

Changing the Way America Moves: Creating a More Robust Economy, a Smaller Carbon Footprint, And Energy Independence

At a time when America must create more jobs, reduce its dependence on foreign oil, and become more carbon efficient, public transportation can make a significant contribution quickly and cost-effectively. Public transportation already saves 4.2 billion gallons of fuel and 37 million metric tons of carbon emissions per year, while supporting 1.7 million jobs. This paper shows that with an investment of 1.6 percent of the U.S. GDP per year, public transportation could support 7.4 million jobs and, by 2020, could save the country 15.2 billion gallons of fuel annually—almost as much as we currently import from the Persian Gulf. This investment would also cut 141.9 million metric tons of carbon emissions per year—about 8 percent of the total carbon emissions from the U.S. transportation sector.

A Discussion Paper by the American Public Transportation Association
Spring, 2009



EXECUTIVE SUMMARY

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The Problem

Transportation is one of the largest and fastest-growing factors in America's dependence on foreign oil and its large carbon footprint. Since 1973, Americans have been traveling 250 percent more miles per capita each year and using more than 36 percent more oil for transportation purposes. As a percentage of U.S. oil consumption, net oil imports have risen from 35.8 percent in 1975 to 58.2 percent in 2007. The growth in annual Vehicle Miles Traveled (VMT) in the United States has outpaced U.S. population growth. From 1970 to 2007, VMT grew by 168 percent while population only grew by 48 percent. In addition, the transportation sector emits about one-third of U.S. greenhouse gas emissions—a share that is rising rapidly, despite the availability of cleaner technologies.

In addition, America's car-based transportation system costs the consumer and the U.S. economy more than personal transportation does in most other developed countries. American households spend 17.6 percent of their budgets on transportation; the average European Union household spends just 11.9 percent. Only 53 percent of Americans have access to any public transportation. This portion is significantly higher in European countries.

The Plan

At a time when America must stimulate its economy, create more jobs, reduce its dependence on foreign oil, and become more carbon efficient, public transportation can make a significant contribution quickly and cost-effectively. An essential course of action is to transfer a significant amount of automobile travel to public transportation. To achieve this, America must make appropriate public transportation available in every community.

America should set a minimum goal of doubling the market share for public transportation by 2020 and achieving, by 2045, a public transportation market share equal to that in the European Union. We can accomplish this by achieving a 5.5-percent annual growth rate for public transportation. But we can accelerate this with a much more ambitious growth rate of 10 percent, attaining a public transportation market share on par with the European Union before 2030.

To create a long-term and significant mobility paradigm shift, this paper offers a plan in which every community would improve its transit based on the size and needs of the community:

- Public transportation in the largest metropolitan areas, with populations over 3 million, would carry a majority of all travel for work and a third of travel overall. Light, heavy and commuter rail systems would be extensive and act as a high-capacity backbone of the entire urban transportation system, supplemented by high-frequency streetcar and bus systems covering a large area of the city and surrounding region. This would ensure not only connections to the city center but between urban sub-centers within metro regions.
- Metropolitan areas with populations between one million and three million would all have a solid commuter rail, light rail, streetcar and bus rapid transit systems with an extensive and integrated bus and paratransit network able to provide connections across the region, carrying over a third of all work journeys and almost a fifth of travel overall.
- In metropolitan areas with populations between 500,000 and one million people, public transportation systems would primarily consist of a dense network of high-quality street car, bus rapid transit and bus and paratransit systems with service provided on a frequent basis.
- In smaller metropolitan areas, between 100,000 and 500,000, a high-quality streetcar, bus and paratransit systems would provide reliable service.
- In smaller communities, public transportation would be based on fixed route bus and paratransit service while rural services would be provided primarily by flexible services tailored to meet the needs of the area. New high-speed rail and expanded intercity bus and passenger rail service would link all areas together.

