



2022 Top 100

Strategic North
American
Infrastructure
Project Report



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INTRODUCTION

Each year, the CG/LA Infrastructure team leverages its extensive network of infrastructure professionals along with months of in-house research to produce a list of the Strategic 100 most important infrastructure projects in the United States. These projects represent opportunity – for improved quality of life, economic growth, job creation, and solving complex problems. As Norman Anderson, remarks in his book, Vision “We use the term strategic infrastructure for a reason. Everything we build, every dollar we spend needs to be focused on maximizing economic, social and environmental benefits.”¹ Given the November 2021 passing of the Infrastructure Investment and Jobs Act (IIJA or Bipartisan Infrastructure Law (BIL)),

This report and list of strategic projects is timely and necessary. It will enable decision makers to maximize efficiency by highlighting the projects that will not only fulfill policy goals but drive additive benefits forward. This report will give a brief introduction of the key themes in the Infrastructure Incentive Policy (IIP) embodied in the recently enacted package of laws enacted by the Congress (e.g. the Rescue Act, the IIJA, the Inflation Reduction Act and the CHIPS Act) to serve as context for the current administration's infrastructure objectives and its policies for achieving them, followed by a discussion of opportunities for both optimism and action. Then, it will provide an overview of infrastructure projects currently under development – giving a sense of current projects that have received funding and how they compare to the projects on our Strategic 100. Next, we dedicate special sections to the energy transition and supply chain, recognizing specific projects that are advancing these initiatives. Finally, we present the Strategic 100 – current projects in the United States that are strategically valuable, shovel-worthy, and ready to deliver opportunity in the next eighteen months.

Key Themes of the IIJA

The IIP is landmark legislation, injecting nearly \$2 trillion across chronically under-funded infrastructure sectors. It also serves to pivot the United States toward a future that aligns with the Fourth Industrial Revolution (also known as Industry 4.0). Notably, it seeks to advance U.S. society and U.S. global leadership by leveraging technology to solve complex problems of the commons that have been

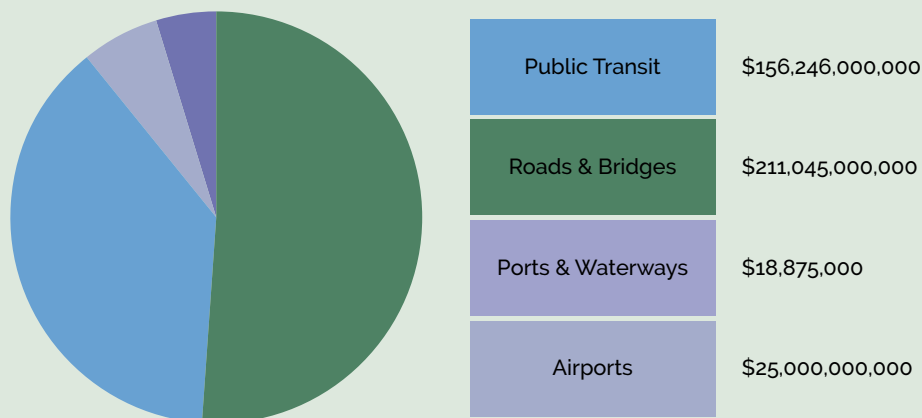
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neglected for too long. It devotes attention to the environment – dedicating hundreds of billions toward clean energy, carbon reduction, clean water, and cleaning up brownfield sites that are detrimental to communities². It also takes important initiative toward addressing inequities – providing \$223 billion for connecting rural communities, increasing broadband deployment to under served communities, and supporting improvements and modernization of multi-modal transit options³. Finally, it creates an opportunity to strengthen U.S. manufacturing and supply chains – reinforcing and modernizing the railroads, highways, bridges, airports, ports, and inland waterways that enable critical components such as steel and microchips, agriculture, and other products to arrive on time, more efficiently and environmentally-conscious than ever before. We cover these themes in more detail below.

Priority Environmental Issues

The package enables and prioritizes significant investment in projects to address critical environmental issues. These efforts include clean water and wastewater actions; clean energy production, storage, and transmission; cleanup of brownfield sites; and new efforts to expand low carbon and zero carbon initiatives, ranging from electric vehicle charging networks to capturing carbon from the air. Importantly, most of these efforts also build in crucial funding and direction for improving the resiliency of U.S. infrastructure, by making our energy grid more secure, diversifying

FIGURE 1: IIJA Transportation Funding Breakdown



energy sources with renewables, and upgrading critical infrastructure to better withstand climate-related disasters. Projects addressing climate change and the energy transition, and, in particular, hydrogen production and carbon capture are given urgency and priority. (See section three).

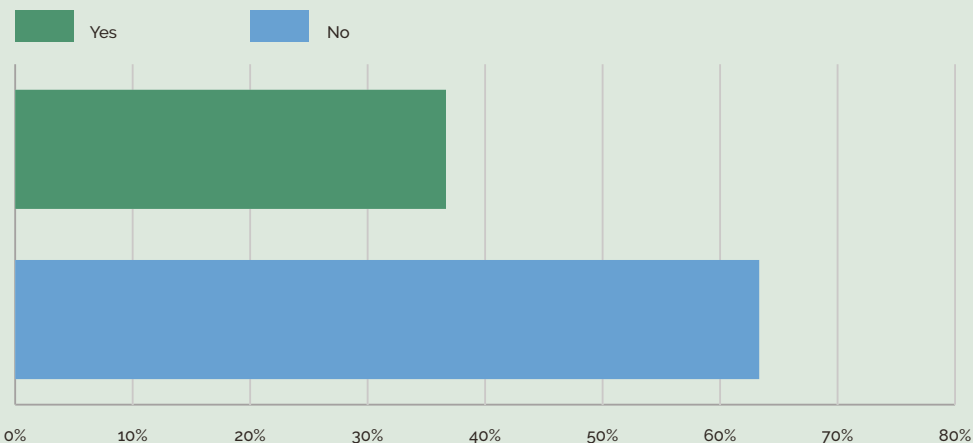
Strengthening the Supply Chain

With food and material shortages, bottlenecks, and overwhelmed ports and inflation, Covid-19 has revealed the inherent pain points and far reaching economic impacts of our deeply interconnected global supply chain. The IIJA addresses these challenges by investing heavily in the transportation infrastructure that enables goods to travel efficiently. In fact, it devotes the largest investment – over \$686 billion – to the combined transportation subsectors that move people and

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FIGURE 2:

Are you optimistic that the \$1.2 trillion funding from IIJA and the subsequent actions taken by the administration to provide guidance for releasing funds will lead to expediting project delivery?



goods where they need to go. Figure 1 shows the breakdown of investments in each of the transportation categories: roads and bridges, railroads, transit, airports, ports. Additionally, many of these investments also seek to improve safety, enhance resiliency, and lower emissions by reducing congestion through efficient design and innovative technologies. With well-prioritized project pipelines, these investments have the potential to significantly support current initiatives for onshoring domestic manufacturing for critical components, such as steel and microchips. Section Four of this report highlights current initiatives and investments in domestic manufacturing and the specific projects that will reinforce them. As the chart shows, the IIJA allocates just over half of the funding to roads and bridges.

SERVING THE UNDERSERVED

Infrastructure is a powerful tool in the transformation of communities. When properly deployed, investment in infrastructure can transform the lives of the communities they serve. The IIJA provides specific funding and guidance for communities that have been traditionally left-

behind. For example, it provides \$65 billion to enhance nation-wide broadband deployment and improve other access issues for rural and low-income communities. It also allocates specific funding for improving rural roads and advancing the Appalachian Development Highway System, which will develop highway corridors and spur economic activity in a historically isolated region. Furthermore, it devotes more than \$156 billion to improving public transit infrastructure, which will increase mobility options for lower-income populations, senior citizens, and persons with disabilities.⁴ Moreover, it sets aside more than \$13.5 billion specifically for Tribal infrastructure programs. Each of these programs support infrastructure development for communities and regions that are currently underserved, and in some cases even harmed, by existing infrastructure.

