

2021-26 Engineering Industry Outlook

Special Report: Infrastructure Scenarios & Their Impact on Engineering and Design Services

June 28, 2021



AMERICAN COUNCIL OF ENGINEERING COMPANIES



Study Overview

The American Council of Engineering Companies (ACEC) commissioned a study to better understand the impact that an enacted infrastructure bill would have on the Engineering and Design Services industry. The study was conducted by Rockport Analytics, an independent market and economic research firm using both publicly available data and proprietary analysis. The infrastructure assessment utilizes an econometric model that was developed by Rockport Analytics for the ACEC Research Institute in creating the *2021-2025 Engineering Industry Forecast* (March 2021). Rockport also utilized an input/output model to help translate the impact that higher levels of economic output in A/E Services would have on jobs, wages, value-added, and taxes generated in the sector.

The Engineering and Design Services Forecast

- Utilizes the historical trends established in the earlier phases of research
- Analyzes the trends, momentum, and correlation of A/E Services with key economic drivers
- Builds an econometric model to estimate A/E Services revenue using the most statistically valid set of predictor variables
- Leverages the econometric model to generate a forecast of A/E Services revenue over the next six years (2021 – 2026)
- “Shocks” the model for various infrastructure spending scenarios
- Compares the Economic Output in A/E Services in each of the chosen scenarios against the baseline forecast
- Compares the impact on jobs, wages value added (GDP) and tax revenue against the baseline forecast

Data Sources

The data used come from both U.S. government sources and private data sources. Key data sources include:

- Census Bureau - Statistics of U.S. Business (SUBS)
- Census Bureau - Quarterly Services Survey (QSS)
- Census Bureau - Value of Construction Put in Place
- BLS Quarterly Census of Employment & Wages (QCEW) Program
- BEA (NIPA) National Income & Product Accounts
- Moody’s Analytics Macroeconomic Model
- Other public and private sources

Overview

In 2020, the ACEC Research Institute commissioned Rockport to develop a model to aid in the forecasting of Economic Output in the Engineering and Design Services sector. In their current analysis, Rockport leveraged that model to assess the impact of potential infrastructure packages on economic activity in the A/E Services sector. In the original baseline forecast released in March 2021, there was no assumption made for a major infrastructure spending plan. This analysis looks at the current infrastructure proposals and makes assessments on the expectations for how these plans would ultimately impact the original forecast.

The Biden Administration's Jobs Plan was formally announced on March 31, 2021. The plan called for a \$2.3 trillion investment in America that will create millions of good jobs, rebuild our country's infrastructure, and position the United States to out-compete China. According to the administration, *The American Jobs Plan will invest in America in a way we have not invested since we built the interstate highways and won the Space Race*. Ultimately, this plan would help to support the necessary revitalization of U.S. infrastructure that has an estimated¹ unfunded gap of nearly \$2.6 trillion.

While there is bipartisan support for infrastructure development, there is a large partisan gap in terms of objectives on the size and scope of the investment. On April 22, 2021, Senate Republicans announced a counter-plan entitled the Republican Roadmap, which offered a pared-down infrastructure plan totaling \$568 billion to be spent over five years.

A \$1.2 trillion compromise, introduced in mid-June, has gained momentum with the support of 10 Democratic and 10 Republican senators. The proposed funding mechanisms for the plan include bond initiatives, public-private partnerships, and utilizing untapped COVID relief funds among other potential sources. The plan has a couple of challenges as there are still some Senate Democrats who are unhappy with its lack of support for climate change and income inequality initiatives. President Biden has also opposed the notion of a gas tax as a potential funding mechanism for the plan. The bipartisan plan, however, represents the most likely scenario for enacting an infrastructure bill outside of budget reconciliation.

This analysis looks at all three plans and their impact on the Engineering and Design Services sector. In order to make a direct comparison between the three plans, we have assumed a 5-year roll out of all proposed expenditures in all cases. The analysis assumes a bill is enacted before the end of this calendar year and fund disbursement begins in Q1 2022.

