Backgrounder

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More Transportation Spending: False Promises of Prosperity and Job Creation

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With the economy slowing and flirting with recession, many Members of Congress and several presidential candidates have been advocating a second, costly stimulus package that would rely more on government spending than on stimulating private spending with tax cuts. In many of these proposals, a portion of the new spending would go to infrastructure, with some or all of it targeted to transportation projects. As is often the case, many of the leading tax users in the field of transportation—the American Association of State Highway and Transportation Officials (AASHTO), the American Road and Transportation Builders (ARTBA), the American Public Transportation Association (APTA), and the Associated General Contractors—have urged Congress to spend more money on projects that would directly benefit their members.

As this paper demonstrates, most of the alleged economic benefits are based on grossly exaggerated claims made by a U.S. Department of Transportation (USDOT) computer simulation conducted in 2000 and 2002. In fact, the vast majority of independent academic and federal government studies on the relationship between infrastructure spending and economic activity have found that the impact is very modest and long in coming.

Lobbyists Clamor for More Spending

Typical is a recent statement by AASHTO Executive Director John Horsley in which he proposed that government provide $18 billion in new transportation spending to create 750,000 new jobs. Presumably,

Talking Points

- With the economy slowing and job growth declining, lobbyists for road and trolley builders are urging Congress to spend more on transportation to stimulate the economy.
- Proponents of highway spending exaggerate the ability of a U.S. Department of Transportation report to predict the number of net new jobs that additional highway spending will create.
- A GAO study of the effects of a job-creation bill found that federal funds were spent slowly and that relatively few jobs were created when most needed in the economy.
- A CBO study concluded that available research does not support the claim that increasing federal spending on infrastructure increases economic growth.
- Creating jobs is not the same as creating value. Spending any money on nearly anything will contribute to a job, but whether that job leads to the creation of products and services of broad public value is another question.

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these figures are based on the exaggerated USDOT simulation that each $1 billion of new transportation spending would create 47,000 new jobs. He also claimed that more than 3,000 transportation projects could be awarded and started within 30 to 90 days, suggesting that if they were this close to being started, they were probably also funded by current state transportation budgets.[1]

An ARTBA vice president told the House Democratic Caucus that "protecting the solvency of the highway trust fund…was one of the most effective ways to facilitate economic recovery" and later noted that a gas tax increase was one way to do this.[2] APTA complains that the proposed $1 billion for transit projects was dropped from the stimulus package (H.R. 5140) before passage and recommends that its $3.6 billion spending plan for its members be considered as part of any subsequent package.[3]

Several presidential candidates have included infrastructure and transportation spending in their proposed stimulus packages. Senator Barack Obama (D–IL) has proposed a new federal infrastructure bank that would spend $60 billion over 10 years (equal to $20 per year per person) on highways and other projects to create 2 million new jobs.[4] Senator Hillary Clinton (D–NY) proposed to increase annual spending on public transit by $1.5 billion and annual spending on passenger rail (Amtrak) by $1 billion,[5] while former Republican presidential candidate Mike Huckabee repeated—and misrepresented—the claim that $1 billion in "federal highways and transit infrastructure" creates 47,000 jobs in announcing "The Huckabee Plan: Four Guiding Principles for Strengthening America's Infrastructure."[6]

Congress is also getting involved in the spending spree. In his statement on the budget resolution for fiscal year 2009, Senate Budget Committee Chairman Kent Conrad (D–ND) announced that he had allowed room for stimulus spending in his budget proposal, including an unspecified sum for highways. Following the lead of the highway lobbyists, the Senator claimed:

> [M]ore than 3,000 "ready-to-go" infrastructure projects were identified. An investment in these projects will not only repair roads and bridges, but it will create jobs and improve economic growth, and start the process of reversing the Bush administration's underfunding of infrastructure.[7]

Yet these many claims that highway spending can quickly create jobs and spur the economy are highly questionable given the mixed findings of decades of independent academic studies on the relationship between federal spending programs and job creation. Only one substantive "study," which was commissioned by the U.S. Department of Transportation, asserts much of an impact on job creation, and the study's authors heavily qualified that claim, recognizing that the results were produced using highly artificial assumptions in the computer simulation. Indeed, a careful review of the USDOT study reveals that many proponents of