APTA estimates that an investment of \$134.2 billion in capital costs and \$102.3 billion in operating costs per year (in 2008 dollars) would deliver this plan for all Americans by 2030. This is 1.6 percent of U.S. GDP per year and far less than the more than 10.5 percent that transportation-related goods and services contribute to GDP overall. It would come from a combination of federal, state, and local public resources, as well as private investment.

The Benefits

Adoption of this public transportation investment strategy would:

- Support 7.4 million green American jobs.
- Inject billions of dollars back into the U.S. economy. An investment of \$236.5 billion in combined capital and operating in public transportation yields \$730 billion in increased business sales. Such an investment would generate public and private revenue streams and make the country more economically efficient and productive, paying far-reaching dividends at a time when our economy needs a large stimulus.

- Save all American households \$2,830 per year on average in transportation costs by 2030, significantly reducing the nation's transportation budget.
- Reduce VMT by 11 percent by 2020, saving the U.S. \$37.6 billion per year by reducing congestion and far more if one takes into account the reduction in road fatalities and injuries which would occur.
- Save the United States 15.2 billion gallons of fuel per year by 2020—nearly equal the amount we import from the Persian Gulf today. This would greatly reduce America's dependence on foreign oil.
- Reduce carbon emissions by 141.9 million metric tons per year by 2020, almost 8 percent of total carbon emissions from the transportation sector.

What we do in the next 10 years to reshape our transportation infrastructure will benefit our economy immediately by providing more jobs—and ensure economic prosperity, as well as a healthy and safe environment, for decades to come.

Changing the Way America Moves: Creating a More Robust Economy, a Smaller Carbon Footprint, And Energy Independence

Introduction

Today, a slowing economy and volatile fuel prices are causing people to look for travel and commuting options other than the car. At the same time, there is a recognized need to reduce America's reliance on expensive, unstable foreign sources of oil and the high carbon emissions this entails. **Investing in public transportation offers immediate solutions to our country's multiple problems of a shrinking economy, increasing unemployment, an uncertain energy future, and a worsening environmental situation.**

Public transportation use in the United States contributes to reductions in energy consumption of 4.2 billion gallons of fuel per year, reducing America's dependence on foreign oil and our carbon footprint. Public transportation supports 1.7 million American jobs. It is saving American households who use public transportation an average of \$8,500 per year in transportation costs.ⁱ Households living close to public transportation drive 4,400 fewer miles annually than those with limited or no accessⁱⁱ. Public transportation availability means affordable options for the more than 10 billion trips taken to jobs, schools, and essential services by public transportation annually.

More Americans are taking public transportation.

Since 1995, public transportation ridership has increased 32 percentⁱⁱⁱ, outpacing population growth and a rise in vehicle miles traveled. In the past three years in particular, due to more available public transportation services, rising fuel costs and a renewed interest in urban lifestyles as well as a widespread recognition of the need to protect our environment for future generations, an increasing number of Americans are leaving their cars behind and using public transportation as an affordable and efficient way to get to work, school, shopping, and leisure destinations. In 2007, public transportation ridership hit its highest level in 50 years. In the first half of 2008, this level has been greatly surpassed, with many systems reporting the highest ridership levels in their history. In fact, by the third quarter of 2008, ridership was up 6.5 percent, and all indications are that ridership is continuing to rise despite a decrease in gas prices.^{iv}

Public transportation systems are stressed beyond capacity.

At the same time, due to decades of underinvestment, most systems in the United States are greatly constrained in meeting new ridership demands. The result is overcrowding and even passengers being turned away. High fuel costs and a declining economy are straining local and state funding sources—which means most systems are struggling to maintain existing services. Many systems are not in a state of good repair, and much of public transportation's need for new infrastructure is unaddressed. As a result, many systems are increasing fares to maintain their operations, and more than one-third of systems are considering service cuts despite the need to

accommodate more passengers. Many more are considering delaying important service improvements and/or expansions.