Opportunity for Optimism and Action

Given the priorities and investments discussed above, the infrastructure community has every reason to be energized and optimistic. Indeed, at the Blueprint 2025 Initiative's quarterly

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member meeting in May 2022, members discussed the six-month progress of the administration's infrastructure package, with one member remarking, "I think there's a whole generation behind us that really would think that maybe for the first time in the universe infrastructure can be cool." Yet, a recent survey we conducted on the state of U.S. infrastructure shows that few infrastructure professionals are optimistic. As Figure 2 shows, 62% of respondents are not optimistic that the IIJA will expedite project delivery, and when asked to rate particular issues as they relate to moving projects forward, over half of respondents noted lack of funding and permitting delays as serious concerns. Similar sentiments arose in the recent Blueprint discussion, calling for better vehicles for private investment; more collaboration between local, state, and federal governments; better knowledge sharing to amplify the benefits of technology; and streamlined processes for delivering projects cost-effectively.

So while the new legislation is a tremendous down payment on a much needed investment for our future, it is only part of the equation. In order to make this down payment truly transformative, we need to have a clear understanding of which projects will enable these goals to happen, how different projects can work together to maximize the benefits, and, importantly, how these projects can be efficiently evaluated and authorized. A piecemeal, "government as usual," approach is not only short-sighted but also irresponsible – it will still use the money but will yield a much smaller return on our investment with a longer time horizon. As Ed Glaeser, a Harvard University distinguished Professor of Economics notes, "I keenly believe that there is no area in which it is easier to waste tens of billions of dollars than infrastructure, which makes doing projects for the wrong reasons phenomenally costly⁵." In other words, we not only need to have a clear vision for what we want our communities to look like in the near- and longer-term, but we also need a clear understanding of how to get there⁶. Making these goals a reality and doing so responsibly will entail finding synergies between the vision, the money, and the projects that will actually benefit the users. Importantly, maximizing these goals will require leveraging innovation, networks of expertise, and existing tools that are currently siloed. Moreover, they will require creativity in financing such as developing or redesigning State Infrastructure Banks (SIBs) to serve a broader variety of infrastructure goals and creating an independent National

Infrastructure Bank that is not subject to political whim.

STRETCHING THE DOLLAR

As we mentioned, this legislative package is a down payment – it cannot and should not bear the brunt of building our future when we already have \$30.4 trillion in national debt⁷. Furthermore, only about half of the \$1.2 trillion in spending authorized by the IIJA is new funding – the rest is normal, programmatic funding, and the new funding levels it authorizes are still subject to the availability of future appropriations. So, where can the United States effectively stretch resources to make project delivery efficient and cost-effective? While there are many conceivable ways, we will highlight two important considerations: de-risking and diversifying, both of which are instrumental to delivering good projects quickly and on-budget.

De-risking and Expediting

The yet to be seen feature of the legislative package, and perhaps its linch pin, is the promised follow on law to improve and expedite the process for identifying and advancing critical infrastructure projects. It is an inescapable truth that the success of any effort to transition to a more sustainable system will be dependent on our ability to identify the right projects get them permitted promptly and then properly financed and built—all without unreasonably impacting economies. The outlines we have seen identifying elements of this initiative are constructive and could improve the prospects of the projects under discussion here. We would, however, suggest some additional provisions:

- As we have suggested before, the environmental review process needs to be streamlined and digitalized and there needs to be a National Environmental Database to avoid reinvention of wheels for every project.

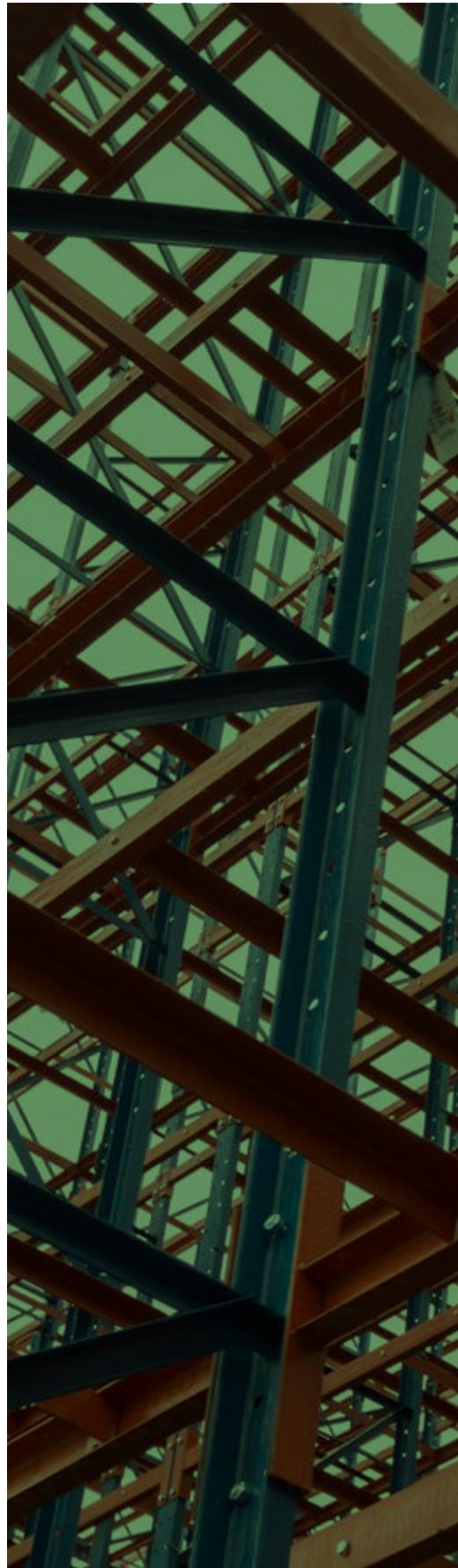
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- There needs to be a network of a National Infrastructure Bank and State Infrastructure Banks to assist in studying the feasibility of potential projects, funding the development process and bringing in private sector funding and expertise to support and expedite investment decisions.
- The Congress needs to be more involved in efforts to expedite decisions on the projects which are most critical and essential to achievement of national goals.
- The process for coordinating public/private research and collaboration in the transition from discovery to commercialization deserves emphasis and enhancement.
- As with environmental review, we need to improve efficiency and transparency by streamlining and digitalizing procurement, project management and oversight.

Diversifying

There are many options for localizing infrastructure planning and implementation and bringing in private funding to supplant or supplement federal dollars. There is a clear need to stretch the federal funding, create investment opportunities, and responsibly pay for the projects that will improve Americans' quality of life. [One illustrative example is a Fiber to the Home (FTTH) broadband project in Fort Dodge, Iowa. The lack of reliable connectivity in Fort Dodge was apparent, especially during the pandemic when school-aged children actually returned to schools and huddled outside the schools' windows to try to connect to the internet. As such, six local banks came together as a consortium, managed by one of the banks, to loan the city the money to deploy broadband to every premise in the city. Since the loan is essentially a home-equity loan, the city only pays interest on what it borrows as they use it, which incentivizes them to move the project forward faster to bring in user-revenue]. This example is a local solution to a local problem, which is exactly the point. Local communities and states not only have a better idea of their unique needs, but they are also able to be more nimble than the lumbering federal government.

