

Key Points

- Senate Democrats propose spending \$1,022 billion on public infrastructure over the next 10 years, financed with taxes on personal income and corporate income.
- An additional dollar of federal aid could lead state and local governments to increase total infrastructure spending by less than that dollar since state and local governments can often qualify for the new grant money within their existing and planned infrastructure programs. Based on an extensive literature review, we estimate that infrastructure investment across all levels of government increases between \$225 billion and \$1,039 billion, including the \$1,022 billion federal investment.
- Depending on how much state and local governments spend on infrastructure in response to federal aid, we estimate that the plan changes GDP between -0.1 and 0.1 percent by 2032 relative to no policy change. By 2042, the plan changes GDP between -0.3 and -0.2 percent.

Summary

The Senate Democrats' *Jobs and Infrastructure Plan for America's Workers* calls for \$1,022 billion in federal infrastructure spending over the next decade. We find the plan will have a small negative effect on GDP.

The Jobs and Infrastructure Plan for America's Workers

Introduction

The American Society of Civil Engineers recommends long-term, consistent investment to address the country's infrastructure needs. However, according to USAFacts, investment in public infrastructure has slowed from an annual growth rate of 2.4 percent in the 1990's to 1.9 percent over the 10 years ending in 2015. The White House and now Senate Democrats released plans to increase federal spending

for infrastructure.

The Penn Wharton Budget Model previously projected the potential impact of additional public infrastructure on the U.S. economy. PWBM then examined the effects of the White House infrastructure plan, which called for \$200 billion in new federal spending over the next decade. This brief analyzes the *Senate Democrats’ Jobs and Infrastructure Plan for America’s Workers*, which calls for \$1,022 billion in new infrastructure spending over the next decade.

Proposed Spending Targets

The *Jobs and Infrastructure Plan* earmarks \$1.022 trillion for investment for a wide variety of types of infrastructure. As shown in Table 1, the majority of the outlays are directed toward traditional public infrastructure investment including the Highway Trust Fund, roads and bridges, public transportation, rail infrastructure and sewer and water systems. However, the plan also invests in newer types of infrastructure including the development of high-speed internet, natural disaster resistance and a more efficient energy grid. While the plan largely augments existing federal grant as well credit and loan programs, some funding is directed to new aid programs.

Table 1: Elements of the Senate Democrats’ Jobs and Infrastructure Plan for America’s Workers

Area	Budgetary Effect (in billions)
Roads and bridges	\$140
TIGER grants	\$10
Sewer and water	\$115
Public transportation	\$115
Rail infrastructure	\$50
Vital infrastructure	\$40
Revitalize main street and promote innovative transportation	\$30

Transportation	
Neighborhood revitalization, lead remediation, and affordable housing	\$62
Schools	\$50
Ports and waterways	\$30
Airports and airspace	\$40
Disaster resistance	\$25
Energy grid	\$80
High-speed internet	\$40
Public land construction projects	\$15
Tribal infrastructure	\$10
Veterans affairs	\$10
Infrastructure financing tools	\$20
Highway Trust Fund	\$140
Total Outlays	\$1,022

Source: Senate Democrats' Jobs and Infrastructure Plan for America's Workers

Financing

Table 2 summarizes the five sources of new revenue that the *Jobs and Infrastructure Plan* proposes using to finance \$1,022 billion in new federal infrastructure spending. Several of the tax proposals would roll back provisions from the Tax Cuts and Jobs Act.

Table 2: Revenues from the *Jobs and Infrastructure Plan for America's Workers*

Area	Budgetary Effect (in billions)	PWBM Estimated Budgetary Effect (in billions)

Increase top marginal rate from 37 percent to 39.6 for married filing jointly with taxable income exceeding \$600,000 (\$500,000 for single filers)	\$139	\$165
Return the alternative minimum tax phase-out and exemptions to their 2017 levels (\$84,500 exemption and 25 percent phase-out starting at \$160,900 for married filing jointly)	\$429	\$318
Return estate tax exemption to its 2017 levels (\$11 million for families, \$5.5 million for individuals)	\$83	\$80
Tax carried interest as ordinary income	\$12	\$22
Raise corporate tax rate to 25 percent	\$359	\$473
Total Revenues	\$1,022	\$1,058