An opportunity not to ‘miss the bus’

We are at a pivotal moment in transportation history. Many indicators show that Americans have been giving up their car dependency over the past few years because they see the benefits of public transportation. In a 2003 survey, four in five Americans stated that increased investment in public transportation strengthens the economy, creates jobs, reduces traffic congestion and air pollution, and saves energy.^v **On November 4 2008, in a time of great economic uncertainty, people overwhelmingly voted for raising public revenue in order to improve public transportation.** In fact, across the country, more than 75 percent of state and local transit-related ballot measures passed, with voters in 16 states approving 26 measures and authorizing expenditures of \$75 billion.^{vi}

There are many factors contributing to a natural shift in the habits of Americans in the way they live and move. But if more sustainable alternatives, including public transportation, walking, and cycling, are not made available or easily accessible on a massive scale, we will lose the opportunity to permanently change the way America moves. However, if we can take bold steps today toward significantly increasing the availability and use of these choices, this can be the beginning of a new era, when America becomes one of the most livable countries in the world, and the majority of Americans have access to and opt for affordable and sustainable public transportation.

An early warning

We have squandered opportunities to take bold steps before. In 1973, with the OPEC oil embargo, America had a wake-up call about how fragile its oil dependent economy really is and how reliant the nation is on foreign oil. Many sectors of the economy learned the lesson and became less reliant on oil. Not the transportation sector. The investment in energy intensive highway and aviation systems and the woeful underfunding of public transportation and rail systems continued. **As a result, since 1973, Americans are traveling 250 percent more miles per capita each year^{vii} and using over 36 percent more oil for transportation purposes.^{viii}** Net oil imports as a share of U.S. oil consumption went from 35.8 percent in 1975 to 58.2 percent in 2007^{ix}.

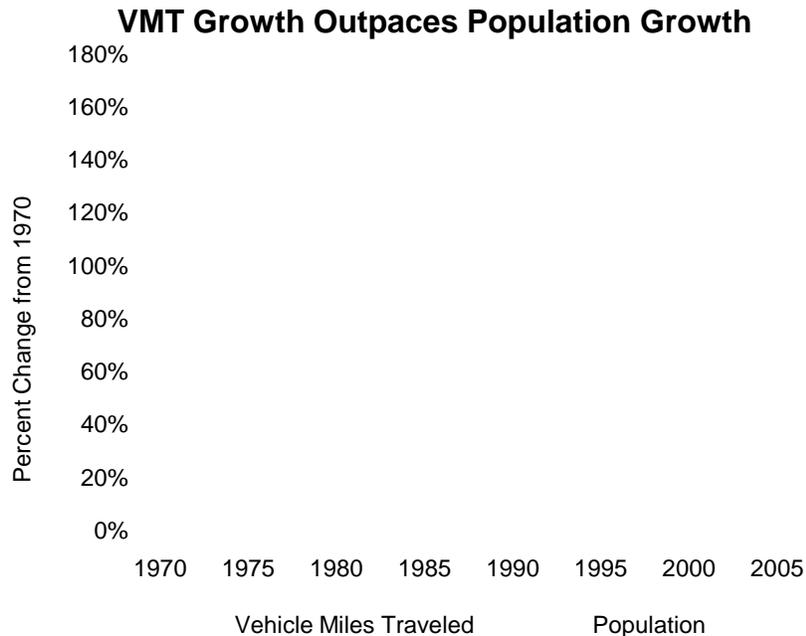
Foreign Oil as Share of U.S. Total, 1975

35.8%

Foreign Oil as Share of U.S. Total, 2007

58.2%

From 1970 to 2007, VMT growth has greatly outpaced population growth, 168percent to 48percent respectively. ^x



If we had decided to invest significantly more in public transportation services in 1973 and each year since, sustaining a 5.5 percent annual ridership increase from that point onward, we would be saving as much as 4.6 times more fuel with public transportation than we are today (19.1 billion gallons of fuel per year) and 4.8 times more carbon emissions (178 million tons per year). Tens of millions more Americans would be given a true choice in travel and commuting.