¹American Society of Civil Engineers (ASCE), www.infrastructurereportcard.org

Estimating Net-New Infrastructure Spending

Before leveraging the existing forecast model for A/E Output, it was important to consider, not only the size of the three infrastructure proposals, but the proportion of the proposed spending that will ultimately have bearing on the Engineering and Design Services industry. Given the broader scope of the Jobs Plan, there are some categories of proposed spending that will not ultimately reach the Engineering and Design Services sector. For this reason, it was important to isolate the amount that would lead to new construction and impact to the Engineering and Design Services sector. Moreover, some of proposed expenditures in the GOP plan and the Bipartisan Plan would replace existing spending that was already assumed in the baseline forecast. In those cases, it was important to isolate only the portion of the plan amounts that can be considered incremental and net-new spending. A summary of expected net-new spending totals that would flow to Engineering and Design Services in each plan is outlined below.

Jobs Plan - Net New Spending	
Transportation	
Road, Highways, Bridges	\$115 billion
EV Charging Stations	\$15 billion
Transit	\$85 billion
Rail	\$80 billion
Airports	\$25 billion
Ports	\$17 billion
Social Justice Projects	\$20 billion
Regional/National Projects	\$44 billion
Other	
Infrastructure Resilience	\$50 billion
Water/Wastewater	\$111 billion
Digital Infrastructure	\$100 billion
Energy Grid	\$100 billion
Public Housing	\$60 billion
Public Schools	\$100 billion
Child Care Facilities	\$25 billion
VA Facilities	\$18 billion
Federal Buildings	\$10 billion
Total	\$975 billion

Republican Roadmap Plan - Net New Spending	
Transportation	
Road and Bridges	\$38.5 billion
Mass Transit	\$-7.8 billion ¹
Intercity Rail	\$4.7 billion
Safety	\$2.2 billion
Airports	\$24.1 billion
Other	
Broadband	\$65 billion
Water	\$14 billion
Ports & Waterways	\$17 billion
Drinking Water and Wastewater	\$35 billion
Total	\$193 billion

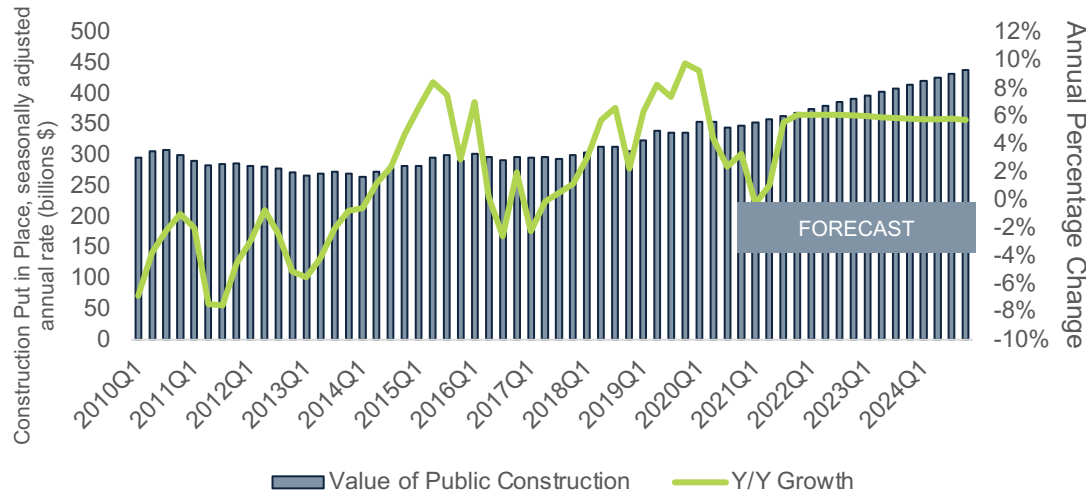
¹Republican Roadmap Plan proposes lower amount than baseline

