefits of digital project delivery are clear to our customers, there are many challenges that preclude wider adoption across the infrastructure and construction sectors. While some states are using digital design and construction management technologies, adoption has not been widespread or uniform. Also, many of the public and private sector stakeholders that work with states on infrastructure development lack the necessary training to effectively utilize them. Lack of adoption of digital delivery processes leaves the American infrastructure system lagging our global peers, resulting in less efficient and more expensive projects.

States and localities are managing a variety of challenges that prevent them from realizing the full benefits of digital project delivery. This includes having a large number of workers nearing retirement, a technology skills gap in their workforce, and a competitive hiring environment. While some have overcome these challenges and adopted digital technologies, there are few examples of agencies that have successfully transformed to a broad digital delivery process as is considered best practice in the private sector. Digitizing design and construction processes will help ensure the transfer of institutional knowledge as many in the workforce retire and help attract talent that expects best in class technology in the workplace. DOTs and other infrastructure owners have differing needs to make the transition to digital processes, including help with implementing best practices, creating new procedures, testing, and training personnel on new technologies, and adopting a common data environment to promote collaboration and break down data siloes among team members.

Congress recognized the importance of driving digital transformation on highway projects by including in the IIJA a new program aimed at "accelerated implementation and deployment of advanced digital construction management systems" in highway and transit projects (Secs. 13006, 30007). As laid out in the legislation, the goals of the program include:

³ https://www.fhwa.dot.gov/construction/econstruction/fact_sheet.pdf

⁴ <https://construction.autodesk.com/customers/granite-construction-highway-99/?pgr=0>

⁵ <https://www.enr.com/articles/51122-state-and-municipal-agencies-expand-use-of-cloud-construction-oversight>



- Accelerated state adoption of advanced digital construction management systems throughout the construction lifecycle (design, engineering, construction, operations)
- Development and deployment of best practices for use in digital construction management
- Development of guidance to assist states in updating regulations to allow project sponsors and contractors to report project data in digital formats and fully capture the efficiencies and benefits of advanced digital construction management systems
- Timely and productive information-sharing among stakeholders through reduced reliance on paper to manage construction processes and deliverables
- Enabling project sponsors to integrate the adoption of digital management systems and technologies in contracts and weigh the cost of digitization and technology in setting budgets
- Reduction in the environmental footprint of construction projects resulting from elimination of congestion through more efficient projects
- Deployment of digital management systems that enable and leverage the use of digital technologies on construction sites by contractors
- Technology training and workforce development to build the capabilities of project managers and sponsors to better manage projects and properly measure and reward technology adoption across projects

This program builds on existing statutory incentives to increase adoption of digital technologies by providing increased federal share for projects that use digital 3-dimensional modeling and other technologies (see 23 USC §120(c)(3)).

Digital transformation of highway project delivery will also require workforce development programs focused on digital skills training. This provides a great opportunity to attract new and more diverse workers into the transportation infrastructure workforce. By developing targeted digital skills training programs, as part of the digital construction management systems program or other initiatives, FHWA can play an important role in bringing new, diverse, and badly needed talent into the sector.

Based on our extensive experience working with infrastructure designers, builders, and owners, we offer below recommendations for how FHWA can successfully leverage the new digital construction management systems program, as well as other programs in the IIJA, to drive transformational improvements in how transportation infrastructure is designed and constructed across the country.

Recommendations for advanced digital construction management systems program:

1. **Provide grants to state DOTs and local transportation agencies to help them transform their processes through adoption of advanced digital construction management system technologies.** The program should create a process for state DOTs and local transportation agencies to apply for and receive grants customized for their particular needs, including:
 - Procuring advanced digital construction management systems technologies to pilot, test, and assess the benefits



- Establishing digital transformation offices, long-term digital construction plans, and/or agency-wide digital processes and procedures
- Investing in using common data environments that utilize open file formats for planning, design, construction, and operations stages
- Securing outside assistance to help assess how their processes and procedures need to change to achieve the benefits of digital delivery
- Developing and implementing digital skills training programs

2. **Establish Digital Construction Advisory Council:** FHWA should establish a Digital Construction Advisory Council of public and private sector experts to ensure the agency is aware of the latest technologies and best practices in the digital design, engineering, construction, and operations of roads and bridges, and has a readily available resource on best practices for adoption and use of such technologies. This Advisory Council should include representatives from state DOTs, regional and municipal transportation agencies, engineering and construction companies, public and private sector transportation design, engineering, and construction employees, and digital construction management technology providers.
3. **Develop best practices guidance for adoption of advanced digital construction management systems technologies and how to connect this with a broader digital delivery process.** Work with the Digital Construction Advisory Council to develop guidance to help state DOTs and local transportation agencies, and their ecosystems, expand adoption of advanced digital construction management systems technologies and integrate them into a broader digital delivery process for projects. This should include specific guidance for how to transition through differing levels of digital maturity and sample policies or procedures that would most efficiently enable agencies to capture the benefits of digitalization. This would be invaluable in helping them understand how to successfully transform to a digital delivery process.

Recommendations for other FHWA Initiatives:

In addition to the advanced digital construction management systems program, FHWA can drive transformational change in the digital delivery of highway projects through other initiatives such as the ones below.

1. **Add criteria evaluating an applicant's adoption of digital technologies in competitive grant determinations.** As FHWA administers new and expanded competitive grant programs under the IIJA, it should include as criteria in its evaluation and determination of awards an assessment of whether applicants have a sufficient plan in place for adoption and use of digital design, construction, operations, and maintenance technologies on projects. Since use of these technologies can save time and money and lead to better project outcomes, the extent to which applicants are using or moving toward better adoption of these tools should be a criterion to take into consideration for competitive grant award determinations. Grant programs could also provide additional funding or priority to projects that specifically drive digital adoption to achieve certain desired outcomes, such as overall reduction in project cost or re-work.

2. **Encourage grantees to perform digital simulations and analysis to assess environmental impacts of infrastructure project designs.** This can include simulating rising sea levels, flooding, or the reduced carbon footprint of material choices. Grantees should be incentivized to conduct these simulations and analyses to understand and better manage the climate impacts of projects.
3. **Include digital skills training as a key part of FHWA workforce development and training programs.** As FHWA expands workforce development and training programs through IIJA funding, the agency should develop specific programs focused on digital skills training for the workforce that will be planning, designing, and building Federal-aid highway projects. This will improve infrastructure development, provide workers the skills necessary for the engineering, design, and construction jobs of the future, and create opportunities to attract new workers and develop a more diverse infrastructure workforce.

The IIJA is a truly historic opportunity to modernize the nation's transportation infrastructure. Autodesk stands ready to partner and support FHWA in this important work. For questions regarding this submission, please contact David Ohrenstein, Autodesk Government Affairs & Public Policy, at 202-627-6914 or david.ohrenstein@autodesk.com.

Sincerely,

A handwritten signature in black ink, appearing to read 'Andrew Friendly', written in a cursive style.

Andrew Friendly
Vice President, Government Affairs