Source: Senate Democrats' Jobs and Infrastructure Plan for America's Workers

The plan has four provisions on the personal income tax side: an increase in the marginal rate on the top bracket rate to 39.6%; a decrease in the exemption and phase-out in the Alternative Minimum Tax to their 2017 levels; restoring the the estate tax exemption to its 2017 level; and taxing carried interest as ordinary income. The Senate Democrats report that these four changes would raise revenue by \$139, \$429, \$83 and \$12 billion, respectively.¹ We estimate that these four provisions would generate \$165, \$318, \$80 and \$22 billion in additional federal revenues.

On the corporate side, the plan increases the corporate tax rate from 21 to 25 percent. The Senate Democrats estimate that this increase will generate \$359 billion in revenue over the next 10 years. We estimate that this provision raises about \$473 billion in revenue.

In total, Senate Democrats expect an additional \$1.022 trillion over 10 years. We estimate that, before any economic feedback effects, an increase of \$1.058 trillion, or about 3.5 percent more.

The Five Major Types of Financial Aid Programs

The outlays in the *Jobs and Infrastructure Plan* generally fall into one of five types of

aid programs. Each aid program has different effects on the total amount of new infrastructure spending because each program has different effects on incentives for state and local governments to invest in public infrastructure. The five categories that PWMB uses to estimate the total change in infrastructure investment are:

Block Grants and Matching Grants with Caps: Block grants are funds that are disbursed to states and local governments for their use on infrastructure projects. Block grants are typically unencumbered by restrictions within a particular category of infrastructure spending. With matching grants with caps, the federal government contributes a share of the cost of a specific project, often as high as 80 to 90 percent in the Senate Democrats' plan. Nonetheless, the total value of each grant is limited by the size of the federal appropriation.

Matching Grants with Caps for Distressed Areas: These grants are earmarked for areas that are economically distressed.

Matching Grants with Caps for Deferred Maintenance: These grants aim to reduce the backlog of deferred-maintenance projects.

Credit Programs, Loans and Tax Credits: These programs are designed to reduce the cost of public infrastructure for state and local governments and private organizations by providing cheaper credit and loans, or by reducing the tax liability for institutions that build or invest in public infrastructure.

Direct Federal Spending: The programs include spending on specific projects, including Amtrak and national parks. These projects have minimal state or local government involvement.

Estimating the Total New Infrastructure Investment

When the federal government awards aid for infrastructure investment, the historical evidence indicates that state and local governments often shift their own spending and revenues. Previously, PWBM reviewed empirical studies about how states and localities changed their spending and revenues in response to federal aid. Those studies indicate that an additional dollar in federal spending typically increases total (federal, state and local) spending by well *less than* one dollar, *including* the federal dollar. In particular, states substitute federal spending for new spending (or new revenues) that they would have otherwise done (or raised) without the federal aid. However, the amount of offset varies across the five types of federal

the federal aid. However, the amount of offset varies across the five types of federal aid just outlined.

Based on the empirical evidence, Table 3 shows our projected total infrastructure spending by the five types of federal aid. In constructing Table 3, we use the descriptions of each of these individual outlays listed in Table 1 to categorize the outlay into one of the five types of federal aid outlined above: block and matching grants with caps; matching grants for distressed areas; matching grants for deferred maintenance; credits, loans and tax credits; and direct spending. If a specific outlay shown in Table 1 is described by more than one of these five financial aid categories and the spending is not explicitly broken out, we assume that the outlay is equally split among the applicable categories. To reflect the wide range of offsets found in the historical evidence, we consider three scenarios---low, medium and high---that are ordered by increasing amounts of state and local spending (fewer offsets).