Bipartisan Plan - Net New Spending	
Transportation	
Road and Bridges	\$110 billion
Passenger & Freight Rail	\$66 billion
Public Transit	\$48.5 billion
Airports	\$25 billion
Infrastructure Financing Authority	\$20 billion
Ports & Waterways	\$16.3 billion
Electric Vehicles: Infrastructure & Transit	\$15 billion
Safety	\$11 billion
Reconnecting Communities	\$1 billion
Other	
Power	\$73 billion
Broadband	\$65 billion
Water	\$55 billion
Resiliency	\$47.2 billion
Other	\$26 billion
Total	\$579 billion

Source: Jobs Plan, Republican Roadmap Plan, Bipartisan Infrastructure Plan, Eno, ACEC, Rockport Analytics

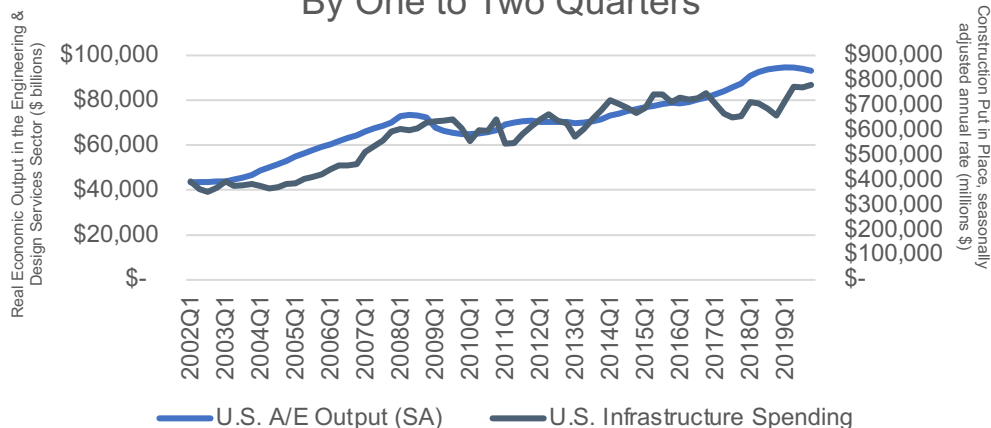
What Public Infrastructure Spending Means for Engineering and Design Services Activity

Value of Public Construction Put In Place: 2010 - 2024



- The ACEC Research Institute’s baseline forecast for A/E Services Output had assumed that baseline highway and transit funding programs would persist.
- There is significant upside to infrastructure development in the form of a major federal infrastructure package: (1) The Jobs Plan would add around 48% to annual infrastructure spending over the next five years; (2) The GOP plan would add around 10% to annual infrastructure spending over the next five years; and (3) the Bipartisan Plan would add around 30% to annual infrastructure spending over the next five years.
- There is a strong correlation between A/E Services Output and infrastructure expenditures. The strongest correlation of infrastructure spending to A/E activity is at a one to two quarter lag. Which means that A/E tends to lead infrastructure spending by a period of around two to six months.

A/E Output Tends to Lead Infrastructure Spending By One to Two Quarters



Source: U.S. Census Bureau, Moody's Analytics

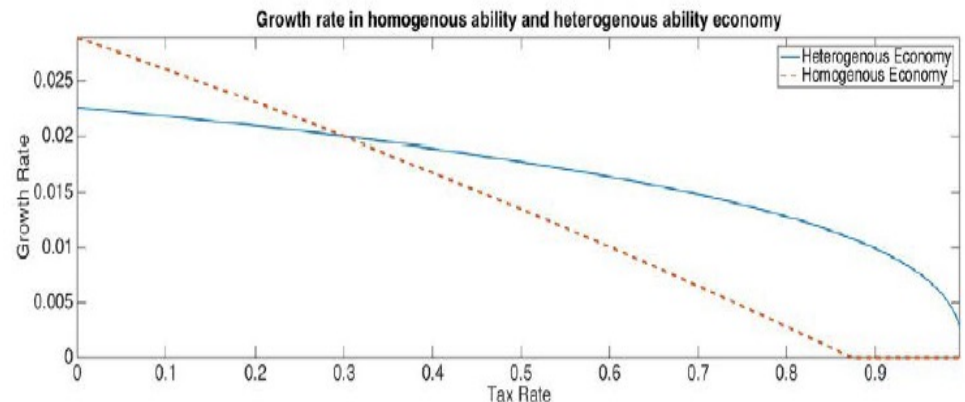
Raising the Corporate Tax Rate Will Have a Relatively Small Impact on A/E Output

