Center for the American Dream
of mobility and home ownership

Issue Backgrounder
2010-C

Independence Institute ★ 13952 Denver West Parkway, Suite 400 ★ Golden, Colorado 80401 ★ 303-279-6536 ★ i2i.org/transportation.php

Colorado Transit: A Costly Failure

Colorado transit systems cost four times as much per passenger mile as driving, and subsidies to transit are more than 40 times as much as subsidies to driving. Moreover, most transit uses more energy and produces more greenhouse gases per passenger mile as driving. So why should taxpayers spend more to promote such a failure?

Introduction

Public transit is often portrayed as a low-cost, environmentally friendly alternative to auto driving.[1] In fact, transit is much more costly than driving, and requires huge subsidies to attract riders. Moreover, transit systems in the vast majority of American cities use more energy and emit more greenhouse gases than the average car.[2]

For every dollar collected in fares from transit riders, the average transit system in America requires more than $2 from taxpayers for operating subsidies plus more than $1 for capital improvements and maintenance.[3] So it is not surprising that transit systems in Colorado require large subsidies. What may be surprising is that most are far less environmentally friendly than a typical sports utility vehicle.

The Cost of Driving

Before looking at the cost of transit, it is useful for comparison sake to calculate the cost of and subsidies to driving. Americans drive for 85 percent of their travel not because we are somehow addicted to the automobile but because autos are both more convenient and less expensive than most of the alternatives. Unlike transit buses, trains, or airplanes, automobiles make it possible for people to go where they want to go when they want to go there.

According to the Bureau of Economic Analysis, Americans spent $950 billion buying, operating, and maintaining their cars and light trucks (including pick ups, SUVs, and full-sized vans) in 2008.[4] That's a lot of money, but those cars and light trucks also carried us nearly 4.5 trillion passenger miles, for an average cost of less than 22 cents per passenger mile.[5]

Contrary to popular belief, there are no federal subsidies to highways and few state subsidies. Since at least 1956, almost all federal highway funds have come from federal gas taxes and other highway user fees.[6] Moreover, since 1982 Congress has diverted billions of dollars of highway user fees to transit and other uses each year. Recent appropriations of general funds to the highway trust fund were needed only because Congress diverted more gas taxes to transit than were being collected.

At the same time, federal highway funding formulas result in funds collected in some states, known as "donor" states, being spent on highways in other states, known as "recipient" states. Colorado is a recipient state: In 2007, the federal government collected $603 million in user fees from Colorado highway users.[7] It returned $694 million to the state for highways.[8] The $91 million difference is funds collected in other states.

State subsidies to highways depend on the state. In 2007, $46 million in Colorado state gas taxes and motor vehicle fees were diverted to non-highway uses, while the state spent $444 million in general funds on roads for a net state subsidy to roads of about $398 million.[9]

The biggest subsidies to highways come from local governments, few of which collect gas taxes or other highway user fees. In 2007, Colorado local governments spent $5 million in local tolls on non-highway programs, while they spent $958 million in general funds on highways and streets.[10]

Adding the federal, state, and local numbers together,

Colorado highways received a net subsidy in 2007 of about $1.45 billion. Since Colorado motorists drove about 48 billion vehicle miles in 2007, and the average car has about 1.6 people, that works out to a subsidy of about 1.9 cents per passenger mile.[11] This means the total cost of driving in Colorado is just over 23 cents per passenger mile.

The Cost of Transit

By comparison, the national average cost of public transit is more than 90 cents a passenger mile, more than 70 cents of which is subsidized by non-transit users. In Colorado, the costs are a little higher: $1.00 per passenger mile, $0.84 of which is subsidized.[12]

Most transit agencies do not even pretend to try to cover their operating costs, much less their capital costs, with passenger fares. Colorado transit agencies, for example, spent $419 million operating transit lines in 2008, but collected only $97 million in fares.

In addition to the annual operating costs, transit subsidies include the capital costs of buying buses and other facilities. Capital costs fluctuate tremendously from year to year as transit agencies receive federal grants to replace large segments of their bus fleets in some years and make few capital purchases in other years.

The Federal Transit Administration has published cost data for every transit agency from 1992 through 2008, providing 17 years' worth of capital cost data.[13] After adjusting for inflation, the average of these 17 years provides a reasonable approximation of annual capital costs for bus transit. In the case of Denver's light-rail system, actual capital costs of the existing system were depreciated over 30 years at 7 percent, as directed by Federal Transit Administration accounting rules.[14]

Annual capital costs and depreciation add another $181 million to the cost of running Colorado transit, meaning taxpayers lost $503 million per year on transit systems in 7 Colorado cities. This does not count the transit agency in Berthoud, which did not submit sufficient information to the Federal Transit Administration to calculate these numbers.

