Re-Training America:

Reducing US Climate Impact by Revitalizing Intercity Passenger Rail

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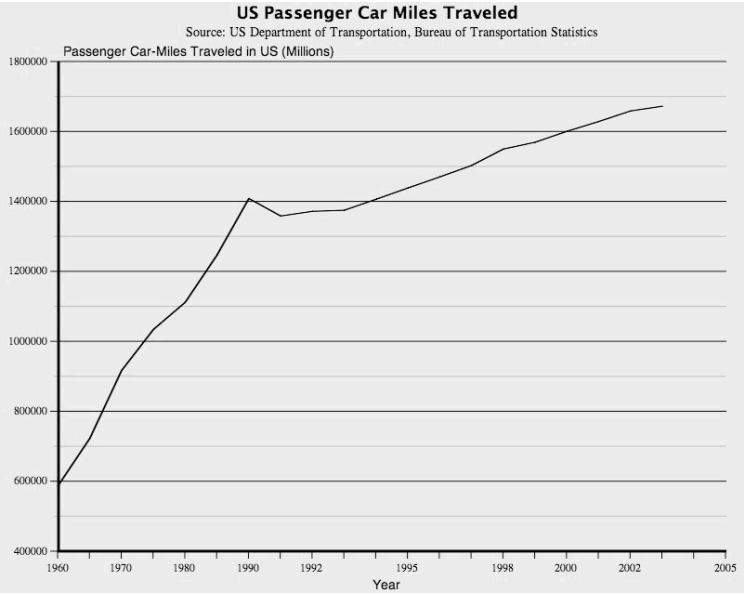
The economy and society of the modern United States was built on the railroads. Steel rails and wooden ties connected all corners of the country, providing energy and cost-efficient transportation of people and goods with much less direct impact on the landscape than highways. Cities and towns, by and large, were built in a compact manner, centered around the train station. Once automobiles became cheap and plentiful, however, Americans seemed to want to forget about railroads and instead rely on the vast network of roads and highways which make suburban living possible. At the dawn of the 21st century, with petroleum shortages and climate change looming as threats to our auto-centered way of life, it is time for America to rediscover the passenger train. Though it will not solve the energy crisis or slow global warming on its own, reconstructing a fast, frequent, expansive and reliable intercity passenger train network would be a good first step towards those goals, with the added benefit of reconnecting America with itself.

Fast, reliable and inexpensive mobility is a necessary precondition for all but the most localized economic activity. People, resources, goods, and physical capital all need to be able to get from one place to another so that business can be transacted. Thus, the potential for beneficial commerce is limited by the transportation infrastructure available and the ease and cost of access to it. Before the 1830s, Americans relied on waterways or horse-drawn carriages for long-distance transportation, making many parts of the country difficult or uneconomical to reach and leaving many communities isolated. Railroads, which expanded rapidly between 1830 and 1870, tied the country together by providing direct and comparatively fast mobility to the masses. The railroads' ability to bring goods from source to factory to market quickly and cheaply allowed industry to flourish and facilitated the exploitation of the continent's resources. The United States reached a peak of railway mileage in 1917, when freight and passenger service linked virtually every corner of the country. Not only was frequent and on-time intercity

passenger service the norm, but it was also possible early in the 20th Century to travel from New York to Boston using only interconnecting interurban transit lines. Railroads, which had became integral to the socioeconomic fabric of the country, would soon suffer a slow decline as a more personal mode of transportation became widely available, affordable and practical.

The inexpensive assembly-line production of the automobile that began in the 1920s, combined with cheap and plentiful gasoline, allowed the masses to enjoy the convenience of increasingly fast, independent mobility. Overall growth in the production of motor vehicles since the end of World War II has risen from about five million motor vehicles per year to almost 50 million. Since 1950, each year has seen motor vehicle production increase by approximately one million vehicles over the previous year.[1] US car sales continued to grow steadily from 1990 through 2001, but leveled off afterwards, to just fewer than 60 million new and used cars and light trucks sold in 2004.[2] The measure most relevant to the environmental impact of increased automobile travel is that of vehicle-miles traveled (VMT). A vehicle-mile is defined as one vehicle traveling one mile. In the case of passenger cars, the chart on the left shows the dramatic increase in VMT over the past 45 years.[3]



Americans have become enamored with the automobile as a symbol of personal freedom

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[1] Walsh, Michael P. "Assessing Transportation-Related Air Pollution in Major Cities." *Journal of Urban Technology* vol. 6, no. 1 (1999): 1.

