THE BOND BUYER

The roads — and bridges, trains, and tunnels — to recovery

By

Peter Keating

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This article is part of The Bond Buyer's multi-platform series on the future of infrastructure: ***Build What Better?***

In this four-part series, The Bond Buyer looks at the changes this infrastructure moment could bring to landscapes and markets across the nation. It includes four longform feature stories running every other Tuesday for the remainder of 2021, beginning November 16th and concluding December 28th; a four-episode companion podcast series beginning November 30th; and a live video December 28th on our 'Leaders' channel, all hosted by the author.

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If you want to see what many infrastructure advocates imagine for the United States' future, look to the Central Puget Sound Regional Transit Authority, known as Sound Transit, which serves the Seattle metropolitan area. Sound Transit's popular light rail system diverts commuters and their gas-guzzling engines away from Interstate 5, Washington state's busiest highway. It makes convenient stops at the airport, major universities and sports stadiums. It's expanding north toward Everett, east to Redmond (home of Microsoft) and south to Tacoma, with $9.9 billion worth of additional stations planned by 2024. And it runs entirely on hydroelectric and wind power.

Many factors converged to make Seattle in general and Sound Transit in particular a model for forward-looking infrastructure development: Geography that makes it hard to keep expanding major highways, the lack of a legacy heavy-rail system, and a voting and riding public that strongly supports environmental protection and transit. Here's another, which is easy to overlook: Shrewd use of federal help. Sound Transit is the single biggest client of the Transportation Infrastructure Finance and Innovation Act (TIFIA), which leverages federal dollars by providing low-cost loans and guarantees to major projects. For example, the agency secured a $2 billion line of credit from TIFIA in

2016, and in September, it obtained $3.8 billion of loans to refinance and advance its current work.

Sound Transit's system could be a model for other cities. ***AdobeStock***

"We are the only entity in the country with a master credit agreement with TIFIA," says Peter Rogoff, CEO of Sound Transit and former Undersecretary of Transportation for Policy during the Obama administration. "Borrowing through TIFIA saves us hundreds of millions of dollars; profound savings to our local taxpayers."

Rogoff also expects Sound Transit to win more federal money through direct grants now that President Biden has signed the $550-billion Infrastructure Investment and Jobs Act (IIJA) into law, and for the other Washington (in D.C.) to pick up a higher share of the tab for projects funded by those grants. He shares these hopes with public officials all over the country — hundreds if not thousands of agency leaders and advocates now prepping for their moment at the federal spigot. To explore what might be coming down the road — or track — *The Bond Buyer* has gathered the stories of 10 projects (including Sound Transit's expansion).

We didn't use strict metrics to assemble this list. Several are huge in scope or cost, while others are relatively small. Some tackle long-deferred problems; others deploy new ideas or technologies. A few involve the private sector. Here's what they have in common: They attempt to improve some kind of connection between people and resources, goods or information — and they are angling for assistance from the IIJA. Our hope is that presenting important projects, from across infrastructure sectors and around the country, will reveal the variety of work that needs to be done in rebuilding America and the common challenges that work will entail.

One note on a project you may notice is missing from our survey: California has been planning a high-speed rail system since 2008, and if it ever comes to pass, electric-powered trains will zoom between Los Angeles and San Francisco in less than three hours. But the project has been plagued by endless delays and massive cost overruns, possibly to a price tag of $100 billion — and there's nothing in the IIJA earmarked specifically for high-speed rail. The latest plan is for a single track to connect Bakersfield and Merced by 2030. That seems like a good time to check back in and see if the bullet train is on target.

*** Re-Connecting Rondo**
Minnesota

When asked recently about the IIJA's provisions for "reconnecting communities" harmed by previous infrastructure projects, Secretary of Transportation Pete Buttigieg set off a social-media uproar and fact-checking tempest by repeating an anecdote from Robert Caro's *The Power Broker* about bridges in New York being built too low for inner-city buses to pass. But just before that, Buttigieg offered a different example of damage: "If a highway was built for the purpose of dividing a white and a black neighborhood." And it's this destruction that's incontestably in need of redress. The whole thrust of American transportation policy for decades after World War II was to build wide, fast-moving roads connecting municipal cores to each other and to rapidly emerging suburbs. All too often, these highways tore across Black areas, wrecking homes and local economies, severely impoverishing residents and leaving them isolated from other neighborhoods.

