Policy Analysis

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Amtrak at Twenty-Five: End of the Line for Taxpayer Subsidies

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Jean Love, Wendell Cox, Stephen Moore

Wendell Cox and Jean Love are economic consultants headquartered in the St. Louis area. They specialize in labor, public finance, and transportation issues in the United States, Canada, Europe, Australia, and New Zealand. Stephen Moore is director of fiscal policy studies at the Cato Institute.

Executive Summary

This year Amtrak is celebrating its silver anniversary. Unfortunately, after 25 years of federal ownership and $13 billion of federal subsidies, Amtrak appears no closer to financial independence than the day taxpayer assistance began. This study shows that virtually every stated justification for continued Amtrak subsidies is based on myth, not reality.

- Amtrak makes a negligible contribution to the nation's transportation system. Amtrak represents just .007 percent of all daily commuter work trips and just 0.4 percent of all passengers making intercity trips.

- Amtrak's typical riders are not low-income Americans. Only 13 percent have incomes below $20,000.

- Amtrak has virtually no impact on reducing traffic congestion, pollution, or energy use. Even a doubling of train ridership would reduce energy consumption and traffic congestion by less than 0.1 percent.

- Amtrak is by far the most highly subsidized form of intercity transportation. The average taxpayer subsidy per Amtrak rider is $100, or 40 percent of the total per-passenger cost. On some of the long-distance routes, such as New York to Los Angeles, the taxpayer subsidy per passenger exceeds $1,000. It would be cheaper for taxpayers to close down expensive lines and purchase discount round-trip airfare for all the Amtrak riders.

Introduction

In 1970 Congress created Amtrak, the National Passenger Railroad, as a publicly owned for-profit company. [1] Twenty-five years later, Amtrak remains heavily dependent on public subsidy; taxpayers contributed more than $1 billion to Amtrak in 1995. [2] And between 1970 and 1995, taxpayers provided more than $13 billion in federal capital and operating support of the passenger rail system. [3] States have contributed additional funds. More than two decades after Congress intended it to become financially solvent, Amtrak commercial revenues cover less than two-thirds of total costs. [4]

Amtrak is unique among forms of intercity transportation--including airlines, buses, and private vehicles--in several respects. First and foremost, Amtrak is the only publicly owned form of intercity transportation. It has by far the highest unit costs (per passenger mile) of any intercity mode--double the highest cost alternative. Amtrak carries the smallest number of passengers of any intercity mode of transportation, and it serves a disproportionately high percentage of affluent passengers. And Amtrak is the only intercity mode that requires net public subsidies.

Amtrak now needs additional public financing and has asked Congress to create a trust fund for its capital needs. Unlike the trusts for highways and air, which are derived from taxes on their respective users, the proposed Amtrak trust fund would be financed not by ticket taxes paid by its passengers but by taxes on road users--that is, on people who do not use Amtrak. Opponents of phasing out operating subsidies or privatizing the rail system justify continued taxpayer assistance by contending that Amtrak has many benefits. The alleged benefits include the following:

- Amtrak is a heavily used form of intercity transportation;
- Amtrak provides crucial transportation for lower-income Americans;
- Amtrak is a national transportation system serving the whole nation;
- The favorable European experience with subsidized rail service is transferable to the United States;
- Amtrak is energy-efficient and good for the environment;
- Passenger rail requires only small taxpayer subsidies;
- Amtrak is not more heavily subsidized than other transportation modes;
- Amtrak reduces traffic congestion;
- Amtrak provides indispensable intercity transportation to areas outside the Northeast Corridor.

This study demonstrates that these claims about Amtrak are based on myth rather than reality.

Amtrak's Legacy of Financial Failure

This year Amtrak is celebrating its 25th anniversary. The train system first came under government ownership during the Nixon administration. At the time, the marriage between the railroad and the federal government was called an "experiment" to make money-losing passenger rail service profitable again.

Yet Amtrak continues to rely on public subsidies. Between 1971 and 1981, annual federal appropriations to Amtrak rose from $140 million to $850 million. [5] During the Reagan administration, the railroad received an average annual subsidy of $600 million a year. In the 1990s Amtrak subsidies have been climbing again. In 1995 taxpayer subsidies exceeded $1 billion. While in the hands of the government, Amtrak need not worry about such matters as a bottom line profit and loss statement. Congress has proven time and again that it is willing to lend a financial hand.

There is little evidence that, over its 25 years as a federal enterprise, Amtrak has made progress toward financial self-sufficiency. Indeed, in recent years Amtrak management has been agitating for more than a $1 billion infusion of funds for the purchase of new trains and equipment. These taxpayer subsidies appear to continue because of supposed national benefits of Amtrak service.

The 10 Myths of Amtrak Subsidies

Proponents of Amtrak normally cite one or all of the following 10 myths as justification for continuing taxpayer subsidies.

Myth #1: Amtrak Is a Crucial Component of the Nation's Transportation System

Proponents of continued subsidies to Amtrak contend that it is an essential component of America's transportation system. To support their claim, they cite that 55 million passengers each year depend upon Amtrak service; 33 million of these passengers use Amtrak to commute to work. [6] This figure appears impressive--but it is highly misleading. [7]

When transportation professionals use the term *passengers*, they are not referring to individuals, but to the number of person trips. [8] Americans made 50.3 billion work trips in 1990. Put into context, the 33 million passenger trips on

Amtrak for commuting to work that year--more than half of Amtrak's total patronage--represent less than .007 percent of the total number of work trips, or .0655 percent. [9] Four and one-half times as many workers used bicycles to get to work as used Amtrak. Twenty-five times as many people walked to work. [10] Put into context, Amtrak makes an inconsequential contribution to getting the nation's workers to their jobs.

Even as a form of intercity transportation, Amtrak's contribution to the nation's mobility is marginal at best, as shown in Table 1. Americans made three billion intercity person trips in 1990. More than 90 percent of intercity trips were made by cars and other private vehicles. Airlines contributed more than one-fourth of intercity trip mileage, while 70 percent of intercity mileage was provided by private vehicles. Intercity buses provided more than 1 percent of trips but contributed less than 1 percent of the mileage. Amtrak's share of the intercity market was the smallest of any mode-- 0.4 percent when measured by person trips and 0.6 percent when measured by person miles. [11]

Table 1 Intercity Market Share		
	Person Trips	Person Miles
Private vehicle	93.1%	70.5%
Airlines	4.6%	27.3%
Bus	1.2%	0.9%
Amtrak	0.4%	0.6%
Other	0.7%	0.6%
Source: Patricia S. Hu and Jennifer Young, 1990 NPTS Databook: Nationwide Personal Transportation Survey (Washington: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, 1993).		

