

WHITE PAPER



PUBLIC BENEFITS AND ECONOMIC DEPENDENCY ON THE CRANE, RIGGING AND SPECIALIZED TRANSPORT INDUSTRY



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Foreword

Despite the role of the specialized transportation, crane, and rigging industries in the growth and development of our society, the unique challenges and regulations encountered are often not well understood by the public, elected representatives, and government officials at a local, state, or federal level. Therefore, the Specialized Carriers & Rigging Foundation (SC&RF) commissioned a white paper as an externally focused resource for business owners and advocacy groups in the specialized transportation, crane, and rigging industries to educate those outside the industry, highlight the shared objectives between the industry and society, and demonstrate the impact of those working in the industry.

Therefore, the white paper was developed to enable the reader to understand the basics of the specialized transportation, crane, and rigging industries and set the stage for targeted discussions. For example, state/local transportation planners, city officials, or members of state legislatures may not fully understand the impact of a change in design standards, permitting regulations, or other policy decisions on the specialized transportation, crane, and rigging industries and the customers they serve. Similarly, job candidates or career counselors are unlikely to understand the uniqueness and the impact of working in the specialized transportation, crane, and rigging industries.

In both cases, this white paper is a useful resource for quickly communicating the following:

- The background on the specialized transportation, crane, and rigging industries for an audience who is not familiar with what each industry does.
- The role of the specialized transportation, crane, and rigging industries in all aspects of modern society, including the buildings we live in, the generation and transportation of energy, and the roads and bridges we use.
- Case studies that provide real-world examples of the connection between the specialized transportation, crane, and rigging industries and major projects.
- Employment statistics of the industries supported by the specialized transportation, crane, and rigging industries.
- Challenges encountered by the specialized transportation, crane, and rigging industries, as well as the opportunities for collaboration and solutions to the industry's challenges.

Overall, we hope that the white paper will be used to improve the understanding of the specialized transportation, crane, and rigging industries to attract talent and facilitate discussions with elected representative and government officials that ultimately results in a safer and more efficient industry.

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Executive Summary

This report analyzes the critical public benefits the specialized transportation, crane, and rigging industries contribute to, highlighting the essential roles they play in the safe and efficient movement of commercial goods and services across the globe.

Each of these industries work together to safely load, transport, deliver, and/or place loads and materials required for the construction of large projects across key industries.

The highly specialized equipment they use ranges dramatically, from truck loads over a million pounds, to multi-story tower cranes, to self-propelled machinery. Projects are often extraordinarily complex, sometimes requiring years of planning.

The specialized transportation, crane, and rigging industries are most visible to the public when looking at a city skyline, during industrial development, and when highway, rail, and ship are transporting large and heavy goods. Although these industries are not always visible, their contribution is baked into all aspects of modern society, from the buildings we live in, the generation and transportation of energy, the roads and bridges we use, and beyond.

Essential Critical Infrastructure Workforce

During the COVID-19 pandemic, the US Department of Homeland Security recognized the crane, rigging, and specialized transport as a critical workforce classified as an Essential Critical Infrastructure Workforce because of the essential nature of their business. The industry was provided permission to work as an important economic resource.



Who We Are

Specialized Transportation

Businesses engaged in the transportation of large, high-value freight that requires intensive planning and coordination due to the extraordinarily complex operational, safety, and regulatory needs associated with their movement.

Crane

Businesses engaged in the lifting and moving of large, heavy objects on construction sites, manufacturing facilities, ports, and other sectors where such heavy lifting is required, including the transport, and hauling of cranes and their components. Cranes are critical to all industries but are particularly important to the construction industry.

Rigging

Businesses engaged in the process of setting up and preparing a crane or other lifting equipment to safely lift, lower and place large industrial components and commodities, including from, and at jobsites.

Working together, the Specialized Transportation, Crane, and Rigging industries safely lift, transport, and place the machines and materials needed for every major infrastructure, residential, industrial, and commercial development project.



