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spotlight

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Public Transit in North Carolina

KEY FACTS: **• 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.**

• In 2008, the federal government collected about $1.11 billion in user fees from North Carolina highway users but returned only $656 million to the state for highways.

• Adding the federal, state, and local numbers together, North Carolina highways users paid about $203 million more user fees than was spent on roads in 2007.

• North Carolina highway users are subsidizing other programs at the rate of slightly more than a penny per passenger mile. The total cost of driving in North Carolina is no more than 22 cents per passenger mile.

• By comparison, the state average cost of public transit is $1.15 per passenger mile, nearly $1 of which is subsidized by non-transit users.

• Annual capital costs and depreciation add another $71 million to the cost of running North Carolina transit. Taxpayers lose $249 million per year on transit systems in a dozen NC cities.

• Bus transit costs taxpayers an average of 85 cents a passenger mile. Subsidies to the Charlotte light rail are several times greater. North Carolina transit riders pay an average of 72 cents every time they board a bus, while taxpayers pay an average of more than $3 to support that trip.

• Driving is more energy efficient and produces less carbon emissions than almost any transit system in North Carolina.

• Currently transit agencies have incentives from Congress to choose high-cost forms of transit. Changing those will make it easier for agencies to allow such reforms as smaller vehicles, contracting out, jitneys, privatization, and vouchers.

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Public transit is often portrayed as a low-cost, energy-efficient alternative to auto driving.[1] In fact, transit is much more costly than driving and requires huge subsidies to attract any riders at all. 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 North Carolina 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

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 pickups, 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.

In 2008, the federal government collected about $1.11 billion in user fees from North Carolina highway users.[7] But it returned only $656 million to the state for highways.[8]

State subsidies to highways are also limited and depend on the state. In 2008, $328 million in North Carolina state gas taxes and motor vehicle fees were diverted to non-highway uses, while the state spent no more than $115 million in non-user fees on roads.[9] Counting both state and federal dollars, the state actually spent $664 million less on roads than users paid.

The only real subsidies to North Carolina roads come from local governments, few of which collect gas taxes or other highway user fees. In 2007, North Carolina local governments spent $461 million in general funds, property taxes, and other non-user fees on highways and streets.[10]

Adding the federal, state, and local numbers together, North Carolina highways users paid about $203 million more user fees than was spent on roads in 2007. Since North Carolina motorists drove about 104 billion vehicle miles in 2007, and the average car has about 1.6 people, this means highway users are subsidizing other programs (or, in the case of federal money, highways in other states) at the rate of slightly more than a penny per passenger mile.[11] Any way you look at it, the total cost of driving in North Carolina is no more than 22 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 North Carolina, the costs are higher: $1.15 per passenger mile, nearly $1 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. North Carolina transit agencies, for example, spent $220 million operating transit lines in 2008, but collected only $41 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 the Charlotte light-rail line, actual capital costs were depreciated over 30 years at 7 percent, as directed by Federal Transit Administration accounting rules.[14]

Annual capital costs and depreciation add another $71 million to the cost of running North Carolina transit, meaning taxpayers lose $249 million per year on transit systems in a dozen North Carolina cities. This does not count transit agencies in Gastonia, Goldsboro, Greenville, Hickory, Jacksonville, Lexington, and Rocky Mount, which did not submit sufficient