Myth #2: Amtrak Provides Essential Service to the Poor

One justification for continued subsidies for Amtrak is that it provides essential intercity transportation for poor and middle-income passengers, who cannot afford airline tickets and who do not have access to cars. Yet, as Table 2 highlights, the poor are not especially heavy users of Amtrak. Three-fourths of Amtrak passengers have incomes above the national average. Travel on Amtrak by persons with incomes above $40,000 is the highest of any mode--3.5 times higher than on buses and nearly 1.5 times higher than on airlines. [12] Nearly one-third of Amtrak passengers have household incomes of $75,000 or more, and 20 percent have incomes of $100,000 or more. [13] Figure 1 shows that Amtrak's clientele is much more skewed toward higher incomes than the general population.

For intercity travel, low-income Americans are much more likely to ride buses, which serve more communities, are cheaper, and are operated privately by profit-making, taxpaying firms.
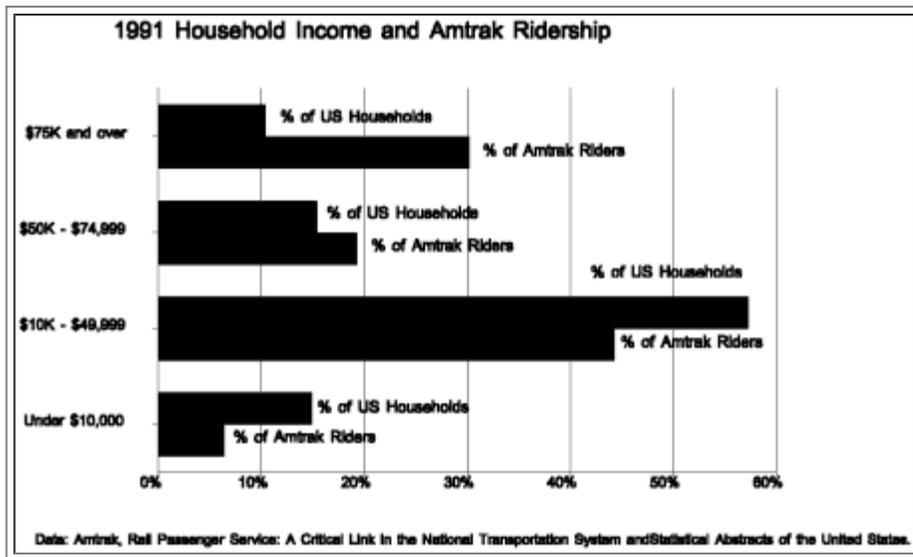
Amtrak caters to its comparatively affluent market through the provision of "luxury" services, such as sleeping car services and first-class ("parlor car") services. Along the Northeast Corridor, Amtrak is the only major carrier offering first-class service--airline shuttles that operate between Washington and New York and between Boston and New York offer only "coach" class service. Yet Amtrak's subsidized first-class fares in the Northeast Corridor are similar to airline shuttle "coach" fares. [14]

Table 2 Intercity Person Mile Market Share by Income within Transport Mode (1990 median household income: $31,203)		
Transport Mode	Below $20,000	Above $40,000

Private vehicle™	14.9%	37.5%
Airlines	11.2%	51.4%
Bus	34.9%	20.1%
Amtrak	13.0%	73.2%
™Includes automobiles, vans, and pick-up trucks. Amtrak data do not include contracted commuter rail service. Calculated from data in Patricia S. Hu and Jennifer Young, 1990 NPTS Databook: Nationwide Personal Transportation Survey (Washington: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, 1993).		

Figure 1

Data: Amtrak, Rail Passenger Service: A Critical Link in the National Transportation System and Statistical Abstracts of the United States.

Myth #3: Amtrak Is a Transportation System Serving the Entire Nation

Amtrak simply is not a national transportation system. Six states--Alaska, Maine, Hawaii, New Hampshire, Oklahoma, and South Dakota--are not served by Amtrak trains. Nearly one-fourth of the 100 largest metropolitan areas in the contiguous 48 states do not receive Amtrak service (see Table 3). Moreover, 10 other metropolitan areas are served by Amtrak three days or fewer per week. They include four metropolitan areas with more than 1 million residents: the nation's 9th largest (Dallas-Fort Worth, Texas: 4,215,000), the 10th largest (Houston-Galveston-Brazoria, Texas: 3,962,000), the 19th largest (Phoenix-Mesa, Arizona: 2,330,000), and the 30th largest (San Antonio, Texas: 1,379,000). [15] By comparison:

- All 100 metropolitan areas are served by the highway system, which is available to users every hour of the day and every day of the year (see Table 4). All but two of the 100 metropolitan areas are served by the interstate highway system--Santa Barbara-Santa Maria-Lompoc, California, is connected to the interstate system by a freeway, while McAllen-Edinburg-Mission, Texas, is connected to the interstate highway system by a four-lane divided highway.
- All 100 of the largest metropolitan areas are served by intercity buses with service at least five days per week. [16]
- All but three of the 100 largest metropolitan areas have scheduled air service at least five days per week. (Canton-Massilon, Ohio; Lakeland-Winterhaven, Florida; and Stockton-Lodi, California, have no scheduled air service.) [17]

Amtrak service is available to a relatively limited number of communities. There are one and one-half times as many

airports with scheduled service as there are Amtrak stations and nearly 10 times as many bus stations.

Table 3 Large Metropolitan Areas Not Served by Amtrak (contiguous 48 states)	
Metropolitan Area	Population
Columbus, Ohio	1,394,000
Nashville, Tenn.	1,023,000
Oklahoma City, Okla.	984,000
Louisville, Ky.-Ind.	968,000
Tulsa, Okla.	732,000
Scranton-Wilkes Barre-Hazleton, Pa.	639,000
Knoxville, Tenn.	610,000
Allentown-Bethlehem-Easton, Pa.	606,000
Baton Rouge, La.	546,000
Wichita, Kans.	501,000
Sarasota-Bradenton, Fla.	499,000
Johnson City-Kingsport-Bristol, Tenn.-Va.	445,000
Augusta-Aiken, Ga.-S.C.	444,000
Chattanooga, Tenn.-Ga.	431,000
Melbourne-Titusville-Palm Bay, Fla.	426,000
Colorado Springs, Colo.	421,000
McAllen-Edinburg-Mission, Tex.	421,000
Lexington, Ky.	420,000
Des Moines, Iowa	406,000
Saginaw-Bay City-Midland, Mich.	403,000
Canton-Massilon, Ohio	399,000
Madison, Wis.	380,000
Shreveport-Bossier City, La.	374,000
Source: 1992 U.S. Census Bureau population estimates. Note: All of the cities listed here are among the 100 largest metropolitan areas in the United States.	

Table 4 Communities Served by Transport Modes	
Highways	Virtually All
Airlines (airports)	800
Bus (stations)	More than 5,000
Amtrak (stations)	524
Source: Marilyn Gross and Richard Feldman, National Transportation Statistics: 1995 (Washington: U.S. Department of Transportation, Bureau of Transportation Statistics, 1995).	

