Infrastructure Bill
Survival Guide

Everything you need to know about the Infrastructure Investment and Jobs Act and what it means for the heavy civil construction industry.

Infrastructure Investment and Jobs Act: Major Takeaways

Insights via Infotech's 2021 panel webinar with representatives from Esri and Trimble.

Gradual Funding Rollout

It will be some time before the industry sees the full scope of this funding, with the majority of spending coming in 2025, 2026, and 2027. $20 billion in discretionary grant spending is earmarked for 2021-2022. While there will be no immediate ramp-up to spending, the numbers will be significant and DOTs can expect their funding to increase over the next several years.

Focused on the Present

The motto of this bill's focal points is "business as usual." There is a substantial amount of funding in the bill to address traditional infrastructure needs and improve the quality of infrastructure nationwide. That said, this iteration of the bill does not do much to address the future of our transportation networks, nor does it build a platform for future growth or redefine the parameters of infrastructure as we know it.

Setting the Standard

While the bill has a number of funding buckets for specific project areas, setting the standard for reporting, compliance, and tech usage will ultimately fall on the US Department of Transportation, as it has in years past. State DOTs will need to look to USDOT to identify project requirements and overcome staffing and capability challenges. USDOT will most likely work with FHWA to determine specific technical and reporting requirements on projects supported by this funding.

Driving Tech Adoption

Currently, there is $100m set aside in the infrastructure bill for the promotion of construction technology on IIJA-funded projects. This number is relatively small when compared to the scope of the bill, but will enable DOTs to use project-specific tech language as they set their requirements for project management.

Interstate Construction Support

Construction projects that cross state boundaries are often overlooked by federal funding. In this bill, there is specific language for funding projects that cross state lines. With this information, DOTs and LPAs can partner with other agencies to identify the types of projects that will get approved and funded.

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Infrastructure Investment and Jobs Act Overview

With US infrastructure receiving a C- in its latest infrastructure report card, the need for new funding quickly became a top priority for the new administration.

The $550B bill, dubbed the Infrastructure Investment and Jobs Act, has funds earmarked for the following purposes:

$110B
for roads and bridge construction and repair

$73B
for electric grid and power infrastructure

$21B
for environmental remediation projects

$65B
for broadband investments

$55B
for water systems and infrastructure

$50B
for Western water storage

$39B
for public transit

$25B
for airports

$15B
for electric vehicles

$66B
for passenger and freight rail

$11B
for road safety

$17B
for ports and waterways

$1B
on community reconnection among neighborhoods divided by infrastructure

While most of these funds apply to traditional infrastructure, the investments into EVs, broadband, and community reconnection mark some of the progressive aspects of the bill.

"The challenge for DOTS, counties, and cities is to become more efficient with all this additional funding. I think we're going to see technologies advance more quickly. There will be a need for data to expand projects and keep track of them. e-Construction and BIM will be accelerated as well. There's a lot more work that has to be processed."

DOUG COUTO, FORMER CIO, MICHIGAN DOT

The Impact of Federal Funding Packages

Federal funds can spur major changes for players across the industry, from Departments of Transportation (DOTs) and Local Public Agencies (LPAs), to contractors and their subs.

These funds bring new projects to the table, and with them, new reporting requirements.

The Federal Highway Administration (FHWA) has very specific requirements for project management, reporting, and record-keeping that often drive the need for organizations to adopt a more systematic and sophisticated oversight approach.

LPAs often feel the burden of heavy documentation requirements that lead to a lack of detailed, accurate, or complete records. If inconsistent documentation persists, organizations can struggle with:

+ Protecting against claims or other legal suits
+ Surviving audits to ensure future funding
+ Securing reimbursements

In recognition of these challenges, FHWA encourages STAs and LPAs to embrace a more uniform process through the help of digital record keeping technology. This technology, known as e-Construction, helps LPAs standardize required recording procedures.

Where might e-Construction strengthen your organization's part in proper stewardship of federal funding?

Federal Reporting & Documentation Requirements

FHWA lists three primary risks in project administration for federally funded projects.

WASTE
Careless expenditure of resources or unnecessary costs that result from inefficiency.