As part of this analysis, it is important to consider the funding plan for each of the proposals and how that would impact the Engineering and Design Services sector and the broader economy. While the Republican Roadmap Plan calls for utilizing surplus dollars from COVID relief plans, the Jobs Plan calls for expanding the corporate tax rate from 21% to 28%. It is expected that raising the corporate tax rate will have a negative effect on overall economic growth at the margin and would act as a headwind to output in the Engineering and Design Services sector. The ultimate funding mechanism for the Bipartisan Plan is not clear as of this writing. Given the initial proposal to fund the plan through bond offerings, public-private partnerships and surplus COVID relief funds, we expect any growth headwind offsets would be minimal from the plan.

There have been several studies over the years that assess the impact of the corporate tax rate. For this analysis we utilized a study² authored by Nir Jaimovich and Sergio Rebelo, initially published in 2012 and then updated in 2015. The study looks at the non-linear relationship between corporate tax rates and economic growth. The result of their research shows that there is a smaller impact on economic growth for each percent change in the corporate tax rate at lower levels of taxation than there is at higher levels of taxation. This makes sense as more productive entrepreneurs would continue to take risks at lower levels of taxes (even as they are rising) but even small changes at already high rates of taxation can disincentivize even the most productive of entrepreneurs from risk-taking behavior.

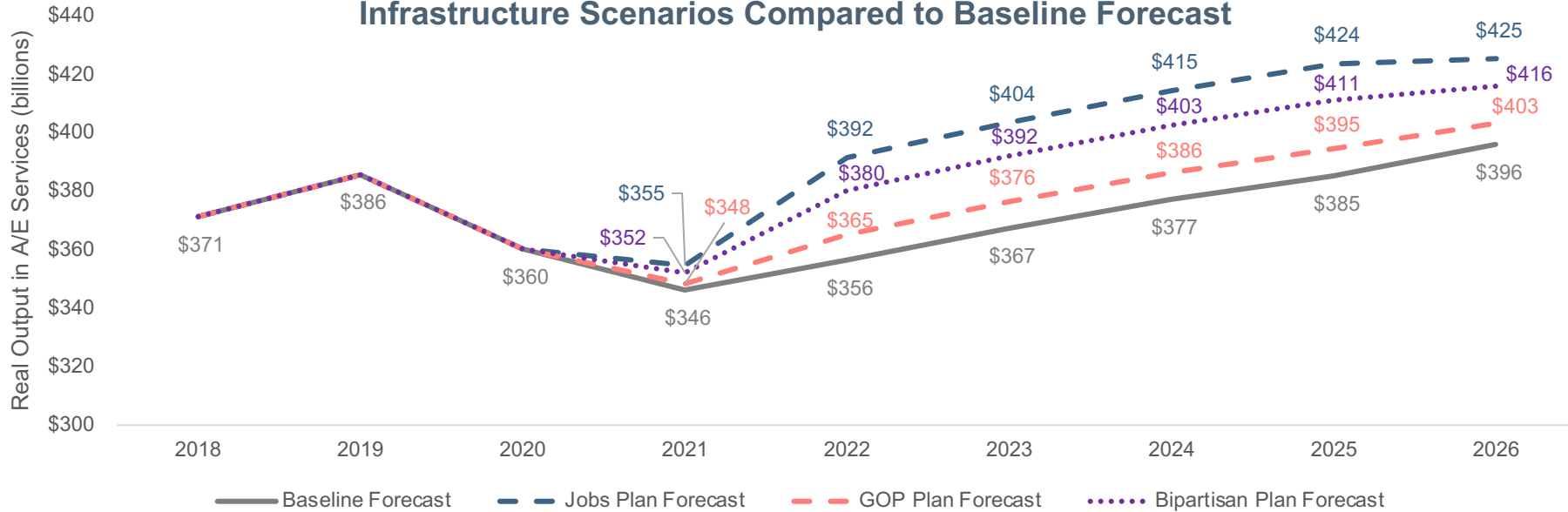
The chart on the right below, illustrates the study's findings with the relationship between corporate tax rates and economic growth in an assumed linear relationship (homogeneous economy) and in the non-linear relationship found in the study (heterogeneous economy). It is important to consider:

- (1) This research finds that relatively low rates of taxation output is not drastically impacted; however, we expect the impact to bottom-line profits would be more severe and have considerable impacts on those A/E firms that are subject to corporate income taxes.
- (2) While we have modeled A/E spending over the next six years, it is important to consider that the corporate tax impacts would persist after this period as long as the tax rate remained at 28%.



²Non-linear Effects of Taxation on Growth, Jaimovich, Rebelo, October 2012, Revised April 2015

Real Output in A/E Services: Infrastructure Scenarios Compared to Baseline Forecast



- The infrastructure scenarios compare the three plans against a baseline forecast from the ACEC Research Institute's *2021-2025 Engineering Industry Forecast*, released March 2021.
- The Institute's baseline forecast was extended through 2026 to assess the full impact of all plans.
- The scenarios assume a 5-year rollout of planned spending in all cases.
- The GOP scenario includes the impact of a rise in corporate tax rates from 21% to 28%.
- Given the lead-lag relationship between A/E and infrastructure spending, we expect the impact would begun to be felt in 2021 with the Republican Roadmap Plan boosting 2021 A/E Output by \$2 billion, the Jobs Plan boosting 2021 A/E Output by \$8 billion, and the Bipartisan Plan boosting 2021 A/E Output by \$6 billion.
- The Jobs Plan proposal would lead to an 8% average annual increase in A/E activity over the 6-year period, pushing annual output to \$425 billion by 2026.
- The GOP Plan proposal would lead to a 2% average annual increase in A/E activity over the 6-year period, pushing annual output to \$403 billion by 2026.
- The Bipartisan proposal would lead to a 6% average annual increase in A/E activity over the 6-year period, pushing annual output to \$416 billion by 2026.

A/E Output Differences From Baseline in Each Infrastructure Scenario

	Jobs Plan		GOP Plan		Bipartisan Plan	
	\$ Increase (billions)	% Increase	\$ Increase (billions)	% Increase	\$ Increase (billions)	% Increase
2021	+\$8.4	2%	+\$2.1	1%	\$5.9	2%
2022	+\$35.2	10%	+\$8.7	2%	\$24.0	7%
2023	+\$36.2	10%	+\$9.0	2%	\$24.7	7%
2024	+\$37.3	10%	+\$9.2	2%	\$25.4	7%
2025	+\$38.3	10%	+\$9.4	2%	\$25.9	7%
2026	+\$29.3	7%	+\$7.3	2%	\$19.9	5%
Total	+\$184.8	8%	+\$45.8	2%	\$125.8	6%

- The Jobs Plan proposal would lead to an 8% average increase in A/E Output over the period, totaling \$184.8 billion. This includes a 2% increase in 2021, a 10% increase from 2022 to 2025, and another 7% increase in 2026.
- The GOP Plan proposal would lead to a 2% average increase in A/E Output over the period, totaling \$45.8 billion. This includes a 1% increase in 2021, and a 2% increase from 2022 to 2026.
- The Bipartisan Plan proposal would lead to a 6% average increase in A/E Output over the period, totaling \$125.8 billion. This includes a 2% increase in 2021, a 7% increase from 2022 to 2025, and another 5% increase in 2026.

