

# constructsteel

Monthly update for the construction industry

December 2021



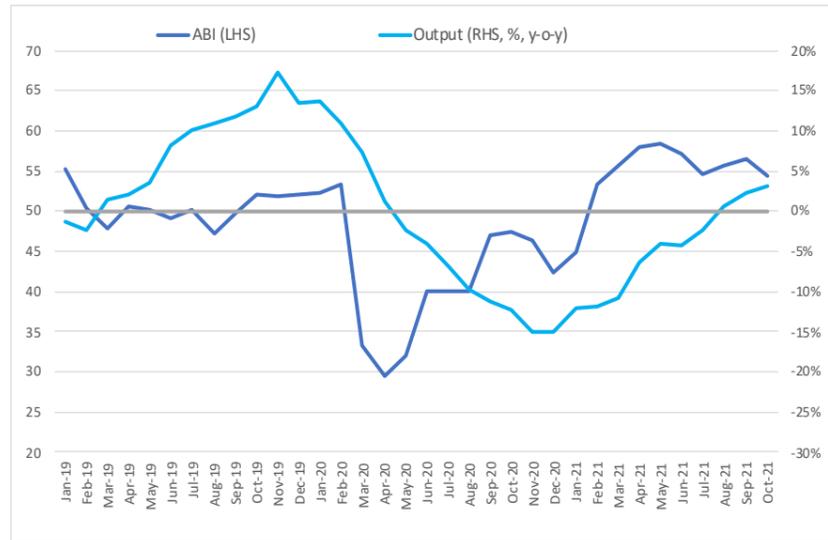
constructsteel

## Construction market trends

**United States** Private residential output constrained by shortages of materials; Private non-residential output growing.

Private residential output down for the second month in October and by -0.5% m-o-m (16.7% y-o-y); building permits up 3.6% y-o-y. Private non-residential output up 0.2% m-o-m (3.1% y-o-y). Architecture Billings Index (ABI) down to 54.3 in October from 56.6 in September (>50, expansion).

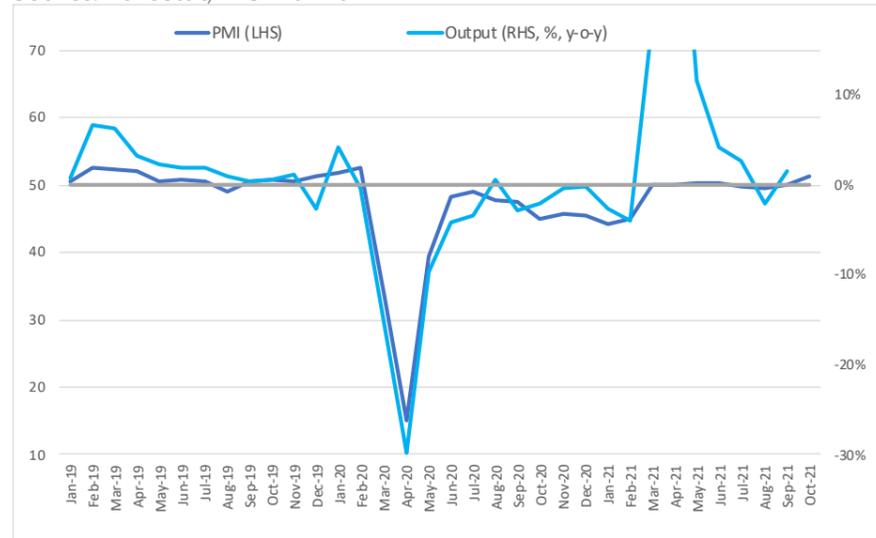
Private non-residential  
Source: US Census, American Institute of Architects



**Europe** Construction shows signs of recovery linked to stronger demand and increasing workloads.

Eurozone construction up 0.9% m-o-m in September (1.5% y-o-y); civil works up 2.6% m-o-m (2% y-o-y). The IHS Markit Eurozone Construction PMI rose to 51.2 in October and to highest levels since February 2020 (> 50, expansion).