Myth #4: Europe's Higher Passenger Rail Patronage Is the Result of Large European Subsidies to Rail

Passenger rail services are used more extensively in Europe than in the United States, as shown in Figure 2. The European market share for rail is more than six times that of the United States. But the heavier use of rail service in Europe is not the result of higher European rail subsidies. Indeed, until recently, Europe provided generous subsidies to airlines and buses as well as to rail. Europe, because of its greater population density, its more concentrated cities and the shorter distance between them, its much higher gasoline taxes, and far fewer automobiles, is more conducive to rail travel than is the United States.

Table 5 Total Travel: United States and Europe: 1990 (market share by person miles)		
	United States	Europe
Private vehicles	85.4%	79.0%
Bus (intercity and urban)	2.4%	8.9%
Airline	11.2%	5.6%
Rail (including commuter and light rail)	1.0%	6.6%
Calculated from Patricia S. Hu and Jennifer Young, 1990 NPTS Databook: Nationwide Personal Transportation Survey (Washington: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, 1993) and The Future Development of the Common Transport Policy: A Global Approach to the Construction of a Community Framework for Sustainable Mobility (Luxembourg: European Communities, Office for Official Publications of the European Communities, 1993).		

Yet even with the higher dependence on rail in Europe, European rail services still provide less than 7 percent of person miles (see Table 5). The primary mode for travel in Europe is the automobile, where it is roughly 90 percent of the U.S. rate. And European automobile usage is increasing at a faster rate than that of the United States despite much higher automobile and petroleum prices. [18] Europe's dependence upon the automobile is becoming increasingly similar to that of the United States. As the European office of the International Road Federation recently noted, "It is time to face the fact that public transport can today be considered as no more than an adjunct, however useful, to modern road networks." [19]

Figure 2

Intercity Passenger Train Market Share, 1990
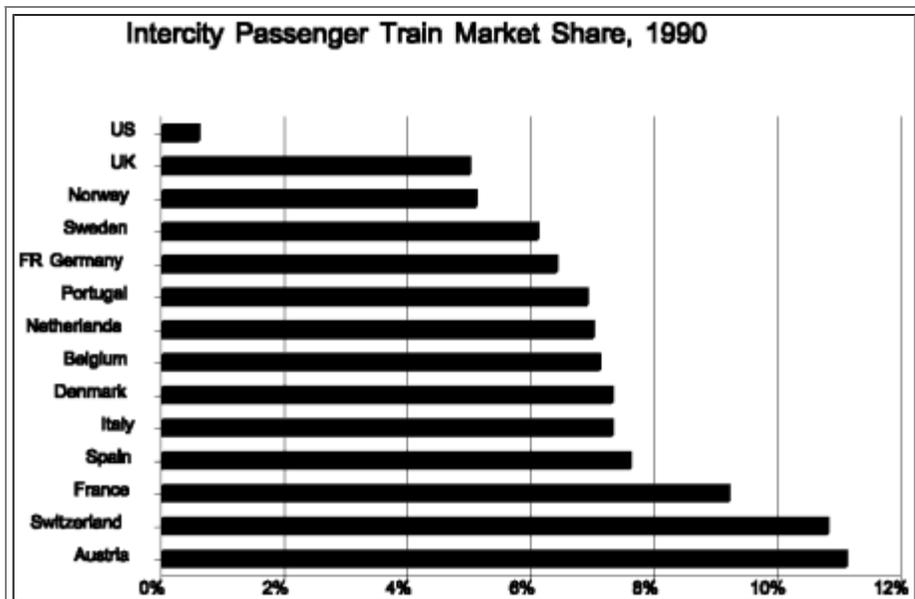
Part of the explanation for heavier rail use in Europe is that the United States has a more efficient and less regulated intercity transportation system. For example, the airline industry is far more deregulated and pro-consumer in the United States than in Europe. As a result, U.S. air-lines provide more frequent and less expensive service. Even so, passenger rail's market share in Europe dropped by nearly 20 percent in the 1980s, while the airline market share increased by 60 percent. [20]

Myth #5: Amtrak Contributes to Energy Efficiency and Pollution Reduction

Amtrak is often touted as an energy-efficient alternative to the automobile. However, intercity buses are far more fuel-efficient than Amtrak, as shown in Table 6. Amtrak is more energy-efficient than automobiles, but the circuitousness of Amtrak routes [21] and the energy losses attributable to generation and distribution of electricity reduce Amtrak's advantage over other modes of intercity travel. [22] Depending on the choice of mode for initial trip origin and final trip destination, Amtrak may have no real advantage over the automobile. [23] And because transportation-related pollution is closely correlated with energy intensiveness, Amtrak provides little or no benefit in reducing air pollution.

A 1982 Congressional Budget Office study concluded that "even with future improvements in Amtrak's operating efficiency, the Northeast Corridor rail service will yield only limited energy savings, while the rest of the system will yield an energy loss. The [Amtrak] rail system as a whole will yield a net energy loss." [24] Since that time, Amtrak's fuel efficiency has improved less than the improvement in automobile fuel efficiency. [25]

If all Amtrak passengers switched to cars, U.S. energy consumption would rise by only 0.1 percent.

Table 6 Energy Intensity of Transport Modes (BTUs per person mile)			
Mode	Unadjusted	Adjusted for Maximum Circuity and Electrical Generation and Distribution Loss	Energy Consumption Compared to Amtrak
Automobile	3,558	4,270	+6.0%
Airlines	Not available	4,647	+15.3%
Bus	997	1,196	-70.3%
Amtrak	1,975	4,029	-
Source: Patricia S. Hu and Jennifer Young, 1990 NPTS Databook: Nationwide Personal Transportation Survey (Washington: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, 1993).			

Despite the fact that Amtrak is somewhat more energy-efficient and somewhat less a polluter than private automobiles and planes, Amtrak serves such a tiny percentage of the overall intercity passenger market that its impact on energy and pollution is minuscule. Even a doubling or tripling of Amtrak ridership would not yield significant energy savings or pollution reduction despite proposed improvements in Amtrak's technology. Indeed, even if

Amtrak's ridership doubled--a highly implausible scenario--and all new passengers were diverted from cars, energy consumption would be reduced by only 0.1 percent.

Myth #6: Passenger Rail Requires Taxpayer Subsidies

All Amtrak routes currently operate at a loss. [26] That does not mean that intercity rail service in the United States is inherently unprofitable. In fact, increasingly, passenger rail service is being provided privately and profitably around the world. Here are some prominent examples: [27]

- Japan's passenger rail system has been broken into six publicly owned operating companies; three earn profits on their total operations (infrastructure, capital, and operations). The other three companies sustain small losses.
- New Zealand Railways has been privatized. It now earns a profit on passenger rail services and has begun to restore services that had been canceled during public ownership. As is typical of government-owned railroads, New Zealand Railways had been significantly overstaffed and has reduced its work force by two-thirds. When the railroad was government owned, subsidies were required for both passenger and freight services.
- A private company operates a profitable passenger rail service between Vancouver, British Columbia; Banff National Park; Jasper National Park; and Calgary, Alberta (600 miles). [28] This recreational service might be thought of as a "land cruise," serving primarily recreational travel. Amtrak services between Chicago and West Coast cities serve a similar purpose.
- A private company has begun to operate rail land cruises in the United States. [29]
- A number of European countries are restructuring their passenger rail systems through competitive strategies. Sweden allows private companies to offer competing passenger services over its government-owned tracks, [30] and, in response to the competition, the government-owned passenger railway has reduced its unit costs by 30 percent. The Netherlands intends to make most of its passenger rail services profitable and will minimize subsidies by competitively contracting with private companies to operate loss-making services. Germany is preparing to privatize its passenger rail system with the objective of minimizing taxpayer subsidies.