Now, with those roads aging, many municipalities are taking another look at what to do with the expressways and loops that slice and segregate their wards. And there are campaigns in 32 U.S. cities to take down or build over divisive roads, according to the Congress for the New Urbanism, a group that advocates for transforming "highways to boulevards."

ReConnect Rondo in St. Paul, Minnesota is one to watch. Before the Federal-Aid Highway Act of 1956, Rondo was home to 80% of St. Paul's African-American population, a mixed-income community studded with Black-owned businesses. City officials cut it in half to build a section of Interstate 94, which connects the Twin Cities. Building the six-lane highway along that route displaced more than 500 families and 300 businesses, and literally demolished Rondo's identity. Today, local advocates want to build a five-block-long land bridge over I-94, creating space for parkland and housing by physically reattaching what remains of Rondo to the rest of the city. This year, they won an initial $6.2 million of funding from the state of Minnesota, and are hoping the federal government will cover half the project's $450 million total cost.

That's a longshot — the IIJA contains just $1 billion for reconnecting communities nationwide, down from the $20 billion President Biden originally pitched. But the new law does at least acknowledge shifting priorities. "I've heard a lot about the Rondo neighborhood," Buttigieg told local media in Minnesota. "We should be paying attention to how federal dollars can help remedy problems that might have been created by federal dollars in the past."

*** Road Repairs**
Rhode Island

Potholes cost American drivers more than $3 billion a year in car repairs and literally uncounted hours of road and bridge shutdowns. They can form anywhere that water gets under asphalt, freezes and swells into ice, then melts and contracts, leaving pockets of air that traveling vehicles crush into pits. But they're most ubiquitous in the Northeast, with its combination of densely packed metropolitan areas and harsh winters. How much so? In 2018, the Friendly's restaurant chain, based in Wilbraham, Massachusetts, introduced its Nor'Easter Pothole ice cream sundae, "complete with a delicious landslide of flat tire fudge, crème cookie gravel and chocolate asphalt chips … finished with a marshmallow snow pile topping and milk chocolate rubble." This sugary representation of road damage proved quite popular — truly a sign of America's impending infrastructure apocalypse if ever there were one.