A new wake-up call

Today, as we use vastly more energy resources than we have at any other time in history, we are getting another wake-up call—this time not only about our economic fragility and our limited energy resources, but also about the dire situation of our environment and the survival of our planet as we know it. **Transportation is one of the largest and still growing factors of our huge dependence on fossil fuel and with that, foreign oil.** Ninety-five percent of all highway transportation is oil-dependent (the rest relying on natural gas, electricity and renewables). Sixty-eight percent of the oil consumed in this country is from transportation (up from 52.3 percent in 1973) and automobiles and light trucks were responsible for over 61 percent of all transportation energy use in 2006. In fact, U.S. transportation petroleum use is equivalent to almost 185 percent of U.S. petroleum production^{xi}. At the same time, fossil fuel will inevitably become a scarcer resource and gas prices will continue to climb. We need to make big changes now to ensure Americans have viable mobility options for the future.

The path to energy independence is a long one and addressing oil consumption by the transportation sector is key. With a predicted increase in population of over 30 percent by 2050^{xii}, travel demand will only continue to increase.

The choice: To invest in solutions or continue with business as usual?

In fact, if we continue the rate of growth in travel we have experienced in the last 40 years, Vehicle Miles Traveled by car and light trucks are projected to grow by over 30 percent in the next 10 years and could be over 50 percent higher than today by 2030. Recent studies show that current vehicle and fuel economy standards alone will not stop the growing emissions and accompanying fuel consumption from car transportation.^{xiii}

This means any efforts to reduce the oil consumed by transportation (68 percent of all oil in the United States) and the carbon footprint (33 percent of all carbon emissions and growing despite the availability of cleaner technologies) must include offering real choices which dramatically reduce the amount of vehicle miles traveled by the individual automobile.

One key course of action is transferring a significant number of trips to public transportation. Indeed, due in great part to higher gas prices and strains on the U.S. economy, 4.7 percent fewer vehicle miles were traveled, or 12.2 billion miles fewer, in June 2008 than June 2007^{xiv}. This is at a time when public transportation trips went up by 5.2 percent in the second quarter of 2008.

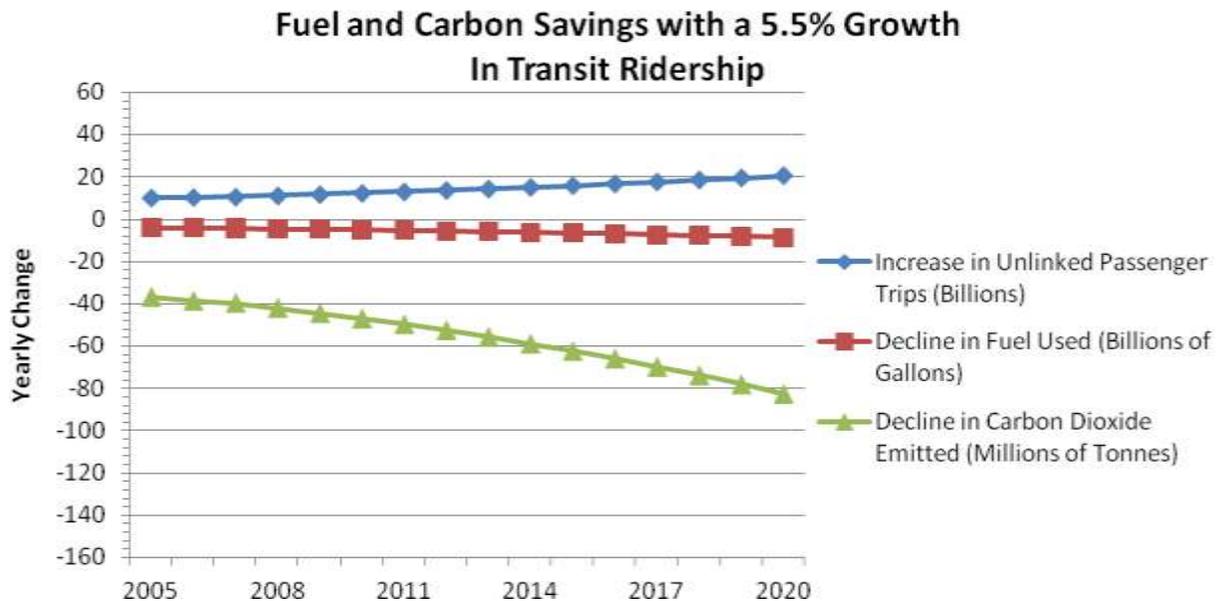
But, to sustain a downward trend in vehicle miles traveled while ensuring the same freedom of mobility, enough public transportation has to be available and communities need to develop hand-in-hand with public transportation. Recent studies have shown that each public transportation passenger mile added translates to two vehicle miles not traveled^{xv}. This means that with a moderately aggressive growth strategy for public transportation of 5.5-percent increase in ridership per year, and taking into account an average of 0.77-percent increase in population per year, VMT could be reduced by 6.5 percent by 2020 and almost 28 percent by 2050. With a more aggressive goal of a 10-percent annual increase, VMT would be reduced 11 percent by 2020 and by more than 60 percent by 2040^{xvi}.