[2] US Department of Transportation, Bureau of Transportation Statistics. *National Transportation Statistics*. Washington: Bureau of Transportaton Statistics, December 2006.

[3] Note that the intervals between years are uneven (5 years from 1960 to 1990 and 1 year between 1990 and 2005).

and our transportation infrastructure has been configured in such a way that all other modes are rendered relatively impractical. But given the impact of Americans' auto dependency on air quality and climate change, as well as the reality of traffic congestion and the social costs it imposes, the United States can no longer afford this driving habit, particularly for intercity travel. The reasons why Americans continue to do so are twofold: the relative prices of different travel modes fail to account for the full costs of auto use, and government subsidy (which is essential to the viability of any mode of long-distance transportation) has been lopsidedly awarded to highways at the expense of other modes. This paper will examine a policy that has the potential to increase mobility and decrease greenhouse gas emissions: the revitalization an intercity travel mode that, tragically, has been neglected for almost sixty years: passenger trains.

Transportation is a key component of human impact on the environment. The greater the distance over which people and goods are moved, the more energy is needed. Locomotives, cars, trucks, boats and airplanes consume energy in order to move their cargo, almost all of which comes from coal or petroleum. These fuels can only be used once and burning them generates gases that pollute the air and are responsible for global climate change. The presence of any type of artificial transportation corridor, even a footpath through a forest, also has an effect or the surrounding landscape. The more land is taken to move people and goods via road and rail and, to a much lesser extent, air and water, the less is available for other purposes.[4]

While the focus here is on air pollution and greenhouse gases, these are not the only negative environmental impacts associated with an auto-dependent transportation system. The

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[4] This speaks to the economic concept of opportunity cost. Economists argue that the costs of building a highway, for example, should include the value of benefits given up in order to allocate land and other resources to the highway, such as the value of the food that could have been grown on the land the highway occupies. Although Nature provides the actual "corridors" used by boats and airplanes, a significant terrestrial infrastructure is necessary to accommodate both modes.

land area used by transportation infrastructure, and the effects of such infrastructure on the natural and human ecology of surrounding areas, is a significant area of concern. The increase in passenger car VMT shown earlier has led to a corresponding increase in miles of roads. From 1990 to 2005, total urban and rural roadway mileage increased by 128,709 miles.[5] The sheer volume of paved surface needed to accommodate the large number of people who rely on the car for basic transportation, including parking lots, is enormous.

When land is covered with asphalt or concrete, rain and snow that falls on it cannot seep into the soil below. With no other place to go, this water either stands in puddles or drains off the paved surface until it is absorbed into the soil or finds a human-made drain or channel. The more paved surfaces there are in a watershed (the area wherein precipitation drains into a particular body of water), the higher the volume of water that reaches said body and the less is absorbed into the soil or the groundwater or taken up by plants. Such copious amounts of water can overwhelm the waterbody and cause several changes in the hydrologic cycle.[6] Such alterations can eventually contribute to higher water levels in the event of a flood and abnormally low levels during dry periods. Not only that, but stormwater runoff also carries leaked engine oils and other human-made debris into streams.

A second area of environmental concern with heavy automobile use is energy consumption. All modes of transport consume energy, and with few exceptions, all except walking and cycling consume energy that comes from petroleum. Even trains that use electricity from an overhead wire or third rail usually rely on electricity produced by fossil fuel-burning

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[5] Ibid.

[6] D'Ambrosio, Jessica, Timothy Lawrence and Larry C. Brown. "A Basic Primer on Nonpoint Source Pollution and Impervious Surface." *Ohio State University Extension Fact Sheet*, 2004.

power plants.[7] Once cheap and abundant, petroleum is becoming increasingly expensive as the remaining reserves are depleted to the point where what remains is much costlier to extract. Petroleum is a nonrenewable resource, meaning that the time it takes for natural processes to replenish what humans use is too long to be a significant factor. Therefore, the more humans continue to use petroleum as a primary energy source, the scarcer and more difficult to extract the remaining supplies will become. While each automobile uses less energy per mile than each bus or locomotive, the fact that each of the latter generally hauls a large number of passengers accounts for the fact that an automobile carrying only the driver uses six times the amount of energy par passenger-mile (one passenger traveling one mile) as a diesel-powered train.[8]