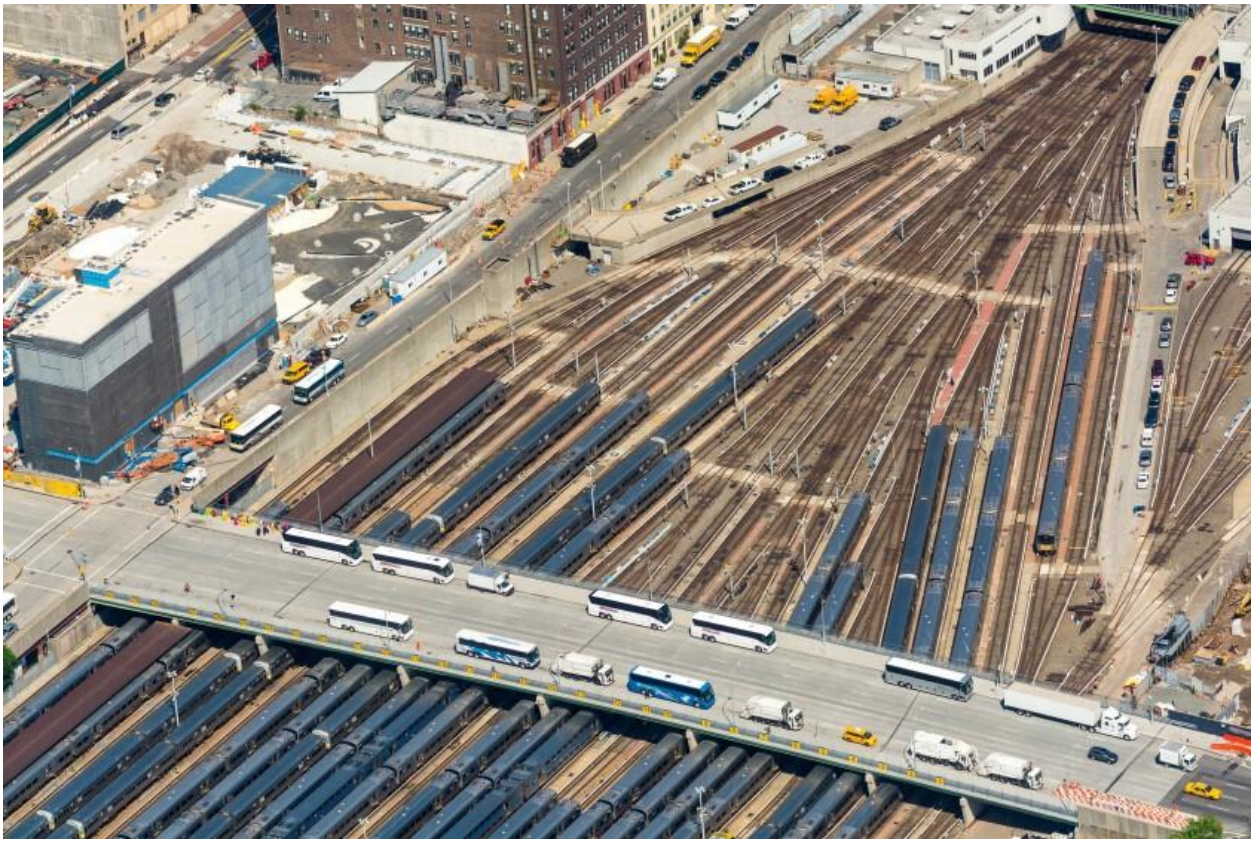
The fight against cratering goes on most acutely in Rhode Island, where 50% of roads are in "non-acceptable" condition by Federal Highway Administration standards, the most of any state, according to a November analysis by the online insurance marketplace QuoteWizard. In Providence — where residents joke the city has no problem with speeding because anyone who drives too fast will destroy their car — Mayor Jorge Elorza holds annual press conferences where he personally takes up a shovel and pushes a compactor to attack street cavities.

The city has even created an app that allows users to report a pothole, link to it on social media and track it until a patch arrives.

But 860 miles of Rhode Island's roadways need repairs, according to the White House, a staggering number for the smallest state in the country. (That works out to 70.8 miles of damaged road per 100 square miles of area, compared with a ratio of 8.7 for California.) To move beyond quick fixes and expand the use of weather-proof compactors, introduce better sealants and eventually repave entire roads, it's going to need an infusion of cash. And the IIJA should finally provide it. State officials expect about $1.7 billion of highway and bridge funding to come their way — more than 10 times what Rhode Island typically spends on infrastructure maintenance in a year.

*** Gateway Tunnel**
New York and New Jersey

The biggest no-brainer on this (or any similar) list. Every weekday, about 450 passenger trains travel through the North River Tunnel under the Hudson River, running through two single-track tubes that make up the only commuter railway between New York and New Jersey. The tunnel is a vital cog in Amtrak’s Northeast Corridor, linking Boston and Washington. But these days, it's also a clog, and badly in need of repairs. The tunnel is 111 years old. It's running at full capacity. And in 2012, Hurricane Sandy flooded its tracks and carried saltwater into its walls. Ever since, seepage has cracked the tunnel's concrete and sporadically shorted out its 12,000-volt copper-wire electric cables. An emergency shutdown is coming sooner or later, and would be an economic disaster; closing even one track before extra volume is ready somewhere else would cost the national economy $16 billion, according to the Regional Plan Association (RPA), a nonprofit planning group based in New York.