There is an existing network of State Infrastructure Banks and Community Development Financial Institutions which are capable, in some instances, of leveraging federal funds for some types of projects. Unfortunately, however, most of these banks are narrowly focused on transportation projects



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and do not have the broad focus needed to deal with the new infrastructure challenges of this century. Thus, though federal law authorizes and provides some funding for these banks, eleven states still do not have SIBs and of the states that do have them, 38 only finance transportation projects and only 24 of those are actively issuing loans⁹. That is, fewer than half of states are actively using an SIB, even if they do have one. Recent research by Chen (2016) shows a clear and strong relationship between SIB funding of projects and capital expenditure on projects: roughly every \$1 dollar of SIB loan disbursements to project sponsors three years ago yields a \$3-4 increase in state and local capital expenditures in the current year¹⁰. The author notes, "This research finds that one dollar of SIB loan disbursements has a much larger stimulating fiscal impact than one dollar of the traditional federal highways grants on state and local highway finance."¹¹ Essentially, well-crafted SIBs offer an important avenue for supplementing federal funding, allowing a flexibility that federal funds, alone, cannot provide. Other sources of financing such as private pension funds, commercial loans, and equity could also be relied upon to provide a multiplier effect for federal funding and would help control some of the major issues we see such as inflation and the need for multi-year investment commitments. A balanced approach rather than depending solely on taxes and user fees provides more flexibility, more economic opportunity, and the ability to push projects forward more quickly, which prevents ballooning costs due to unnecessary delays.



02

**Projects
by the
Numbers**

II. Projects by the Numbers

In this section, we provide an overview of the value and number of projects both on the Strategic 100 and those that have received IIJA funding so far. We provide comparisons between and among sectors and regions to give an idea of the state of U.S. infrastructure and strategically valuable projects

Projects and Funding by Region

As of late May 2022, the federal government had awarded or allocated funds to 4,313 projects through the IIJA for a total of over \$23 billion¹². Figure 3 provides a breakdown of the distribution of funding by region. The South received the greatest allocation with over \$7 billion for 1,508 projects. The following map shows the geographic regions and regional divisions as a reference. Florida (132 projects) and Illinois (105 projects) received the largest distributions with just over \$1.5 billion each.

US Regional Divisions

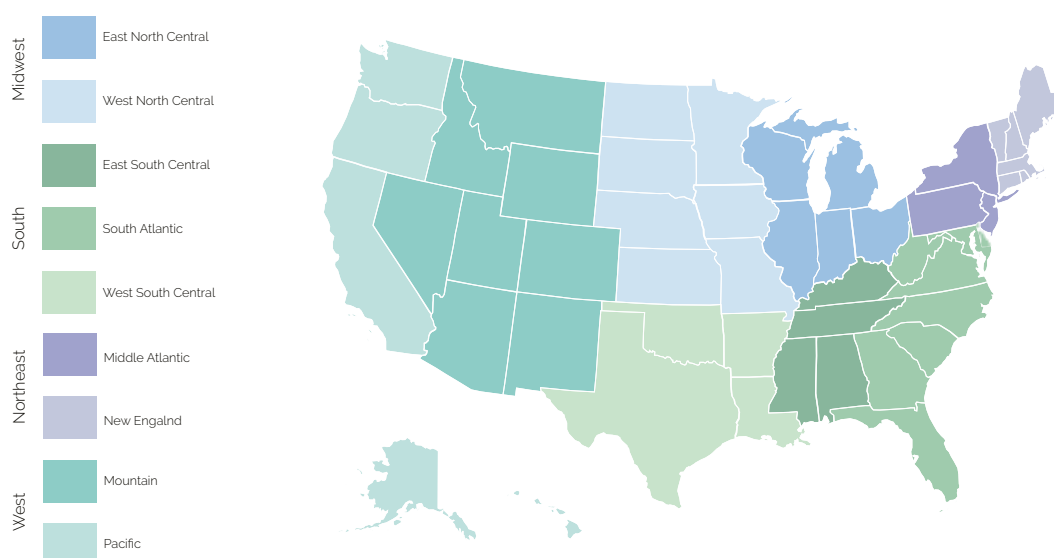


FIGURE 4: S100 Funding by Region

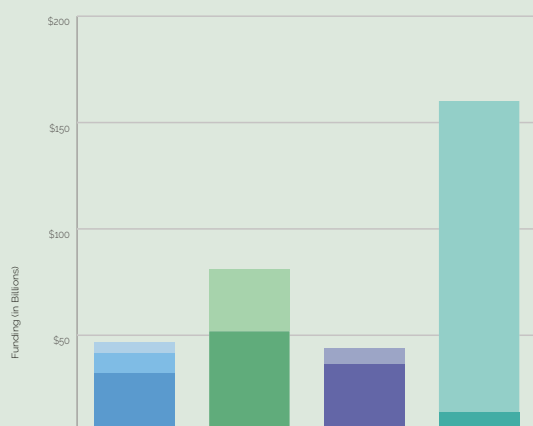
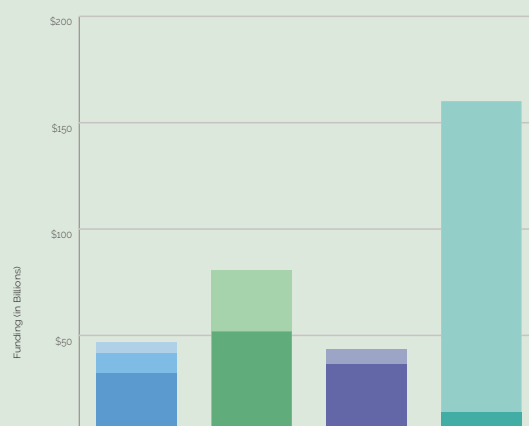


FIGURE 4: S100 Funding by Region



II. Projects by the Numbers

The largest U.S. states by area, Alaska, Texas, and California, had the greatest number of projects receive funding with 261, 258, and 245 projects, respectively.

On the Strategic 100, only 17 of the projects have received funding from IIJA thus far, for a total of just over \$3.5 billion; although, a few additional projects have either applied or anticipate additional funding, for an additional nearly \$9 billion. To put that in perspective, the total amount of announced possible and awarded funding for Strategic 100 projects is over half of the total amount awarded for all 4,313 projects as of late May 2022. Figure 4 provides a breakdown of the Strategic 100 projects by regional division. Projects are relatively evenly dispersed with 33 projects in the South, 28 projects in the West, 20 projects in the Midwest, and 19 projects in the Northeast¹⁴.

Projects and Funding by Sectors

Looking at infrastructure sectors, Figure 5 shows the breakdown of IIJA funding by sector for the 4,313 projects. Transportation and water/wastewater projects receive the most funding, which is consistent with historical trends and needs. For example, the American Society of Civil Engineers gives America's water infrastructure a C-, wastewater infrastructure a D+, and stormwater infrastructure a D, citing increases in funding for each of these essential for improving public health and safety and saving billions of dollars in costly emergency-related repairs¹⁵. One project worth highlighting, the Potomac River Tunnel Project, works to improve its combined stormwater/wastewater system and improve the quality of a watershed home to 18 million people..

Figure 6: S100 Funding By Sector

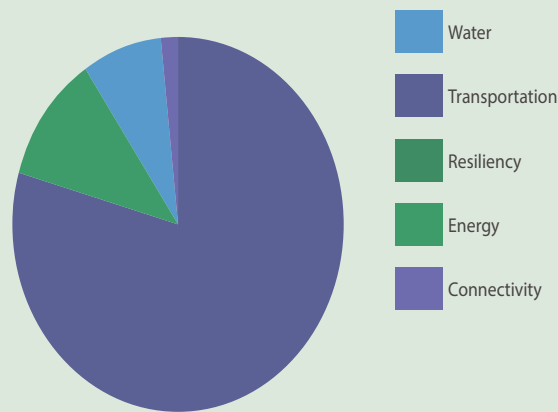
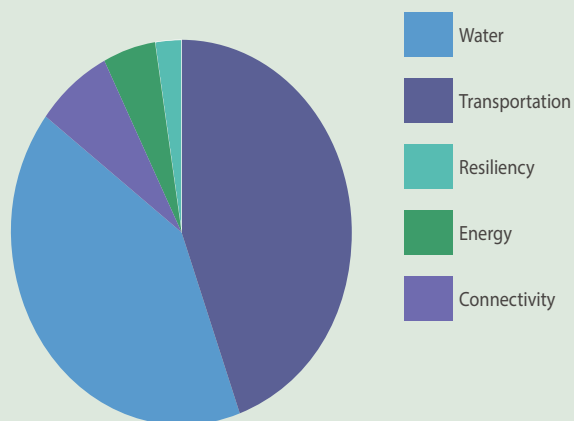


Figure 5: IIJA Funding By Sector



Spotlight on Water

Similar to the IJJA, as shown in Figure 6, more than half (59) of the Strategic 100 projects are in the transportation sector, which also represents the largest value with over \$260 billion (79% of the total). Among transportation projects, public transit projects represent nearly half with a total value of over \$200 billion (78% of the transportation total).