Some of the social costs imposed by automobile reliance are not environmental problems in the traditional sense. One of these is the car's poor safety record as compared with trains, buses and airplanes. The annual death toll on America's highways is consistently in the hundreds of thousands, and "the risk of death in an auto accident is roughly 18 times that for rail."[9] Another is the aesthetic impact of the copious amounts of paved surfaces required for the automobile to be practical. Building mulit-lane highways generally requires altering a significant amount of land. The economics of railroad construction, on the other hand, dictate that they are built in a way that is more accommodating to the landscape. Since railroad rights-of-way are generally narrower than highways and need to be fairly straight with few sharp changes in elevation, the least costly places to build them are alongside rivers and on ridgelines, so that they tend to complement the existing topography. Finally, the fact that a car is required to accomplish

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[7] The potential for electricity to be provided on a large scale by renewable, nonpolluting sources would make an electrically-powered train system even more environmentally advantageous.

[8] Lowe, Marcia D. *Back on Track: The Global Rail Revival*. Washington: Worldwatch Institute, April 1994:10.

[9] Lowe, 16.

most of the average American's daily errands severely disadvantages those unable to afford cars or unable to drive due to age or disability. Viable public transportation systems, on the other hand, promote greater social equity by providing mobility to parts of the population underserved by cars.

The kinds of air pollution most directly attributable to automobile exhaust are ground-level ozone (O_3), also known as smog, and particulate matter (PM). Ground-level ozone affects many cities during the summer months. The primary ingredients in smog are volatile organic compounds (VOCs) and nitrogen oxides (NOx), both of which are the byproducts of internal combustion engines. These two gases undergo a series of heat-induced chemical reactions to form ozone. While ozone in the upper atmosphere is beneficial, absorbing the sun's ultraviolet radiation, the O_3 that forms in the troposphere, the layer closest to earth's surface, remains there. The human health impacts of smog are well documented, and the cost of care and treatment of those affected is imposed on society. [10] The other primary pollutant resulting from the burning of fossil fuels, particulate matter (PM) is a mixture of solid particles and liquid droplets in the air, including dust, dirt, soot and smoke. PM is linked to several human health impacts, including respiratory ailments, aggravation of existing respiratory and cardiovascular diseases, immune-system alterations, lung cancer, and premature death.[11]

A third auto exhaust component of concern, though it is not directly harmful to human health, is greenhouse gases (GHGs), particularly carbon dioxide (CO_2). These gases partially trap the Sun's heat in the atmosphere, preventing it from re-radiating into space. A certain amount of greenhouse gases occur naturally; without them, the planet would be too cold to support life as

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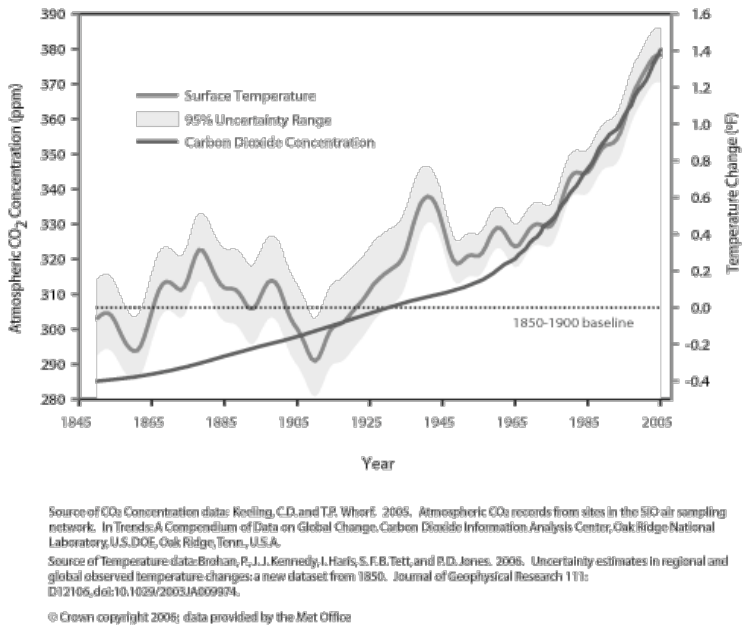
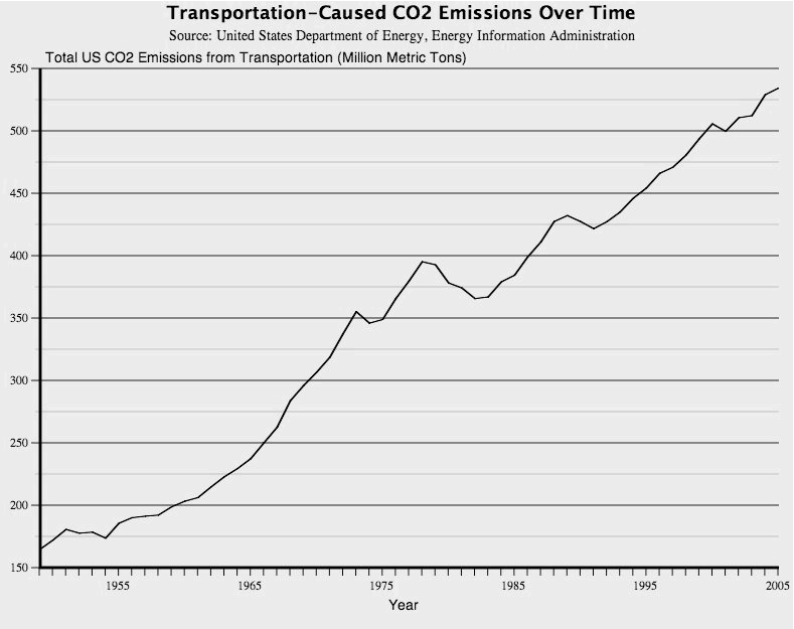
[10] Walsh, 2-3.