Quick action is required to sustain public transportation ridership growth in the United States and to develop top-notch public transportation systems to meet the nation's mobility needs. **Today, only 53 percent of American households have access to public transportation of any kind.**^{xvii} **Fewer still have truly attractive public transportation options.** With more than 80 percent of Americans living in cities or their surrounding suburbs, there is an immense opportunity to attract tens of millions more to use public transportation if extensive, quality public transportation services are provided coupled with supportive land-use policies.

Saving fuel and cutting emissions by growing ridership

With accelerated growth, public transportation use can do much more to support this nation's progress to energy independence while reducing the carbon footprint from the transportation sector. More than 10.3 billion trips are taken yearly on public transportation in the United States. With every additional billion trips taken, we can reduce our oil consumption from transportation by at least 420 million gallons and our carbon footprint by 3.7 million metric tons. Establishing a goal to put in place high-quality, high-capacity, energy-efficient and environmentally responsible public transportation systems in every metropolitan area in America is essential. **We can achieve this goal by the time those now in primary school join tomorrow's workforce.**

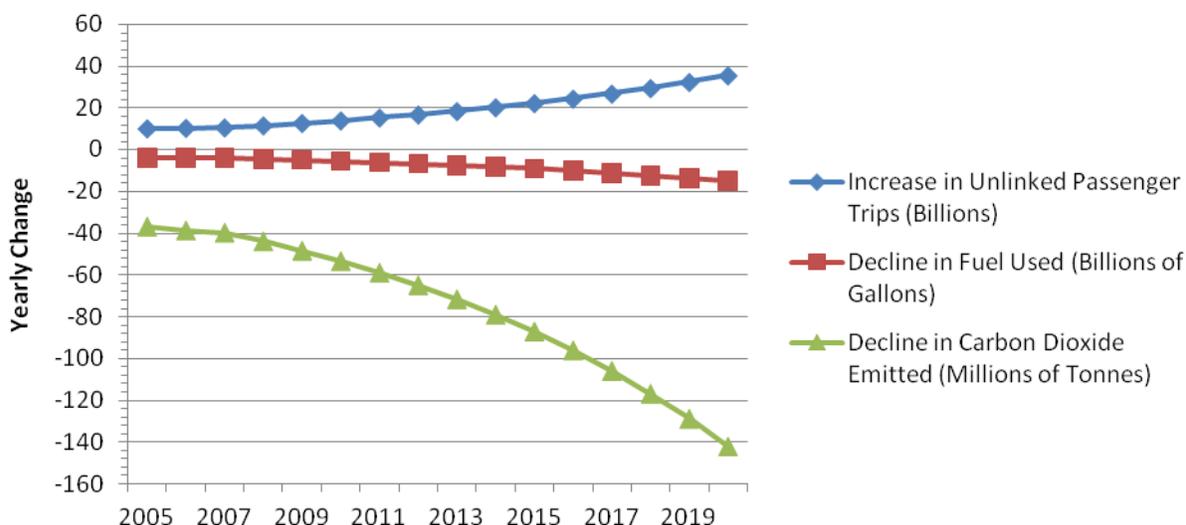
By setting a goal of doubling ridership by 2020, tripling it before 2030, and growing it ten-fold by 2050, equivalent to a 5.5-percent annual growth rate in ridership, a significant, long-term impact on fuel savings and carbon emissions can be made. By 2020, with a 5.5 percent growth rate, public transportation would be saving the United States another 4.5 billion more gallons of fuel per year and an additional 46 million metric tons of carbon per year. By 2050, public transportation would save the United States more than 48.1 billion gallons of fuel per year—more than the amount of gasoline refined from the oil we import from OPEC countries— and cut annual carbon emissions by 449.2 million metric tons, well over one-third the carbon emissions from the gasoline used for transportation purposes today. These investments would have the added benefit of reducing the amount of land consumed for development, allowing greater efficiencies in resource use while giving tens of millions more Americans choices in how they travel.