Industry Data Profile

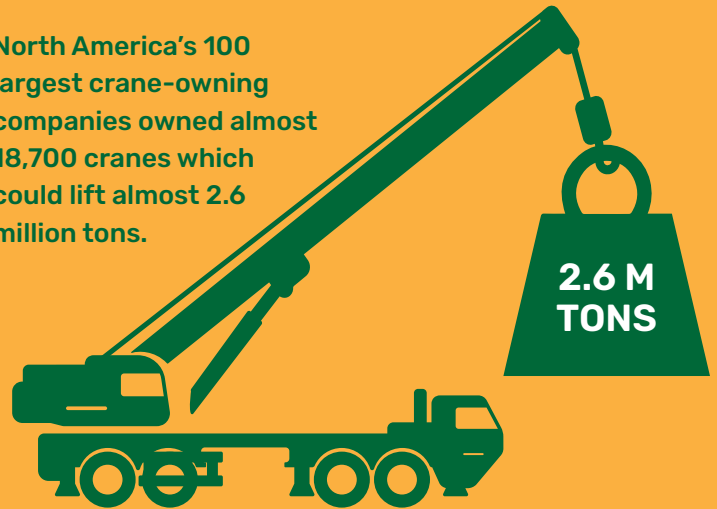
Heavy Lifting

In 2022, the U.S. freight transportation system moved 19.96 billion tons of freight worth \$19.87 trillion by land, water, and air.

The top 50 specialized transport companies operated almost 24,700 trucks, and had a combined capacity of over 1.2 million tons.



North America's 100 largest crane-owning companies owned almost 18,700 cranes which could lift almost 2.6 million tons.



Employment: 2021 - 2022

The top 50 specialized transport companies employed almost **30,000** people

North America's 100 largest crane-owning companies had over **41,000** employees

Construction, Utilities, Manufacturing, Mining, and Petrochemical industries were a combined \$4.7 trillion (18.6%) of U.S. GDP and were responsible for about 20.5 million full-time equivalent jobs (15%).

43,400 people were employed as crane/tower operators.*

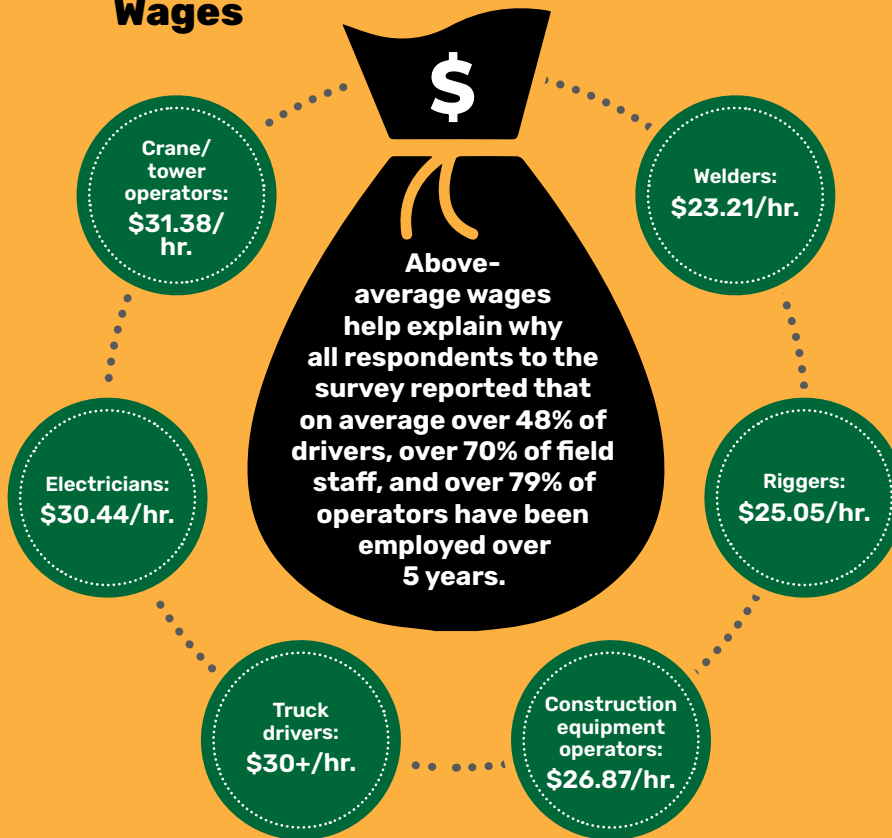
17,980 people were employed as riggers.*



