Infrastructure: Past, Present, and Future

FROM ROADS AND HIGHWAYS, to railways and airports, and now the internet and more, infrastructure has supported American development and progress. Can we learn from history, assess current needs, understand the economics, and have a vision for our future? Dean Baker, Rosabeth Moss Kanter, Laurie A. Schintler, and Lee Vinsel discussed these issues.

LEE VINSEL

- The question of what role the federal government should play in infrastructure is one of the oldest debates in American history, going back to the earliest years of the nation. On the one side, the Federalists argued that the development of internal improvements—such as roads, canals, and harbors—was the duty of the nation. On the other side, the Jeffersonians argued that these structures furthered the interests of elites, rather than the public good. The federal government created select public works in the nineteenth century—most famously the National Road that ran between the Potomac and Ohio rivers, built between 1811 and 1837.
- In terms of infrastructure, the most iconic public works projects were primarily products of the Progressive and New Deal eras—when the federal government was much more developed and active in the economy.
    - The Federal Aid Road Act of 1916 was the first piece of legislation that enabled the United States federal government to support modern automobile-centered highway construction.
    - Infrastructure highlights of the New Deal include the Hoover Dam, built between 1931 and 1936, the Tennessee Valley Authority, and rural electrification.
- Research has shown that the fruits of infrastructure are not evenly distributed. For example, historians have shown that rural electrification often excluded black neighborhoods. This is a theme in infrastructure that has continued to this day.

Speakers

LEE VINSEL
Associate Professor of Science, Technology, and Society, Virginia Tech

LAURIE A. SCHINTLER
Associate Professor in the Schar School of Policy and Government, George Mason University

DEAN BAKER
Senior Economist and Co-Founder, Center for Economic and Policy Research

ROSABETH MOSS KANTER
Ernest L. Arbuckle Professor, Harvard Business School

Moderator

PETER COY
Economics Writer, *New York Times* Opinion Section

Event presented by

Network for Responsible Public Policy

Event Co-sponsors

The Academy of Political Science

The Puffin Foundation, Ltd.

The News Literacy Project

- Infrastructure in the twentieth century was a bipartisan issue in many instances. After World War II, Republican President Dwight Eisenhower created the Interstate Highway System—the largest and most significant publicly-owned infrastructural network in U.S. history.
- During the post–World War II period, the United States developed a system of federal loans and grants for states and localities to build roads, bridges, sewer systems, waste treatment plants, and other publicly-owned infrastructural assets. This is still the basis of infrastructure policy today—federal money goes to the localities.
- By the 1980s and 1990s, infrastructure became the subject of a series of reports focused on how the federal, state, and local governments were failing to maintain and repair already built structures.
- The economic doldrums of the 1970s cut into tax revenues. Charles Marohn, founder of Strong Towns, has argued that municipalities were able to get below market rate loans and grants to build infrastructure in the post–World War II period, with the municipalities promising to maintain this infrastructure forever. With some cities having over twice the infrastructural burden than they do tax revenue, however, municipalities often do not have the tax revenue to pay for upkeep.
- Modernizing some infrastructure systems in pursuit of goals around climate change and other social issues are important. President Joe Biden's "care infrastructure" is not a stretch. There were talks of social infrastructures back in the 1960s.
- However, Vinsel would like to see more emphasis on the maintenance of existing infrastructure in the Biden infrastructure bill. He and others have called for a "fix it first" approach.
- Research by Daniel Armanios and his colleagues documents the racist legacy of American infrastructure. For example, black neighborhoods have worse bridges than most white neighborhoods, which limits economic development in various ways. In addition to modernization and maintenance, Vinsel pointed out that equity should also be a key part of infrastructure policy going forward.

LAURIE A. SCHINTLER

- Transportation infrastructure includes the physical structures—roads, bridges, and railways. It includes the vessels—cars, trucks, and planes. It encompasses the people and goods moving from one place to another. There is also an invisible side—the information technology and data running behind the scenes to optimize and manage transportation infrastructure systems.
- How are artificial intelligence (AI) and big data being used for managing, designing, and optimizing these services? What are the benefits, and the downsides?
- The middle of the last century ushered in the digital revolution with inventions such as the computer, the internet, GPS, and later mobile phones. This led to the first intelligent vehicle highway systems (IVHS as coined in the 1980s), which describes a group of technologies that connect vehicles to infrastructure to improve the safety and efficiency of transportation systems.
- We now have a technological revolution underway, which some refer to as the Fourth Industrial Revolution. This entails an array of technologies, such as AI, blockchain, big data, nanotechnology, cloud computing, and quantum computing.
- There are some funds in the Biden bill for intelligent transportation systems, AI, and big data. Big data is used to design, develop, train, and test AI systems, which are used to manage and optimize transportation infrastructure and related services.
- What are the opportunities and benefits? Overall, AI and big data improve the efficiency, safety, and productivity of transportation systems. AI and big data can also make transportation systems more personalized.
  - Mobile phone data and social media can track the movement of individuals around a city. That information is used in conjunction with AI to improve the performance of the transportation system.