Public transportation investment provides innumerable benefits including reducing road congestion and therefore emissions; increased property values, which can increase local tax accumulation; and perhaps most importantly, better, more-reliable access to healthcare, education, and employment, particularly for lower-income communities who may not have adequate access otherwise. In short, these investments improve the quality of life for Americans, providing direct benefits for both users and the broader communities that the projects serve. The investments in transportation infrastructure also contribute to significant efforts to strengthen the domestic supply chain, which we discuss in the last section. Projects across the energy sector represent the next largest distribution, with 21 projects and a total value of nearly \$37 billion¹⁶. Notably, reaching our net-zero emissions targets by 2050 will require government flexibility to unblock and promote research and innovation in order to prevent locking into outdated technologies and methods. We dedicate Section 3 to the energy sector, specifically, and the transformational projects that are moving us in the right direction. And although connectivity projects may not represent a significant number of projects on our list, broadband deployment projects do have tremendous potential for closing the digital divide, improving the quality of life for communities and municipalities, and enabling significant future economic opportunities. For that matter, connecting communities enables them to more efficiently use available and new technologies to develop better, smarter infrastructure. For that reason, we provide a spotlight on California's ambitious broadband deployment program.

Potomac River Tunnel Project

Location: Washington, D.C.
Sector: Water - Wastewater
Value: \$500 million

The DC Clean Rivers - Potomac River Tunnel Project is an ambitious project to capture Combined Sewer Overflows (CSOs) and convey them to the Blue Plains Advanced Wastewater Treatment Plant for treatment. When complete, the controls will reduce CSO volume entering

the Potomac River by 93% and reduce the frequency of events from approximately 74 to 4 events in a year of average rainfall. The project will significantly improve the water quality of both the Potomac River and the Chesapeake Bay. The National Park Service has already approved DC Water's proposal to move forward with construction, and DC Water anticipates beginning the procurement process, starting with construction management, in August 2022.



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Spotlight on Connectivity

California Middle Mile Broadband

Location: California

Sector: Connectivity - Broadband

Value: \$3.25 billion

The California Middle Mile Broadband Initiative is a network of open-access, state-owned high capacity fiber lines that will connect to last mile infrastructure to connect homes and businesses with local networks. The initiative will improve access to education, healthcare, and employment opportunities throughout the state, giving 675,000 underserved Californians access to a broadband network. As Governor Newsom stated in prepared remarks, "Access to high speed internet can mean the difference between launching a successful career and being without work. Once constructed, this network will be the largest in the world – and our action today will make the promise of broadband for all a reality." Recently, California awarded two contracts to supply the necessary materials for the \$3.25 billion, 3,000 mile broadband network. This critical step enables the initiative to move forward toward construction.



Spotlight on Smart Infrastructure

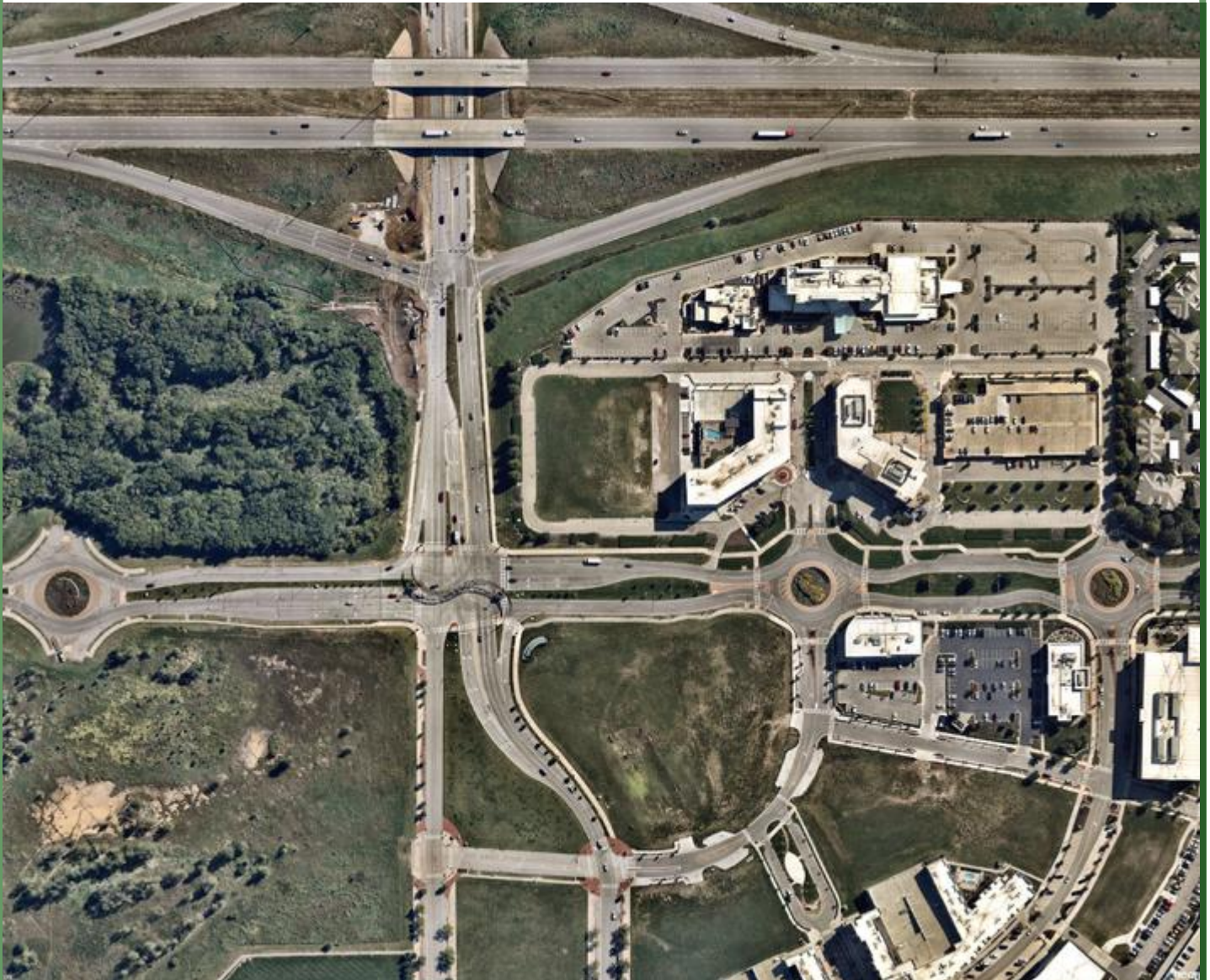
Smart City Showcase, Lenexa City Center

Location: Kansas

Sector: Transportation - Smart

Value: \$250 million

The Smart City Initiative in Lenexa, Kansas will use Integrated Roadways' Smart Pavement technology in five key intersections in the city's center, as part of a 10-year transformational infrastructure pilot program. The Smart Pavement embeds digital technology and fiber optic connectivity and is fully upgradeable, enabling "Wi-Fi access, 5G, wireless EV charging and more through antennas in the expansion ports, edge services and cloud access." The City of Lenexa is ready to move forward with construction of this project and anticipates breaking ground later this summer.