*According to the Bureau of Labor Statistics (BLS)

Industry Data Profile, continued

Wages



In 2021, about **5.2 million** single trip permits were issued for OS/OW vehicles, up from 4.7 million in 2017.



Education

According to a 2021 SC&RF (Specialized Carriers & Rigging Foundation) survey, 92% of crane operators received specialized certifications, participated in training programs, and/or belong to a union, highlighting a limited need for post-secondary education and a high wage.

4-year degree \$33.35/hr.

Associates degree \$24.08/hr.

High school degree: \$20.23/hr.

Less than a high school degree: 15.65/hr.

Industries We Support

The specialized transportation, crane, and rigging industries support every major project. They are critical to the Construction, Utilities, Manufacturing, Mining, and Petrochemical industries.

The following statistics show the 2021 employment and 2022 GDP (latest available) for these key industries.

- **Construction:** 7.4 million employed in 2021 and \$1.0 trillion of GDP in 2022
- **Utilities:** 540 thousand employed in 2021 and \$440 billion of GDP in 2022
- **Manufacturing:** 11.1 million employed in 2021 and \$2.1 trillion of GDP in 2022
- **Mining:** 390 thousand employed in 2021 and \$110 billion of GDP in 2022
- **Petrochemical:** 1.1 million employed in 2021 and \$1.1 trillion in 2022

The specialized transportation, crane, and rigging industries support projects in five major industries employing more than 27 million employees in 2021 and totaling over \$4.7 trillion of GDP in 2022.



Case Study – Wind Power Project in Oklahoma

- Wind power provides an example of the specialized transportation, crane, and rigging industry supporting the manufacturing, energy, and utility industries.

According to the Department of Energy, in 2021 the U.S. wind industry employed over 120,000 people, primarily in the construction and manufacturing industries.

Additionally, wind power accounted for 32% of the growth in energy capacity, bringing wind's share of energy production to about 9.1% in 2021.

The images to the right show the OS/OW freight utilized by Oxbo Mega Transport Solutions to support a 100-megawatt wind farm. In total, 290 components were transported over a 20-week period and used 13,500 labor hours to accomplish.

Each windmill required 10 pieces ranging from 17.5 to 212.5 tons and thousands of other components. At peak construction, the project created 250 jobs, which are in addition to all the jobs in industries that build windmills.



Communities We Serve

The services the specialized transportation, crane, and rigging industries provide to these industry clusters are essential for public works projects of all kinds. Examples include the construction, maintenance, and rehabilitation of civil infrastructure like highways, bridges, public transportation, public utilities, hospitals, and schools.

Because the specialized transportation, crane, and rigging industries are critical to the execution of these public projects, the industries were classified as Essential Critical Infrastructure Workforce to continue their normal operations throughout the COVID-19 pandemic.

The case studies below demonstrate the role of public works projects the crane, rigging and specialized transport companies provide. Examples include construction, maintenance, and rehabilitation of civil infrastructure like highways, bridges, public transportation, public utilities, hospitals, and schools.

Case Study – Public Transit

- Silk Road Transportation was contracted by the MBTA to deliver the new rolling stock to service the Green Line expansion of Boston’s subway system. Due to their weight, each of the more than 140 train cars loaded onto a truck must be permitted as a superload, requiring extensive planning of the route and the use of escorts in heavily congested urban areas.