FRAUD
Wrongful or criminal deception intended to result in financial or personal gain.

ABUSE
Excessive or improper use of something in a manner contrary to the legal rules for its use.

To combat these risks, FHWA has outlined project supervision requirements that organizations must follow to receive federal aid.

So, how do these requirements typically affect LPAs, contractors, and DOTs? →

LPAs

LPAs often face an uphill battle in meeting federal requirements if they don't have a digital project delivery system in place.

As those involved might know, LPAs are required to demonstrate contract compliance by maintaining thorough documentation on every project. This ongoing documentation will enable the LPA to complete the three major steps of the project closeout process:

Final Acceptance: The federal oversight agency reviews your records and determines if there are any outstanding claims, unfinished work, or other contract administration issues.

Final Voucher: The federal oversight agency initiates the final financial transaction to reimburse your agency for project related expenses. Proper record-keeping is essential to getting the right amount for your work.

Records Retention: LPAs are required to maintain accurate and complete records throughout the life of the project and for a minimum of three years after the project is complete. These records are important in the event of an audit.

Support Project Documents Source records, project inspectors diaries, inspection reports, materials testing results, and any other project management paperwork.

3

how many years federal project records must be maintained

$750K

baseline federal fund expenditure for an annual single audit

Those are just a few of the essentials for LPAs. With more federal funding on the way, it's important for LPAs to re-assess and plan for an increased workload with more stringent tracking requirements. Preparedness with right staff resources to bolster comprehensive data uniformity is a critical component to successful handling of federal funds.

Contractors

Although Federal reporting requirements for contractors are not as extensive as they are for LPAs, and many fall on the LPA or oversight agency to report correctly, Contractors are, for example, still required to submit weekly payroll records that contain:

+ Employee's full name and employee number
+ Classification code
+ Hourly wage
+ Hours worked
+ Gross wages

+ Itemized deductions
+ Net wages

Weekly

how often contractors on federally-funded projects have to submit weekly payroll records

General contractors have been among the first to recognize the importance of technology to keep projects running smoothly and maintain the quality expected from the public sector.

In many cases, contractors have been the reason for agencies to adopt bidding systems that enable remote submission, minimize mistakes, and decrease late bids. e-Construction tools designed for workflow-driven collaboration are not only ensuring contractors are getting paid quicker and strengthening relationships, but allowing contractors to avoid administrative project delays.

Contractors can play their part by continuing to be a positive voice for increased collaboration and partnership across project stakeholders.

DOTs

DOTs are well aware of federal reporting requirements, as they're beholden to them on many of their projects. Since DOTs often act as the oversight agency or work closely with

the FHWA chapter serving as an oversight agency, they will need to have systems in place to monitor and track LPA projects and contractor work. Payment verification and documentation will often ultimately fall on the DOT to provide to meet federal standards. Ensuring DOTs have a digital reporting platform that plays nicely with what LPAs and contractors are using is key to streamlining these processes.

Project Bidding
Whether DOT, LPA, or large general contractor, all entities are subject to the same federal requirements for reporting bid information.

When the low bid is awarded, the agency must answer four questions:

+   Is the bidder considered responsible?
+   How do the bids compare to the engineer's estimate?
+   Is the bid considered responsive?
+   Was there adequate competition?

Then, the agency must summarize this analysis and include bid tabulations and bid item details for the report they submit to the oversight agency.

+/- 10%
The engineer's estimate must be within this percentage of the low bid for at least 50% of awarded projects.

6+
competition is considered excellent when there are six or more bids within 20% of the low bid

The Value of e-Construction + The Maturity Framework

When DOTs and LPAs are tasked to steward federal funding, many recognize the need to take stock of current systems in place to survive the onslaught of projects and expectations that follow. Did you know that 75% of roads are owned and maintained by LPAs? With such a high degree of responsibility for the majority of American roads, LPAs often use specific tools to overcome the project management challenges outlined by FHWA.

Primarily, e-Construction.

e-Construction allows LPAs, their owners, and other project stakeholders to move to digital project delivery - eliminating hard copies and spreadsheets in favor of some kind of contract or asset management system.