Eurozone construction output vs PMI  
Source: Eurostat, IHS Markit

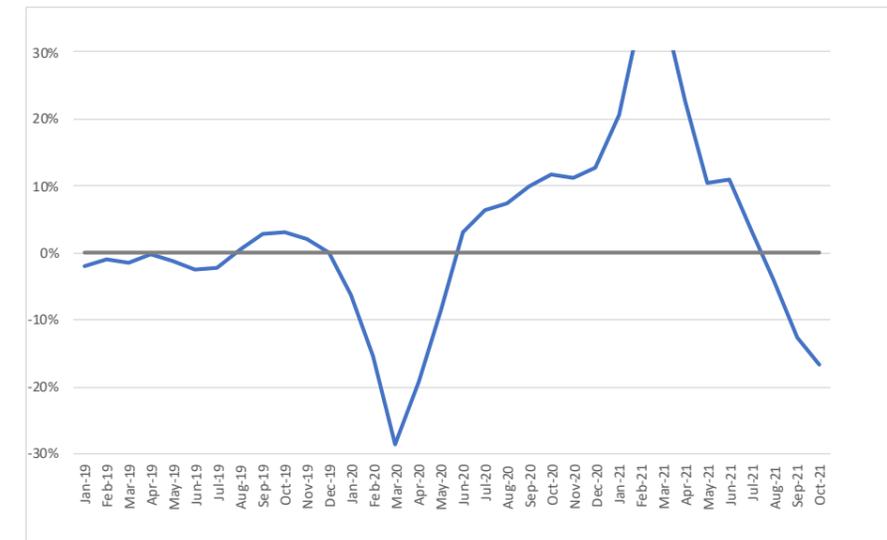


Knowledge partner:  
**McKinsey & Company**

**China** Further declines being seen in the residential property sector.

The 3 month moving average y-o-y growth in floor space started fell -21% in October; floor space sold fell -17% y-o-y.

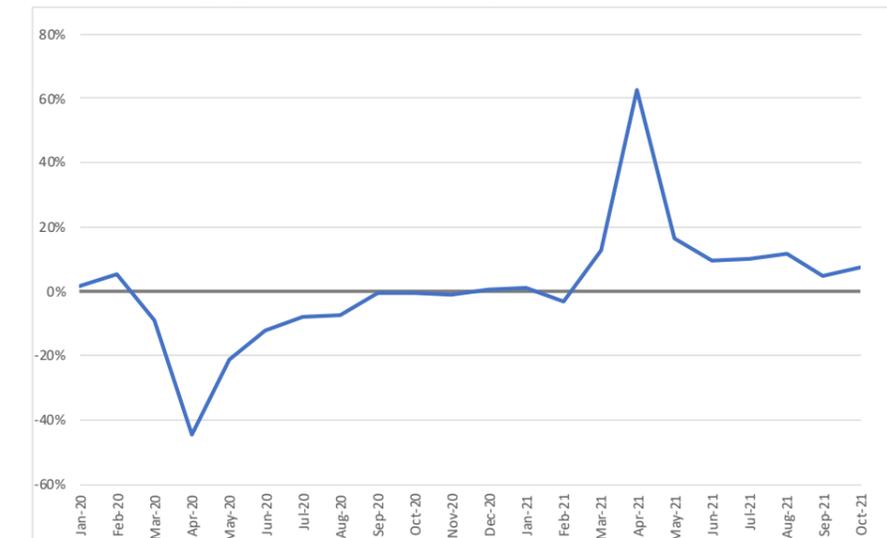
Floor space started (3 month moving average, % y-o-y)  
Source: National Bureau of Statistics of China



**India** Increased stability in activity being seen.

Weighted average of eight core industries output up 7.5% y-o-y in October; production of steel and cement up 0.9% and 14.5% y-o-y respectively.

Weighted average of eight core industries industrial production (% y-o-y)  
Source: Ministry of Commerce & Industry, India



## Special topic: Promoting the use of sustainable construction materials



### Dr. Troy Coyle

CEO at Heavy Engineering Research Association (HERA)

**HERA**

Sustainability, particularly reducing carbon emissions, in construction is a hot topic in New Zealand. Government-led initiatives, such as Building for Climate Change, are directing change within the sector. This framework proposes to set mandatory reporting and measurement requirements for whole-of-life carbon emissions, including from the materials used in construction, the construction process, construction waste, and the disposal of a building at the end of its life, which will form part of the NZ Building Code and associated regulations.

In recent years, it has become noticeable that the New Zealand government procurement has been placing a stronger focus on carbon, with the timber lobby pushing for a "Timber First" approach for all government buildings. The steel and concrete industries have had to respond, reaffirming that professionals, such as architects and engineers, and not politicians should be determining the best material for the required application. It is our view that procurement decisions should be made based on evidence and not on an assumption that timber is automatically preferable. It is also not the role of the government to be a material specifier, albeit specifying appropriate sustainability outcomes is reasonable.