  - AI is also used for transportation planning and the prioritization of infrastructure investments. For example, AI is used to determine the sequence of bridge maintenance, or which bridges need to be repaired first.
  - Autonomous vehicles have lots of AI running behind the scenes and use vast amounts of big data. Information is gathered from the vehicle to optimize its movement and performance in real time.
- What are the drawbacks?
  - AI and big data can lead to job loss. Segments of the population—such as black and Hispanic males who tend to work in the trucking industry—may be negatively and disproportionally impacted by the automation of transportation.
  - There are privacy concerns. The data collected and used for AI is very detailed, including personally sensitive information about where people have been and when.
  - Another concern is algorithmic bias and discrimination. AI is notoriously biased. The data that the AI systems are using to learn from are biased and not representative of the entire population.
  - The private sector, particularly the tech industry, is designing the AI systems, and is increasingly part of the management and design of infrastructure. The concern is that the values encoded into those AI systems may not be those associated with social good or the public sector.

DEAN BAKER

- In his talk, Baker focused on debt, explaining that he does not see deficits as a big issue. It is not clear at this time how much debt Biden's infrastructure or reconciliation packages will create.
- The United States had large deficits in 2020 and 2021—with spending higher than the revenue taken in. There was a big fall in GDP and in tax revenue. The CARES Act meant paying out a lot of money to keep people whole through the pandemic.
- The conventional argument against running big deficits is that borrowing will push up interest rates. However, the current interest rate is about 1.3 percent—which is extraordinarily low by any historic standard.
- Another concern is that deficits lead to inflation. However, Baker does not think that the inflation we are seeing now is due to overstimulating the economy. The supply constraint on semiconductors resulted in a rise in both new and used car prices. It is a supply constraint that has little to do with excess demand.
- With respect to debt being a problem: Are we creating too much of a burden? We should ask: How much do we have to pay in interest on that debt? The public debt of the United States is about $28.4 trillion. Even with more added to that debt, the current low debt service and interest rate environment reduces the likelihood that the debt will be a big burden on our kids.
- Baker pointed out two burdens for the future related to prescription drugs and climate change. He suggested that the federal government would spend less on prescription drugs if drug companies did not have patent and copyright monopolies. He would like instead to see the federal government finance prescription drug research. Additionally, there are big costs to be paid year after year if we do not address climate change.
- If the infrastructure plans go through, there is a lot we do not know about how much debt will be added. However, it is hard to see that as a serious issue, particularly given the severity of the problems we face.

ROSABETH MOSS KANTER

- The United States lags in nearly everything, including rail systems, public transit, and roads. It is a major impediment to growing the economy.

- The Biden plan says that every time you fix something, you can improve it. It is talking about more than maintenance. It is talking about investment, just as when we first created our current infrastructure decades ago.
- The Biden plan is very sensible, but it is stuck because of politics. There is usually a lot of support locally for infrastructure spending. However, there are enormous state and local tensions when it comes to infrastructure.
- We have an urban-rural divide. For example, the governor of Wisconsin diverted funds that were targeted for public transit—which Milwaukee badly needed—to build interchanges on the interstate.
- Can the private sector step in and solve these problems? There are certain projects for the public good that only the public sector can do.
- Private investors, however, have stepped in to build a high-speed rail line in Florida. This will be very good for the economy. The plan for a high-speed rail train in Texas between Houston and Dallas is still alive.
- How do you get public support for big infrastructure projects? From the time of the transcontinental railroad through today, all of the big infrastructure investments have been made in the name of national defense.
- Some of the strengths of the Biden plan are: it tends to balance maintenance with innovation; it includes a lot of inherent social remedies; internet is a big component; it balance modes of transportation; there is an emphasis on green technology; and there is a 50 state emphasis, so every state should get something.

QUESTION AND ANSWER TAKEAWAYS

How does the United States stack up compared to our international partners?

- Kanter: We stack up very poorly. The only area in which the United States has scored high is in the number of airports and flights, though not in quality. We also do well on telecommunications technology, but not on deployment.

Do you think AI and big data itself should be regarded as part of infrastructure?

- Schintler: We definitely need to regard it as part of infrastructure. It is the invisible infrastructure.

Is our country perhaps just too big to manage/solve all the infrastructure problems we face?

- Kanter: For the things that seem too big, that is why we have regions. Regional planning is an increasing phenomenon in the United States. There are many projects that cross state lines, but they involve segments of the country, not the entire country.