Table 3: Three Options for State and Local Government and Private Sector Response to Federal Aid for Infrastructure

		Net Change in the Value of Infrastructure Spending by Federal, State and Local Governments Under the Senate Democrats’ Jobs and Infrastructure Plan for America’s Workers, (billions of dollars)		
Type of Federal Spending Program	Senate Democrat Plan (billions of dollars)	Low	Medium	High
Block Grants and Matching Grants (with Cap)	\$661	\$0	\$330	\$661
Matching Grants (with Caps) - Distressed Areas	\$32	\$16	\$24	\$32

Matching Grants (with Caps) - Deferred Maintenance	\$70	\$0	\$18	\$35
Credit and Loan Programs; Tax Credits	\$103	\$51	\$103	\$154
Direct Federal Spending	\$158	\$158	\$158	\$158
Federal Spending	\$1,022	\$1,022	\$1,022	\$1,022
Net Total Spending	\$1,022	\$225	\$632	\$1,039

Note: Under each of the above options the federal government spends \$1,022 billion. Adding each category of spending may not result in totals because of rounding.

Block Grants and Matching Grants with Caps: Block grants and matching grants with caps do not provide strong incentives for state and local governments to invest additional money in infrastructure. The grants do not change the cost of additional infrastructure once the grant is exhausted. For each \$1 of federal grant money, we assume that total spending increases by \$0, 50 cents and \$1 dollar for the low, medium and high spending scenarios, respectively. Therefore, \$661 billion in block grants and matching grants with caps generate low, medium and high values of \$0, \$330 and \$661 billion in new public infrastructure, respectively.²

Matching Grants with Caps for Distressed Areas: Distressed areas---typically economically-impooverished areas with high property vacancy rates---may have limited capacity to increase their revenues. Valuable local infrastructure projects may lack funding because the jurisdiction lacks the means to affordably finance them. Therefore, \$1 in federal aid is less likely to displace existing public infrastructure programs. At the same time, because these jurisdictions may have difficulty raising taxes or attracting financing, one more \$1 in federal aid is not going to generate more than \$1 of total public infrastructure spending. For each \$1 of federal grant money to distressed areas, we assume that total spending increases by 50 cents, 75 cents and \$1 for the low, medium and high spending scenarios, respectively. Therefore, the \$32 billion in federal aid to distressed areas generates of \$16, \$24 and \$32 billion of public infrastructure, respectively.³

Matching Grants with Caps for Deferred Maintenance: The *Jobs and Infrastructure Plan* allocates about \$70 billion toward deferred maintenance. Deferred

maintenance expenditures are planned infrastructure investments used to maintain existing infrastructure. By definition, these grants are likely to displace existing state and local infrastructure spending. Therefore, we assume the \$70 billion in matching grants for deferred maintenance will lead to \$0, \$18 and \$35 billion in additional public infrastructure, respectively.⁴

Credit Programs, Loans and Tax Credits: Subsidized interest rates, greater credit availability and tax credits lower the cost of building infrastructure. The lower cost of building infrastructure encourages additional investment. Some state and local governments will take planned infrastructure projects that rely on alternate funding and, instead, use new federal money for project funding. Therefore, PWBM applies a wide range to how state and local governments respond to this program: The \$103 billion in the Senate Democrats' plan will result in \$51, \$103 and \$154 billion dollars of additional public infrastructure in the low, medium and high spending scenarios, respectively.⁵

Direct Federal Spending: Direct federal spending is typically spent on projects with little or no state and local involvement. State and local government projects are mostly unaffected by this program. Therefore, we assume that the full \$158 billion allocated to this program is turned into additional public infrastructure.⁶

Economic Effects

As was the case for PWBM's analysis of the White House infrastructure plan, we use our dynamic model to evaluate the effects of the *Jobs and Infrastructure Plan* on the U.S. economy. We model investment in public capital as a complement to private capital.⁷ In other words, more public capital investment raises the productivity of private capital and labor. Our model assumes the additional dollar of public infrastructure generates over 10 cents of output *per year*, everything else equal, which is a larger return than for private sector investment.

Since our previous analysis of the White House infrastructure plan, PWBM has continued making additions to its dynamic model. These model additions prevent a direct comparison of the Senate Democrat plan considered in this brief and our analysis of the White House plan that we previously released.