Initially, much of the conversations and government white papers focused on embodied carbon versus lifecycle carbon, placing timber at an advantage over steel. Embodied carbon only considers carbon at the point in time that a building is built, while lifecycle carbon also considers carbon that is emitted during operations and at the end-of-life of a building. Of course, if net carbon reductions are the objective, life cycle carbon is key, and requires significant diligence, education and advocacy from the sector broadly, including from life cycle analysis (LCA) experts.

As means of shifting this erroneous focus on embodied carbon in comparisons between steel and timber, HERA has developed the world's first comprehensive carbon offsetting program for steel products used in New Zealand. The calculator was independently developed and is based on LCA data and preferably EPD data. It covers steel products ranging from roll-formed roofing and cladding, reinforcing, light gauge and heavy structural steel, and stainless steel. It currently covers carbon from cradle to erection. Early-stage industry indicators of relative construction costs of timber versus steel design are suggesting that the zero carbon steel option will come in 30-80% more affordable than the timber option.

In efforts to further extend this to a cradle-to-cradle approach, HERA has also commissioned work to determine steel scrap recycling levels in New Zealand. This independent report identified that 72% of scrap in New Zealand is recycled. A figure that is likely to be higher for construction steel (we estimate approximately



85%), which we are in the process of determining. The scrap is currently sent offshore for recycling and has an associated 1050kg/t carbon equivalent reduction, a value that increases as the recycling levels also increase due to reduced landfill.

Interestingly, HERA conducted comprehensive market research across the New Zealand population and found some significant misunderstandings about the sustainability credentials of steel. Probably the most concerning was that more New Zealanders thought that timber was more recycled than steel, whereas timber recycling levels are likely to be close to zero due to Building Code requirements for timber treatment, making it toxic and therefore of limited use at end of life.

Currently, HERA is also in the process of developing Australasia's first material passport, which will involve a research to identify roadblocks and barriers to the reuse of structural steel. It will also investigate the role of a data platform in facilitating steel reuse. Then a material passport decision-making framework will be developed. The aim is to facilitate reuse and repurposing of steel, adding more value in terms of steel's role in the circular economy.

HERA also recently commissioned an assessment of the economic impacts of adopting Construction 4.0 (Industry 4.0 adapted to Construction sector) in New Zealand. The study showed that Construction 4.0 adoption would lead to a 0.5 to 1.0% increase in GDP, worth \$1.2 to \$2.5 billion within 5 years. HERA has already developed capability in Fabrication 4.0 (through our fab4.0lab), and now we are looking to develop capability in Sustainability 4.0 as part of our broader Construction 4.0 research program.

In addition to the HERA led initiatives in New Zealand, the Sustainable Steel Council has developed a certification program based on Aotearoa New Zealand's Living Standards Framework (LSF). This means that at least 70% of structural steel volume is now coming from certified members and the steel industry was the first in New Zealand to use the framework to assess its economic contribution to the nation. The LSF looks at sustainability in terms of intergenerational wellbeing across four capitals: financial, human, social, and natural. New Zealand's steel industry has used the LSF as the basis for developing the Aotearoa Steel Industry Transformation Plan, with New Zealand Steel and many of the steel industry associations already on board.

HERA is thrilled to have joined constructsteel's international network, and we are really looking forward to sharing access to emerging research and approaches to improving and evaluating the sustainability credentials of steel. We are also keen to connect with like-minded organisations to develop best-practice initiatives and coordinate information sharing across the globe.

# Technical trends: The US Infrastructure Investment and Jobs Act – Breaking it down

McKinsey & Co Public and Social Sector Insights, Reinvesting in America series



The Infrastructure Investment and Jobs Act (IIJA), signed on November 15, 2021, will provide significant public investment in US transportation networks, broadband, and public works projects.

The legislation seeks to address a broad range of critical needs in the United States' built environment, which was recently rated C-minus by the American Society of Civil Engineers. The act will modernise the country's ageing infrastructure through extensive upgrades for roads and bridges. The IIJA further provides funding to replace lead pipes that provide drinking water and to remediate pollution in disadvantaged communities—thus helping to build a more inclusive, sustainable economy.