1. American Association of State Highway and Transportation Officials, "Highway Investment: The Road to Economic Recovery," March 3, 2008, at *www.transportation.org/news/96.aspx* (March 26, 2008).
2. Press release, "ARTBA Promotes Transportation Investment at Democratic Retreat," American Road and Transportation Builders Association, February 1, 2008, at *www.artba.org/news/press_releases/2008/02-01-08.htm* (March 26, 2008).
3. American Public Transportation Association, "Bush Administration Releases FY 2009 Budget—$10.135 Billion Proposed for Transit: Economic Stimulus Package Approved Without Funds for Transit," *Legislative Update*, February 15, 2008, at *www.apta.com/government_affairs/washrep/2008feb15.cfm* (March 26, 2008).
4. Mark Memmott and Jill Lawrence, "Obama to Call for $60B 'Infrastructure' Reinvestment Bank," *USA Today*, February 13, 2008, at *http://blogs.usatoday.com/onpolitics/2008/02/obama-to-call-f.html* (March 26, 2008).
5. Zach Behrens, "Hillary Clinton on LA Public Transportation," February 6, 2008, at *www.laist.com/2008/02/06/hillary_clinton_1.php* (March 26, 2008).
6. Mike Huckabee for President, "Strenghtening [sic] America's Infrastructure," at *www.mikehuckabee.com/?FuseAction=Issues.View&Issue_id=29* (March 26, 2008). The four principles were stimulus, safety, security, and sustainability.
7. Senator Kent Conrad (D–ND), "The Chairman's Mark: FY 2009 Senate Budget Resolution," March 5, 2008, at *http://budget.senate.gov/democratic/documents/BudRes09CHAIRMAN'SMARK030508FINAL.pdf* (March 26, 2008).

highway spending exaggerate its ability to predict the number of jobs created by additional spending.

The USDOT Study

Many of these claims for job creation are drawn from a computer simulation conducted in the early part of this decade by several researchers under contract with USDOT. The simulation calculated that each $1 billion of highway spending by the federal government would lead to what USDOT analysts describe as "employment benefits" totaling 47,576 person-years.[8] The study used USDOT's JOBMOD Employment Estimation Model, an input/output (I/O) model of the highway construction sector of the U.S. economy, to calculate the employment effects of additional highway spending as follows:

- **First-round** effects totaling 19,585 person-years, composed of 12,453 jobs in the highway construction sector and 7,132 jobs in industries supplying equipment and materials (e.g., stone, concrete, rebar, and fuel).
- **Second-round** effects totaling 6,939 person-years of indirect employment, caused by additional production demands in industries that supply highway construction materials (e.g., iron and steel, financing, insurance, repair, and chemicals).
- **Third-round** effects of 21,052 person-years, resulting from spending by the workers employed in the first two rounds on consumer goods (e.g., DVDs, Big Macs, baseball caps, hockey tickets, bourbon, socks, magazines, and home repair).

As the $1 billion of federal highway spending works its way through the economy, this input/output analysis contends that the money will produce the equivalent of 47,576 jobs for one year.

Notwithstanding the extent to which Senators, lobbyists, and the media tout the number of new jobs that the bill "creates" for every extra $1 billion spent, the words "new" and "create" appear only infrequently in the study's lengthy written report about the operation and results of the model. Often, it refers to ambiguous "employment benefits."

Such cautionary statements are appropriate because the analytical approach and mathematical model used to calculate these employment benefits have only a limited capability to make firm predictions on new job creation. Indeed, in an introductory section, the report carefully hedges its predictions with statements such as "assuming there is slack labor supply, each construction project creates a number of new jobs directly."

Such qualifications are particularly justified given that the mathematical model used by USDOT—traditional I/O analysis—is little more than a comprehensive technical description of the quantities of materials, supplies, and labor that are needed to make a certain product. This model does not accurately describe the complex workings of a market economy in which, each moment, thousands of participants make millions of choices involving hundreds of thousands of services and commodities, all in limited supply. In the real economy, more of one thing means less of another in the short run as individuals and businesses substitute one product for another in response to changing prices. USDOT's traditional I/O analysis does not consider such offsets and substitutions.