Government-owned rail systems have a formidable propensity to incur huge losses. Under government ownership, Japanese rail systems incurred a debt of $350 billion--nearly $3,000 per capita. The German federal government is assuming $45 billion in government railway debt--more than $500 per capita. It is virtually certain that these government railway debts will be the responsibility of general taxpayers. However, the European and Japanese examples suggest that where passenger rail services are converted to competitive strategies, taxpayers are relieved of the burden of spiraling subsidies.

Myth #7: Amtrak Provides Cost-Effective Transportation Service

Amtrak fares per person mile are higher than bus fares and slightly lower than airfares. But Amtrak riders pay less than half the cost of a trip. Amtrak's total costs per person mile are nearly double those of the automobile and airlines and almost three times those of intercity buses, as shown in Table 7. [31] (Airline advance purchase tickets and discount airline services tend to provide air service for even lower costs.) Amtrak's subsidies are so large that they would be more than enough to pay the fares of all intercity bus riders with less than $20,000 annual income. [32]

Worse, Amtrak subsidies per passenger are generally higher than discount airfares. For example: [33]

- The estimated round trip subsidy per passenger for an Amtrak trip from New York to Los Angeles is $1,270. Discount airfares are usually $400 or less.
- The estimated round trip subsidy per passenger for an Amtrak trip from Chicago to St. Louis is $113. Discount airfares are typically below $100.
- The estimated round trip subsidy per passenger for an Amtrak trip from Chicago to New Orleans is $370. Discount airfares are typically below $175.
- The estimated round trip subsidy per passenger for an Amtrak trip from Denver to Chicago is $650. Discount airfares are typically below $300.

It is likely that, in most major markets, subsidies would be reduced if discount air tickets were provided, free of charge, to all Amtrak riders.

Historically, the higher the federal subsidy to Amtrak, the greater the inefficiency in its operations. In the 1970s, subsidies more than doubled, while Amtrak unit costs (cost per passenger-car mile) escalated more than 60 percent

(inflation-adjusted). From 1980 to 1992, however, federal subsidies to Amtrak declined, and Amtrak's unit costs declined by 9 percent (inflation-adjusted). It is likely that a substantial increase in taxpayer subsidies to Amtrak would be largely consumed by escalating unit costs, instead of providing substantially higher levels of service, as is typical of unregulated monopolies such as Amtrak. [34] Unlike enterprises operating in a competitive environment, in monopolies, neither management nor labor has sufficient competitive incentives to minimize costs.

Table 7 Fares and Costs by Transport Mode			
	Per Person Mile		
	Average Fare	Total Cost*	Net Subsidy*
Automobiles	Not Applicable	16.7¢	0
Airlines	13.0¢	13.0¢	0.01
Bus	11.6¢	11.6¢	0
Amtrak	13.7¢	30.0¢	16.3¢
*Total cost includes operating, capital, and infrastructure costs. Amtrak figures represent fares plus subsidies and do not include total operating costs, which are higher. Net subsidies refer to total subsidies less user fees such as fuel and ticket taxes. Calculated from data in Gross and Feldman, National Transportation Statistics: 1996 and Amtrak, 1995. Airline subsidy under the Essential Air Service program is less than 1/100¢.			

Myth #8: Other Transportation Modes Are More Highly Subsidized than Amtrak

Amtrak management argues that other forms of intercity transportation--such as buses, cars, and airlines--are just as heavily subsidized by taxpayers as Amtrak. They point out that the roads used by buses and autos were built with federal (and state) dollars. Moreover, the airlines benefit from the air traffic control system that is federally operated through the Federal Aviation Administration. However, there is virtually no net taxpayer subsidy of either highways or airlines. Maintenance of the infrastructure for both of these transport modes is financed by taxes on users rather than by general taxpayer subsidies. [35]

With respect to both highways and airlines, vehicle capital and operating expenses are fully paid by users. [36] Public facility costs also are financed through user fees. [37] Road construction and repair are funded through the gasoline tax paid by drivers. The FAA's costs are largely covered by an airline ticket tax. The federal government has a highway and an airline trust fund, each of which has accumulated a large surplus balance ($12 billion in the air trust fund and $22 billion in the highway trust fund). [38] For that reason, a case could be made that airline travelers and drivers pay more than their own way.

By contrast, nearly 40 percent of Amtrak costs are paid by general taxpayers--$850 million by federal taxpayers and additional subsidies by state taxpayers. If all intercity travelers were subsidized to the same extent as Amtrak passengers, an annual federal taxpayer subsidy of $125 billion would have been required in 1992 [39]--three times the entire Department of Transportation budget.

To "level the playing field" among transportation modes, Amtrak has proposed that Congress create a trust fund. However, the proposed Amtrak trust fund would not be financed by taxes on users of Amtrak services; it would be financed instead by gasoline taxes on highway users--that is, on travelers who do not use Amtrak. The only true Amtrak "user fee" is the cost of the ticket--which currently falls far short of covering Amtrak's costs.

Myth #9: Amtrak Reduces Road and Air Traffic Congestion in the Northeast Corridor

As was indicated above, Amtrak's market share is infinitesimal. Nonetheless, it is often claimed that Amtrak usage

provides considerable relief to highways (especially in the Northeast Corridor from Boston to New York to Washington), [40] which is often cited as justification for substantial federal taxpayer subsidies and for automobile users to help defray the cost of Amtrak operations. It has even been asserted that in the absence of Amtrak, new interstate highways would have to be constructed. It has further been claimed that Amtrak diverts such a significant number of passengers from airlines that the air traffic system would not be able to accommodate them.

Amtrak's impact on the intercity transportation system is most significant in the Northeast Corridor, which accounts for approximately half the Amtrak passengers.