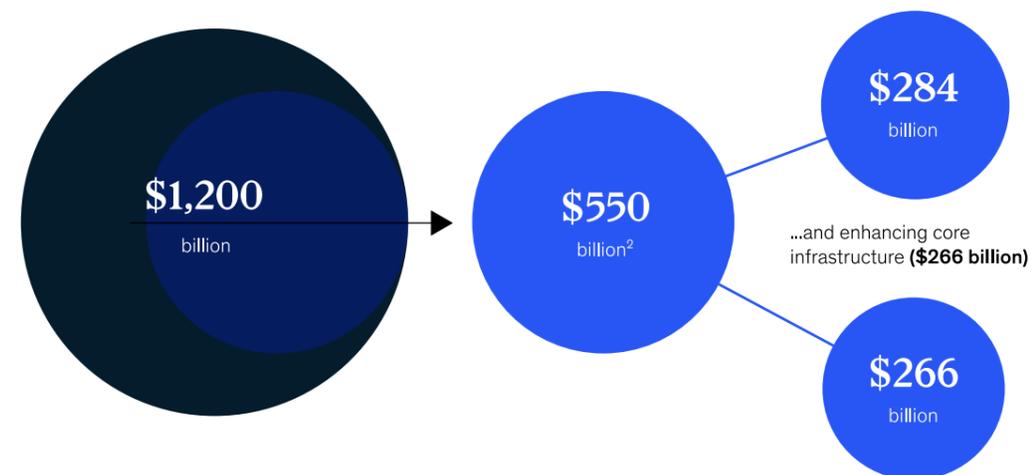
### From the top

The act allocates an estimated \$1.2 trillion in total funding over ten years, including \$550 billion in new spending during the next five, divided between improving the surface-transportation network (\$284 billion) and society's core infrastructure (\$266 billion).

### The US Infrastructure Investment and Jobs Act will authorize \$550 billion in new spending.

#### Infrastructure Investment and Jobs Act (IIJA) investments

The act allocates about **\$1.2 trillion<sup>1</sup>** over 10 years ...  
 ...including **\$550 billion** in new spending...  
 ...divided between improving the surface-transportation network (**\$284 billion**)...  
 ...and enhancing core infrastructure (**\$266 billion**)

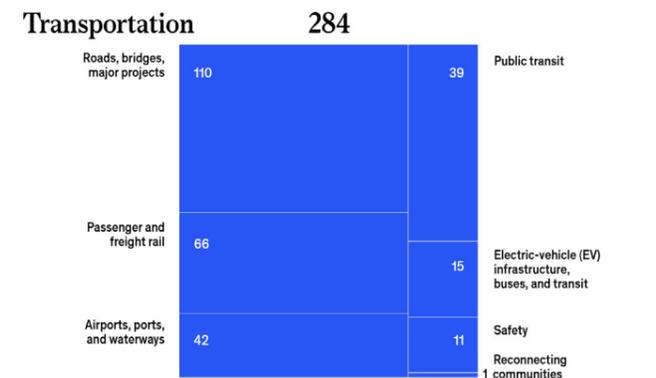


### Priority investments

The act will include funding for a range of issues. See the breakdown of spending in the act's two main categories: transportation (including roads and bridges; passenger and freight rail; airports, ports, and waterways; public transit; electric vehicles; safety; and reconnecting communities) and core infrastructure (which includes the power grid, broadband, water, environmental resiliency, and environmental remediation).

The US Infrastructure Investment and Jobs Act will provide **\$284 billion** in new spending for transportation.

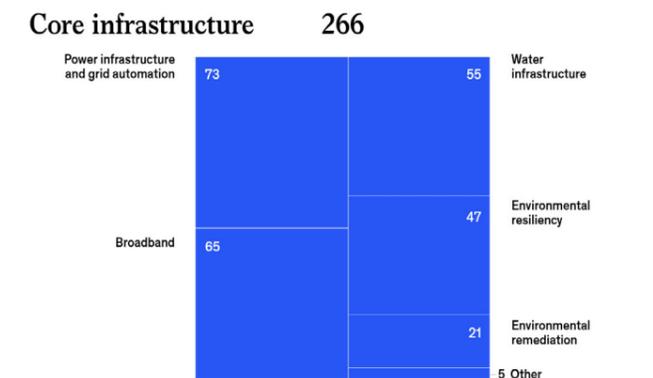
Infrastructure Investment and Jobs Act (IIJA) new spending on transportation, \$ billion