For example, using the job-creation numbers provided by JOBMOD, an additional $1 billion in highway spending requires an estimated 26,524 additional workers[9] to build and supply $1 billion worth of new highways. In the real world, the additional federal borrowing or taxing needed to pro-

8. The USDOT study that was used to provide the employment estimates is in fact a series of studies completed between June and December 2000 by two professors at the Boston University Center for Transportation Studies under subcontract to Battelle Memorial Institute. In turn, some of the results of these studies were incorporated into an employment estimation model (JOBMOD, version 1.1) and made available for use in 2002. Several studies were provided to the Federal Highway Administration. The most relevant is Boston University, Center for Transportation Studies, *Evaluating Federal-Aid Highway Construction Program Employment Impacts and Productivity Gains, Final Report B (Revised): Comprehensive Employment Estimation Model*, June 2000, revised December 2000. The summary findings of JOBMOD (version 1.1) are incorporated into U.S. Department of Transportation, Federal Highway Administration, *Introduction to JOBMOD, A Federal-Aid Construction Spending Income and Employment Estimation Model.*

vide this additional $1 billion means that $1 billion less is spent or invested elsewhere and that the jobs and products previously employed by that $1 billion thus disappear. Regardless of how the federal government raised the additional $1 billion, it would shift resources from one part of the economy to another, in this case to road building. The only way that $1 billion of new highway spending can create 47,576 new jobs is if the $1 billion appears out of nowhere as if it were manna from heaven.

USDOT's I/O model could be used to approximate such substitution effects, but the department did not incorporate these considerations into the study; hence, the professors prefaced their report with the condition "assuming there is slack labor supply"—economists' equivalent of manna. At the height of I/O analysis, as used during the 1970s in the centrally planned socialist economies of Eastern Europe and the Soviet Union, the operation of these models explicitly considered such substitution effects. Without markets and prices to allocate these countries' scarce resources, government central planners had to consider the full implications of taking from one sector to give to another.

For example, building a new hydroelectric dam would require tens of thousands of cubic yards of concrete, thousand of tons of rebar, dozens of bulldozers, thousands of workers, and so forth. Without free markets to allocate and produce these products by signaling supply and demand through price changes, government central planners used I/O models to calculate from which sectors to take the needed labor and supplies. This also allowed the government planners to determine the implications of such withdrawals: how many new apartments, roads, warehouses, missile silos, farm tractors, and other outputs would be sacrificed to build the hydro project.

With the collapse of most centrally planned economies, the use of I/O analysis is now confined largely to economic consultants hired to justify costly and underutilized building projects such as convention centers and football stadiums because they will "create" jobs. In fact, such projects never create anything approaching the benefits projected through the misuse of these models, but there always seem to be local boosters, businessmen, and politicians who are willing to exaggerate the potential benefits.

Because of these inherent limitations, I/O models such as the one used by USDOT should be used with great caution, and their limitations and artificial assumptions should be clearly acknowledged. When these conditions are considered, the job-creation potential of any spending scheme will be found to be a small fraction of what such models initially report.

Although the USDOT report made only passing and oblique references to such limitations and drawbacks, a number of other federal studies investigating the same or similar types of spending explicitly acknowledged such deficiencies. These studies—including three other studies discussed in this paper—concluded that the job-creation potential of government infrastructure spending is substantially less than that reported by USDOT.

The Congressional Research Service Study

Using a different I/O model, an earlier Congressional Research Service (CRS) study reported a much more cautious and qualified estimate of the potential of highway spending to create jobs.[10] Although the CRS study found similar first-order and second-order effects—24,300 jobs versus USDOT's estimated 26,524—it clearly states in its summary and conclusion that losses elsewhere in the economy would likely offset these employment gains:

> To the extent that financing new highways by reducing expenditures on other programs or by deficit finance and its impact on private consumption and investment, the net impact on the economy of highway construction in terms of both out-

9. This number includes only first-order and second-order effects. The third-order effects are excluded because they are irrelevant in this brief analysis.
10. David J. Cantor, "Highway Construction: Its Impact on the Economy," Congressional Research Service *Report for Congress* No. 93–21E, January 6, 1993.