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03

**An Effective
Energy
Transition**

III. An Effective Energy Transition

At its core, the energy transition involves decreasing our reliance on fossil fuels and increasing the availability of low- and zero-carbon energy options. The United States has set a goal of halving its net emissions by 2035 and reaching net-zero emissions by 2050. Toward that end, the IIJA allocates nearly \$75 billion toward the clean energy transition, including authorizations for renewable energy sources, clean energy storage and transmission, grid modernization and resiliency, and research and development of new technologies, among others¹⁷. Importantly, it includes \$8 billion to establish four clean hydrogen hubs and \$3.5 billion to establish four clean direct air capture hubs, with an additional nearly \$8 billion to support the advancement of carbon capture, more generally. As such, this section focuses on these two initiatives and how to think strategically about where these hubs can be located to maximize their efficient use of the regional resources available to them. The projects we highlight in this section demonstrate examples of using existing infrastructure, existing skilled workforces, and innovative technology to drive this transition forward intelligently.

Carbon Capture

An air purifier and power provider, Carbon Capture Utilization and Storage (CCUS) is a dual action plan that features capture and storage (CCS) as well as capture and utilization (CCU), offering significant strategic value in meaningfully decreasing climate impacts by transitioning to net-zero carbon emissions through four mechanisms: (1) hampering emissions from current energy assets; (2) posing as a well-suited alternative for sectors with "hard-to-abate" emissions; (3) providing low-carbon hydrogen production; (4) and removing carbon from the atmosphere permanently. According to the Global CCS Institute, CCUS hubs currently stand out as the only option that will significantly reduce direct emissions from other industrial point sources such as fossil fuel power plants²⁰, estimated to confront up to 32% of global CO₂ emissions by 2050 (IEA, 2020).

While countries and organizations increasingly have begun to strive towards net-zero emission targets, looking to introduce this advantageous technology on the forefront of clean energy will require government support to put CCUS on the fast-track in order to meet net-zero aspirations. Inconsistent policy support, absence of emissions penalties, and difficulty securing financing have all led to squandered CCUS progress.

Recently in the United States, however, projects have seen motivation and support from policies such as California's Low Carbon Fuel Standard and the U.S. Section 45Q, making it possible for CCUS projects to move forward in development by offering tax credits based on the amount of carbon captured and sequestered. The IIJA stresses the importance of such developments



for CCUS hubs as well, with Congress emphasizing large-scale deployment of CCUS as a critical part for achieving mid-century climate goals. Following these findings, Congress has authorized robust funding to develop four regional DAC hubs along with countless monumental clean energy programs to be funded through the Department of Energy (DOE). These hubs will see a total of \$3.5 billion in program funding and an overall \$18.9 billion in funding for carbon management infrastructure.

Spotlight on Carbon Capture

Permian Direct Air Capture (DAC1)

Location: Texas
Sector: Energy
Carbon Capture
Value: \$1 billion



Permian Direct Air Capture, in the Permian Basin in Texas, will be the world's largest Direct Air Capture facility and is expecting to break ground this fall. This facility will remove one million metric tons of carbon dioxide, the equivalent of 215,000 vehicle emissions, annually. The U.S. Department of Energy recently announced a notice of intent to invest \$3.5 billion for the development of Regional Direct Air Capture hubs, and 1PointFive's DAC1 project is exactly the model needed to push this initiative forward. As U.S. Secretary of Energy Jennifer M. Granholm remarked, "President Biden's Bipartisan Infrastructure Law is funding new technologies that will not only make our carbon-free future a reality but will help position the U.S. as a net-zero leader while creating good-paying jobs for a transitioning clean energy workforce."

In addition to recognizing the significant impact that CCUS will have on curbing climate change, these projects are also driving "regional economic development, technological innovation, and high-wage employment¹⁸." How can we effectively deploy these technologies and locate these hubs efficiently to maximize the resources we have, reduce waste, and catalyze technological advancement and

economic transformation? In addition to critical policy support, hub placement will require land development that has the capacity to store massive amounts of CO₂, and the capacity to build or transition national delivery infrastructure to ensure strategic and timely transportation of hydrogen for further use. To envision a "green" future in which CCUS is incorporated into our communities, it is imperative that these multiple factors are taken into consideration. For example, Figure 7 shows a map of recently announced CCS projects on the Gulf Coast.

The DAC1 project along with each of these projects on the map essentially enables a linked cluster of industrial CO₂ sources, particularly among some of the highest emitters: petrochemical and manufacturing facilities. Moreover, this captured carbon creates new market possibilities as it is stored and then sold for other uses, such as synthetic fuels when combined with hydrogen. Furthermore, proposals to overlap renewable off-shore wind energy (for example) to power direct air capture facilities would enable companies to take advantage of a location with built-in expertise¹⁹. Both the Permian Basin and the Gulf have an ample supply of oil and natural gas-trained workforces, making the

jump to renewable energy and hydrogen production an easier and potentially faster transition. Intimately related to carbon capture, utilization, and storage is the production and transmission of hydrogen, another initiative receiving ample attention for its potential in fast tracking the energy transition. As noted, the IIJA provides \$10 billion for the creation of at least four hydrogen hubs. Electricity from clean energy sources such as nuclear, hydro, geothermal, ocean thermal energy conversion (OTEC), solar, and wind can produce hydrogen, but captured carbon from fossil fuels can also work in tandem with hydrogen, ultimately reducing the carbon footprint of processing. Currently, natural gas drives the production of hydrogen (so-called “gray” hydrogen), but developments in “blue” hydrogen using carbon waste, and “green” hydrogen using clean energy are also key advancements that can direct the creation of hydrogen hubs. Moreover, the diversity of off-takers of hydrogen products can facilitate an efficient location strategy. That is, the same economies of scale and location that will drive the creation of CCUS hubs also will factor in the creation of clean hydrogen hubs.

Spotlight on Clean Hydrogen

IPP Renewed

Location: Utah
Sector: Energy - Generation/Transmission
Value: \$1 billion

Intermountain Power Project (IPP Renewed) is a transformational project that retires existing coal-fueled units and replaces them with new, natural-gas/hydrogen-capable fueled units. IPP will use renewable energy-powered electrolysis to split water into oxygen and hydrogen, storing the latter in underground salt caverns for use as fuel to drive electricity-generating turbines. The project intends to incrementally increase green hydrogen production and transmission, with the goal of 100% green hydrogen by 2045. The project also includes modernization of its Southern Transmission System, which connects with Southern California. The Department of Energy’s Loan Program Office recently closed a \$504.4 million loan guarantee for the Advanced Clean Energy Storage hub in Delta, Utah, which will capture excess renewable energy when it is most abundant, store it as hydrogen, then deploy it as fuel for IPP Renewed. “I’m pleased to see DOE support Utah’s efforts to become a world leader in hydrogen,” said U.S. Senator Mitt Romney (UT). These two projects, combined, represent an important initiative in moving the United States closer to green hydrogen production, storage, and transmission.

ACES Delta along with several projects are pushing forward this energy transition effectively and concurrently displaying exciting innovations such as utilizing salt caverns to store massive amounts of energy that would require

Advanced Clean Energy Storage (ACES)

Location: Texas
Sector: Energy - Carbon Capture
Value: \$1 billion

less developed space. Furthermore, project sponsors predict it will provide significant economic benefits to the state and supporting regions with 400 local construction jobs and \$180 million in state property taxes. Another potential project we look forward to next year is a new venture called “Hydrogen City” in Texas. Similarly to the CCUS facilities and IPP Renewed/ACES, Hydrogen City makes excellent use of land capacity (salt dome storage at Piedras Pintas), existing energy resources (renewable solar and wind sources on the ERCOT grid), and a strategic location near the Ports of Corpus Christi and Brownsville to supply its large market of potential hydrogen off-takers, such as green ammonia for exports and fertilizers, sustainable aviation fuel, sustainable rocket fuel, and fuel-switching power plants. Likewise, recent research supporting Ohio’s move to become a hydrogen hub maximizes these same benefits: a large supply of natural gas, abundant pipeline infrastructure and industrial assets, ample potential off-takers, and an energy-trained workforce in the Appalachian region who can transition readily²¹. Notably the shift to “green” hydrogen relies on renewable energy sources to power the production process; therefore, advancements in wind, solar, and battery storage technologies are critical to effectively powering the hydrogen solution.