In a 2017 study on the ROI value of e-Construction, FHWA defined it in the following ways:

+   Electronic capture of construction data
+   Electronic submission of construction documentation
+   Increased use of mobile devices
+   Increased automation of document review and approval
+   Use of electronic signatures
+   Secure document and workflow management accessible on any device

Projects are most effective when e-Construction tools are used in every stage. **Is your organization using the following digital tools in these project areas?** →

Electronic bidding and contract award

Project construction management

Project inspection and data collection

Construction document submission and review

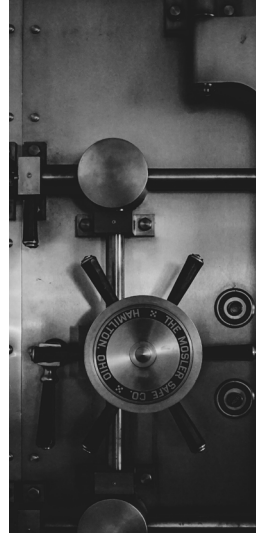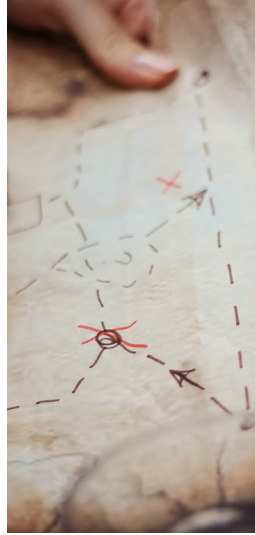Resource tracking

Project communications

Project acceptance

Project closeout

The Maturity Framework

FHWA has developed a maturity framework so agencies can self-assess to see where they are in the process. There are three levels: nascent, intermediate, and mature.

How does your organization stack up?

Nascent
It's like burying your gold in the backyard. Hard to access, and easily lost.

Intermediate
It's like storing your wealth in a safe. More accessible, but still clunky.

Mature
It's like online banking. Accessible from anywhere, convenient, secure and trackable.

Electronic Bidding

Nascent
Bidding and awarding on paper.

Intermediate
Pairing online and offline/paper bids.

Mature
Mandating electronic bidding through Bid Express or other automated software.

Construction Management

Nascent
Documenting the project on paper.

Intermediate
Combination of paper and electronic systems to track and store daily reports.

Mature
Electronic construction management system to track daily reports, progress percentage, change orders, payments, and more.

Project Inspection

Nascent
Manual, paper-based methods like field notes and measuring wheels.

Intermediate
Mix of manual and electronic systems to take measurements, track inspections and material test results.

Mature
Electronic systems to track all inspections and material test results.

Project Closeout

Nascent
Manual tracking of most warranty items.

Intermediate
Some automated tracking of warranty items through spreadsheets.

Mature
Release retainage amount to contractor automatically, ability to show all project warranty items and details on a map.

e-Construction ROI

Organizations using e-Construction to overcome challenges that lead to waste, fraud, and abuse have reported the following:

Duplicate Data Entry
6 hours saved weekly, per employee for a Department of Transportation

Travel Time
4 hours saved weekly, per employee for a large engineering firm

Travel Savings
$100,000/month for a large engineering firm

Research & Audits
95% reduction in time spent researching old files for a mid sized engineering firm

Bidding Audience
40%-70% increase in bidders per project for a County construction office

Bid Advertisements
95% reduction in bid ad costs for a City procurement office

FHWA has estimated the following ROI for using digital project delivery in these areas:

PROJECT AREA	BREAKEVEN YEAR	7-YEAR ROI
Electronic bidding	Year 3	700%
Digital project documentation	Year 2	775%
Project construction management	Year 4	250%
Mobile devices	Year 3	200%

Key Challenges & Solutions: Construction Administration

How are LPAs and DOTs tackling issues that can lead to FHWA's main concerns with federally-funded projects? By embracing e-Construction, of course!

When funding from the infrastructure bill starts trickling down, agencies and firms that are prepared to handle and report on those funds in digital systems will have an advantage when it comes to winning work. **Here's how your industry peers are getting ahead of common challenges** →

Record-Keeping and Reporting

In order to remain compliant on DOT-funded municipality projects, the public works department in the City of Meriden used a paper-based Four Volume method that often led to time-consuming project slowdowns.