Table One
2008 Costs and Subsidies
Per Passenger Mile and Per Trip

	Cost /PM	Subsidy /PM	Cost /Trip	Subsidy /Trip
	Bus			
Colorado Springs	$0.85	$0.70	$5.69	$4.68
Denver	0.88	0.71	4.39	3.57
Fort Collins	1.68	1.52	4.29	3.89
Grand Junction	0.70	0.62	3.40	3.02
Greeley	1.18	0.99	4.33	3.63
Loveland	0.89	0.80	5.20	4.70
Pueblo	1.09	0.94	3.29	2.83
State Average	0.89	0.72	4.42	3.61
	Paratransit			
Colorado Springs	3.09	2.82	20.21	18.41
Denver	3.24	3.07	27.60	26.10
Fort Collins	8.54	7.80	40.60	37.08
Grand Junction	4.76	4.52	32.90	31.20
Greeley	7.83	7.43	31.30	29.73
Loveland	6.78	6.29	28.95	26.86
Pueblo	3.15	2.84	17.18	15.46
State Average	3.35	3.15	26.72	25.13
	Vanpools			
Denver	0.12	0.06	3.50	1.81
Fort Collins	0.13	0.00	6.28	0.00
	Light Rail			
Denver	1.22	1.05	7.91	6.85
Average of All Transit	1.00	0.84	5.47	4.58
Driving	0.23	0.02	1.27	0.10

Sources: Transit from 2008 National Transit Database*, operating expense, capital cost, and service spreadsheets; driving from Bureau of Economic Analysis, "Personal Incomes Expenditures by Type of Expenditure," table 2.5.5 and* Highway Statistics 2008*, table VM-1. Per-trip numbers for driving assume trip lengths of 5.5 miles, equal to the average for Colorado transit. In reality, auto trips tend to be longer than transit trips.*

Rail capital costs do not end after the initial construction costs are paid for: rail systems must be completely rebuilt or replaced about every 30 years, and the costs of doing so are a significant fraction of the original construction costs. The failure of agencies to budget for such reconstruction has led to an infrastructure crisis in the transit industry, which currently has a $78 billion backlog of deferred maintenance, leading Federal Transit Administrator

Peter Rogoff to publicly ask why transit agencies continue to build new rail lines when they can't afford to maintain the ones they already have.[15]

Table one shows that no transit system other than vanpools costs taxpayers less than 70 cents per passenger mile. Bus transit requires subsidies averaging 72 cents a passenger mile, while subsidies to Denver's light-rail system are about a third more. Users of paratransit—the door-to-door services many transit agencies offer to disabled and senior citizens—also receive large subsidies. But paratransit accounts for less than 2 percent of Colorado transit trips.

Overall, the subsidies average 84 cents per passenger mile. Colorado transit riders pay an average of 81 cents every time they board a bus and $1.04 when they ride light rail, while taxpayers pay an average of more than $3.60 to support each bus trip and close to $7 to support each light-rail trip.

Transit's Environmental Costs

The environmental benefits of transit hardly make up for its costs. In most cases, there are no environmental benefits, only costs. As shown in table two, driving is more energy efficient and less polluting than most transit systems in Colorado. The most energy efficient transit systems in Colorado are vanpools, which is the closest thing public transit offers to actual cars.

Denver's light rail is more energy efficient than light trucks, but the numbers in table two do not account for the huge energy costs required to build it. According to a life-cycle analysis by researchers at the University of California, the complete environmental costs of rail transit are about 155 percent greater than the operational costs, compared with only 63 percent greater for autos.[16] Those who want to save energy and reduce pollution would do better encouraging people to drive more fuel-efficient cars than encouraging cities to expand transit service.