Amtrak's second busiest corridor, San Diego to Los Angeles to Santa Barbara, accounts for 7 percent of its ridership. The Northeast Corridor is unique in that it is the only portion of the Amtrak system that operates frequent intercity service. Moreover, in the Washington to New York market, Amtrak's fastest trains are time-competitive with airline services, city center to city center, and are considerably faster than automobiles or buses. [41]

Two models were developed to estimate the volume of traffic carried by Amtrak that would otherwise be carried by other modes of intercity transport. The first--the "Maximum Diversion to Private Vehicles Model" [42]--assumes that Amtrak passengers would be diverted to other modes of transport in the same percentages that the other transport modes attract travelers for trips of similar lengths. The second--the "Maximum Diversion to Airlines Model"--assumes that a much higher percentage of passengers who currently ride Amtrak's fastest trains would be attracted to airline services. [43]

Maximum Diversion to Private Vehicles Model. On the basis of national intercity travel data, [44] it is estimated that Amtrak reduces traffic by--at most--46.6 private vehicles per hour per freeway or toll road lane (between Philadelphia and New York)--a reduction of one vehicle every 1.3 minutes (1 minute, 18 seconds). To put this in context, the capacity of a freeway lane is approximately 2,500 vehicles per hour--an average of more than 40 vehicles per minute or a vehicle every 1.5 seconds (see Table 8).

The diversion occurs in the corridor between New York and Philadelphia where the only interstate-standard highway (the New Jersey Turnpike) narrows to six traffic lanes. (Within close proximity are two alternate limited-access highways, US 1 and US 130, which are not considered in this analysis.) [45]

Nonetheless, Amtrak's impact on this congested corridor is too small to be perceived by the average driver. It is estimated that Amtrak removes barely 2 percent of lane capacity--considerably below the threshold required for construction of a new lane, much less a new freeway or toll road. [46] Growth in traffic is dependent on economic growth, business expansion, and suburban growth, which Amtrak has virtually no capability of affecting.

The lowest Northeast Corridor traffic diversion occurs in the Boston to New York segment, where Amtrak is estimated to reduce traffic by 5.7 vehicles per lane each hour--a reduction of one vehicle every 10.5 minutes.

Table 8 Maximum Diversion to Private Vehicles Model (Northeast Corridor)			
Segment	New Vehicles per Lane Hour	Minutes between New Vehicles	New Daily Passengers, Bus and Commuter Rail
Boston-New York	5.7	10.5	28
New York-Philadelphia	46.6	1.3	245
Philadelphia-Washington	32.8	1.8	89
For methodology see note 43. Includes trips made on trains operating over			

In sum, even in the most congested highway areas, Amtrak diverts little traffic from the roads. Closing down Amtrak would increase automobile traffic imperceptibly.

Maximum Diversion to Airlines Model. The second model assumes a much higher diversion of passengers to airlines. Despite the large airline market in the Northeast, Boston to New York services account for less than 10 percent of

Boston's Logan Airport volume, while Washington to New York services account for less than 10 percent of the volume at Washington's airports. Similarly, Boston and Washington air travel accounts for less than 10 percent of the volume at New York airports. [47]

Under this model, the potential impact on airline traffic is within the capacity of presently operating air services.

- In the New York to Washington corridor, airline load factors would be increased, but additional flights would not be necessary. Based on airline industry averages, it is estimated that this passenger volume would consume approximately three-quarters of the unused capacity of existing flights in the New York to Washington corridor. [48] The higher diversion of riders from Amtrak to airlines in the Washington to New York market presumes that airlines would attract two-thirds of present riders of the higher quality, high-speed Metroliner service. Comparable service is not provided in any other Amtrak corridor. The increased volume of air travelers could be accommodated simply by substituting larger airplanes, such as Boeing 757s, on the twice-hourly airline shuttle service between New York and Washington.
- In the Boston to New York corridor, an average of 291 passengers per day are estimated to be diverted from airplanes, or 93,000 passengers per year. Based on airline industry averages, it is estimated that that passenger volume would consume only 6 percent of the unused capacity of existing flights in the Boston-New York corridor.

This finding differs from the conventional wisdom. It has been suggested that Amtrak Northeast Corridor passengers would fill 10,000 commercial airliners. In reality, the airlines would be able readily to handle the higher load factors.

This analysis assumes that without Amtrak taxpayer subsidies there would be no passenger train service between Washington and Boston, a very unlikely worst case scenario. As discussed below, train service could and would continue in some form in the Northeast Corridor even without federal involvement.

Myth #10: Amtrak Service Provides Indispensable Relief to Highways and Airports outside the Northeast Corridor

Amtrak services have an even smaller impact outside the Northeast Corridor. [49] The highest diversion from private vehicles is estimated between New York and Niagara Falls at 11.9 private vehicles per lane hour (one car every 5 minutes). That is less than 0.5 percent of a lane's capacity. In the Los Angeles to San Diego corridor, diversion from private vehicles is estimated at 9.1 vehicles per lane hour, or approximately 4 percent of lane capacity.

Further, with the exception of Amtrak's Washington to New York services, Amtrak's passenger trains operate at terminal-to-terminal speeds that are sometimes faster and sometimes slower than intercity bus and automobile speeds. For example, Amtrak's Chicago to Los Angeles train requires 40 hours compared with 51 hours for intercity buses. The trip from Chicago to Oakland is 52 hours by Amtrak and 48 hours for intercity buses. The Washington to Chicago train takes 23 hours compared with 18 hours for intercity buses. Amtrak is nearly one hour slower than intercity buses and automobiles in the Portland to Seattle market and nearly two hours slower than autos and buses in the Philadelphia to Pittsburgh market. [50] Between Boston and New York, the fastest train and bus travel times are virtually the same.

The estimates in Table 9 are for the weekly peak average. Amtrak ridership can be higher on particular days, but given the natural constraints of Amtrak resources (trains and schedules), even on its busiest days, Amtrak's contribution to mobility falls far short of what would be required to contribute to "gridlock" in even its mildest form. [51]

Table 9 shows that Amtrak ridership has little impact on any portion of the nation's transportation system. Amtrak's six

billion annual person miles are less than 1/30th of the unused capacity of scheduled airline services. [52] In contrast, Amtrak services would need to be increased by at least 35 times to accommodate the nation's air travel. [53] Amtrak has a negligible effect on congestion of the nation's highway and air traffic systems.

Table 9 Maximum Diversion to Other Modes outside the Northeast Corridor				
Amtrak Route	New Vehicles per Lane Hour	Minutes between New Vehicles	New Daily Passengers	
			Airline	Bus
Autotrain	2.3	26.3	18	2
Chicago-Carbondale	1.2	48.6	4	3
Chicago-Detroit/Toledo	4.4	13.5	15	11
Chicago-Grand Rapids	0.4	142.8	0	1
Chicago-Houston	1	61.7	14	1
Chicago-Indianapolis	0.7	88.7	0	1
Chicago-Los Angeles	0.9	65.3	107	1
Chicago-Milwaukee	2.1	28.6	0	4
Chicago-New Orleans	1.8	33.7	14	1
Chicago-New York/Boston	3	19.9	24	2
Chicago-Oakland	1.8	34	205	2
Chicago-Port Huron	1.3	47.4	4	3
Chicago-Quincy	1	61.5	0	1
Chicago-Seattle/Portland	1.2	50.6	138	1
Chicago-St. Louis	3.6	16.6	12	9
Chicago-Washington	1.5	40.1	12	1
Kansas City-St. Louis	1.1	55.5	4	3
Los Angeles-New Orleans-Miami	0.7	86.2	81	1
Los Angeles-Seattle	3.2	18.8	47	3
New York-Miami/Tampa	6.6	9	99	7
New York-	1	58.6	4	3