Case Study – Petro Chemical Industry

- In 2015, Deep South Crane & Rigging transported two vessels weighing 375 tons and 180 tons 800 feet through pipe racks with only a 2-inch clearance. The vessels were used at an Ohio refinery as part of the process of producing petroleum products.



Case Study – Energy/Utility

- A transformer like the load shown here was transported from Arizona under an emergency/ expedited process to replace a damaged transformer in New Mexico. The 450-mile move included permits from Arizona and New Mexico, coordination with five electric utilities and three communications companies, and had an 18-page route survey. Once on-site, cranes are used to lift and move the transformer into place for operation.



Case Study – Energy/Utility

- PSC Crane & Rigging was called in when a one-million-pound transformer at Beaver Valley Nuclear Power Station failed. The failed transformer was critical to resuming power production and minimizing the \$2 million per day cost of lost operation.



Specialized Transportation

The specialized transportation industry includes businesses transporting large, high-value freight heavily regulated by local, state, and federal governments to ensure the safe and efficient delivery of goods for the benefit of their customers, employees, and the public alike.

Equipment used by the specialized transportation industry includes truck and trailer combinations, as well as consolidated, self-propelled commercial motor vehicles like mobile cranes and other specialized mobile equipment.

Though most freight is moved by commercial motor vehicles on public roadways, specialized transportation also utilizes rail, marine, and intermodal operations.

OS/OW

Federal law controls maximum gross vehicle weights and axle loads on the Interstate System. Federal limits are 80,000 pounds gross vehicle weight, 20,000 pounds on a single axle, and 34,000 pounds on a tandem axle group.

There are also Federal standards for length and width on the National Network (NN). The NN comprises the Interstate and certain roadways designated by the States. There are no Federal vehicle height limits. For public roadways not on these networks, size and weight limits are established at the state and local levels.

The authority to permit OS/OW travel on any highway, including the Interstate Highway System, is in most cases exclusive to state and local governments that require, and issue, special travel permits for those roads under their jurisdiction.

In 2021, about 5.2 million single trip permits were issued for OS/OW vehicles, up from 4.7 million in 2017. Each OS/OW permit is a load that supports jobs in the industry producing and using freight.

Case Study – Nuclear Reactor

- In 2020, Emmert International transported the nuclear reactor pressure vessel pictured to the right, over 400 miles from Utah to Nevada. The route included 7% grades, and required several civil engineering modifications, including the strengthening of culverts, highway, and rail crossing improvements. Weighing over 1.4 million pounds total, it was the heaviest load ever moved in Nevada.



Crane & Rigging

Cranes

While tower cranes are frequently seen along a city's skyline, other commercial buildings and construction sites, their importance extends far beyond construction. Cranes are critical to all industries, including the maintenance and rehabilitation of civil infrastructure like highways, bridges, hospitals, and schools and manufacturing industries that produce heavy and bulky products. In addition to tower cranes, mobile and crawler cranes are frequently seen moving on highways and operating on job sites.

In 2022, North America's 100 largest crane-owning companies had over 41,000 employees, owned almost 18,700 cranes which could lift almost 2.6 million tons.

Crane operators are highly trained and skilled professionals vital to the safe and efficient operation of cranes. As of 2021, there are over 43,300 crane operators employed in the United States alone, 92% of whom received specialized certifications, participated in training programs, and/or belong to a union.

Rigging

A rigger helps operate machines to move heavy objects. Also highly trained and skilled professionals, riggers work closely with crane operators to calculate the hoisting of structures for rigging cable and hardware, determine where best to attach hooks, chains, or cables to lift a load and decide the safest options for getting the job done. 18,000 riggers are currently employed in the United States alone.

Together, these industries are especially relied upon to carefully remove and replace critical components, including manufacturing facilities, power plants, and public infrastructure.



Case Study – Construction

- The 2020 expansion of the Seattle-Tacoma International Airport included a new pedestrian walkway that spanned an active airport taxi lane. To minimize the disruption and shutdown time, Mammoet transported and lifted into place a 1,472-ton prefabricated walkway over two nights.