The Gateway Tunnel would double the number of LIRR and Amtrak trains that can run between New York and New Jersey to nearly 50 per hour each way. ***AdobeStock***

The Gateway Program would renovate the North River tunnel and build an entirely new path under the Hudson, ultimately doubling the number of trains that can run between New York and New Jersey to nearly 50 per hour each way. First put forward by Amtrak a decade ago, the project was repeatedly blocked by President Donald Trump, whose aides reportedly called it the "Hateway," and who was irritated that Senate Majority Leader Chuck Schumer, a New Yorker, refused to support building a border wall with Mexico. The delays added to costs, which Amtrak estimates will total $11.6 billion over 12 years. But the Biden administration approved the tunnel work in May, and the Gateway Program is now on track to get up to $8 billion of capital grants from the IIJA. Construction, which will entail burying giant concrete cylinders beneath 250 feet of water off the shores of New York City, will be extraordinarily complicated. But as the RPA puts it, this is "the nation's most urgent infrastructure project."

*** D.C. Smart Street Lighting**
District of Columbia

A plain old lamp post may not leap to mind when you think of infrastructure, but there's nothing commonplace about the luminaires now popping up around the country. 59% of large cities in the U.S. are converting to LED street lights, according to a 2020 survey by Northeast Group, an infrastructure research and consulting firm. And 19% are considering smart lighting systems, which can use cameras, sensors, power-grid connections and software applications to deliver services across a whole new kind of network.

On the cutting edge: Washington, D.C. The nation's capital has an ongoing need to bridge physical and digital divides between neighborhoods occupied by federal agencies and workers and the rest of the city. At the same time, it doesn't have to deal with state-level bureaucracies. So it's recently become something of a laboratory for infrastructure innovation. Indeed, the Institute for Management Development, which measures how well municipalities use technology to bring the benefits of urbanization to residents, has ranked the District among America's three smartest cities each year since it launched its global rankings in 2019. Now Washington plans to upgrade more than 75,000 lights along its streets and alleys over the next two years, upgrading mostly yellowish-glowing sodium-vapor lamps with LEDs, which are brighter, use less energy and last much longer, cutting costs (and carbon emissions) by at least 50%.

Washington, D.C., plans to upgrade more than 75,000 lights along its streets and alleys over the next two years, upgrading mostly yellowish-glowing sodium-vapor lamps with LEDs. ***AdobeStock***

The D.C. Smart Street Lighting project will be a public-private partnership, and the District expects to name a lead contractor by the end of 2021. In addition to maintaining the lights for 15 years, the partner company will install sensors so a new central system can monitor outages as well as street accidents and other problems, even garbage overflows, to direct help where needed. Maybe most important in a city where 25% of the population still lacks broadband, the new smart poles will also serve as wireless access points, expanding high-speed WiFi across the capital. City officials expect all of these to be selling points when it comes to divvying up D.C.'s share of funding from the feds.

*** Lead Pipe Removal**
West Virginia

This spring, the West Virginia Office of Environmental Health Services reported that children from three homes in Clarksburg, West Virginia, had tested positive for elevated levels of lead in their blood. The news was disturbing not only because lead is so toxic — exposure can delay childhood development and cause brain, blood and hearing damage — but because in 2019, the Clarksburg Water Board had told the Environmental Protection Agency that its system had no service lines, or pipes running from water mains to residences, made of lead. Subsequent testing by state engineers delivered staggering results: lead levels ranged from 326.6 parts per billion to 2,130 parts per billion at water meters at the three residences — when just 15 parts per billion would normally compel a system to take action. A month later, the EPA issued an emergency administrative order requiring Clarksburg to identify and replace lead service lines, provide alternative drinking water to anyone affected by them and start a public education campaign about lead.

On one level, this is a success story, because regulators took strong corrective action in the face of a severe infrastructure problem. But Clarksburg is a town of just about 15,000 people. Its Water Board, while able to scratch together $416,000 this year by forgoing the purchase of three trucks and lab equipment, is now facing costs that will likely run into millions of dollars for years to sample water, dig up pipes and control corrosion. That’s where the IIJA comes in. It dedicates $15 billion specifically to lead-line replacement projects, and Clarksburg Water Board officials say they will have their hands out as soon as funds are available.

It seems like that money might go fast, since there really is no safe level of exposure to lead and 9.7 million to 12.8 million lead service lines are still carrying water into American homes, according to the National Resources Defense Council. But 27 states don’t even track how many lead pipes they have,

according to NRDC research. "We've known for decades that states and utilities should be out doing surveys to figure out where the lead pipes are, how many there are and what they're going to do to pull them out," says Erik Olson, a senior strategic director at the group. "It's a huge problem." For this facet of the IIJA to work, municipalities will have to acknowledge the problem they need to solve.