Montreal				
New York-New Orleans	2.1	28.4	31	2
New York-Newport News	10.5	5.7	36	26
New York-Niagara Falls	11.9	5	41	30
New York-Washington-Chicago	2.2	27.5	17	2
Oakland-Bakersfield	3	19.8	21	15
Philadelphia-Harrisburg	8	7.5	1	10
Philadelphia-Pittsburgh	2.7	21.9	9	7
San Jose-Oakland-Sacramento	2.7	21.9	2	6
Santa Barbara-Los Angeles-San Diego	9.1	6.6	7	28
Seattle-Portland	3.1	19.6	1	5
Washington-Charlotte	5.6	10.7	19	14
Washington-Montreal	0.6	100	6	1

Toward a Competitive Future for Amtrak

Perhaps the greatest myth of all is that Amtrak simply could not survive under private ownership and operation. The existence of rail passenger service in the United States is not dependent on continuous taxpayer subsidies. Amtrak costs are far higher than necessary. Amtrak provides especially unprofitable services for political reasons, and it is hamstrung by archaic work rule provisions that raise its costs far above the levels of other transport modes. For example, a provision of federal law requires Amtrak to pay up to six years of severance pay to workers who are laid off. If Amtrak could shed some of its worst money-losing routes, reorganize its management, and reform its Byzantine work rules, hundreds of millions of dollars in savings could be realized. Competitively contracting food service could also save millions of dollars and probably improve meal service on the trains.

Amtrak's fundamental problem is not so much insufficient revenues (although creative marketing and pricing strategies could certainly boost revenues) as it is excessive costs. Excessive costs will vanish only when subsidies are discontinued and competitive forces are brought to bear on Amtrak.

Freed of excessive federal regulation and political control, Amtrak would be capable of earning profits on some services, especially in the Northeast Corridor. [54] Indeed, the Metroliner, which serves the Northeast Corridor, covers 90 percent of its fully allocated costs already and could be profitable in the absence of federal regulation and ownership. Services in other corridors, such as San Diego to Los Angeles, could be profitable as well. Some services, especially long-distance routes, could be operated at higher fares as "land cruises" with costs paid in full by users. For hopelessly unprofitable routes, service should be canceled, just as cruise line service from Florida to the Caribbean would be canceled if it were unable to operate in the black. Uneconomic services routinely fail in the market. There is no more reason for taxpayers to subsidize Amtrak than there is for taxpayers to provide subsidies to United Airlines,

Greyhound Bus Company, or vacation cruise lines, such as Carnival.

There are a number of privatization plans that might be pursued to return passenger rail service to profitability. One option would be to turn over the railroad to its employees and management [55] or other private investors. Other options might include competitive franchising similar to the British Rail model, where Amtrak would seek competitive bids to provide services for the lowest cost consistent with quality and safety standards.

Privatizing Amtrak is not the far-fetched idea that it may seem to be. Although the rail unions and passenger groups complain that Amtrak could not survive in the private sector, in 1988 the President's Commission on Privatization, a bipartisan panel including representatives from labor and management, concluded unanimously that privatization of Amtrak was in the best interest of taxpayers and the future of the railroad.

Many of the arguments against a profitable future for Amtrak were made 10 years ago about Conrail, the freight railroad that was owned and operated by the federal government until 1987, when it was sold through a public stock offering. Since then, Conrail has remained consistently profitable.

Unlike the outlook 10 or 20 years ago, intercity rail passenger service is almost certainly here to stay in the United States; indeed, it may prosper. Americans' love affair with trains is as evident now as ever.

Even some of the long-distance routes would probably survive under innovative private ownership. For instance, the route from Chicago to Seattle, which runs through breathtaking scenery, is routinely overbooked: sleeper cars are packed and reservations must be made months in advance. Amtrak does not have a fleet of trains large enough to accommodate rising demand for its product, because the government does not have the money for new equipment. If private owners could increase revenues on long-distance routes by adding new trains and raising prices, the red ink might be erased.

Ultimately, the decision of which routes should remain and which should be terminated is for the market to determine. The public interest is not served by government subsidization of business trips to New York or Los Angeles--with more than half the riders earning more than $40,000 per year. Similarly, passengers, not taxpayers, should pay for family vacations to Glacier National Park and Disneyland.

Conclusion

Traditionally, there are two alleged justifications for taxpayer subsidies: market failure and social equity. Market failure occurs when the competitive market fails to provide (or provide enough of) an essential product or service. Concern for social equity arises when the competitive market price of an essential good or service is too high to allow access or purchase by people with low incomes.

Amtrak fails on both counts. Amtrak's market share is so small that it contributes no meaningful enhancement to transportation system capacity. Train service supplies less than 0.5 percent of intercity trips annually, and it provides less than 0.007 percent of the daily work trips Americans make each year. As a result of Amtrak's low patronage, it does not divert a significant portion of traffic from busy highways or airports even in the Northeast Corridor. More U.S. communities are served by airports than by Amtrak stations. Taxpayer subsidies to Amtrak provide no benefit that is not more effectively provided by the competitive market. The smallest of the nation's 10 major airlines, for example, has double the intercity market share of Amtrak, measured in passenger miles. The intercity transportation market is competitive, vibrant, and characterized by high levels of service. Amtrak subsidies cannot be justified by the theory of "market failure."

Taxpayer subsidies to Amtrak do not increase social equity either. Three-fourths of Amtrak passengers have household incomes that surpass the national average. Amtrak serves a far smaller percentage of travel by people with low incomes than do buses and private vehicles.

There is no question that, for many people including the authors, it is fun to ride the train. A long rail trip across the West can constitute a memorable vacation. But the real issue is, Who should pay for those kinds of trips? Riders or general taxpayers?

Amtrak can be profitable but only if Congress puts it back on track by weaning the railroad from federal subsidies. For 20 years, Amtrak supporters have promised that self-sufficiency is "just around the corner." Now is the time for Amtrak to turn that corner.

Notes

[1]. Amtrak received an initial grant of $40 million from Congress and equipment, personnel, and money from private railways. In return for their participation, Congress allowed the private railways to discontinue their passenger service, which had incurred losses for years. George W. Hilton, Amtrak: The National Railroad Passenger Corporation (Washington: American Enterprise Institute for Public Policy Research, 1980).

[2]. In 1995, the federal government contributed $392 million in operating funds, $230 million for capital, $200 million for the Northeast Corridor improvement project, and $150 million for retirement fund payment. Thirty-six states also provided Amtrak with public funding.

[3]. Not adjusted for inflation. For a more complete discussion, see United States General Accounting Office, Intercity Passenger Rail: Financing and Conditions Threaten Amtrak's Long-Term Viability (Washington: United States General Accounting Office, Resources, Community, and Economic Development Division, 1995).