III. An Effective Energy Transition

Clean Energy

Energy from renewable sources is an important enabler of electrification as well as strengthening U.S. electrical grids by providing diverse energy sources from nuclear, wind, solar, water, and battery storage. Transitioning away from a reliance on fossil fuels both supports environmental goals and national security goals, as it enables energy resilience and reliability primarily from domestic sources. It also fuels job creation, economic development opportunities, and a much-needed boost to the renewables supply chain. As large companies and states make ambitious goals for reducing emissions, it is increasingly important that electric companies diversify their grids with low-carbon and zero-carbon alternatives. For example, West Virginia's Black Rock Wind Farm provides carbon-free electricity to Toyota and American Electric Power²². State leaders there note, "after generations of a coal-driven West Virginia economy...energy diversity now paves the road to future prosperity²³." Regions that embrace this transition and provide adequate supportive infrastructure will be better able to attract investment and further supply-chain improvements, such as boosting manufacturing and R&D.

Similar to CCUS and hydrogen hubs, clean energy can take advantage of strategic locations with ample supply, adequate demand for the end-user, robust infrastructure that can be developed or retro-fitted, and an abundant workforce able to transition. For example, off-shore wind production requires dedicated port infrastructure that can support all phases of offshore wind development and operations. Facilities would be used to support manufacturing of wind turbine components, inter array cables, offshore substations, provide lay down for marshaling and assembly of components prior to transport for offshore installation. Port facilities can also act as staging facilities for a diversified supply chain, which would require robust intermodal transport solutions. During the operations and maintenance phase, port facilities would support the day to day activities associated with maintaining the offshore generating and supporting infrastructure. Some elements such as turbine blades, foundations and offshore substations are too large to transport via rail or highway; therefore, companies must manufacture them port-side. The New Jersey

Wind Port, Port of Albany, and Portsmouth Marine Terminal are excellent examples of enhancing or creating port infrastructure to accommodate the burgeoning off-shore market. Each effort has created construction jobs, attracted investment, and supported grid resiliency by enabling off-shore wind energy generation. Moreover, as Made in America mandates tighten, more of the components supporting the energy transition will require domestic production. While this mandate means more jobs, more investment, and more capacity, it also means improvements in manufacturing and logistics must occur concurrently. As such, we discuss current efforts at strengthening the U.S. supply chain below.





04

**Strengthening
the Supply
Chain**

Strengthening the Supply Chain

The supply chain relies on materials, labor, and logistics, which means, when any one of these elements is weak or broken, the whole chain suffers. Global issues like the COVID-19 pandemic, the war in Ukraine, climate change, exacerbates these weaknesses and illustrate why strengthening and shortening the U.S. supply chain is critical.



Strengthening the U.S. supply chain entails strengthening each of these elements: materials (manufacturing), labor (work-force training), and logistics (multimodal transportation options). Additionally, reinforcing critical supportive elements such as resilient, reliable energy to power manufacturing facilities, enhanced connectivity to support Industry 4.0, and social infrastructure such as schools, hospitals, and affordable housing that sustain the workforce and their families also make the supply chain work better. Efforts such as the CHIPS for America Act, FABS Act, and new rules within the Buy American Act all seek to develop and expand domestic sources for critical products such as rare earth minerals, semiconductors, and steel²⁴. Importantly, some of these efforts such as the CHIPS for America Act also require grant applicants to demonstrate investments with regional educational partners to develop and support workforce training²⁵. Current investments by companies like Intel (\$20B, Ohio), Texas Instruments and Samsung (\$30B & \$17B, Texas), SkyWater (\$75M, Florida), Taiwan Semiconductor Manufacturing Company (\$12B, Arizona), Nucor (\$2.7B, West Virginia), and U.S. Steel (\$3B, Arkansas) are key examples of efforts

supporting the United States' push to boost its domestic capacity materials production²⁶. Furthermore, though these projects have not secured Department of Commerce funding, many of them have already partnered with and invested in local educational institutions, which reinforce their capabilities and commitments. For example, Intel also made a \$100 million pledge toward "partnerships with educational institutions to build a pipeline of talent and bolster research programs in the region²⁷". Similarly, NeoCity in Osceola County, Florida (where SkyWater has recently invested) is strategically located near Valencia College and the University of Central Florida, giving it prime access to innovative research and critical workforce development programs.

Spotlight on Supply Chain Innovation

NeoCity

Location: Florida

Sector: Connectivity - Smart Cities

Value:



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NeoCity in Osceola County, Florida is a project that will not only build a unique smart city from the ground up, but will also strengthen the U.S. supply chain and national security by on-shoring critical semiconductor manufacturing. It was recently announced as a finalist for up to \$100 million in the Build Back Better Challenge, giving the area a unique opportunity. As Tim Giuliani, President and CEO of the Orlando Economic Partnership notes, the funding will "position our region and state to lead our nation's semiconductor renaissance while advancing Broad-based Prosperity™ for all who call our region home." The NeoCity proposal includes six projects: construction and expansion of the Neovation advanced manufacturing semiconductor fabrication lab; construction of Neovation Way, the road system needed to develop the technology district; an Advanced Packaging Institute; a Digital Twin Institute; a skills-based workforce development platform; and building Cornerstone Osceola, which will expand and scale a purpose-built community model used in Orlando that provides a holistic, neighborhood revitalization.

In addition to crucial investments in manufacturing and workforce development, the supply chain relies on transportation networks that are well-designed, resilient, and efficient. Projects that expand and reinforce our airports, ports and waterways, railways, highways, and bridges not only enhance safety for the people who travel upon them but also increase capacity for moving people and goods more efficiently. Furthermore, projects that capitalize on developments in digital technologies and electrification support increased efficiency plus deepen our efforts in environmental restitution and digital access. For example, coupling rural road development with fiber deployment can connect rural communities physically and digitally. Building smart corridors can streamline trucking and advance autonomous and electric vehicle capabilities. Expanding our inland ports and waterways allows goods to move more efficiently and reduces pollution, noise, and roadway congestion.

Spotlight on Inland Waterways

Navigation-Ecosystem Sustainability Program

Location: Illinois, Iowa, Minnesota, Missouri, Wisconsin

Sector: Transportation - Inland Waterways

Value: \$3.34 billion (first phase); \$7.74 billion total

The Navigation-Ecosystem Sustainability Program will modernize and expand seven outdated locks at the most congested lock locations along the Upper Mississippi and Illinois Rivers as well as fund nearly \$2 billion in ecosystem restoration. The first two of these projects will be the expansion of Lock & Dam 25 and environmental restoration at Lock 22, allocating \$829.1 million of the \$2.5 billion IJA funding designated for inland waterways. Late last year, 47 lawmakers signed a bipartisan, bicameral letter urging the US Army Corps of Engineers to prioritize funding for construction of the NESP on the UMRS. The projects at Lock 25 and Lock 22 will be ready for construction within one year now that funding has been allocated.

The NESP is a great example of an infrastructure project that supports the supply chain, improves environmental sustainability, and enhances economic vitality. The Upper Mississippi River System transports more than 60% of U.S. corn and soybean exports, is a flyway for over 40% of North American bird species, and supports a \$54.8 billion recreation and tourism industry employing 686,000 people²⁸. Similarly, Nucor's investment in West Virginia makes use of the logistical advantages of the Ohio River, another waterway project featured on the Strategic 100. And just like NeoCity and Intel, Nucor will also leverage existing resources while making important economic contributions to West Virginia's population, noting "We look forward to breaking ground in Mason County and partnering with colleges and universities on workforce development programs, supporting veterans' organizations and local food pantries, and working with opioid recovery programs that will provide meaningful pathways to jobs²⁹." Other strategic projects also make use of the additive benefits of location by coupling deepwater port expansions with necessary improvements to the railways and highways that transport goods across the United States, for example.