> put and employment could be nullified or even negative.[11]

In effect, the CRS study acknowledges that the substitution effects of the new highway spending could more than completely offset the first-order and second-order employment benefits from such spending.[12]

Similarly, any tax increase to fund an equal amount of highway spending would certainly substantially offset the impact, and output and employment could be nullified or even negative. For example, the National Surface Transportation Policy and Revenue Commission's proposal to increase the federal fuel tax by up to 8 cents per gallon per year for five years and then link it to the rate of inflation in subsequent years would reduce personal incomes by $204 billion over the next five years. In turn, this reduction in income would reduce personal consumption expenditures and eliminate the jobs of the workers who provided the lost goods and services.[13]

The General Accounting Office Study

In contrast to the USDOT and CRS studies, which rely on similar models to predict likely employment impacts of highway spending, a General Accounting Office (GAO)[14] study examined the historical record to determine the actual impact of several federal spending programs on employment.[15] It also examined the effect of the spending on the unemployed at the time the programs were launched, thereby addressing USDOT's qualification regarding a "slack labor supply." While the study dates from the early 1980s, the types of programs and issues examined are similar to those being debated today.

The GAO study investigated the employment impact of the Emergency Jobs Appropriations Act of 1983, which was enacted when the U.S. unemployment rate was at double-digit levels. The legislation provided $9 billion ($19.5 billion in 2007 dollars) to 77 federal programs to stimulate the economy and provide employment opportunities to the jobless. According to the GAO, its specific objectives were to:

- Provide productive employment for jobless Americans,
- Hasten or initiate federal projects and construction of lasting value, and
- Provide humanitarian assistance to the indigent.

These programs were targeted particularly at those who had been unemployed for at least 15 weeks.

Although the program was enacted during the worst of the recession, the GAO found that "implementation of the act was not effective and timely in relieving the high unemployment caused by the recession." Specifically, the GAO found that:

> Funds were spent slowly and relatively few jobs were created when most needed in the economy. Also, from its review of projects and available data, the GAO found that (1) unemployed persons received a relatively small proportion of the jobs provided, and (2) project officials' efforts to provide employment opportunities to the unemployed ranged from no effort being made to working closely with state employment agencies to locate unemployed persons.[16]

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11. *Ibid.*
12. The summary mentions only potential substitution effects from spending shifts and deficit finance and is silent on how a tax increase could affect employment because the U.S. economy was in recession at the time, and a tax increase was not an issue. Ironically, Congress raised the federal fuel tax by 4.5 cents in 1993 to facilitate deficit reduction, not road construction. In 1997, the proceeds from that tax increase were redirected to the highway trust fund.
13. Ronald D. Utt, "The Transportation Commission's Proposed 200 Percent Gas Tax Increase: One of Several Bad Ideas in its Report," Heritage Foundation *Backgrounder* No. 2103, January 30, 2008, p. 1, at *www.heritage.org/Research/SmartGrowth/bg2103.cfm*.
14. The GAO's name was changed to the Government Accountability Office on July 7, 2004.
15. U.S. General Accounting Office, *Emergency Jobs Act of 1983: Funds Spent Slowly, Few Jobs Created*, GAO/HRD–87–1, December 1986, at *http://archive.gao.gov/f0102/132063.pdf* (March 26, 2008).
16. *Ibid.*, p. 3.

Of relevance to the potential impact of highway spending alone, the study also notes that "funds for public works programs, such as those that build highways or houses, were spent much more slowly than funds for public services."[17] This is understandable given the long lead time between the decision to build and the actual beginning of construction. For the typical federally funded road, environmental impact studies, construction plans, land acquisition, competitive bidding, and awarding of contracts can take several years. In some instances, the environmental permitting process can exceed five years.[18] Because of such delays, any employment effects related to additional highway spending would not occur for several years, thereby providing only a few jobs to those who were unemployed when the bill was enacted.