[11] Ibid, 4.



we know it. However, as the graph on the left[12] shows, human activity over the past 100 years has dramatically increased their concentration in the atmosphere, by about 60 parts per million in only 40 years. This increase directly corresponds with annual increases in global surface temperature. This has already begun to cause major changes to regional temperatures, precipitation amounts and weather patterns across the globe, all of which have potentially catastrophic consequences for human endeavors.

The chart below shows the alarming, exponential rate at which the total volume of carbon dioxide emissions from the transportation sector alone has grown in the past 55 years. All the transport modes included in these figures run on petroleum, natural gas, coal, or electricity that is largely produced using one of these three fossil fuels. In 2004, transportation was responsible for 28% of the United States' GHG emissions.[13] Given that 88.8% of US passenger-miles traveled



[12] From the Pew Center on Global Climate Change, http://www.pewclimate.org/global-warming-basics/facts_and_figures/temp_ghg_trends/co2_and_temp.cfm.

[13] Ibid.

that year were traveled by car or truck,[14] the use of private motor vehicles as the main means of travel within and between cities has contributed greatly to the US's world-leading level of GHG emissions.

By contrast, a person traveling a given distance by public transportation in 1999 produced, on average, nearly half as much CO_2 as he or she would have in traveling the same distance by private automobile or light truck.[15] That year, US private vehicles produced 7.4 million more metric tons of CO_2 per vehicle mile than public transportation.[16] These figures are based on the average number of travelers per vehicle in the US in 1999. If each bus or train carried the same number of people as the average car, the per-traveler emissions from cars would be much less. Public transportation's per-passenger efficiencies come from the fact that buses and trains generally carry many more riders than cars. Even though most buses and trains travel the same number of miles each day regardless of how many riders use them, the per-person emissions average out to be less than those for private cars, which only make trips as needed.

A large part of the difference in per-traveler CO_2 emissions between cars and trains is due to the inherent characteristics of rail that make it more energy-efficient. "Trains require less propulsive energy than cars and trucks because of superior aerodynamics and the lower rolling resistance of steel wheels on steel rails."[17] The friction of steel on steel generates less resistance to forward movement than does the friction of rubber on asphalt. Every driver experiences this as a car begins to slow down immediately once the foot is taken off the accelerator, unless the car

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[14] Calculated from US DOT, 2006.

[15] Shapiro, Robert J., Kevin A. Hassett and Frank S. Arnold. "Conserving Energy and Preserving the Environment: The Role of Public Transportation." American Public Transportation Association, July 2002: 9.

[16] Shapiro et al, 24.