*** Mississippi River Ship Channel Dredging Project**
Louisiana

The Mississippi River connects the agricultural heartland of the United States with the rest of the world. It carries 60% of America's grain freight (along with 22% of its oil and gas and 20% of its coal), and the Port of South Louisiana, near its southernmost point, ships more goods than any in the country. Even so, today's largest cargo vessels cannot traverse the relatively shallow depths of the river's main channel — historically maintained at 45 feet by the Army Corps of Engineers. That's about to change, thanks to the Mississippi River Ship Channel Dredging Project. In September 2020, the Corps began scooping out the river to a depth of 50 feet along 256 miles of delta coastline, and hopes eventually to extend the more voluminous channel from the Gulf of Mexico to Baton Rouge.

The largest cargo vessels cannot traverse the relatively shallow depths of the Mississippi River's main channel.

AdobeStock

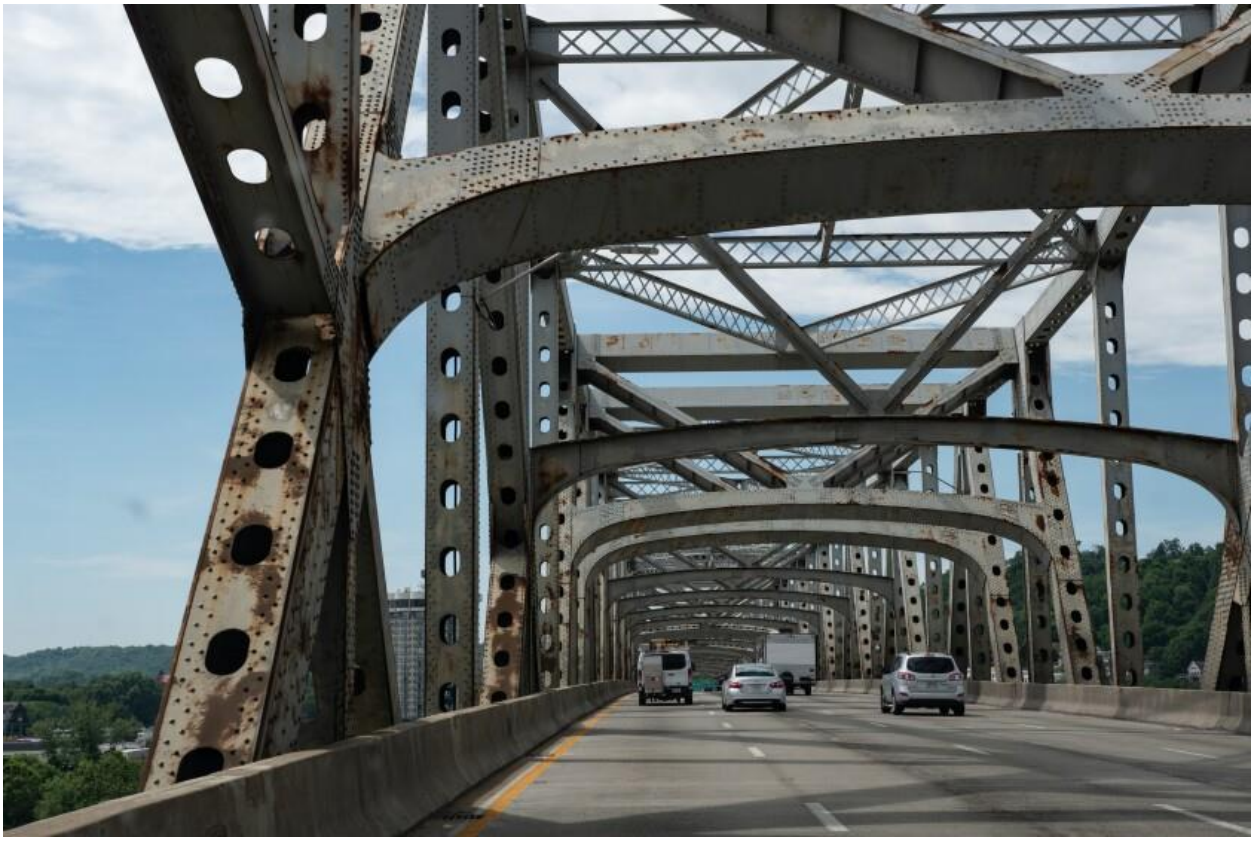
Amidst all the complicated logistics of underwater excavation, here's a simple fact: the deeper a river, the harder it is for a heavy ship to scrape bottom. Today, standard Panamax vessels — named for the fact that they have the biggest dimensions that can fit through the Panama Canal — can typically haul about 66,000 metric tons through the lower Mississippi to meet grain elevators and barges. Deepen the channel by five feet, and that number rises to 80,000, meaning every vessel transporting wheat or corn could increase its load by half a million bushels of grain. "We have ships coming into the river that could carry more cargo in or out," says Sean Duffy, executive director of the Big River Coalition, a Metairie, Louisiana-based group of 170 organizations that advocates for and advises the project. "We'll also have ships that go to other, deeper ports that could then come here."