In order to streamline this process, Director of Public Works Howard Weissberg, P.E., and his team started using a web-based construction administration and inspection platform. As a result, the City of Meriden experienced improved project management, data reporting, cost savings, and a 75% increase in inspector field time.

Pay Estimates and Fund Package Tracking

Bradley Utz, Construction Manager for the City of Terre Haute, sought to automate manual processes and cut down on wasted labor hours. Utz began vetting cloud-based construction administration and inspection solutions. After landing on one, his team used it to research historical bid pricing, grant stakeholders access, manage pay items, and other functions that are helpful when it comes time to generate pay estimates based on pay items and track funding packages.

Staffing and Personnel Efficiency

As the County Engineer in Hancock County, Ohio, Douglas Cade and his team of inspectors are responsible for county roads, bridges, drainage and daily inspections of new subdivision developments. With paper processes, Cade faced a number of challenges - from a staff spread too thin to a lack of quick access to vital project data.

With digital daily reporting functionality and real-time access to project data, Hancock County inspectors can stay in the field longer and report instantly back to Cade, where he can quickly step in when problems arise. This access allows Cade to intervene and prevent potential project delays if needed, while his inspectors can be more productive in the field.

ANNUAL USE
Office location: Meriden, Connecticut
Project amount range: $213K - $3M
Team size: 6
Project types: Public transportation
Annual projects used: 5

"If you have to research an issue, having all that information available at your fingertips without having to go back through stacks of paper is fantastic. It's great to give a snapshot of where the project is at to elected officials."

HOWARD WEISSBERG, P.E.
DIRECTOR OF PUBLIC WORKS

ANNUAL USE
Office location: Terre Haute, Indiana
Project amount range: $100 - $500K
Team size: 1-3
Project types: Local transportation infrastructure
Annual projects used: ~10

"A pay estimate would take 2-3 hours to put together, check all the numbers, and transfer between programs. It was pretty awesome to go from that to a web-based solution and be able to do it basically any time. Not having to be in my office is even better."

BRADLEY UTZ, CONSTRUCTION MANAGER

ANNUAL USE
Office location: Findlay, Ohio
Project amount range: $67K - $401K
Team size: 4
Project types: Road resurfacing and widening, bridge repair, and drainage work
Annual projects used: 3-5

"Instead of inspectors having to handwrite on a piece of paper, come back to the office, type it up, print it, and then hand it to me at the end of the week, we use a digital system for real-time access and that is a huge time-saver. We can determine what kind of problems are occurring at any time, instead of waiting one week to find out the problem was a big problem."

DOUGLAS CADE, COUNTY ENGINEER

Key Challenges & Solutions: Project Bidding

In the previous section on FHWA reporting requirements for the bidding process, we highlighted all the information DOTs and LPAs typically have to provide to an FHWA oversight agency, from low bid analysis to full bid tabulations.

Manual Transcription

After dealing with late submissions, time-intensive bid processing, and wasted plan packets, the City of Grand Rapids, Michigan, adopted an online bidding system to allow web-based submissions, enable automatic bid report creation, and provide unlimited space for plans and specs. This switch enabled Grand Rapids to go entirely paperless for their bidding process.

Transcribing the handwritten bid packets from contractors was one of the biggest pain points in the City's process. The need to double check figures or make out illegible handwriting made for an extensive, manual process. Online bidding has taken these manual tasks out of the equation.

"Since we've adopted online bidding, the longest a bid tab has ever taken me is maybe two or three hours, compared to four or five before, and it's never an issue of putting in the numbers. Inputting numbers is the quickest part of what I do now." – Ema Ludge, Office Administrative Specialist

Bid Set-Up

Kim Bailey, Purchasing Director for the City of Huntington, began looking for an e-bidding solution to combat the rising number of filing cabinets in her office and the vendors coming through her door daily to pick up bid packets. She was also tired of the multiple hours it would take to set up a complex bid.

By adopting a platform for secure online bidding, she was able to start storing bid records digitally to clear up space in her office. Templating her bids also allowed her to expedite the bid set-up process, cutting down from hours to a matter of minutes.