[17] Lowe, 10.

is going downhill. With a train traveling on a level rail bed, the engineer can release the throttle and still have the train maintain speed for several hundred feet. The greater forward momentum generated by the train's heavier weight helps with this as well. Railroads' relative lack of stop signals and other slowdowns that bedevil drivers also means less need for acceleration and braking in trains.[18] Acceleration is the point at which any engine burns the most fuel.

The air pollution and other environmental impacts of fossil fuel-based transportation systems impose high costs on society. As with many aspects of an industrial economy, these costs do not factor into the decisions of suppliers and consumers that, in the absence of government regulation, would dictate the amount of the service that is provided and its price. Economists call these costs externalities, since they are borne by individuals other than the buyer and seller involved directly in the market transaction. The benefits of good externalities and the burdens of bad ones are borne instead by society as a whole, and by other life forms and natural systems. Since these benefits and burdens are not considered by travelers when deciding how best to get from point A to point B, they have very little influence on the amount of traveling that is undertaken and by which means. The lack of consideration of the external costs of an activity means that the market price for engaging in it is lower than it would be if the externalities were accounted for, leading consumers to engage in more of it than is socially desirable.

The fact that automobile travel has increased so greatly in the past 50 years, along with the attendant carbon emissions, is evidence of a disconnect between what travelers are willing to, and actually do, pay to travel and the full costs of providing the infrastructure and service that makes such travel possible. This includes not only the external costs described above, but also the capital, maintenance and labor costs necessary for each mode to be viable. While travel is a

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[18] Ibid.

valuable enough good that people are willing to pay something towards the cost of their trips, travelers "are rarely if ever willing or able to cover the full cost."[19] Thus, if government were taken out of the picture, very few paved roads would be available (with the possible exception of a few toll roads in high-density areas) and very little public transportation service would be provided because the costs of doing so would be so high that potential travelers couldn't make transit enterprises profitable. However, governments generally recognize mass travel to be crucial to economic vitality and other social goals, so they usually subsidize transportation as a public service.[20] Without investment from all levels of government, the private companies which own US railroads would never have been able to recover the costs of building them. Beginning in the 1940s, though, the bulk of that investment switched to highways and aviation, and railroads began to be treated as businesses with the false expectation of self-sufficiency. In order for passenger rail to be able to compete with other modes in the 21st Century, the American people and their elected officials will need to return to viewing it as an essential public utility.

For all trips regardless of length, the automobile has the advantage of convenience (one can drive directly from origin to destination without having to go to an airport or train station) and time flexibility (the traveler is not bound by flight or train schedules, but can go at his or her own pace). However, factors such as traffic congestion and the scarcity of parking spaces, which are influenced by an area's population density, detract from the car's time savings, especially for trips of fewer than 300 miles. Other factors travelers consider are the potential to use one's time productively (for business travelers) or enjoyably (for vacationers) while in transit, as well as the reliability of service. Trains have an advantage in both of these respects, especially on short

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[19] Sclar, 6.

[20] Ibid.

hauls. It is easier to do work or to enjoy the trip while on a train than while driving a car or squeezed into an airline coach seat. Train service is much more reliable in inclement weather than is driving or flying. Snow, ice and thunderstorms make driving slow and dangerous and often ground airplanes, but rarely cause delays in train service.

To illustrate what influences travelers' decisions between modes, my recent leisure trip from Greensboro, North Carolina, to New York City, a distance of 518 miles, can be used as a case study. I chose to go by train since it is my preferred method of travel for reasons other than what it costs me privately. Were it not for a discount I received, I would have paid $86.13 for a one-way ticket on Amtrak. The per-mile gasoline cost for an average small sedan in 2007 is 7.4 cents, given a gas price of $2.256 per gallon.[21] If I were to drive a small sedan for this trip, I would have paid $38.33 in gas and oil alone, a savings of $47.80 over the train fare. However, if I were to factor in the average maintenance and tire replacement cost for a mid-sized car, my trip would have cost $64.23 one-way, $21.90 less than what I paid for my train ticket. This does not take into consideration the tolls I would have paid along the way or the extra miles driven by detouring for rest and meal stops. Nor does it account for rising gas prices, which are above $3.00 per gallon in most of the country at the end of 2007. Taking into account all auto-related expenses (insurance, registration fee, finance charge, etc), as well as tolls and extra miles, the total cost of the trip to New York becomes $186.52 more than the one-way train fare.[22]

The decision to drive to New York from Greensboro seems like a no-brainer solely on that basis of the cost of gasoline, especially if a driver shares his or her ride with others.