To complete the job, Duffy and his allies are expecting help from the new infrastructure bill, from funds flowing either through the Corps or the state of Louisiana, which is picking up 25% of the project's estimated $270 million tab. They argue it would be an investment in efficiency: bigger cargo loads will cut the costs of ocean freight and spur higher-volume purchases of American products. Indeed, a 2018 report by Informa Economics Group, an agriculture market research firm, found: "The deeper draft of the lower Mississippi River will increase soybean revenues by close to half a billion dollars annually." Considering just that benefit alone, the dredging will pay for itself in about seven months.

***Brent Spence Bridge**
Ohio and Kentucky

The Brent Spence Bridge opened in 1963 and has aged into a case study in American infrastructure dysfunction. Connecting Cincinnati and Covington, Kentucky, it originally carried three 12-foot-wide lanes on each of its two cantilevered decks across the Ohio River. In 1985, engineers wiped out its emergency shoulders so the bridge could squeeze in four lanes with a width of just 11 feet going in each direction. That worsened driving conditions just as traffic was increasing to the point where the Brent Spence became the third-busiest bridge in the U.S. More than 160,000 vehicles now cross it every day — twice as many as it was designed to handle. Predictably, it's also home to an average of more than 600 accidents per year, and drivers are three to five times more likely to crash along its corridor than on any other interstate road in Indiana, Kentucky or Ohio, according to the Ohio Department of Transportation. After one pileup in 2014, a car plunged from the upper to the lower deck. Last year, a two-truck crash triggered a huge fire and shut the bridge for 41 days.

Meanwhile, maintenance has fallen behind and upgrades have been nonexistent. The bridge has been functionally obsolete by federal standards since the 1990s. Earlier this year, it was named the second-worst bottleneck in the country by the American Transportation Research Institute. From 1991 to 2021, it wasn't even painted, and grew visibly rusty.



Maintenance of the Brent Spence Bridge has fallen behind and upgrades have been nonexistent. ***AdobeStock***

In 2011, then-President Barack Obama stood on the Ohio side of the Brent Spence and called on Congress to pass his jobs and rebuilding bill. In 2017, Donald Trump said about the bridge, "We're going to get it fixed." Each time, nothing happened. Now, the stars finally seem to be aligning for a $2.5 billion project that would repair the span and erect another bridge next to it. After the House of Representatives passed the IIJA, Sen. Rob Portman, R-Ohio, a key infrastructure negotiator, said: "This program, alongside other funding opportunities, can move forward the Brent Spence Bridge Corridor Project once and for all."

* **El Vado Dam**
New Mexico

There are more than 90,000 dams across the United States, holding back water from rivers and lakes. They are 57 years old, on average. And most are privately owned, which makes it hard to enforce maintenance and repair requirements. Climate change is causing more frequent and intense waterfall, and when dams get too full, they tend to erode and eventually fail. The areas near many dams have grown more densely populated in recent years, dramatically boosting the potential costs, in lives and dollars, of any such failure. These are all scary trends. America caught a glimpse of just how horrifying a collision among them could be in May 2020, when heavy downpours caused the Edenville and Sanford dams in Michigan to collapse, forcing the evacuation of more than 10,000 people. Something similar could happen in almost any part of the country: A 2019 investigation by the Associated Press found 1,688 dams that were both in poor or unsatisfactory condition and rated "high-hazard," meaning their failure would cause significant damage downstream, across 44 states and Puerto Rico.