"Probably about 60% of the bids I've done, I've templated somehow. Ammunition, road slips, retaining walls, all of those I've templated. My bids take me 15 minutes max." – Kim Huntington, Purchasing Director

Errors, Omissions, & Late Bids

Contractors who submit bids on paper can easily make a mental math error or forget to fill out a form. Even contractors who fill out their bid packet perfectly may run into issues with weather or traffic when they're trying to submit it. For the City of Milwaukee, the City of Grand Rapids, and the Minnesota DOT, moving to online bidding eliminated these issues.

"Finding a place to park near us isn't always easy. We've had contractors booking it up the stairs and they would get in just after 11 am. That was obviously a big issue." – Ema Ludge, Office Administrative Specialist

"Inclement weather or traffic delays could cost someone their bid. Sometimes we'd have contractors sprinting in just to miss the deadline by seconds. It's really hard for a contractor to submit a non-responsive bid with electronic bidding which saves the State financial resources by not having to reject a potentially low bidder." – Nancy Boeve, Contract and Lettings Supervisor, Minnesota DOT

"When we take bids on paper, there are figures that don't always match or you can't read them. [With online bidding], we don't have any issues with non-compliance or nonresponsive bidders."

CELESTE JANTZ, CONTRACT COMPLIANCE OFFICER, CITY OF MILWAUKEE

Infotech e-Construction Solutions

As a 40+ year solutions provider for the infrastructure construction industry, we understand the challenges agencies face. Our web-based solutions for construction administration & inspection, secure online bidding, and paperless contracting help organizations tackle the common issues outlined by FHWA - waste, fraud, and abuse.
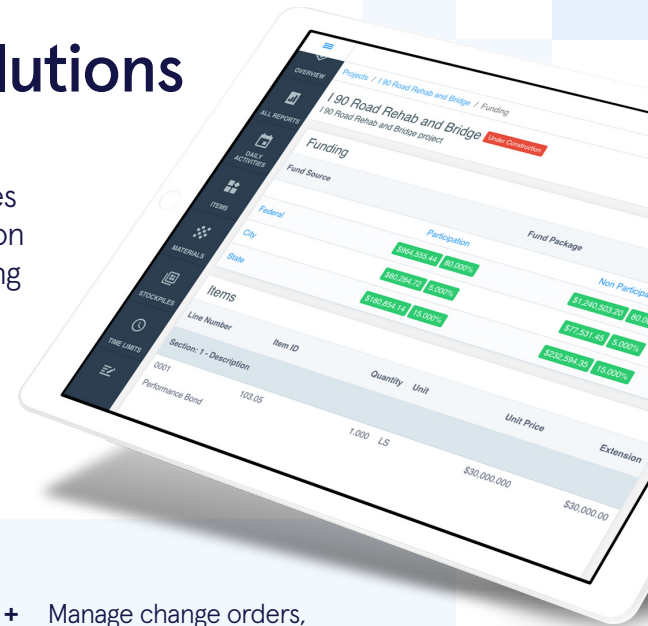
We offer the following e-Construction platforms:

Appia®

Municipalities and engineering firms nationwide use the Appia service to streamline construction contract management. Maintain project records, capture data at the source, generate instant pay estimates, and above all - eliminate clunky processes.

+ Manage change orders, material tracking, and more in one database
+ Keep field personnel in the field with real-time collaboration in the cloud
+ Manage complex funding with fund source administration

Bid Express®

Ditch paper packets and crowded inboxes. Accept bids online to eliminate errors and paper waste. Cut your bidding process in half with smart templates, instant bid tabs, and more.

+ Sponsor vendor submissions or sign up for our free, vendor-pay model
+ Get started today with no contract
+ No installation and little-to-no training needed

Doc Express®

The Doc Express service is a secure platform for paperless contracting, designed specifically to handle construction administration document workflows. With vital project documents stored safely in the cloud, everything from audits to certifications goes off without a hitch.

+ Sign documents and contracts quickly with verified signatures
+ Configure your workflow to determine how documents move to project stakeholders
+ Protect from audits with a secure and robust digital filing cabinet

→ To learn more about our solutions, visit **infotechinc.com/products**

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