Accordingly, in this brief, we present our projections of the Senate Democrat plan *and* the White House plan using our updated model. We model the sources of

revenue presented in the Senate Democrat plan and we assume that those sources of revenue expire after ten years.⁸ The White House infrastructure plan is funded by user fees. For comparison, we also analyze both plans funded with higher deficits. The government is assumed to focus spending on "shovel ready" projects and so our simulations assume spending rates and building rates that are twice as fast as previously estimated by the experts at the CBO (2016).⁹

Selecting "Senate Democrats' Plan" and "Revenue Financed" from the drop down menus in Table 4 shows the changes in key budget and economic variables that we project that the *Jobs and Infrastructure Plan* will have over time. Higher tax rates in the first 10 years lower GDP because they reduce households' incentives to save, lowering private capital services.¹⁰ Lower GDP leads to a drop in revenues below what is necessary to finance the infrastructure spending. As a result, debt also increases between 0.9 and 1.0 percent by 2032 relative to the baseline economy without the policy change. Although private capital is lower, there is a significant increase (between 1.1 and 5.0 percent) in public capital, which makes both capital and labor more productive and offsets some of the effects of the decline in capital. The net effect is a very small (between -0.1 and 0.1 percent) change in GDP in 2032.

By 2042, some of the additional public capital has depreciated and the increase in public capital relative to the baseline is smaller by 2042 (between 0.6 and 2.8 percent) than it was by 2032 (between 1.1 and 5.0 percent). Moreover, higher debt now encourages even less private capital formation, reducing productivity. GDP falls between 0.3 and 0.2 percent.

Table 4: The Effects of Federal Investment in Public Capital on Key Variables Relative to Current Policy in Year Shown

Amount Invested

Senate Democrats' Plan	▼
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Source of funding

Revenue Financed	▼
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Tax Financed Senate Democrats' Infrastructure Plan

Year	Net Change to Infrastructure Spending by Federal, State and Local Governments	Debt (% change)	GDP (% change)	Hours Worked (% change)	Average Hourly Wages (% change)	Public Capital Services (% change)	Private Capital Services (% change)
2032	Low	1.0	-0.1	0.0	-0.1	1.1	-0.5
	Medium	1.0	0.0	0.1	-0.1	3.0	-0.6
	High	0.9	0.1	0.1	0.0	5.0	-0.6
2042	Low	0.9	-0.3	0.0	-0.3	0.6	-0.9
	Medium	0.8	-0.2	0.0	-0.2	1.7	-0.9
	High	0.8	-0.2	0.0	-0.2	2.8	-0.9

Note: The \$1.022 trillion in federal infrastructure investment is financed with the revenues outlined in the Senate Democrats' Jobs and Infrastructure Plan for America's Workers. Consistent with our previous dynamic analysis and the empirical evidence, the projections above assume that the U.S. economy is 40 percent open and 60 percent closed. Specifically, 40 percent of new government debt is purchased by foreigners. The government is assumed to focus spending on "shovel ready" projects and so, the above projections assume double the spending rates and building rates applied by CBO (2016). Consistent with empirical evidence, the projections above assume that the elasticity of output to a change in public capital is 0.05. The projections above assume a high rate of return to private capital. Projections that assume a low rate of return to private capital are not materially different. Revenue estimates change with the distribution of taxable income that reflect a dynamic economy.

Selecting "Senate Democrats' Plan and Deficit Financed" from the drop down menu in Table 4 presents the effects of the same infrastructure investment, but now financed with higher deficits. To be clear, the Senate Democrat plan does *not* call for deficit financing. Still, we provide this analysis as a potential comparison against the White House plan discussed below, which lacks an explicit financing mechanism, potentially making it deficit financed. Without taxes to fund the infrastructure investment, debt increases by between 3.8 and 3.9 percent by 2032. The increase in federal debt crowds out private capital services, which decline by 1.2 percent in the same year. Smaller capital leads to lower wages and lower GDP. GDP declines between 0.2 and 0.4 percent in 2032 and between 0.7 and 0.8 percent in 2042 relative to the baseline economy.