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Spotlight on Transportation Synergy

Port of Mobile Modernization

Location: Alabama
Sector: Transportation - Ports & Logistics
Value: \$508 million

Alabama-USA Rail Corridor

Location: Alabama
Sector: Transportation - Rail
Value: \$231.6 million



PORT OF
MOBILE

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Two projects in Alabama deserve recognition for their synergistic potential. The Port of Mobile Modernization Project is a multi-phase endeavor that will substantially increase the port's capacity. Concurrent with a \$366 million deepening and widening effort by the US Army Corps of Engineers, a recent agreement between the Port Authority and APM Terminals will also add 32 acres to the existing 134-acre facility bringing the facility's annual throughput capacity to one million Twenty-foot Equivalent Units (TEUs) as well as construct an interterminal connector at the container terminal, for a projected value of \$508 million. Additionally, the \$231.6 million Alabama-USA Rail Corridor will transform Alabama's supply-chain by improving Alabama's rail infrastructure to increase capacity as well as providing new intermodal service to the Port of Mobile.

While not all of the transportation projects on the Strategic 100 directly support strengthening America's supply chain, they all provide strategic value for their ability to move both people and goods more safely and more efficiently than ever before. Many of the projects enhance mobility for underserved populations; others improve the resiliency of key highways and bridges, creating safer and less-congested routes; and others enhance the capacity of existing infrastructure, yielding substantial savings in time, emissions, and money. Furthermore, many take advantage of new technologies, contributing new knowledge to future innovation and possibilities. In short, each of the projects result in strategic advantages for the communities and companies that rely on them.

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9. These numbers include Puerto Rico and Washington, D.C., both of which have active SIBs.
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12. The IIJA-specific statistics are current as of May 24, 2022; however, different programs have released notices of funding and awards for multiple projects since then. We are constantly checking the Strategic 100 data for updates regarding IIJA funding, so the numbers for those projects are current as of the publication of this report.
13. Washington, D.C. is included in the South Atlantic division, and the four territories are Puerto Rico, Guam, Northern Mariana Islands, and the U.S. Virgin Islands.
14. While some states are more represented on the S100 than others, we did try to balance the portfolio of projects across the country while sticking with our research parameters. Given the new opportunities for funding, it is increasingly important for state decisionmakers to have a full grasp of the projects in their states that will provide strategic value, which will further enable them to maximize policy and economic development goals.
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Project Name	Location	Region	Regional Division	Stage	Sector	Subsector	Budget (Millions)	IJA Funding Amount if Applicable
Alabama-USA Rail Corridor	AL	South	East South Central	Planning	Transportation	Freight	\$232	\$67,300,000
Port of Mobile Modernization	AL	South	East South Central	Multi	Transportation	Ports & Logistics	\$508	\$197,700,000
McClellan-Kerr Navigation System	AR, OK	South	West South Central	Planning	Transportation	Ports & Logistics	\$183	\$201,100,000
Ten West Link Transmission Project	AZ, CA	West	Mountain	Planning	Energy	Transmission	\$280	
California Middle Mile Broadband Initiative	CA	West	Pacific	Procurement	Connectivity	Broadband	\$3,250	
Northern Extension of the Metro Crenshaw /LAX Line	CA	West	Pacific	Environmental Review	Transportation	Transit	\$6,600	
West Santa Ana Branch Transit Corridor	CA	West	Pacific	Planning	Transportation	Transit	\$8,600	
Innovate 680 Connected Corridor	CA	West	Pacific	Planning	Transportation	Highways	\$904	
LA Union Station Renovation (Link US)	CA	West	Pacific	Planning	Transportation	Multi-modal	\$423	
Cadiz Water Conveyance	CA	West	Pacific	Permitting	Water	Conveyance/Storage	\$300	
Palo Alto Advanced Metering Infrastructure Project	CA	West	Pacific	Pilot	Water	Utilities	\$20	
Regional Recycled Water Advanced Purification Center	CA	West	Pacific	Planning	Water	Treatment	\$3,400	
Delta Conveyance Project	CA	West	Pacific	Environmental Review	Water	Conveyance	\$16,000	
Brightline West	CA, NV	West	Pacific	Planning	Transportation	Transit	\$8,000	

Project Name	Location	Region	Regional Division	Stage	Sector	Subsector	Budget (Millions)	IIJA Funding Amount if Applicable
Pike Solar Hybrid (175MW) +Storage (25MWh)	CO	West	Mountain	Procurement	Energy	BESS	\$260	
Colorado I-270 Corridor Improvements	CO	West	Mountain	Feasibility	Transportation	Highways	\$500	
Denver B Line Extension	CO	West	Mountain	Feasibility	Transportation	Transit	\$1,100	
Arkansas Valley Conduit	CO	West	Mountain	Procurement	Water	Conveyance	\$610	
Replacement of the Walk Bridge Over the Norwalk River	CT	Northeast	New England	Planning	Transportation	Transit (Amtrak)	\$511	
New England OceanGrid	CT, MA, RI	Northeast	New England	Planning	Energy	Transmission	\$3,000	
DC Smart Street Lighting P3	DC	South	South Atlantic	Procurement	Connectivity	Smart City	\$309	
DC Water Potomac Tunnel	DC	South	South Atlantic	Planning	Water	Wastewater	\$500	
Northeast Maglev - Phase I	DC, MD	South	South Atlantic	Feasibility	Transportation	Transit	\$12,500	
NeoCity Expansion	FL	South	South Atlantic	Procurement	Connectivity	Smart City	\$1,200	
Jacksonville Airport Course B and bypass taxiway	FL	South	South Atlantic	Planning	Transportation	Airports	\$275	\$9,003,324
The Sunshine Corridor	FL	South	South Atlantic	Planning	Transportation	Transit (HSR)	\$6,000	\$15,875,000
Venice Gardens Advanced Water Treatment Conversion	FL	South	South Atlantic	Planning	Water	Treatment	\$115	
GA SR 400 Expansion	GA	South	South Atlantic	Procurement	Transportation	Highways	\$1,800	
Rome-Cartersville Development Corridor	GA	South	South Atlantic	Planning	Transportation	Highways	\$219	

Project Name	Location	Region	Regional Division	Stage	Sector	Subsector	Budget (Millions)	IIJA Funding Amount if Applicable
Navigation and Ecosystem Sustainability Program	IA, IL, MN, MO, WI	Midwest	North Central	Planning	Transportation	Ports & Logistics	\$3,340	\$829,100,000
Corn Belt Ports Upgrade	IA, IL, MO	Midwest	North Central	Procurement	Transportation	Ports & Logistics	\$1,200	
Mountain Home Air Force Base Sustainable Water Project	ID	West	Mountain	Planning	Water	Supply	\$76	
I-290 (Eisenhower Expressway) Expansion	IL	Midwest	East North Central	Planning	Transportation	Highways	\$2,700	
O'Hare Global Terminal	IL	Midwest	East North Central	Planning	Transportation	Airports	\$2,200	\$73,672,455
SOO Green Renewable Rail	IL, IA	Midwest	North Central	Permitting	Energy	Transmission	\$2,500	
Grain Belt Express Clean Line	IL, MO, KS	Midwest	North Central	Planning	Energy	Transmission	\$2,300	
Wabash Valley Resources CCS Project (1.6MM tons of CO2/year)	IN	Midwest	East North Central	Pilot	Energy	CCUS/ Hydrogen Production	\$600	
Wireless Charging Highway Pilot Project	IN	Midwest	East North Central	Planning	Transportation	EV	\$26	
Smart Infrastructure Showcase at Lenexa City Center	KS	Midwest	West North Central	Procurement	Transportation	Smart	\$250	
K-10 Expansion	KS	Midwest	West North Central	Planning	Transportation	Highways	\$250	
Brent Spence Bridge Project	KY	South	East South Central	Planning	Transportation	Bridges	\$2,800	
Louisiana International Terminal (LIT) container terminal facility	LA	South	West South Central	Planning	Transportation	Ports & Logistics	\$1,500	
I-10 Lake Charles Calcasieu River Bridge	LA	South	West South Central	Procurement	Transportation	Bridges	\$960	