Infrastructure Proposal Assessment

Expected Impacts on the Engineering and Design Services Industry (6-year totals)

New Infrastructure Investment



Jobs Plan
+\$193B

Jobs Plan
+\$925B

Jobs Plan
+\$579B

A/E Full & Part-Time Jobs



Jobs Plan
+30,000

Jobs Plan
+121,000

Jobs Plan
+82,000

A/E Industry GDP (Value Added)



Jobs Plan
+\$27B

Jobs Plan
+\$110B

Jobs Plan
+\$75B

A/E Industry Sales

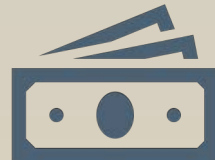


Jobs Plan
+\$46B

Jobs Plan
+\$185B

Jobs Plan
+\$126B

A/E Industry Wages



Jobs Plan
+\$22B

Jobs Plan
+\$91B

Jobs Plan
+\$62B

Total Tax Collections

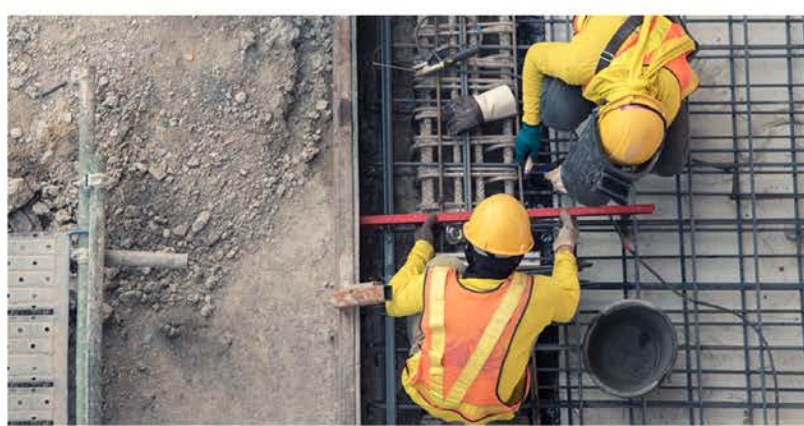


Jobs Plan
+\$5B

Jobs Plan
+\$21B

Jobs Plan
+\$15B

- **Under all infrastructure scenarios, A/E Services Output would grow significantly over the baseline forecast** – averaging \$30.8 billion per year in additional inflation-adjusted sales over the next six years under the Jobs Plan scenario, \$7.6 billion per year in additional inflation-adjusted sales over the same period under the GOP Plan scenario, and \$21 billion per year in additional inflation-adjusted sales over the same period under the Bipartisan Plan scenario.
- **Roughly 8 cents of every proposed Jobs Plan, Republican Roadmap Plan, or Bipartisan Plan dollar** will ultimately end up in the Engineering and Design Services sector.
- Raising the **corporate income tax to 28%** would be a drag on A/E sector output to the tune of **~\$1 billion per year** (around 0.2% of annual industry output). It is important to note that raising the corporate tax rate would likely have an even **larger impact on the profitability** (net income) of many firms in the Engineering and Design Services sector.
- The Jobs Plan would support **121,000 annual jobs, \$110 billion in industry GDP, \$91 billion in employee wages, and \$21 billion in tax revenue** offsets.
- The Republican Roadmap Plan would support **30,000 annual jobs, \$27 billion in industry GDP, \$22 billion in employee wages, and \$5 billion in tax revenue** offsets.
- The Bipartisan Plan would support **82,000 annual jobs, \$75 billion in industry GDP, \$62 billion in employee wages, and \$15 billion in tax revenue** offsets.



Prepared for ACEC By: Rockport Analytics

Annapolis, MD
West Chester, PA

web: rockportanalytics.com
email: info@rockportanalytics.com
phone: (866) 481-9877

ACEC

AMERICAN COUNCIL OF ENGINEERING COMPANIES



ROCKPORT
ANALYTICS