- Roads, bridges, major projects**
  - Funds through DOT<sup>1</sup> and DOT<sup>2</sup> to upgrade roads and bridges and to address climate change and resilience
  - Dedicated funding for state highway and transportation agencies (via Highway Trust Fund) would see immediate 2% increase
- Passenger and freight rail**
  - Amtrak, Northeast Corridor, and Federal Railroad Administration funding for capital investment, operations and maintenance, and program administration
  - Includes largest investment in rail since the creation of the rail system, representing 11-fold increase in historical funding levels
- Airports, ports, and waterways**
  - ~35% increase in historical funding levels for airport infrastructure (terminal improvements, multimodal transport, traffic-control infrastructure)
  - Also includes enhancements to port infrastructure and waterways, in part to counter effects of extreme weather
- Public transit**
  - Funds to modernize transit and improve accessibility, including extending existing transit programs for 5 years
  - Includes \$5.3 billion to replace thousands of transit vehicle with zero-emission vehicles
- Electric-vehicle (EV) infrastructure, buses, and transit**
  - First national investment in EV charging infrastructure to build a national network of EV chargers along highways in rural and disadvantaged communities
  - Also includes funds to electrify school and transit buses and passenger ferries
- Safety**
  - Funds for safety programs, including a new "Safe Streets for All" program to help reduce community crashes and fatalities
  - Doubled funding directed to programs that improve the safety of people and vehicles, including highway safety, truck safety, and pipeline and hazardous materials
- Reconnecting communities**
  - First ever national investment to reconnect communities divided by transportation infrastructure

The US Infrastructure Investment and Jobs Act will commit **\$266 billion** in new spending on core infrastructure: Power, water, broadband, and the environment.

Infrastructure Investment and Jobs Act (IIJA) new spending on core infrastructure, \$ billion



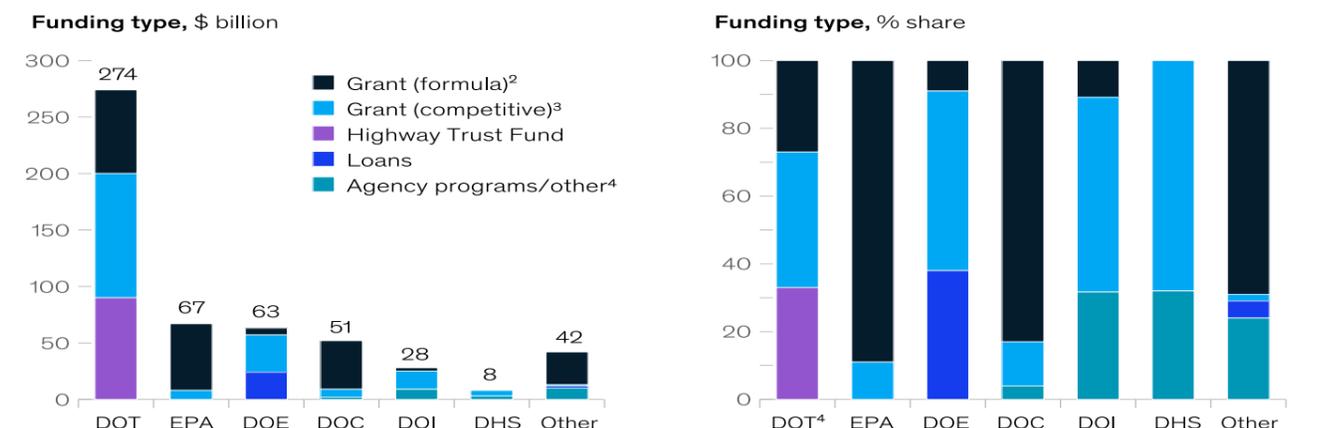
- Power infrastructure and grid automation**
  - Funds to upgrade power infrastructure, including by building new transmission lines to facilitate the expansion of renewable energy
  - Provides \$21.5 billion to fund clean-energy technology—eg, clean hydrogen, carbon capture and sequestration, and carbon transportation—for projects that currently aren't economically viable for most utilities
- Broadband**
  - Investments address key drivers of the digital divide: the availability of subscriptions, and digital inclusion and literacy
  - 65% of funding is designated to connect underserved areas
- Water infrastructure**
  - Funding to modernize water infrastructure, including dedicated funding for lead-pipe removal
  - Includes a ~3x funding increase to historical Drinking Water State Revolving Fund appropriations
- Environmental resiliency**
  - Investments in infrastructure to ensure resiliency against cyberattacks and storms/natural disasters due to climate change
- Environmental remediation**
  - EPA funds for remediation of legacy pollution, as well as funds to clean up ~1,200 Superfund sites, improve brownfield sites to useable land tracts, and reclaim abandoned mine land
  - 73 million Americans (or 22% of the US population) live within 3 miles of a Superfund site
- Other**
  - Cross-sector initiatives and funding programs, including funding for Advanced Research Projects Agency for Infrastructure (ARPA-I) to provide grants to universities, companies, and research foundations working on early-stage projects

### Expanding agency budgets

The Department of Transportation will direct the largest portion of the act's investments. Several other agencies will also see their budgets expand. Investments will go to five main areas: agency programs and operations, grants calculated by a formula, competitive grants, loans, and the Highway Trust Fund.