What is the caring economy? This is a new kind of infrastructure that is being talked about in the Biden plan.

- Kanter: People have to fumble to get care, yet it is an important need to be able to go to work and stay healthy. We care about quality of life, not just the economy. So, it is a matter of taking something that is fragmented, organizing it, and making it accessible to more people. Countries like Bhutan and those in Scandinavia, which get the highest marks for happiness and ideal societies, have long understood the importance of an infrastructure of care—so that people have access to caregivers, formal health systems, as well as education systems.

- Vinsel: He is in favor of bundling the care infrastructure and the physical infrastructure, but whether it is politically efficacious is another

question considering how some Republican politicians have reacted to it.

Cybersecurity seems to be an increasingly vulnerable issue for many sectors in the United States. How do infrastructure improvements take this into consideration?

- Schintler: When we think about big data and AI, we need to think about potential cyber-attacks. For example, there are significant concerns about cyber-attacks involving autonomous vehicles. It is hard to know what the solution is.
- Vinsel: We are increasingly using digital infrastructures to run our physical infrastructures. This does open us up to all kind of risks. It is important to look at ongoing cybersecurity measures as an ongoing maintenance cost, just as physical infrastructures require.

Is education a part of infrastructure?

- Baker: If it sells, that is great. However, it is qualitatively different.
- Kanter: It is of value in and of itself, and depends on the quality of infrastructure. It is one of the outputs. However, we do not want to throw everything into the infrastructure category.

The Regional Plan Association is very much involved in developing infrastructure for the tri-state area. Are advisory boards such as those efficacious in addressing local needs within a regional context?

- Kanter: Yes, depending on the project. There have to be regional bodies weighing in because projects do cross state lines. These kinds of coalitions are the only way to move things forward, because we need collaboration across jurisdictions to solve many of these problems.

What is the role of leadership in improving infrastructure?

- Kanter: We need leaders to provide a coherent vision or mission for the people to rally behind. Leaders are good at convincing people. If we are going to do anything about big public problems like infrastructure, it is all about leadership.

The politics surrounding this issue are certainly contentious. What are the options going forward?

- Baker: There is a large group of progressive Democrats that will not support the bipartisan bill unless they get something they are satisfied with. They have basically drawn a line in the sand. It will be less than $3.5 trillion, but it will be a substantial package for things like childcare, extending the subsidies and Affordable Care Act exchanges, and other things like that.
- Kanter: It will not be $3.5 trillion. There is some room for compromise. The more it is brought home to districts as something that will directly benefit the people, the more it becomes concrete, and not just about huge federal numbers. Even a more modest expenditure can get the ball rolling towards these goals.

Is the deficit the key issue for the Republicans? Can they be persuaded otherwise?

- Coy: Government and taxation are two correlated but separate issues here. Republicans do not like large government. Also, it is clear that the Republicans are happy with deficits when they are caused by large tax cuts. So no, the deficits are not the stumbling block for this package.

INFRASTRUCTURE: PAST, PRESENT, AND FUTURE

September 23, 2021

ABOUT THE EVENT HOST

NETWORK FOR RESPONSIBLE PUBLIC POLICY is a non-partisan 501(c)(3) nonprofit organization that provides credible news and authoritative information on key public policy issues to foster informed citizenry and civic engagement. NFRPP is a trusted source that follows media literacy guidelines. It strives to motivate conversations, mitigate polarization, and combat misinformation. NFRPP's vision is to contribute to and foster a vibrant democracy through education and civic engagement. www.nfrpp.org.

ABOUT EVENT CO-SPONSORS

THE ACADEMY OF POLITICAL SCIENCE, founded in 1880, promotes nonpartisan, scholarly analysis of political, social, and economic issues by sponsoring conferences and producing publications. Published continually since 1886, the Academy's journal, *Political Science Quarterly*, is edited for both specialists and informed readers with a keen interest in public and international affairs. www.psqonline.org.

THE PUFFIN FOUNDATION, LTD. has sought to open the doors of artistic expression by providing grants to artists and art organizations who are often excluded from mainstream opportunities due to their race, gender, or social philosophy. www.puffinfoundation.org

THE NEWS LITERACY PROJECT, a nonpartisan national education nonprofit, provides programs and resources for educators and the public to teach, learn and share the abilities needed to be smart, active consumers of news and information and equal and engaged participants in a democracy. www.newslit.org

Thank you to Dean Baker, Rosabeth Moss Kanter, Laurie A. Schintler, Lee Vinsel, and Peter Coy for their participation. Marianna Palumbo and Loren Morales Kando contributed to producing and editing this summary report. The views expressed do not reflect those of the institutions with which participants are affiliated or of any other organization.