Table 1. 2008 Costs and Subsidies Per Passenger Mile and Per Trip

Bus	*Cost/PM*	*Subsidy/PM*	*Cost/Trip*	*Subsidy/Trip*
Asheville	$0.81	$0.68	$3.26	$2.72
Cary	2.36	2.28	14.99	14.45
Chapel Hill	0.97	0.53	2.48	1.35
Charlotte	1.00	0.86	4.96	4.27
Durham	0.72	0.58	2.82	2.27
Fayetteville	1.58	1.39	4.93	4.33
Greensboro	0.94	0.81	3.60	3.11
High Point	1.32	1.09	3.16	2.61
Raleigh	0.95	0.82	3.70	3.20
Raleigh	1.23	0.35	2.30	0.65
Research Triangle Park	1.34	1.24	15.09	13.98
Wilmington	1.54	1.36	4.29	3.80
Winston-Salem	1.97	1.68	4.03	3.44
State Average	1.03	0.85	4.17	3.45
Paratransit	*Cost/PM*	*Subsidy/PM*	*Cost/Trip*	*Subsidy/Trip*
Asheville	1.49	1.28	13.99	12.01
Cary	4.36	4.21	39.75	38.38
Chapel Hill	6.10	6.10	27.55	27.53
Charlotte	3.51	3.26	31.47	29.23
Durham	3.18	3.04	25.87	24.75
Fayetteville	3.24	3.11	33.34	32.03
Greensboro	3.64	3.55	28.69	27.94
Guildford County	1.92	1.88	32.49	31.83
High Point	1.90	1.60	13.06	11.02
Research Triangle Park	2.47	2.02	55.19	45.11
Wilmington	1.88	1.86	17.50	17.29
Winston-Salem	3.73	2.30	16.44	10.14
State Average	3.01	2.80	27.45	25.53
Vanpools	*Cost/PM*	*Subsidy/PM*	*Cost/Trip*	*Subsidy/Trip*
Charlotte	0.09	0.05	4.14	2.14
Research Triangle Park	0.15	0.10	4.53	3.03
Rail	*Cost/PM*	*Subsidy/PM*	*Cost/Trip*	*Subsidy/Trip*
Charlotte Light Rail	3.61	3.49	20.86	20.14
	Cost/PM	*Subsidy/PM*	*Cost/Trip*	*Subsidy/Trip*
Average of All Transit	1.15	0.99	5.38	4.62
Driving	0.23	–0.01	1.08	0.02

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 4.7 miles, equal to the average for North Carolina transit. In reality, auto trips tend to be longer than transit trips.

information to the Federal Transit Administration to calculate these numbers.

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 1 shows that no transit system other than vanpools costs taxpayers less than 50 cents per passenger mile. Bus transit requires subsidies averaging 85 cents a passenger mile, while subsidies to the Charlotte light rail are several times greater. 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 only about 2 percent of North Carolina transit trips.

Overall, the subsidies average nearly $1 per passenger mile. North Carolina transit riders pay an average of 72 cents every time they board a bus, while taxpayers pay an average of more than $3 to support that trip.

Table 2. Energy Consumption and Carbon Dioxide Emissions Per Passenger Mile

Bus	*BTUs*	*Pounds CO_2*
Asheville	5,413	0.87
Cary	9,924	0.58
Chapel Hill	5,363	0.87
Charlotte	4,929	0.80
Durham	5,331	0.86
Fayetteville	9,077	1.46
Greensboro	3,577	0.58
High Point	6,489	1.05
Raleigh	5,444	0.32
Raleigh	7,453	1.20
Research Triangle Park	6,543	1.06
Wilmington	10,890	1.75
Winston-Salem	9,620	1.55
State Average	5,434	0.82
Paratransit	*BTUs*	*Pounds CO_2*
Asheville	13,431	2.10
Cary	7,772	1.07
Chapel Hill	22,229	3.48
Charlotte	18,517	2.99
Durham	15,043	2.35
Fayetteville	17,546	2.75
Greensboro	15,920	2.55
Guildford County	12,019	1.89
High Point	9,928	1.55
Research Triangle Park	9,597	1.50
Wilmington	13,311	2.08
Winston-Salem	24,021	3.87
State Average	15,289	2.42
Vanpools	*BTUs*	*Pounds CO_2*
Charlotte	1,269	0.20
Research Triangle Park	816	0.13
State Average	1,045	0.16
Rail	*BTUs*	*Pounds CO_2*
Charlotte Light Rail	3,588	0.49
	BTUs	*Pounds CO_2*
Average of All Transit	5,266	0.80
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; CO2 calculated from same sources plus Energy Information Administration, "Fuel and Energy Emission Coefficients," (Washington: Department of Energy), tinyurl.com/smdrm.