Project Name	Location	Region	Regional Division	Stage	Sector	Subsector	Budget (Millions)	IJA Funding Amount if Applicable
Allston Multimodal Project	MA	Northeast	New England	Planning	Transportation	Highways	\$1,200	
Cape Cod Bridge Replacements	MA	Northeast	New England	Planning	Transportation	Bridges	\$1,000	\$5,175,000
New Frederick Douglass Tunnel (B&P Tunnel Project)	MD	South	South Atlantic	Procurement	Transportation	Transit (Amtrak)	\$4,000	
Baltimore Penn Station Modernization	MD	South	South Atlantic	Planning	Transportation	Transit (Amtrak)	\$115	
Michigan Connected and Automated Vehicle Corridor	MI	Midwest	East North Central	Planning	Transportation	Smart	\$130	
Delta WWTP Reconstruction	MI	Midwest	East North Central	Procurement	Water	Wastewater	\$90	
Minneapolis Blue Line Extension	MN	Midwest	West North Central	Planning	Transportation	Transit	\$1,500	
St. Mary's Rehabilitation Project	MT	West	Mountain	Planning	Water	Supply	\$60	\$85,000,000
Monolith Olive Creek Expansion	NE	Midwest	West North Central	Planning	Energy	Hydrogen Production		
Kitty Hawk Offshore Wind Project	NC	South	South Atlantic	Planning	Energy	Offshore Wind	\$7,500	
CLT Fourth Parallel Runway	NC	South	South Atlantic	Planning	Transportation	Airports	\$672	\$43,247,316
Lynx Silver Line	NC	South	South Atlantic	Planning	Transportation	Transit	\$3,500	
I-95 Corridor Improvements	NC	South	South Atlantic	Procurement	Transportation	Highways	\$5,000	
Fargo-Moorehead Flood Diversion	ND	Midwest	West North Central	Procurement	Water	Flood Resilience	\$3,200	\$437,000,000

Project Name	Location	Region	Regional Division	Stage	Sector	Subsector	Budget (Millions)	IJA Funding Amount if Applicable
Atlantic Shores Offshore Wind (1.5GW)	NJ	Northeast	Middle Atlantic	Permitting	Energy	Offshore Wind	\$4,000	
Newark Airtran	NJ	Northeast	Middle Atlantic	Procurement	Transportation	Transit	\$2,100	
Hudson Tunnel Project	NJ, NY	Northeast	Middle Atlantic	Procurement	Transportation	Transit	\$12,300	\$100,000,000
The SunZia Southwest Transmission Project	NM, AZ	West	Mountain	Procurement	Energy	Transmission	\$2,000	
SNWA Horizon Lateral Water Pipeline	NV	West	Mountain	Permitting	Water	Conveyance	\$1,600	
Garnet Valley Water and Wastewater Systems	NV	West	Mountain	Planning	Water	Supply	\$250	
ErieNET	NY	Northeast	Middle Atlantic	Planning	Connectivity	Broadband	\$37	
Empire Offshore Wind Farm	NY	Northeast	Middle Atlantic	Planning	Energy	Offshore Wind	\$3,000	
Sunrise Wind	NY	Northeast	Middle Atlantic	Planning	Energy	Offshore Wind	\$1,000	
NYC Penn Station Modernization	NY	Northeast	Middle Atlantic	Planning	Transportation	Transit (Amtrak)	\$6,000	
Laguardia Airtran	NY	Northeast	Middle Atlantic	Planning	Transportation	Transit	\$2,000	
Amtrak East River Tunnel Rehabilitation	NY	Northeast	Middle Atlantic	Planning	Transportation	Transit (Amtrak)	\$1,200	
Pleasant Prairie Solar Energy Project Energy Center	OH	Midwest	East North Central	Pending	Energy	Solar	\$250	
SR-8 Bridge Replacement	OH	Midwest	East North Central	Planning	Transportation	Bridges	\$142	
US30 Roadway Relocation Project	OH	Midwest	East North Central	Planning	Transportation	Smart	\$1,000	

Project Name	Location	Region	Regional Division	Stage	Sector	Subsector	Budget (Millions)	IJA Funding Amount if Applicable
Great Lakes Hyperloop	OH, IL	Midwest	East North Central	Planning	Transportation	Transit	\$25,000	
Coos Bay North Spit Terminal Project	OR	West	Pacific	Planning	Transportation	Ports & Logistics	\$1,000	
I-5 Bridge Replacement Project	OR,WA	West	Pacific	Planning	Transportation	Bridges	\$4,000	
Upper Ohio Navigation Project	PA	Northeast	Middle Atlantic	Procurement	Transportation	Ports & Logistics	\$2,600	\$77,000,000
King of Prussia Rail	PA	Northeast	Middle Atlantic	Procurement	Transportation	Transit	\$2,100	
EV Charging Network	RI	Northeast	New England	Planning	Transportation	EV	\$21	\$3,380,000
Route 146 Reconstruction	RI	Northeast	New England	Procurement	Transportation	Highways	\$196	
Revolution Wind	RI, CT	Northeast	New England	Permitting	Energy	Offshore Wind	\$1,500	
TRISO-X Fuel Fabrication Facility (TF3)	TN	South	East South Central	Procurement	Energy	Nuclear	\$160	\$80,000,000
Memphis Innovation Corridor	TN	South	East South Central	Planning	Transportation	Transit	\$74	
Brownsville Middle Mile Broadband Network	TX	South	West South Central	Procurement	Connectivity	Broadband	\$20	
Port of Corpus Christi H2 Plant	TX	South	West South Central	Feasibility	Energy	Hydrogen Production	\$500	
DAC1 (Direct Air Capture)	TX	South	West South Central	Procurement	Energy	CCUS	\$1,000	
D2 Subway	TX	South	West South Central	Planning	Transportation	Transit	\$1,300	

Project Name	Location	Region	Regional Division	Stage	Sector	Subsector	Budget (Millions)	IIJA Funding Amount if Applicable
Austin-Bergstrom Airport Expansion	TX	South	West South Central	Procurement	Transportation	Airports	\$3,500	\$17,306,188
Intermountain Power Project: IPP Renewed (840MW)	UT	West	Mountain	Procurement	Energy	Generation; Transmission	\$1,000	
Advanced Clean Energy Storage (ACES) Delta	UT	West	Mountain	Construction	Energy	Hydrogen; Storage	\$1,100	
National Landing Smart City (Crystal City Metro Upgrade)	VA	South	South Atlantic	Planning	Transportation	Transit	\$91	
Long Bridge Project	VA, DC	South	South Atlantic	Planning	Transportation	Transit (Amtrak)	\$1,900	
Maple Broadband	VT	Northeast	New England	Procurement	Connectivity	Broadband	\$30	
Sound Transit 3	WA	West	Pacific	Various	Transportation	Transit	\$53,800	
Cascadia Ultra High Speed Ground Transportation Project	WA, OR, BC	West	Pacific	Planning	Transportation	Transit (HSR)	\$40,000	
Connect Superior Municipal Fiber	WI	Midwest	East North Central	Planning	Connectivity	Broadband	\$31	
Virgin Hyperloop Certification Center	WV	South	South Atlantic	Planning	Transportation	Freight	\$500	
I-73 Corridor Completion	WV	South	South Atlantic	Planning	Transportation	Highways	\$1,900	
Sodium Reactor Demonstration Project (345MW)	WY	West	Mountain	Planning	Energy	Nuclear	\$2,000	\$1,318,500,000
TransWest Express Transmission Line	WY, UT, NV, CO	West	Mountain	Procurement	Energy	Transmission	\$3,000	
Texas Central	TX	South	West South Central	Procurement	Transportation	Transit (HSR)	\$20,000	