[4]. In 1995, commercial revenues including passenger-related revenues, trackage charges, baggage, express, and real estate were 63 percent of total costs. Amtrak 1995 Annual Report and Statistical Appendix to Amtrak FY 1995 Annual Report (Washington: 1996).

[5]. Congressional Budget Office, Federal Subsidies for Rail Passenger Service: An Assessment of Amtrak (Washington: Congressional Budget Office, 1982).

[6]. Amtrak Government and Public Affairs, Rail Passenger Service: A Critical Link in the National Transportation System (Washington: Amtrak, not dated).

[7]. Amtrak is a major provider of contracted commuter rail service to regional transit authorities. These contracts are awarded for limited periods (usually five years) through a process in which Amtrak competes against other rail operating companies. There is a definite trend toward competitive contracting of commuter rail services with conversions completed or planned in Stockholm, Adelaide, Perth, the United Kingdom, and the Rhine-Ruhr conurbation in Germany. Approximately 60 percent of Amtrak's 55 million riders are on contracted commuter rail services. Amtrak's own (proprietary) ridership is approximately 22 million annually.

[8]. Person trips are the number of trips (or one-way journeys) times the number of people, so that two people on a one-way journey in a car make one trip but two person trips. If two people use one car for a round-trip journey to the supermarket, they make two trips and four person trips.

[9]. Patricia S. Hu and Jennifer Young, 1990 NPTS Databook: Nationwide Personal Transportation Survey (Washington: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, 1993).

[10]. The 1990 work trip market share includes car, truck, jeep, van (82.7 percent); motorcycle (0.3 percent); public transportation (5.0 percent); taxi (0.1 percent); bicycle (0.4 percent); walking (3.7 percent); and other (2.0 percent).

[11]. Based upon NPTS "longer trip" data. Hu and Young.

[12]. Ibid.

[13]. Amtrak Government and Public Affairs, p. 4.

[14]. The highest weekday first-class Amtrak fare from Washington to New York is $156 compared with $160 for airline shuttles, which do not offer first-class service. Amtrak's highest Boston to New York first-class fare is $72, compared with $160 for airline shuttles (as of September 25, 1995).

[15]. Other metropolitan areas among the top 100 with Amtrak route service four days per week or less are Austin-San Marcos, Tex. (901,000); Las Vegas, Nev. (971,000); Birmingham, Ala. (859,000); Tucson, Ariz. (690,000); El Paso, Tex. (628,000); Little Rock-North Little Rock, Ark. (526,000); Mobile, Ala. (496,000); and Spokane, Wash. (381,000). Grand Rapids-Muskegon-Holland, Mich. (964,000) has service only four days per week.

[16]. Analysis of information in Russell's Official National Motor Coach Guide, September 1995 (Cedar Rapids, Iowa: Russell's Guides Inc., 1995).

[17]. Analysis of information in Skyguide: The Pocket Guide to North American Airline Schedules (New York: American Express Publishing Corporation, September 1995), p. 13.

[18]. People, Cities and Cars: An Analysis of Avoiding the Collision of Cities and Cars (Washington: Highway Users Federation, 1994), p. 13.

[19]. International Road Federation, Warning Against Over-Dependence on Public Transport (Geneva, Switzerland: International Road Federation, December 1995), p. 1.

[20]. The Future Development of the Common Transport Policy: A Global Approach to the Construction of a Community Framework for Sustainable Mobility (Luxembourg: European Communities, Office for Official Publications of the European Communities, 1993), pp. 68-69.

[21]. For example, Amtrak's Chicago to Oakland route is 2,425 miles. The highway mileage is 2,153 miles, and the airline mileage is 1,850 miles.

[22]. There is an average 70 percent energy loss as a result of circuity for Amtrak, a 20 percent loss for highways (autos and buses). There is a further 20 percent Amtrak loss in energy efficiency attributable to electric power generation and distribution (most Amtrak Northeast Corridor trains operate on electric power). Data from Transportation Statistics Annual Report: 1994 (Washington: U.S. Department of Transportation, Bureau of Transportation Statistics, 1994), p. 81.

[23]. Unlike the automobile, Amtrak does not provide door-to-door service. Amtrak passengers get to and from stations by walking or, more likely, by automobile, taxi, or public transportation. Except in the case of walking, these small trips add to total energy usage. Because most energy is consumed in stopping and starting a vehicle and operating at low speeds, including idling, the auto or taxi trip to the station may eliminate any net energy saving from taking the train. Further, most forms of public transit at average levels of patronage are less efficient than automobiles at average occupancies. See Wendell Cox, Jean Love, and Samuel A. Brunelli, "The Livable American City: Toward an Environmentally Friendly American Dream," The State Factor 19, no. 3 (Washington: American Legislative Exchange Council, August 1993), p. 7.

[24]. Congressional Budget Office, pp. 14-15.

[25]. Analysis of data in National Transportation Statistics, multiple editions.

[26]. United States General Accounting Office, p. 64.

[27]. See Reason Foundation's Privatization reports 1991 through 1995 (Los Angeles: Reason Foundation, multiple years).

[28]. Operated by the Great Canadian Railtour Company.

[29]. The American Orient Express, represented by TCS Expeditions (Seattle).

[30]. This general approach is being adopted in other nations as well, with competing rail services operated over the same tracks. It is similar in concept to the air traffic control system, which allows competing airlines to use the same airspace and airports.

[31]. Amtrak costs include the federal government contribution of $150.2 million for employee benefits. Airlines provide trust fund subsidized service to more than 100 communities under the federal government's "Essential Air Service" program, under which the federal government seeks competitive proposals from airlines to operate services to more remote communities (the present funding level being approximately $30 million). Airline public facilities are user-financed. Public facilities for automobiles are financed by user fees (see below). Higher costs per automobile person mile are popularly cited, but generally apply to new cars. This calculation is based upon actual consumer expenditure data. All figures calculated from data in Gross and Feldman, pp. 17-52.

[32]. Calculated from data in Hu and Young.

[33]. Assumes average subsidy of $0.02 per passenger mile for routes outside the Northeast Corridor (estimated from United States Government Accounting Office data).

[34]. This dynamic has been noted in transit. A strong correlation has been shown between the rise in total revenues (fares, subsidies, and other revenues) among 109 U.S. public transit agencies. (See Wendell Cox and Jean Love, "Controlling the Demand for Taxes through Competitive Incentives," The State Factor 17, no. 12 [Washington: American Legislative Exchange Council, December 1991].) A similar effect has been demonstrated among Canadian transit operators. (See Wendell Cox and Jean Love, "How the Competitive Market Can Make Canadian Transit Efficient and Effective," in Essays in Canadian Surface Transportation, ed. Filip Palda [Vancouver: The Fraser Institute, 1995].) Generally, higher increases in costs per mile are associated with larger increases in total revenues, reducing overall efficiency. In response to this effect, a number of developed nations have converted or are in the process of converting their transit systems to competitive contracting or other competitive strategies. (Sweden, Finland, Denmark, Australia, New Zealand, and the United Kingdom are examples.)