As far as the GAO was able to determine, less than 1 percent of the jobs created by the economy during the relevant period could be attributed to the program:

> GAO estimates that as of March 1984, 1 year after the act was passed, about 34,000 jobs in the economy were attributable to the act's funds spent at that time. The employment increase attributable to the act peaked at about 35,000 jobs in June 1984 when about 8 million persons were unemployed. These additional jobs represented less than 1 percent of about 5.8 million jobs created by the economy since the act was passed. After June 1984, the additional employment attributable to the act began to decline and had decreased to an estimated 8,000 jobs by June 1985.[19]

Obviously, these estimated job-creation impacts, all drawn from actual experience, are substantially less than those predicted by the USDOT study.

In the end, the 35,000 new jobs created by the Emergency Jobs Appropriations Act of 1983 came at a taxpayer cost of $257,142 per job ($546,136 in 2007 dollars). Under the circumstances, hiring the unemployed to dig holes in the morning and fill them up in the afternoon would have been far more cost-effective.

The Congressional Budget Office Study

The Congressional Budget Office (CBO) has also looked into the relationship between federal spending and job creation and other economic benefits. Based on the evidence adduced during its review, it concluded that the connection is relatively weak.[20]

In contrast to the USDOT, CRS, and GAO studies, the CBO study was a comprehensive review of a large number of academic studies on the subject conducted by individuals and institutions during the preceding 10 years. Although these studies approached the economic impact of infrastructure spending from slightly different perspectives using a variety of estimation techniques, the overall opinion was that the evidence on the effect of federal infrastructure spending on job creation was inconclusive. For example, in a 1997 review of 15 separate studies on the state and local impact of highways, eight studies found a statistically significant and positive impact, and seven found negative or insignificant results.[21]

The CBO review also cited a 1996 study commissioned by the Federal Highway Administration (FHWA), which found that the federal highway program produced extremely high benefits in its early days, but that the value of these benefits declined as the interstate system neared completion. At this point, further federal investment in highways was estimated to be less productive than private investment in general. Other studies found that federal money sometimes merely displaced

17. *Ibid.*
18. John W. Fischer, "Highway and Transit Program Reauthorization," Congressional Research Service *Report for Congress*, December 11, 2002, p. 23.
19. U.S. General Accounting Office, *Emergency Jobs Act of 1983*, p. 4.
20. Congressional Budget Office, *The Economic Effects of Federal Spending on Infrastructure and Other Investments*, June 1998, at *www.cbo.gov/ftpdocs/6xx/doc601/fedspend.pdf* (March 26, 2008).
21. *Ibid.*, p. 18.

state and local money that would have been spent on the project anyway. The CBO concluded:

> The available information suggests three conclusions: some investments in public infrastructure can be justified by their benefits to the economy, but their supply is limited; some (perhaps substantial) portion of federal spending on infrastructure displaces state and local spending; and on balance, available studies do not support the claim that increases in federal infrastructure spending would increase economic growth.[22]

Other Studies

A report prepared by two academic researchers for the FHWA in 2003 found that the impact of additional highway investment on the economy waned over time, perhaps reflecting the considerable benefits derived from the completion of the interstate highway system in the early 1980s and the less focused federal highway spending that has occurred since then. As the report's summary notes:

> Using a simple general equilibrium model the researchers estimate the net rate of return for highway capital investment over the period from 1949 to 2000. The net rate of return is found to be about 34 percent on average from 1949 to 2000. This rate of return however is found to be only 14 percent in the period 1990 to 2000 implying that there is not an underprovision of highway infrastructure capital.[23]

Several years earlier, the same two researchers published an extensive study that was part of a large symposium (partly funded by the FHWA) on the economic return of transportation investment. Like several others who have examined the subject, they found that benefits were higher earlier and declined over time, that benefits accrue over the long run, and that short-term changes in highway capital contribute only minimally to growth. The following are among the study's conclusions:

- "There is some evidence of increasing returns to scale in most industries and at the national level. Both at the industry and national levels, the contribution of private capital to economic output dominates that of total highway capital or NLS [Non-local System] capital by almost four times. This is in sharp contrast to the results reported in the literature."[24]
- "The results indicate that net social rate of return on total highway capital was high (about 35 percent) in the 1950s and 1960s, then declined considerably until the 1980s to about 10 percent. The same pattern holds for NLS capital although the net social rates of return are higher for NLS, approximately 16 percent. In the 1980s the rates of return on total highway capital and private sector capital seem to have converged, and are basically equal to the long term rate of interest."[25]
- "The ratio of optimum to actual highway capital, measured by either total or NLS highway capital, was high in the 1950s and then declined throughout the 1960s as construction of the Interstate Highway System neared completion."[26]
- "The main contributor to productivity both at the industry and aggregate level is aggregate demand. Relative prices, the capacity utilization rate and technical change also contribute to the growth of TFP [Total Factor Productivity], but their contributions are generally smaller and vary across industries. The contribution of highway capital is to long run trend TFP growth and only minimally to its acceleration or deceleration over different periods such as the period 1973–76."[27]

22. *Ibid.*, p. 23.
23. Theofanis P. Mamuneas and M. Ishaq Nadiri, "Production, Consumption and the Rates of Return to Highway Infrastructure Capital," U.S. Department of Transportation, Federal Highway Administration, 2003.
24. Theofanis P. Mamuneas and M. Ishaq Nadiri, "Highway Capital and Productivity Growth," Appendix A, in *Economic Returns from Transportation Investment* (Lansdowne, Va.: Eno Transportation Foundation, Inc., 1996), at *www.fhwa.dot.gov/policy/otps/060320a/060320a.pdf* (March 26, 2008), p. 56.
25. *Ibid.*, p. 57.
26. *Ibid.*

Creating Jobs vs. Creating Value

The CRS, GAO, and CBO studies conclude that the impact on jobs would be much less than the 47,000 new jobs per $1 billion in new highway spending implied by the USDOT simulation. However, none of these studies questioned the extent to which job creation should even be a high priority of any federal program. Most federal programs were created to meet a particular need that Congress believed government should address in the interest of the general welfare. Food stamps feed the poor, Medicare helps the elderly with medical costs, and the Department of Defense protects America from external threats. To the extent that elusive efforts to create jobs compromise these goals, scarce taxpayers dollars are wasted.

In a 1992 study about federal spending and job creation, CRS analysts pointedly—and sarcastically—asked:

> Have you noticed that most proposals to change some element of Federal economic policy—ranging from a minor tax provision to building public infrastructure to changes in trade restrictions—are debated at least in part in terms of how many jobs they will create? Will these proposals really create jobs? If so, why not just keep adding new programs until full employment is achieved?[28]

Lost in the job-creation debate is the fact that the federal transportation program is supposed to be about transportation, mobility, congestion mitigation, and safety—not job creation. To the extent that these goals are sacrificed to some illusive job-creation process, the program becomes less effective, if not irrelevant, and ought to be scrapped rather than be allowed to continue to waste the taxes paid by beleaguered motorists.

Furthermore, arguments for a costly commitment to a highway-based stimulus package cobbled together by a handful of lobbyists for the benefit of their members and clients fail to recognize that creating jobs is not the same thing as creating value. Spending any sum of money on nearly anything will contribute to a job, but whether or not that job leads to the creation of products and services of broad public value is another question. Hurricanes, tornadoes, and forest fires create large numbers of jobs, but they also destroy value in the process—an outcome not materially different from much of today's federal spending on costly and underutilized light-rail systems and pork-barrel earmarks.[29]

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27. *Ibid.*
28. Jane G. Gravelle, Donald W. Kiefer, and Dennis Zimmerman, "Is Job Creation a Meaningful Policy Justification?" Congressional Research Service *Report for Congress* No. 92–697E, September 8, 1992.
29. For one obvious example (massive federal spending on public transit), see John Semmens, "Public Transit: A Bad Product at a Bad Price," Laissez Faire Institute for Economic and Policy Studies *Issue Analysis*, January 2003, pp. 11–12.