### The Department of Transportation will direct more than half of all new funding under the US Infrastructure Investment and Jobs Act.

#### Infrastructure Investment and Jobs Act (IIJA) new funding, by federal department<sup>1</sup>

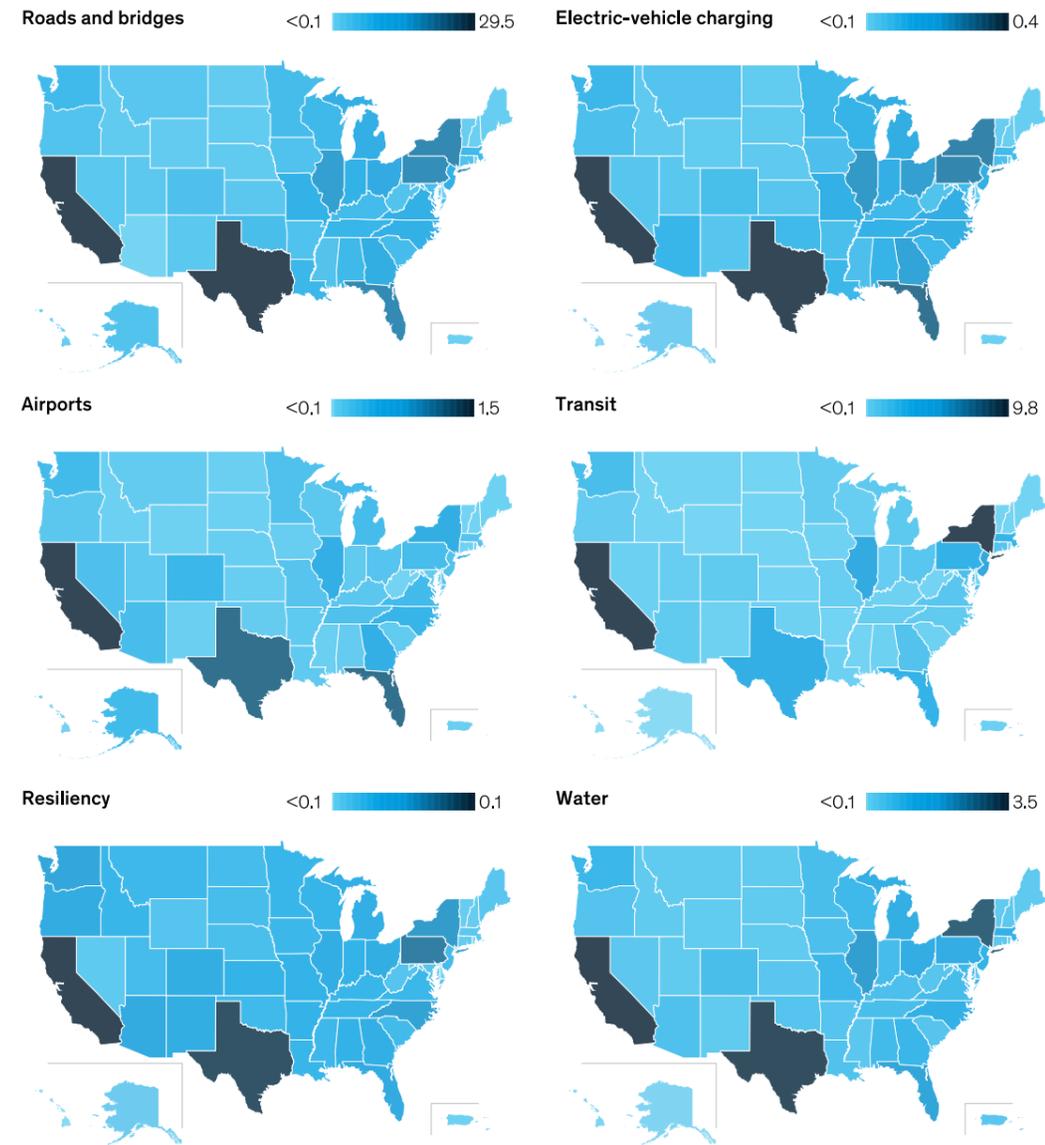


## State by state

Some \$300 billion in formula grants (including allocations to the Highway Trust Fund) will be disbursed through the IIJA. These formula grants provide predetermined funding to states based on various factors (for example, population size). Most formula-based funding is dedicated to roads and bridges—and most of that is dedicated to the two states with the most highway infrastructure: Texas and California.