[35]. Primary user fee sources are motor fuel taxes, airline ticket taxes, and airline landing fees.

[36]. For example, see Rayola S. Dougher, Estimates of Annual US Road User Payments Versus Annual Road Expenditures (Washington: American Petroleum Institute, March 1995) and Wendell Cox and Jean Love, People, Cities and Cars: An Analysis of "Avoiding the Collision of Cities and Cars" (Washington: Highway Users Federation, 1994).

[37]. Highway user fees are primarily excise taxes on fuels, truck weight-distance taxes, and vehicle registration and license fees. Airline user fees include airline ticket taxes, passenger facility charges, and airport landing fees (included in ticket prices).

[38]. Budget of the United States Government: Fiscal Year 1996 (Washington: Superintendent of Documents, 1995).

[39]. Applies the Amtrak taxpayer subsidy per passenger mile to all intercity travel. Based on data from Hu and Young.

[40]. In this discussion, the Northeast Corridor is limited to the Washington-New York-Boston route. All other routes are included in the national analysis.

[41]. However, an increasing percentage of intercity trips end or begin (or both) in the suburbs, rather than in the city center.

[42]. Private vehicles include automobiles, vans, and light trucks (single axle, four tires).

[43]. Northeast Corridor methodology: 1. Annual Amtrak ridership was estimated by using April 1995 Amtrak ridership data (scaled on the basis of the April 1994 percentage of 1994 ridership). 2. Using the annual ridership estimate, Boston to Washington route Northeast Corridor, average peak weekday ridership was estimated on the basis

of daily train volume, yielding a peak day factor of 1.14 compared with the average day. For purposes of trip allocation, days are counted as 18 hours. 3. Using average trip length data (calculated from United States Congressional Budget Office, Federal Subsidies for Rail Passenger Service) scaled upward to account for Amtrak's 1981 to 1992 increase in passenger miles, average load factors were estimated for the trains operating within the Boston to Washington corridor. Using the assumptions for the national model, a load factor was added to account for trains operating along the route but which continue to the west or south (for example, to Chicago or Florida). Separate load factors were estimated for three segments of the route, Boston to New York, New York to Philadelphia, and Philadelphia to Washington. 4. The minimum number of freeway and tollway lanes is as follows: Boston to New York, 8 lanes (Interstate 95 and Merritt Parkway-Interstate 91-Interstate 84-Interstate 90); New York to Philadelphia, 6 lanes (New Jersey Turnpike); Philadelphia to Washington, 6 lanes (Interstate 95). 5a. Maximum Diversion to Private Vehicles Model: Based on NPTS data (Hu and Young). For trips of similar length, Amtrak riders were distributed to private vehicles (97.5 percent), buses (1.4 percent), and airlines (1.1 percent), except that New York to Philadelphia airline riders were allocated to commuter rail. 5b. Maximum Diversion to Airlines Model: Two-thirds of New York-Washington Metroliner riders were assumed to transfer to airline services. Riders of all other trains were distributed to private vehicles (80 percent), buses (5 percent), airlines (15 percent), except that New York to Philadelphia riders diverted to airlines were allocated to commuter rail. New York-Washington Metroliner riders were distributed to private vehicles (80 percent), airlines (19 percent), and buses (1 percent). This model assumes a private vehicle market share the approximate equivalent of an intercity travel market with average trips three to four times greater than in the Northeast Corridor. 6. Private vehicle riders were assumed to carry the NPTS intercity average of 2.3 occupants. 7. No adjustment is made for trips that would not be made if Amtrak service were not available.

[44]. For nonrail trips of lengths similar to that provided through Amtrak's Northeast Corridor, national data indicate that 97.5 percent of travelers would go by private vehicle, 1.4 percent by bus, and 1.1 percent by airline. Calculated from Hu and Young.

[45]. Highway traffic in this corridor is artificially constrained. The only interstate segment of the national interstate highway system to be canceled is in this corridor (Interstate 95 between Trenton and New Brunswick, New Jersey). This segment would have completed the interstate link between the nation's largest metropolitan area, New York (19.7 million), and the sixth largest metropolitan area, Philadelphia (5.9 million), the nation's densest intercity corridor.

Moreover, exceedingly complicated and indirect connections between major highways unnecessarily increase traffic congestion and air pollution (such as the Pennsylvania Turnpike to Interstate 95 connection in Bucks County, and the New Jersey Turnpike to Interstate 295 connection in the Trenton area). The only portion of this corridor with less than 10 lanes of freeway or tollway is an approximately 20-mile segment on which the New Jersey Turnpike has six lanes. It is estimated that an additional lane in each direction could be built for less than $50 million, a small amount in relation to the Amtrak subsidy. If Interstate 95 had been completed, freeway and toll road capacity would have more than doubled. Some of the congestion in this corridor is the result of the political decisions in New Jersey to cancel Interstate 95.

[46]. Even if all Amtrak passengers were assumed to be diverted from single-occupant private vehicles, the traffic maximum reduction would be less than 5 percent of lane capacity.

[47]. Calculated from Air Transport 1995: The Annual Report of the U.S. Scheduled Airline Industry.

[48]. Both calculations assume an airline load factor of 63 percent. Calculated using travel market data in Air Transport 1995: The Annual Report of the U.S. Scheduled Airline Industry.

[49]. Methodology for outside the Northeast Corridor: 1. Annual Amtrak ridership was estimated using April 1995 Amtrak ridership data (scaled on the basis of the April 1994 percentage of 1994 ridership). 2. Using the annual ridership estimate, average weekday ridership was calculated (annual ridership/365). For purposes of trip allocation, days are assumed to have 18 hours. 3. Based on an analysis of trip length data (calculated from United States Congressional Budget Office, Federal Subsidies for Rail Passenger Service), scaled upward to account for Amtrak's 1981 to 1992 increase in passenger miles, average load factors were estimated for long-distance trains (55 percent) and short-distance trains (75 percent). 4. The minimum number of freeway or tollway lanes used on all routes was four,

except for Chicago to Milwaukee (6), Oakland to Bakersfield (8), and San Jose to Roseville (6). 5. On the basis of NPTS data for trips of the trip length for each route, Amtrak riders were distributed to private vehicles, buses, and airlines. 6. Private vehicle riders were assumed to carry the NPTS (Hu and Young) intercity average of 2.3 occupants. 7. No adjustment is made for trips that would not be made if Amtrak service were not available.

[50]. Automobile travel times from Rand McNally, Road Atlas, 1995.

[51]. Higher Amtrak load factors can be expected closer to large cities. There is also significantly more highway capacity near large cities.

[52]. Based on airline load factors. See Gross and Feldman.

[53]. Calculated from data in Gross and Feldman. Amtrak load factor is estimated at 60 percent, pp. 21-26.

[54]. If government-collected user fees were required, they could be added to rail tickets using the same approach as applies to airline tickets.

[55]. This option is discussed in detail in Moore.