Selecting "White House Plan and Funded with Revenues" from the drop down menu

in Table 4 shows the economic effects of the White House infrastructure plan funded by user fees. The effects of the White House infrastructure plan are much smaller than the effects of the Senate Democrats' plan because the effect on public infrastructure capital is much smaller. By 2032, the effects on public capital services are between 0.1 and 1.1 percent. Unlike the Senate Democrats' plan, which proposes increases in personal and corporate tax rates, the user fees have a much smaller effect on household savings and labor decisions over the first ten years because user fees are more akin to lump-sum taxes. The smaller effect on household savings and labor decisions leads to a smaller effect on output, which leads to a much smaller effect on debt. Private capital declines only by 0.1 percent in 2032 compared to the baseline. Although the new infrastructure raises the productivity of both labor and capital, the size of the increase is not large enough to create any significant change in hours worked, wages, or GDP. Even in 2042, the effects on the economy are extremely small.

Selecting "White House Plan and Deficit Financed" from the drop down menu in Table 4 shows the same White House infrastructure plan funded with higher deficits. Debt increases between 0.7 and 0.8 percent by 2032 compared to the baseline. More debt crowds out productive investment, reducing private capital by 0.2 percent. As before, public investment makes private capital and labor more productive. The net effect on GDP in 2032 is between -0.1 and 0.0 percent. The effect of the public capital investment on private capital and labor productivity declines over time. By 2042, these effects lead to a drop in private capital (0.5 percent), which, in turn, contributes to a slightly larger decline in GDP, between -0.2 and -0.1 percent.

Conclusion

The Senate Democrats' *Jobs and Infrastructure Plan for America's Workers* calls for the federal government to increase infrastructure spending by \$1,022 billion over the next decade. PWBM estimates that total spending, including state and local spending, will increase between \$225 and \$1,039 billion, including the federal contribution. Moreover, we project that this proposal results in a small change in GDP, between -0.1 and 0.1 percent in 2032 and between -0.3 and -0.2 percent in 2042.

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1. The *Jobs and Infrastructure Plan* does not indicate a source of its revenue estimates. Neither the Joint Committee on Taxation nor the Congressional

- Budget Office have released public estimates. ↩
2. All of the programs in Table 1 contain block grants or matching grants with caps (excluding grants targeted to distressed areas or for deferred maintenance) except for the schools, high-speed internet, tribal infrastructure, veterans affairs and innovative financing tools. ↩
 3. The programs in Table 1 that provide matching grants for distressed areas are roads and bridges; public transportation; revitalize main street and promote innovative transportation; and tribal infrastructure. ↩
 4. Public transportation, rail infrastructure and schools programs in Table 1 have grant programs targeting deferred maintenance. ↩
 5. The programs from Table 1 that allocate money for loan and credit programs and tax credits are sewer and water; neighborhood revitalization, lead remediation and affordable housing; ports and waterways; resilient communities; energy grid; and innovative financing tools. ↩
 6. Of the programs listed in Table 1, rail infrastructure; ports and waterways; airports and airspace; energy grid; high-speed internet, public land construction projects and veterans affairs contain outlays for direct federal spending. ↩
 7. Capital services reflect both the size of the physical capital stock and the productivity of different types of capital assets. In the dynamic model, public capital services are modeled separately from private capital services. The amount of public capital in the economy does not change in response to economic conditions. Private capital services reflect the amount of privately-owned, productive capital in the economy, which, by contrast, changes as households and foreign investors change their saving and investing behavior in response to changing economic conditions. ↩
 8. In all models of economies that are open to foreign capital flows, foreign investors move capital in and out of the economy to equalize the return to capital in the U.S. economy and the return to capital in the rest of the world. Policies that affect the return to capital incentivize foreign investors to move large amounts of capital into and out of the economy, which results in large, temporary economic effects. The end of the corporate tax provisions in the tenth year of the *Jobs and Infrastructure Plan* generates these large, temporary economic effects that do not reflect the overall effects of this policy. Therefore, to show results that more accurately reflect the overall economic impacts of these plans, we report the economic effects at a horizon of 15 and 25

impacts of these plans, we report the economic effects at a horizon of 15 and 25 years, in 2032 and 2042. ↩

9. “The Macroeconomic and Budgetary Effects of Federal Investment.”

Congressional Budget Office, June 2016.

<https://www.cbo.gov/publication/51628> ↩

10. In our analysis of the Senate Democrat plan, both the corporate income tax rate and the four personal income tax provisions revert to their baseline values after the tenth year. In our analysis of the White House infrastructure plan, the lump sum tax expires in the sixth year, after the infrastructure outlays are complete.

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