### The US Infrastructure Investment and Jobs Act will direct spending on formula grants to each of the 50 states.

Infrastructure Investment and Jobs Act (IIJA) formula grants, by state, \$ billion



While the IIJA aims to bring much-needed investment to the ageing infrastructure of the United States, the legislation also raises new questions, such as how to balance integrity, equity, and efficiency in administering new funds; how to scale up loan and grant programs quickly; how to ensure that new programs are designed to meet the evolving needs of individuals and businesses; and how to embed sustainability and equity in new infrastructure investments. By answering these and other important questions, government and business leaders can help ensure that the IIJA delivers a transformation for the US economy.



## Construction steel news headlines

### construction market and regulations

The European Union has announced a multi-billion-euro plan to support construction and climate projects, in what is being seen as an alternative to China's Belt and Road Initiative. The Global Gateway plan will reveal a €300 billion investment fund, to be rolled out between now and 2027. The European Commission said the plan "will focus on physical infrastructure – such as fibre optic cables, clean transport corridors, clean power transmission lines - to strengthen digital, transport and energy networks." [Link](#)

Over the past year, supply chain snarls and pandemic-related uncertainty have continued to affect the construction industry, leading to high materials costs, delays and difficulty finding skilled labor. At the same time, some costs remained relatively flat, the impact of COVID-19 is easing in much of the U.S. and passage of the Infrastructure Investment and Jobs Act (IIJA) will infuse federal money for a variety of projects. ConstructionDrive has picked up interesting graphs that illustrate some of the challenges contractors have faced and break down the machinations behind key pain points. [Link](#)

Investors reluctant to adopt green building practices on projects as RICS survey finds more than half of industry investors did not take biodiversity into account on schemes. Construction investors are still reluctant to adopt carbon neutral designs and building practices in projects, according to new research by the Royal Institution of Chartered Surveyors. The body's Q3 construction survey found that nearly a quarter, 22%, of respondents said they had seen no shift at all in support towards

green construction practices. [Link](#)

An international coalition of construction experts has published what is said to be the world's first universal standard for reporting carbon dioxide emissions used in the building and lifecycle of structures in the industry. The International Cost Management Standard (ICMS3) sets out a methodology for construction professionals and developers to account for the amount of embodied carbon their projects will create, whether through the delivery of new roads, schools, offices, housing or railways. It is hoped that ICMS3 will help the construction sector embrace net-zero as a global, interconnected industry. [Link](#)

Built environment can meet net zero by 2050 but only with urgent government action. Detailed roadmap launched at COP26 by coalition of architects and other construction professionals. A net zero built environment sector by 2050 is achievable – but only with urgent government action. More than 100 organisations led by the UK Green Building Council were today due to publish a Net Zero Whole Life Carbon Roadmap for the nation's built environment detailing the necessary actions they say government and industry must take to achieve net zero across the sector. [Link](#)

UK's infrastructure priorities over the next three decades revealed as National Infrastructure Commission sets out nine areas most in need of government investment ahead of official report due in 2023. Hydrogen, carbon capture and renewable energy will be at the heart of the next official assessment of the UK's long term infrastructure needs. The National Infrastructure Commission has set out the areas which are most in need of investment over the next

10 to 30 years to decarbonise the economy, protect the environment and 'level up' poorer regions. [Link](#)

The euro zone housing market is heating up, increasing the chances of a correction in both the residential and commercial segments, the European Central Bank said in a stability report. With families building up savings during pandemic and increasingly working from home, demand for property is on the rise, pushing house price growth to over 7%, its fastest rate since 2005. "Risks of price corrections over the medium term have increased substantially amid rising estimates of house price overvaluations," the ECB said in a biannual stability report. [Link](#)

The average prices of new homes in China dropped 0.2% in October from September, the first such decline since March 2015. Resale prices have also fallen in 64 of 70 major cities NBS tracks. New construction starts fell 33% year-on-year in October, deepening the 14% fall seen in September. [Link](#)

Investment in the construction technology ecosystem reached a record level of US\$4.5 billion in 2021, triple the amount of money invested in 2020. North America and Europe are the leading regions and the US is the country with the most companies in the Top 50 ConTech Startups 2021. [Link](#)

### Building materials & construction technologies

The governments of Canada, Germany, India, the UAE and the UK have signed a commitment to support the development of markets for low-carbon cement and concrete in their countries. The governments will create market incentives for purchasers, review and update product standards to allow low-carbon

materials to be used in all safe settings and promote their use through their public sector tendering rules. [Link](#)