But given how far behind we are in achieving fuel and carbon emission savings from transportation, we must make a much greater effort in the next 40 years if we are to achieve a more energy-efficient, environmentally sustainable transportation sector by shifting the mobility paradigm in America. This means aggressively growing public transport services and ridership on a much greater scale—a 10-percent increase per year.

With that level of growth, the energy and environmental dividends would come more quickly. **By 2020 public transportation would save the United States 141.9 million metric tons of carbon emissions annually, almost 8 percent of total carbon emissions from transportation today and 15.2 billion gallons of fuel per year, almost as much as we import from the Persian Gulf today.** This will have a far quicker impact than bringing more domestic oil into production, currently estimated not to happen before 2018 by the U.S. Energy Information Administration. In fact, by 2033, with a 10 percent annual ridership growth rate, public transportation use could be saving the United States the equivalent of all U.S. off-shore oil reserves estimated in the Atlantic and Pacific combined^{xviii}. By 2040, public transportation use could be saving 97.5 billion gallons of fuel per year, almost the equivalent of what the United States consumes today of crude oil for transportation. Carbon emissions would be cut by 910 million metric tons annually, nearly 50 percent of total carbon emissions from transportation today^{xix}.

Fuel and Carbon Savings with a 10% Growth in Transit Ridership



Technology, yes

The green dividends of aggressively investing in public transportation growth are even more compelling when we look at the time lag for achieving greater fuel efficiency from the automobile fleet versus the commercial bus fleet. Today, with over 25 percent of the bus fleet using alternative fuels, the bus fleet is relatively much cleaner than the automobile and light truck fleet. **Due to stricter mandates and public policy pressure, bus fleets will continue to become more efficient more quickly—so much so that by 2020, the fleet could be entirely hybrid and thus emitting 25-30 percent less pollutants than today.** By 2050, efficiency could be 50 percent greater due to lighter vehicle weight, increased use of alternate propulsion with energy storage, as well as smaller engines and superior vehicle-assist technology.

Today, alternative fuel vehicles are only 4.3 percent of the entire automobile fleet in the United States. According to MIT transportation experts, it will take at least another 20 years before vehicles with even moderately improved technology will be on the roads in sufficient numbers: “As a result of high initial cost and strong competition from mainstream gasoline vehicles, market penetration rates of low-emission diesels and gasoline hybrids in the United States are likely to have only a modest, though growing potential for reducing U.S. fleet fuel use before 2025. Even with aggressive market penetration rates of new technologies, it will be difficult to reduce the 2035 fleet fuel use by more than 10 percent below fuel use in 2000.”^{xx} It is predicted that efficiencies will initially come from a downsizing of gasoline engines, the introduction of gasoline-hybrid electric vehicles, and reductions in vehicle size and weight.

