Aging infrastructure in the USA



\$1.2 trillion in funding to be provided by the U.S. government for infrastructure over the next 5 years.²



Historic funding in infrastructure helps tackle the **\$2.6 trillion** needed by 2025 to fix the country's dams, transport, and other infrastructure creating opportunity across the board.¹





Funding breakdown of the \$373 billion U.S. government stimulus across Autodesk segments to address current state of infrastructure.²

Industry	Grade*	Key Fact
Roads	D	43% of our public roadways in poor or mediocre condition
Bridges	C+ ↓ to C	There are more than 617,000 bridges across the us with 42% being at least 50 years old
Transit	D-	Commuter & hybrid railroads operate a combined 9,227 miles, a 12% growth over 10 years. Light rail/street cars operate on 1,811 miles , a 30% increase over that same period
Aviation	<pre> D to D+ </pre>	Over a two-year period, passenger travel increased by 236 million per year, yet flight service only increased by 5 million flights per year
Drinking water	D ↓ to C-	It is estimated that more than 12,000 miles of water pipes were planned to be replaced by drinking water utilities across the country in 2020
Stormwater	D	There are 3.5 million miles of storm sewers, 270 million storm drains, and 2.5 million stormwater treatment assets across the U.S.
Dams + Leeves	D	As of 2019, there are approximately 15,600 dams in the U.S. classified as high-hazard structures . In spring 2019 the midwest experienced severe flooding , causing 700 miles of damaged levees
Inland waterways	<pre> D to D+ </pre>	12,000 miles of inland navigation channels as well as an additional 11,000 of intracoastal waterways

*This grade change represents the ASCE report card change from 2017 to 2021.¹

Budgetary

Complex project pressures

Aging infrastructure is often complex to maintain, modernize or replace. Traditional systems and outdated 2D processes add to the project complexities, while also exacerbating budgetary and schedule concerns.



Achieving an infrastructure system fit for the 21st century requires technology + innovation

Building Information Modeling (BIM) processes based on intelligent models and enabled by a cloud platform are changing how infrastructure is planned, designed, built and managed.







to exchange data with their project teams³

their ROI on BIM³



Multi-Phased **Reconstruction of I-25** Interchanges

Montgomery I-25 interchange

Albuquerque, NM Originally built in 1961, Estimated start of construction in 2021

I-25 through Albuquerque is one of the busiest and most congested freeways in the state. Current traffic volumes overwhelm the existing corridor at Montgomery. The NMDOT plans to increase capacity with additional lanes, larger bridges, and reconfigure on and off ramps to a braided type condition. Due to these major changes, the NMDOT has integrated an InfraWorks model into a workflow process to track major quantities, investigate utility conflicts, evaluate design alternatives, and help communicate improvements to the public.

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Communicating the Replacement of a Local Landmark

Sixth Street Viaduct

Los Angeles, CA Built in 1932, Replacement expected to be completed by 2020

Spanning the Los Angeles River, the Sixth Street Viaduct is one of America's most iconic bridges . The bridge was determined vulnerable to earthquakes and needed to be replaced. The team used a modelbased workflow and a BIM process from the earliest stages of the project to control and understand the bridge's parameters. The model helped communicate that the replacement infrastructure was not only equal to the existing landmark, but that it would exceed in its ability to serve the public.

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Scanning a Critical Existing **Infrastructure Asset** for the Future

Glen Canyon Dam

Page, AZ Built in 1964, 3D model completed in 2016

The second tallest concrete-arch dam in the United States, the Glen Canyon Dam, will serve as a pilot project for the benefit of creating unified, intelligent models of existing assets to support operational efforts. The model will make it easier for Reclamation to observe trends and forecast the impact of climate change. The resulting earlier and better maintenance will help ensure a lasting water supply for the western states, while preventing the kind of crisis unfolding at Oroville Dam.

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Implementing BIM Mid-Stream in a Long-Term **Mega-Project**

East Side access

New York City, NY Completion expected by 2022 Project first discussed in the 1950s, initiated in the 1990s

One of the largest and most complex infrastructure projects currently underway in the United States, the East Side Access is a new train station connected to Grand Central Station. The longterm mega-project has had to adapt to the ever-changing city, requiring a dynamic planning structure to match. The team implemented BIM in the middle of construction to analyze, visualize, and communicate project geometry, data and workflows.

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Get the most out of BIM

Explore BIM workflows to drive efficiencies across your infrastructure project.

As part of the Architecture, Engineering, and Construction (AEC) Collection, BIM tools for Civil Infrastructure combine Civil 3D, InfraWorks, Revit, ReCap, and AutoCAD with other specialized tools to help you improve decision quality, project outcomes, and delivery.

Learn more:

https://www.autodesk.com/solutions/bim/infrastructure/

Sources

¹ASCE (2021), A Comprehensive Assessment of America's Infrastructure, 2021 Report Card For America's Infrastructure. www.infrastructurereportcard.org

²Infrastructure Investment and Jobs Act (IIJA) Implementation Resources. https://www.gfoa.org/the-infrastructure-investment-and-jobs-act-iija-was

³Out of a global BIM survey, here's some findings around BIM adoption and practice in Civil Engineering. www.autodesk.com/global-bim-study