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 produces less carbon emissions than almost any transit system in North Carolina. The only truly energy-efficient transit system in North Carolina is vanpools, which is the closest thing public transit offers to actual cars. Those who want to save energy and reduce pollution and greenhouse-gas emissions would do better encouraging people to drive more fuel-efficient cars than encouraging cities to expand transit service.

In addition to greenhouse gas emissions, Charlotte and other urban areas have to comply with ozone limits. While not as easy to calculate as carbon dioxide emissions, transit emissions per passenger mile of nitrogen oxides (a primary ozone precursor) tend to be significantly higher than auto emissions.

Diesel-powered buses tend to emit more nitrogen oxides than gasoline-fueled autos. Electric transit, which gets much of its power from coal-fired electrical plans, also effectively emits large amounts of nitrogen oxides. For example, an analysis of a plan to expand bus and light-rail service in Denver found that nitrogen oxide emissions from transit would be more than twice the nitrogen oxides of all the cars that the transit improvements took off the road.[16] The results for North Carolina should be roughly the same, as 58 percent of North Carolina electricity comes from coal-fired plans compared with 65 percent in Colorado.[17]

Other than vanpools, the only North Carolina transit system that appears to be more energy-efficient than the average light truck is the Greensboro bus system. This is either a reporting error or Greensboro buses are extraordinarily energy-efficient, as they used 15 percent less energy per bus-mile than buses in Fayetteville even though Fayetteville buses are, on average, smaller.

A crucial part of energy efficiency is filling seats. The average transit bus in North Carolina fills only a fifth of its seats, and counting standing room they operate an average of about one-eighth full. The Charlotte light rail fills an average of 45 percent of its seats, but counting its ample standing-room capacity it too operates only about one-eighth full.[18]

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 and greenhouse gases per passenger mile as the most efficient cars on the road.[19]

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.[20]

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 North Carolina transit bus has 35 seats and room for 17 people standing, yet carries an average of just 7 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.[21] 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.[22]

Privatization: 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 92 percent of North Carolina households have at least one car, so even people who can't drive usually have someone in the household who can drive for them.[23] 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.

Conclusion

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 North Carolina taxpayers hundreds of millions of dollars while truly improving transit services for most people.

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End Notes

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 Consumption Expenditures by Function," table 2.5.5, *bea.gov, tinyurl.com/y89ajej*.
5. *Highway Statistics 2008* (Washington, DC: Federal Highway Administration, 2009), table VM-1.
6. *Highway Statistics 2008*, table HF-10.
7. *Highway Statistics 2008*, table HDF.
8. *Highway Statistics 2008*, table SF-1.

9. *Highway Statistics 2008*, tables SDF and SF-1. In table SF-1, "other state imposts" for North Carolina are driver license and vehicle registration fees. The $115 million under "Miscellaneous" includes funds from a variety of sources, including local governments, damage claims, and contributions from property owners, most of which are not user fees.
10. *Highway Statistics 2008*, table LGF-1.
11. *Highway Statistics 2008*, 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. "Review of the RTD Fastracks Plan," Denver Regional Council of Governments, 2004, p. 26, *tinyurl.com/25xwhu2*.
17. *State Electricity Profiles 2008* (Washington: Department of Energy, 2009), pp. 33 and 201, *tinyurl.com/239xz3l*.
18. 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.
19. M. J. Bradley & Associates, "Comparison of Energy Use & CO_2 Emissions From Different Transportation Modes," American Bus Association, Washington, DC, May 2007, p. 4, *tinyurl.com/mztgq3*.
20. 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*.
21. *2008 National Transit Database*, "operating expense" and "service" spreadsheets.
22. "The Washington Wave," *thehoustonwave.com*.
23. *2000 Census*, table QT-H11, "Vehicles Available and Household Income in 1999," *tinyurl.com/22pq2kb*.