The final location of the bridge had 1.5 inches of tolerance, requiring precision to safely place the walkway 72 feet above the ground. It is the world's longest pedestrian bridge span over an active airport taxi lane.





Our Workforce: Highly Skilled & Highly Paid

The specialized transportation, crane, and rigging industries face similar workforce development challenges to the trucking industry and other skilled trades. They also face challenges attracting and retaining the next generation of talent needed to support them due to the increasing complexity of rigging, lifting, and moving freight.

As of May 2021, there were 43,400 and 17,980 people employed as crane/tower operators and riggers, respectively. Although wages vary by company, region, and experience, in 2021, crane/tower operators and riggers had an average wage of \$31.38/hr. and \$25.05/hr., respectively.

According to a 2023 SC&RF (Specialized Carriers & Rigging Foundation) Research Study State of the Workforce in the Crane, Rigging and Specialized Transport Industry, 92% of crane operators received specialized certifications, participated in training programs, and/or belong to a union, highlighting a limited need for post-secondary education and a high wage.

Similarly, 62% of those responding to the SC&RF (Specialized Carriers & Rigging Foundation) Survey reported that the average pay for truck drivers was over \$30/hr.

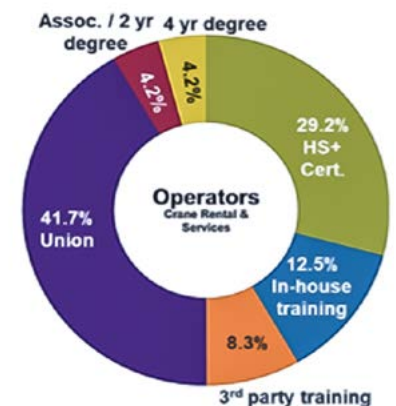
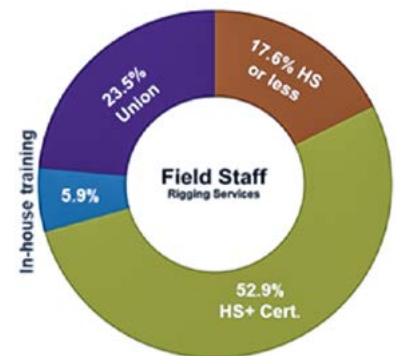
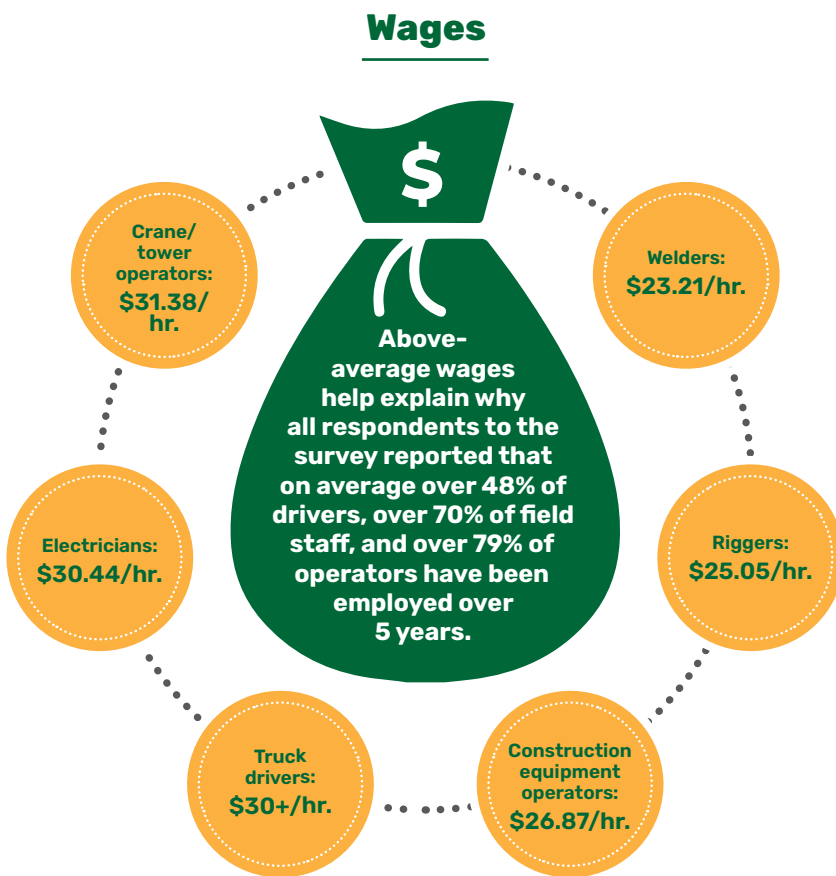
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The specialized transportation, crane, and rigging industries provide accessible, high-wage, and impactful jobs.

