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Transportation Infrastructure in the United States

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Support for massive investments in transportation infrastructure, possibly with a change in the share of spending on transit, seems widespread. Such proposals are often motivated by the belief that our infrastructure is crumbling; that infrastructure causes economic growth; that current funding regimes give large investment to urban public transit at the expense of rural drivers; or that capacity expansions will reduce congestion. We provide an empirical and conceptual foundation for this important debate and highlight questions on which further research is needed.

We proceed in four stages. First, we document the quantity and quality of the interstate highway network, bridges of all types, public transit buses, and subways in each year over the past 20–30 years. Second, we investigate total expenditure and the unit cost for each of the four types of infrastructure over about the same time period. Third, we survey available estimates of the effects of infrastructure on economic growth and congestion. Finally, we propose a simple theoretical framework with which to organize this information and to think about whether current investments can be rationalized as part of a socially optimal infrastructure policy.

On average, most U.S. transportation infrastructure is not crumbling, except (probably) for our subways. Over the past generation, the condition of the interstate highway network improved consistently, its extent increased modestly, and traffic about doubled. Over about the same time period, the condition of bridges remained nearly the same, the number of bridges increased slowly, and bridge traffic increased modestly. The inventory of public transit motor buses is younger than it was a generation ago and about 30 percent larger, although ridership has been about constant. The mean age of a subway car stayed about the same from 1992 to 2017, but at more than 20 years, the average subway car is quite old. Subways carry about twice as many riders as they did a generation ago. Speed of travel by car, bus, and subway all declined between 1995 and 2017, most likely as a consequence of large increases in road traffic and subway ridership. Like public transit, the interstate system is largely organized around the provision of short trips in urban areas.

Both the expenditure on transportation infrastructure and its cost have increased. Expenditure on the interstate highway network about doubled from 1984 to 2008, and building new highways has become markedly more expensive. Expenditure on bridges about tripled from 1984 to 2008. This expenditure resulted in modest expansions and maintained the condition of aging bridges. Expenditure on transit buses does not show any clear trend on a per rider basis. Subways also operate at about constant expenditure per rider. In 2008, total expenditure on the public transit bus fleet was about the same as the sum of capital and maintenance expenditure on the interstate highway system and about double total U.S. expenditure on subway operation and maintenance.

To sum up, U.S. transportation infrastructure is, for the most part, not crumbling, and expenditure is rising rapidly. However, still larger investment might make sense if such

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investment contributes to economic growth or reduces congestion. We review the recent literature estimating the effects of transportation infrastructure on economic activity. While this body of research strongly suggests that transportation infrastructure plays an important role in determining where economic activity takes place, it provides little compelling evidence about transportation infrastructure creating economic growth. We also review the recent literature relating capacity expansions to congestion. This literature says that demand management is the most effective policy to combat congestion. Capacity expansions typically meet with offsetting expansions in travel demand and do little to increase the speed of travel. Investments in transportation infrastructure intended to boost the overall level of economic activity or reduce congestion are risky at best.

The allocation of expenditure across modes of transportation requires scrutiny. That we spend about the same amount on public transit buses, which provide about two billion rides per year, as we spend on the interstate highway system, which provides about 700 billion miles of vehicle travel per year (primarily for local travel), is a central and surprising feature of U.S. transportation policy. To assess the reasonableness of this allocation, we imagine a planner whose objective is to provide mobility and who accounts for the public cost of capital and user inputs. This simple model suggests that the U.S. federal government values a passenger mile of bus travel about two and a half times as much as a passenger mile of car travel. Households are implicitly willing to trade the same two quantities at a rate of one and a half to one. The rationale for so strong a federal preference for transit over roads is unclear. It may be consistent with redistributive objectives or that bus miles in central cities are more valuable than car miles on exurban highways. Regardless, this policy preference merits further careful consideration, as do changes to bus service that improve its ability to compete for users.

Massive investments in transportation infrastructure seem to draw support from across the political spectrum. These policies are often motivated by claims that our current infrastructure is crumbling or that such investments will spur economic growth. The available evidence does not support these claims. Expenditure on transportation infrastructure is growing and, for the most part, allows maintenance to match or outpace depreciation. Moreover, the available empirical evidence does not allow for much confidence in the claim that capacity expansions will lead to economic growth or reduce congestion. With that said, ongoing debates over the allocation of funds across modes of transportation seem justified. U.S. spending on buses seems large relative to their ability to attract riders. Put another way, rationalizing current policy requires that the planner value travel by car much less than travel by bus. This relative valuation merits further debate and analysis.

With this said, transit reform should surely wait until after the COVID-19 pandemic. Service workers have been most affected by the pandemic and are relatively reliant on transit. Federal bailouts of transit to preserve service probably make sense as a way to facilitate the reemployment of these workers.

Beyond this, we draw attention to the need for further research into the effects of transportation infrastructure on economic development, for the development of more and better data to monitor personal and truck travel, and for the development of even a rudimentary inventory of U.S. water and sewer infrastructure. Finally, we reiterate longstanding recommendations of transport economists for demand management as an alternative to capacity expansion for congested roads and for per axle weight fees to incentivize the use of trucks that are less damaging to the highways and roads.

NOTE:

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