A crucial part of energy efficiency is filling seats. The average transit bus in Colorado fills less than a quarter of its seats, and counting standing room they operate an average of about one-sixth full. Denver's light-rail system fills an average of 22 percent of its seats, but counting its ample standing-room capacity it operates only about one-twelfth full.[17]

Table Two
Energy Consumption and Carbon Dioxide Emissions Per Passenger Mile

	BTUs	Pounds CO_2
Bus		
Colorado Springs	4,477	0.26
Denver	4,030	0.65
Fort Collins	5,308	0.38
Grand Junction	3,943	0.63
Greeley	5,440	0.88
Loveland	3,375	0.54
Pueblo	5,321	0.86
State Average	4,084	0.63
Paratransit		
Colorado Springs	11,660	1.20
Denver	14,946	2.34
Fort Collins	18,405	2.94
Grand Junction	23,988	3.83
Greeley	26,331	4.25
Loveland	20,289	3.20
Pueblo	15,666	2.51
State Average	14,635	2.22
Other		
Denver vanpools	1,369	0.21
Denver light rail	3,748	0.66
Average of All Transit	4,199	0.66
Average light truck	4,016	0.69
Average car	3,514	0.55
Toyota Prius	1,659	0.26

Source: Transit BTUs calculated from 2008 National Transit Database*, energy consumption spreadsheet; car and light truck BTUs from Stacy C. Davis and Susan W. Diegel,* Transportation Energy Data Book: Edition 28 *(Oak Ridge, TN: U.S. Department of Energy, 2009), table 2.13, tinyurl.com/ykhfvvu; Toyota Prius from Environmental Protection Agency, Model Year 2008 Fuel Economy Guide (Washington: EPA, 2007), tinyurl.com/25y3ce; CO_2 calculated from same sources plus Energy Information Administration, "Fuel and Energy Emission Coefficients," (Washington: Department of Energy), tinyurl.com/smdrm.*

While urban transit buses tend to be less energy efficient than light trucks, intercity buses are among the most energy-efficient vehicles in America. They pay slightly lower fuel taxes than auto users, but

otherwise require little or no subsidy. They tend to be at least as energy efficient and emit as little pollution per passenger mile as the most efficient cars on the road.[18]

Intercity buses are energy efficient because they are private and operate where people want to go, tending to fill at least half to two-thirds of the seats. Urban buses are public and operate where the taxpayers are, even if that means running buses to neighborhoods that have few potential riders.

Fixing Public Transit

Transit agencies could do several things to provide better transit at a lower cost. One of the major obstacles to change is that Congress has, intentionally or not, given transit agencies incentives to choose high-cost forms of transit. Once these incentives are changed, it will be easier for transit agencies to adopt some or all of the following policies.[19]

End highway subsidies: Taxpayers and highway users would both be better off if highways were funded exclusively out of tolls, vehicle-mile fees, or some other user fee. While ending subsidies would only increase the cost of driving by a few pennies per mile, it would take away the excuse rail advocates use for diverting billions of dollars of highway user fees to pay for the construction of expensive rail lines, which is "highways are subsidized, so therefore we need to subsidize rail transit as well."

Smaller vehicles: A major urban area sees millions of passenger trips each day from hundreds of thousands of different origins to hundreds of thousands of different destinations. No more than a tiny fraction of these trips will ever be taken by "big box" forms of transit such as trains or large buses. The average Colorado transit bus has 40 seats and room for 16 people standing, yet carries an average of less than 10 people. Smaller vehicles can save energy and nimbly serve more parts of each urban area.

Contracting out: Hiring private companies to operate buses and other transit vehicles can save taxpayers millions and/or spread available resources to more transit routes. Denver contracts out half of its bus services, and it pays only 52 percent as much per vehicle mile for the contracted service as it spends on buses it operates itself.[20] The main obstacle to contracting out services is generally union opposition, even though some contracting companies are unionized and pay scales are comparable.

Jitneys: Also known as shared taxis, jitneys are a combination of taxis and buses. They tend to be privately owned vehicles operating on fixed or semi-fixed routes. The airport shuttles found in most American urban areas are a form of a jitney, but one that can only start or end at the airport. Opening up urban areas to competitive jitney services would allow more people to take advantage of door-to-door or near-door-to-door services at a lower cost than taxis. The main opponents are taxi companies, but they could in fact become major jitney operators. A private party in Houston has recently started a jitney service called the Wave.[21]

Privatize: Transit agencies could take the ultimate step of selling their assets to private operators, restoring the system that prevailed in most American cities before Congress gave cities incentives to take over private transit companies in 1964. The private operators would have incentives to find the optimal sized vehicle for each route and to run transit where people want to use it, not in every suburb that pays taxes to the transit agency. The United States still has a few private transit services that operate largely without subsidies, including the Atlantic City Jitney Association, New York Waterway, and *publicos* (jitneys) in Puerto Rico.