For reference, in 2021 the average wage for construction equipment operators was \$26.87/hr., electricians \$30.44/hr., welders \$23.21/hr., and truck drivers were \$30.00/hr. Similarly, the average wage for people with less than a high school degree was 15.65/hr., high school degree \$20.23, associates \$24.08/hr., and 4-year degree \$33.35/hr. Above-average wages, especially compared to similar education levels, may also help explain why most respondents reported that on average over 48% of drivers, over 70% of field staff, and over 79% operators have been employed over 5 years.

Drivers, crane operators, and riggers in the field are supported by a host of engineers, dispatchers, maintenance, sales, operations, and executives.

The research report by SC&RF (Specialized Carriers & Rigging Foundation) and BLS statistics demonstrate that the specialized transportation, crane, and rigging industry provides well-paying jobs that are accessible for those holding a high school degree and up. Additionally, the low turnover as compared to the private sector and general transportation industry displays the stability and opportunity present in the industry.



Challenges

The specialized transportation, crane, and rigging industries face many challenges affecting their ability to provide public benefits to the nation. Major examples of these challenges include:

➤ Variations in State and Local Regulations

A lack of national uniformity in regulations for OS/OW permitted loads remains a major impediment. For example, one state may restrict a permitted load to travel only at night while a neighboring state allows daytime travel only. This inefficiency causes delays, increases costs, and generally hinders interstates commerce. Additionally, disparate tax, environmental, and other policies impacting these industries reduce the relative competitiveness of states seeking major economic development opportunities.

➤ Uniform Application of the Federal Divisible Load Definition

An OS/OW commercial vehicle and its load may only be permitted for travel if it is non-divisible. While federal policy specifically defines non-divisible loads, different interpretations of it at the state and local levels also create major impediments.

The highly specialized equipment and challenges encountered by the industry affect safety, economic growth, and achieving social goals.

➤ Restricted and Costly Access to Freight Facilities

The connections between roadways, railways, and waterways are critical to the movement of OS/OW freight. Identifying, planning for, preserving, and improving these multimodal connections provides an opportunity to use other modes when the size, weight, or number of pieces allow. This flexibility enables the most efficient use of the multimodal system.

➤ Circuitous Routing Caused by Design Standards, Posted Roads, and Bridges

The complexity and length of the route that OSOW vehicles take increases as bridges and roadways are posted with maximum weight limits, as well as when design standards do not consider OSOW vehicles. The result is more miles, higher cost, and increased infrastructure wear and tear. This challenge will increase as bridge and roadway infrastructure continue to fail.

➤ Future Workforce

Declining interest among younger workers to join the specialized transportation, crane, and rigging industry threatens the future availability of businesses and staff to support the rigging, lifting, and transportation of OS/OW freight.

Case Study—Impact on Schedule and Cost

- The complexity and length of the route that OS/OW vehicles take increases as bridges and roadways are posted with maximum weight limits, design standards do not consider OS/OW vehicles, and state-by-state permit rules and regulations are not uniform. The result is more miles, higher cost, and increased infrastructure wear and tear. This challenge will increase as bridge and roadway infrastructure ages.