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[21] American Automobile Association. *Your Driving Costs*. Heathrow, FL: AAA Association Communications, 2007 (actual gas prices around the time of this writing are around $3.00 per gallon).

[22] To reach this figure, I added an estimated toll cost of $5.00 and a conservative estimate of 12 extra miles to the trip for food and rest stops to the 2007 AAA estimated per-mile cost for a small sedan driven 10,000 miles in the year of 50.5 cents.

Unfortunately, this is the only cost many Americans consider when contemplating a car trip. However, if drivers were forced to consider not only the maintenance, insurance, registration, tolls, and other private costs for driving, but also his or her share of road construction and maintenance costs (which are only partially covered by gas taxes), taking the train to New York would be a lot more attractive on a private-cost basis.

This does not even account for the external social costs of driving versus taking the train, including the traveler's contribution to the greenhouse gas emissions problem. According to 2006 data reported by Carbonfund.org, the average car emits 0.35 kilograms of carbon dioxide per passenger-mile, while a diesel-powered Amtrak train emits 0.196 kilograms per passenger-mile. By taking the train from Greensboro to New York, I was responsible for 79.77 fewer kilograms of CO_2 than I would have produced had I driven, a significant amount for one traveler. By taking the train, I also avoided the Northeast's notorious highway congestion, which would have increased my CO_2 emissions due to idling, and avoided the very high cost of parking in New York City. Taking the train also allowed me to relax, read, take in the scenery, and meet other people while in transit, benefits that are worth the higher sticker price. I would have been able to do none of those things had I driven by myself, keeping my eyes on the road the whole time.

The majority of the costs associated with providing any public transportation service, including air travel, are fixed, and as stated earlier, taxpayers foot almost the entire bill. These include what it costs to produce, operate, repair and replace the vehicles that carry passengers (cars, buses, trains, etc.), as well as the costs of building and maintaining the infrastructure over which these vehicles travel (roads and railways). Adding an additional passenger adds negligibly to the cost of the transit system, but does raise revenue by the amount of that passenger's fare. In

addition to their high fixed costs, public transportation systems (particularly railroads) are, by nature, comprehensive and concentrated operations, and are thus best suited to monopolies since multiple companies providing the same service would be redundant and highly cumbersome.[23] The fixed-route nature of most public transportation also means that its total CO_2 emissions generally do not vary with ridership levels. Private automobiles, however, carry high variable costs (those dependent on the level of usage). The amount that one pays to drive his or her car (for gasoline, parts and maintenance) varies greatly according to how much he or she drives it, as do the CO_2 emissions for which that car is responsible.

With no change in current public policy or in people's preferences and attitudes, the current upward trends in miles driven by car and in transportation-caused greenhouse gas emissions are likely to continue in the United States in the near future, despite mounting concern about the current and future effects of climate change. What little effort that has been made to address the contribution of transportation to atmospheric emissions problems has been focused on incentivizing the production of cars that go farther on a tank of gas. However, much stronger policies are needed sooner in order to curb the skyrocketing levels of carbon dioxide emissions caused by transportation in the US, 89 percent of which comes from private automobiles.[24] Policies that increase the fuel efficiency of automobiles or promote alternatively-fueled cars result in drivers paying less for fuel per mile driven, which only encourages them to drive more.

Thus, while driving a fuel-efficient or alternatively-fueled car does reduce one's individual carbon emissions, making all new cars this way will cause an increase in driving over time. As long as fossil fuels remain the primary source of the electricity needed to produce all

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[23] Sclar, 8.

[24] *Op cit*. US DOT.

alternative vehicle fuels, policies encouraging their use will not curb overall CO_2 emissions, but may in fact lead to the continuation of the current upward trend. Therefore, the only policies capable of reducing transportation-caused CO_2 emissions are those that reduce the number of miles driven by discouraging travelers from driving and encouraging them to use more efficient, less polluting public transportation instead. These goals can be best accomplished by making it more costly to own and drive a car and less costly and more convenient to take public transportation, particularly between cities.