Vouchers: Transit is important to people who have no access to cars. But such people are rare: more than 93 percent of Colorado households have at least one car, so even people who can't drive usually have someone in the household who can drive for them.[22] Instead of funding expensive transit agencies to serve those few who still lack automobility, state and local governments could give transportation vouchers/stamps to people who are too young, too old, or otherwise unable to drive. These vouchers could be applied to any public conveyance: taxis, private shuttle buses, intercity buses, Amtrak, or the airlines. This would give people the mobility they need at a much lower cost to taxpayers.

Many people think that a major goal for transit is to persuade people to get out of their car and drive less. Considering that the transit systems we know today are more expensive, less convenient, and have greater environmental impacts than driving, this goal is self-defeating. The changes described above could save Colorado taxpayers hundreds of millions of dollars while truly improving transit services for most of the people who need or prefer transit over driving.

References

1. See, for example, "Penny Wise, Pound Fuelish: New Measures of Housing + Transportation Affordability," Center for Neighborhood Technology, Chicago, IL, 2010, p. 7, tinyurl.com/yl38cec.
2. See table 6 of Randal O'Toole, "Does Rail Transit Save Energy or Reduce Greenhouse Gas Emissions?" Cato Institute Policy Analysis no. 615, April 14, 2008, tinyurl.com/kpaw7r.
3. "2008 National Transit Profile," Federal Transit Administration, 2009, p. 1, tinyurl.com/2cmnujk.
4. Bureau of Economic Analysis, "Personal Incomes Expenditures by Type of Expenditure," table 2.5.5, bea.gov, tinyurl.com/y89ajej.
5. *Highway Statistics 2007* (Washington, DC: Federal Highway Administration, 2009), table VM-1.
6. *Highway Statistics 2007*, table HF-10.
7. *Highway Statistics 2007*, table HDF.
8. *Highway Statistics 2007*, table SF-1.
9. *Highway Statistics 2007*, tables SDF and SF-1.
10. *Highway Statistics 2007*, table LGF-1.
11. *Highway Statistics 2007*, table VM-2.
12. Calculated from *2008 National Transit Database* (Washington, DC: Federal Transit Administration, 2009), operating expense, capital cost, and service spreadsheets.
13. *National Transit Database Historical Datafiles* (Washington: Federal Transit Administration, 2009), "Capital Expenditures Time-Series" spreadsheet, tinyurl.com/yhubppv; *2008 National Transit Database* (Washington: Federal Transit Administration, 2009), "capital expense" spreadsheet, tinyurl.com/yeuucn8.
14. *New Starts Handbook* (Washington, DC: Federal Transit Administration, 2002), section 3.4, "Cost Effectiveness," tinyurl.com/ylrjevl. The handbook actually specifies 25-year depreciation periods for rail cars, 20 years for parking lots, 100 years for rights of way, and 30 years for all other rail infrastructure. This analysis used 30 years as a reasonable average. For a complete description of how rail capital costs were calculated, see Randal O'Toole, "Defining Success: The Case Against Rail Transit," Cato Institute Policy Analysis no. 663, March 24, 2010, pp. 20–22, cato.org/pubs/pas/pa663.pdf.
15. Peter Rogoff, "Remarks at the Federal Reserve Bank of Boston," May 18, 2010, tinyurl.com/28km9vs.
16. Mikhail Chester and Arpad Horvath, "Environmental Assessment of Passenger Transport Should Include Infrastructure and Supply Chains," *Environmental Research Letters*, 2009, tinyurl.com/njz4vt.
17. Calculated from the *2008 National Transit Database* by comparing seats and standing room in "revenue vehicle inventory" spreadsheet, with average occupancy (passenger miles divided by vehicle revenue miles) from "service" spreadsheet.
18. M. J. Bradley & Associates, "Comparison of Energy Use & CO2 Emissions From Different Transportation Modes," American Bus Association, Washington, DC, May 2007, p. 4, tinyurl.com/mztgq3.
19. For a detailed description of these incentives, see Randal O'Toole, "Defining Success: The Case Against Rail Transit," Cato Institute Policy Analysis no. 663, March 24, 2010, pp. 17–18, cato.org/pubs/pas/pa663.pdf.
20. *2008 National Transit Database*, "operating expense" and "service" spreadsheets.
21. "The Washington Wave," thehoustonwave.com.
22. *2000 Census*, table QT-H11, "Vehicles Available and Household Income in 1999," tinyurl.com/22pq2kb.