The EU is to invest more than €1.1bn in seven large-scale projects aimed at decarbonising European industry. Coming from the EU's Innovation Fund, the grants will support breakthrough technologies in energy-intensive industries in Belgium, Italy, Finland, France, the Netherlands, Norway, Spain and Sweden. [Link](#)

The United States will lift tariffs on some steel and aluminium imports coming from Europe beginning Dec. 1 as part of an agreement to ease trade tensions between the two. The agreement sets a quota allowing a certain amount of steel and aluminium to be imported from the European Union duty-free, with anything above that level subject to existing tariffs. In response, the EU said it will remove billions of dollars worth of retaliatory tariffs on bourbon and other American-made products that were set to increase in December. [Link](#)

Engineers from South Korea have invented a cement-based composite that can be used in concrete to make structures that generate and store electricity through exposure to external mechanical energy sources like footsteps, wind, rain, and waves. By turning structures into power sources, the cement will crack the problem of the built environment consuming 40% of the world's energy. [Link](#)

Steel industry to play an integral role in steering India into a \$5 trillion economy by 2025 according to the latest EY – CII report. "Government support in terms of logistics, ports, roads, rail and water supply amongst others is required by the steel sector for achieving the target of 300 MT steel production by 2030". The Indian steel sector has been vibrant and growing at a CAGR of about 5% to 6% year-on-year with V-shaped demand recovery post-covid. [Link](#)

Modular builder CEO: 'Katerra's failure was spectacular'. The head of Volumetric Building Companies shares why he purchased the bankrupt firm's California factory and how he will avoid similar pitfalls. As availability of construction materials and their costs remain volatile, Philadelphia-based modular builder Volumetric Building Companies made a move to the West Coast to ensure its customers there continue to be served. The company purchased Katerra's assets in Tracy, California, including its state-of-the-art manufacturing facility for \$21.25 million in August. [Link](#)

German construction manufacturer Peri and Austrian contractor Strabag have created Europe's largest 3D-printed office space and Austria's first 3D-printed building. The 125 sq m building was printed in 45 hours at Strabag's asphalt mixing plant in the northern Austrian town of Hausleiten using a dry mortar supplied by Lafarge applied by a Bod2 printer

### construction sector players

made by Danish firm Cobod. [Link](#) US infrastructure bill impacted the construction stocks. When markets opened, stocks of heavy-equipment manufacturer Caterpillar posted one of the biggest jumps, at more than 4%. Stocks of steel manufacturers United States Steel Corporation and Nucor Corporation also surged more than 4%. Alabama's Vulcan Materials—the country's largest producer of construction materials such as gravel, crushed stone, and sand—and North Carolina-headquartered Martin Marietta Materials—supplier of construction aggregates and heavy building materials—were both up more than 3%. [Link](#)

Dallas-based technical, professional and construction services firm Jacobs Engineering group posted revenue of \$3.6 billion in the Q4 2021, a 1.9% increase from Q4 2020. Jacobs' backlog rose to a record-high \$26.6 billion year-over-year, a 12%

increase. [Link](#) Another US-based multinational contractor Fluor announced that Q3 2021 revenue fell 10% year over year to \$3.1 billion, due to lower revenue streams in its business units focused on government and infrastructure work. Backlog fell as well to \$21 billion, down 21% from a year ago, but basically flat from what it showed in Q2 2021. [Link](#) In the meantime, Tutor Perini, took a hit to both its revenue and profits in the third quarter due to its public sector clients not paying their bills amid funding uncertainty as the infrastructure bill languishes in Congress. The firm's revenues fell 18% compared to a year ago. The firm's backlog rose 11.8% compared to Q2 2021 numbers. [Link](#)

Holcim says it wants to reach at least 40% of sustainable financing by 2024 as it intends to put climate action, water preservation and safety at the heart of its strategy to do this. The company has linked this commitment with the completion of two new sustainability-linked financing transactions worth above Euro2.8bn. It has also joined the United Nations Global Compact Chief Financial Officers Taskforce alongside 60 companies representing a combined US\$1.7Tn in market capitalisation which aligns members' finance strategies with the United Nations Sustainable Development Goals. [Link](#)

Four former senior staff members at Katerra, the offsite construction firm that declared bankruptcy earlier this year, have landed new roles with a London-based construction technology company. The former Katerra directors joined U.S. operations last month at Modulous, which is opening its first U.S. office in the Seattle region. The contech company offers a digitised platform to modernise the design and construction process of modular housing – it is working with its delivery partners on five pilot multifamily housing developments in the coming 12 months in the U.K. and is looking to gain similar traction in the U.S. starting in the first and second quarter in 2022. [Link](#)

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