Raising fuel economy standards is an example of command-and-control regulation since it involves setting a maximum number above which auto manufacturers are fined. As such, it is a costly policy option from the government's perspective since it involves paying for employees and equipment to monitor every auto plant in Detroit. Increasing the per-gallon gasoline tax, on the other hand, actually encourages people to drive less and generates revenue for the government rather than imposing additional costs on taxpayers.[25] A Congressional Budget Office study compared the economic impacts of reducing gasoline consumption 10 percent through raising Corporate Average Fuel Economy (CAFÉ) standards to 31.3 miles per gallon for cars and 24.5 mpg for light trucks versus increasing the federal gasoline tax by 46 cents per gallon. The study found that raising the CAFÉ standards would cost the US economy $3.6 billion per year ($3 billion if automakers were allowed to trade fuel economy credits), whereas the tax increase would cost $2.9 billion annually.[26] Over the first 14 years of the policy, raising the gas tax would save 90.5 billion gallons of gasoline and cost a total of $21 billion, whereas

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[25] The only other policy option for reducing CO_2 emissions is a type of command-and-control that would involve measuring emissions from each car's tailpipe and setting a specific emissions cap on each car, a prohibitively costly endeavor.

[26] Dinan, Terry and David Austin. "Fuel Economy Standards versus a Gasoline Tax." *Economic and Budget Issue Brief*, Congressional Budget Office, 9 March 2004: 3.

increasing CAFÉ standards would save 26.9 billion fewer gallons and would cost $7.9 billion more.[27]

Although these numbers are rough estimates, they can be taken as evidence that, although both policy options significantly impact the economy, the overall effect of a higher gasoline tax is considerably less. The main drawback of a gasoline tax as a way of reducing CO_2 emissions is that it is impossible to set a tax rate that reduces emissions by a set amount. However, since reducing the operation of one car by one mile cuts CO_2 emissions by 347.2 grams, it is possible to come very close to a target reduction level by estimating how many fewer miles drivers will drive per each cent increase in the price of gas. Another unavoidable consequence of raising gasoline taxes is the undue burden this places on low-income drivers, particularly those living in rural areas with no access to alternative transportation. These impacts can be softened by increasing the tax gradually rather than all at once, and by using some of the revenue to provide income tax credits to low-income and rural citizens.

To calculate the total revenue generated from a gasoline tax, one must multiply the per-gallon amount of the tax by the total gallons of gasoline sold in the US. For the week ending on November 16, 2007, 9.28 million barrels of gasoline were sold per day.[28] Given that each barrel contains about 44 gallons, about 408.3 million gallons were sold per day. A gas tax of $1.00 per gallon would therefore yield $408.3 million in revenue per day, $2.00 would yield $816.6 million, and so on. Over a year, the tax would generate $149 billion in revenue. By one US Department of Transportation estimate, the total annual costs of "bring[ing] 21 intercity

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[27] Ibid.

[28] US Department of Energy, Energy Information Administration. *This Week in Petroleum*, accessed 25 November 2007. http://tonto.eia.doe.gov/oog/info/twip/twip_gasoline.html

passenger rail corridors to a good state of repair are $3.3 billion.[29] Although the gas tax revenue would be more than enough to cover the cost of revitalizing intercity passenger rail, there are many ways that the cost of the project could be reduced so that more funding is available for other public needs, including the income tax credit. Contracting with private companies, selling bonds, receiving matching contributions from state departments of transportation, and recruiting volunteer labor would all trim the cost of expanding and improving intercity passenger rail.

Since climate change is such a large-scale problem and because the focus here is on intercity travel, the best policy remedy will be one that is legislated and enforced on the federal level. The federal gasoline tax should be raised at a constant rate each year and adjusted for fluctuations in the pre-tax market price of gasoline, such that a gallon of gasoline will cost five dollars in ten years, closer to the current price in many European countries. The reasons for incrementally increasing the tax, rather than hiking it to $5.00 per gallon overnight, include a concern for social equity (as discussed earlier) and that increasing it by a predetermined amount each year will allow consumers to make plans for the future. Returning to my trip from Greensboro to New York, a gas price of five dollars per gallon would cause the per-mile gas cost to increase to 16.4 cents, resulting in a total gas cost of $84.71, which is more comparable to the current train fare. Increased public investment in passenger rail would likely cause a decrease in most fares, making the train even more attractive purely on the basis of price.