Opportunities

Many opportunities for governments at all levels to collaborate improve the movement and operations of the specialized transportation, crane, and rigging industries, and in turn increase the economic competitiveness. These include:

➤ Better Harmonize OS/OW Permit Requirements

Increase uniformity of OS/OW permit policies across local, state, and regional authorities as including consistent application of the federal divisible load definition.

➤ Address Future Workforce Availability

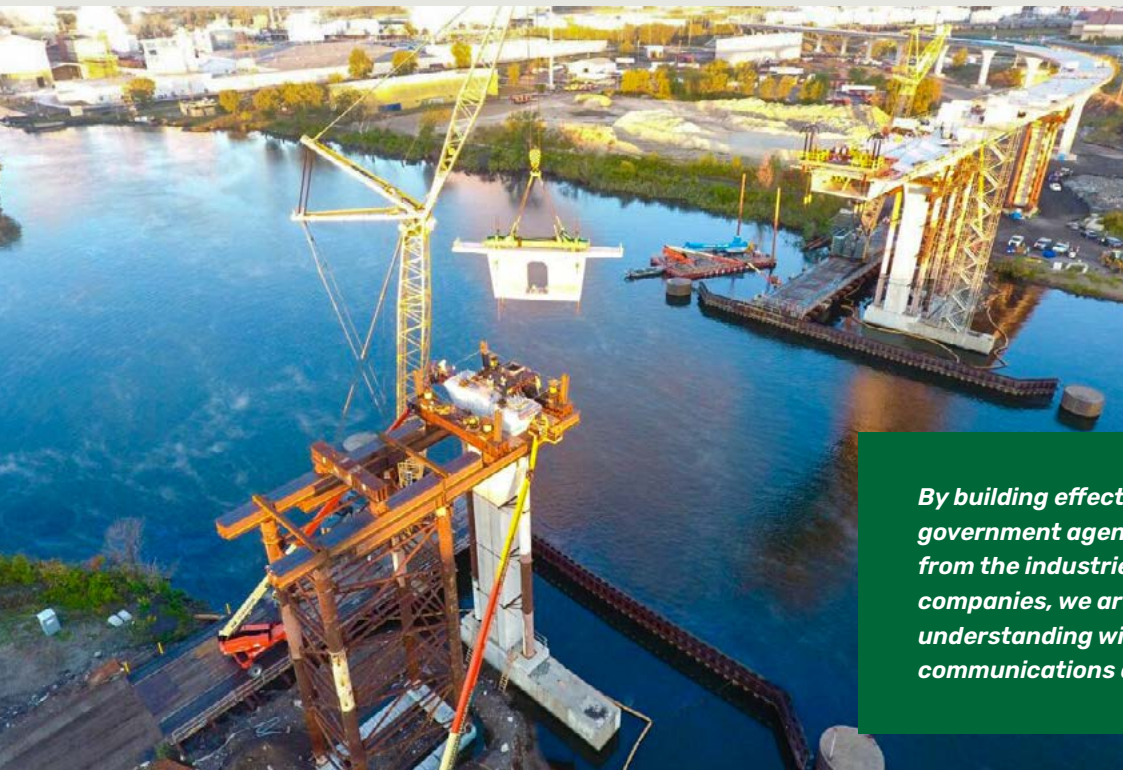
These industries require a highly skilled and trained workforce for the benefit of employees' companies, and the public at large. Government agencies should promote the benefits of jobs in these industries and partner with businesses to incentivize workforce recruitment and retention.

➤ Eliminate Regulatory Barriers

For the major industries the specialized transportation, crane, and rigging industries serve.

➤ Leverage Technology

24/7 automated permitting and routing enables the industry to self-issue most permits, reducing time and cost to industry and the public alike. Additionally, data from automated systems can also be used to make better planning and programming decisions when designing new infrastructure and improving current infrastructure.



By building effective partnerships with government agencies that both benefit from the industries and regulate these companies, we are confident that a greater understanding will lead to improved communications and uniformity.

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