Like so much else in the IIJA, its dam-safety provisions will send cash to a crazy quilt of agencies and programs in amounts that far surpass anything seen in decades, but still just down payments on long-neglected bills. There's $585 million for the Federal Emergency Management Authority's program to rehabilitate high-hazard dams, which had been puttering around on about $12 million a year, and another $118 million for FEMA to pass on to states. There's $750 million for hydroelectric-power dams and $75 million for the Army Corps of Engineers. And there's $600 million for the Bureau of Reclamation, which oversees water management in 17 states and owns or manages nearly 500 dams. "It's definitely not enough to fix all that needs to be done, but it's a huge step forward," says Mark Ogden, project manager at the Association of Dam Safety Officials in Lexington, Kentucky.

The El Vado Dam in New Mexico's steel faceplates need replacement or repair. ***Bureau of Reclamation***

Making major repairs at El Vado Dam in New Mexico is one of the Bureau of Reclamation's top priorities for spending new funds. Situated on the Rio Chama about 160 miles north of Albuquerque, El Vado is 230 feet high and its reservoir can hold almost 200,000 acre-feet (or 65 billion gallons) of water. It is unusual in that it's partially lined with huge steel faceplates. And since the dam was built in 1935, erosion and shifting lands have cracked and weakened its plates and its spillway, the channel that lets flooding water flow safely downstream. Some of the plates are so bent that they're audibly hollow underneath, creating a risk that water could get under them and break them entirely. Next year, crews will begin strengthening and lining the dam's face, at a cost of $31 million — provided it gets past spring irrigation season.

*** Ports of Los Angeles and Long Beach**
California

Consumer spending in the U.S. has boomed through most of 2021, and by now it's no secret that global supply chains have become severely strained. The Ports of Los Angeles and Long Beach handle more containers per vessel than any complex in the world. But cargo ships are bottlenecking there, increasing travel times and jacking up prices for companies that ship goods.

The Cap Capricorn container ship is unloaded at Pier 400 in the Port of Los Angeles in Los Angeles. ***Bloomberg News***

IIJA advocates have said it will improve roads and bridges around the ports. But spending on repairs and upgrades can't provide relief anytime soon to a system of production and delivery that's just not set up to operate at maximum intensity over global distances month after month. A renewed focus on supply chains could, however, bring attention to a largely overlooked sector of infrastructure: freight rail. Once goods do make it into West Coast ports, trains and trucks have to carry them to the rest of the country. And Los Angeles and Long Beach rail operations "from all terminals and the off-dock ramps continue to deteriorate as demand exceeds capacity, therefore inland moves by rail can suffer considerable delays," according to delivery company DHL, which issues regular port updates.

Burlington Northern Santa Fe (BNSF), the nation's largest freight rail company, wants to avoid or at least alleviate this problem by building the Southern California International Gateway, which would move its railyards from 24 miles from the twin ports to just four miles away. That would drastically reduce the time trucks spend driving back and forth in SoCal gridlock between ports and trains — and the fuel they consume and carbon they emit — and speed its link in the supply chain.

Incredibly enough, BNSF first made this proposal in 2005. Environmental reviews and litigation have ensnared it ever since, holding it up for more than five times as long as it would have taken to build the new railyards. The company wants to spend $500 million on a project it plans to make "the greenest intermodal facility in the U.S.," in part by using equipment like electric cranes and low-emissions switching trains. But it's still trapped in California's regulatory labyrinth without a yes or no answer.

As funds start to flow from Washington to the rest of the country, it's a useful reminder that every project has its costs and benefits. And governments that can't evaluate them accurately and efficiently can thwart infrastructure as easily as they can build it.

****Coming December 14: Part Three of our "Build What Better?" series looks at how the purpose and scope of American projects will change with the new infrastructure law taking effect.***

Peter Keating