The ideal intercity train system would resemble the Interstate Highways, but would consist of fast and frequent passenger trains sharing, with freight trains, existing rights-of-way, expanded and enhanced with the use of the tax revenue, as well as new dedicated rail lines to

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[29] American Association of State Highway and Transportation Officials. Transportation – Invest in our Future: Future Needs of the US Surface Transportation System, February 2007 (http://search.bts.gov/tris/record/tris/01047334.html)

serve areas without the rail infrastructure currently in place.[30] Each larger city's train station would provide convenient nearly round-the-clock connections to short lines serving surrounding communities, as well as other medium- and long-distance routes, in a network with many hubs and spokes. Private railroads will be encouraged to take part in this program because improving railways for better passenger service also enhances the performance and reduces the cost of freight operations. Part of the tax revenue may still have to be used to cover the cost of providing tax breaks as additional incentives to the railroad companies.

The project would generate thousands of new jobs in the planning, engineering and execution phases. The cost of hiring all these workers could be lowered by recruiting young people, from programs like the Peace Corps and the Civilian Conservation Corps of old, to do much of the necessary physical labor. Not only would such an approach save money, it would be a source of civic pride for those who put their own sweat into restoring this grand public utility, as well as for future generations who could learn from the stories of their ancestors. In twenty years, the bulk of intercity trips currently made by car should be able to be made on fast, reliable, convenient and comfortable passenger trains at fares less than or equal to the current cost of gasoline for comparable trips.

An increase in gasoline taxes would be a direct hit in the pocketbook for many Americans, but increasing it incrementally would lessen its impact. The increase could be adjusted with the market price of gasoline so that the total cost (price plus tax) of a gallon of gas each year for the next ten years would be knowable in advance. This would allow Americans to make long-term plans, restructuring their travel needs to take advantages of the new options available or to travel shorter distances. The intercity rail system that this tax would help fund

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[30] Improving existing railways to accommodate more and faster passenger trains would benefit freight operations as well, allowing faster and more reliable schedules for both types of trains.

would provide enhanced mobility to many of those who would no longer be able to afford to drive, or to drive as much as they currently do, and would certainly help those unable to drive for reasons other than cost. Having such an attractive intercity mode of travel in place will also have several positive effects in the longer term, including the improvement of intra-city public transportation and taxi service connecting to intercity trains and a consequent transition back to the more compact development patterns that were seen earlier in the 20th century. This will eventually lead to a reduction in overall miles traveled since people will live closer to where they work, shop, go to school, etc, which will prove beneficial to the elderly, low-income people and others who are unable or unwilling to drive or own a car.

The tax scheme proposed here, on its own, is not enough to lower the United States' greenhouse gas emissions to a level where their atmospheric levels would begin to stabilize or even drop. Accomplishing this requires addressing intra-city transportation, urban planning, and other economic sectors, but it also involves a change in people's attitudes towards transportation. Contemporary American culture sees the car as a necessity for most travel, as well as a symbol of status and independence. Passenger trains, on the other hand, are often seen as relics of the past that only exist to transport people who can't afford cars or to provide "rail cruises" and tourist excursions. Even after the tax is enacted, when driving is very expensive and train service is more inexpensive, convenient and reliable, those who can afford to drive would likely still do so and take advantage of lower traffic on the highways. The only way to prevent this from happening in the long term is for there to be a shift in people's attitudes towards their daily transportation decisions, which would accompany the redefinition of railroads as public utilities.

Such a shift could be motivated by a major public relations campaign, funded by either government or nonprofit agencies (or perhaps both). Its message would be twofold: to stigmatize

driving a private car between cities (particularly solo) and to tout the many personal, social and environmental advantages of train travel. The reduced contribution to pollution and sprawl would be a selling point for trains, as would the more comfortable, pleasurable, and perhaps productive nature of the journey itself and the unique way that a train brings people together and encourages respect and admiration for the surrounding landscape. "To embrace diversity in the context of travel," environmental historian Al Runte maintains, "is to agree that we are a better people, both individually and collectively, the more we get to mingle." [31] People who drive private cars between cities could be portrayed as snobs who not only pollute more, but are also anti-social, while train travelers rediscover the camaraderie and democratic spirit that allowed America to first see itself as a united nation through its railroads. Reorienting US society away from a technology that does not respect the landscape and isolates people to one that connects people and teaches an ethic of respect for the land, while helping to curb climate change, should be seen as a triumph of the ideal of democratic unity over the egotism and isolationism embodied by the automobile.

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[31] Runte, Alfred. *Allies of the Earth: Railroads and the Soul of Preservation*. Kirksville, MO: Truman State University Press, 2006: 146.

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