But not technology alone

Even as all vehicles become cleaner, this will not alleviate the congestion many Americans face on the road. Nor will it bring down road fatalities and injuries or satisfy the need for more parking and road space—a demand counter to sustainable development. Congestion costs the U.S. economy \$78 billion a year in the form of 4.2 billion lost hours and 2.9 billion gallons of wasted fuel. Without the public transportation services we already have, we would have an additional \$10 billion in costs from congestion.^{xxi} And, according to a recent AAA study, the cost for automobile crashes is even higher, \$164.2 billion^{xxii}. To put the total annual costs of vehicle miles traveled by automobile into context, automobile crashes cost every person in the United States \$1,051 and congestion an additional \$430.

A question of space

The way land use has developed in the United States—to accommodate the need for more road and parking space for the automobile—there is vast urban sprawl today that greatly increases the vehicle miles traveled. The need to create space for automobiles to drive and park paradoxically forces more people into car dependency. The environmental and economic consequences of urban sprawl are devastating: decreases in air and water quality; loss of green space, farms and wetlands; heat-island effects, whereby temperatures artificially increase due to the presence of asphalt and buildings; and increased energy consumption and higher costs for providing services to homes and business spread farther apart. And as urban areas sprawl, the environmental and economic problems grow dramatically.

Land use and public transportation can have a positive symbiotic relationship. **Good land-use planning supports better and more efficient public transportation systems, and public transportation systems support sustainable communities.** When integrating good land use with public transportation, the economy, society, and the environment win on every count.

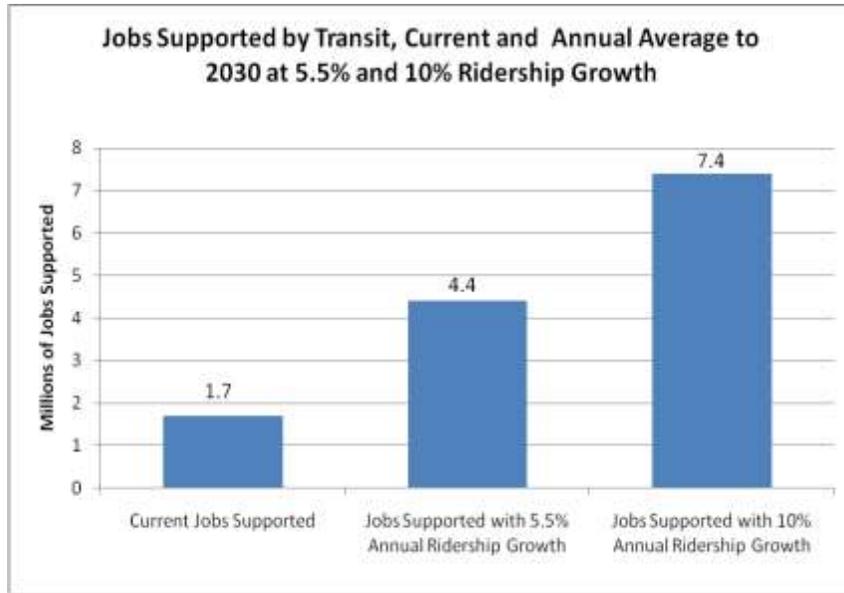
What investment do we need to make as a nation?

To achieve a more significant shift to public transportation in the United States, a growing, long-term source of funds is required to meet the annual capital funding shortfall the industry faces. Current capital investment must be increased by 4.5 times to \$60 billion per year in combined federal, state, and local money to meet current growth rates. But to make a significant change in this country's transportation culture, capital funding must be increased more than six-fold, to \$82 billion/year. An additional \$60.2 billion would be required in annual operating costs. However, if this country is truly serious about creating a long-term and significant mobility-paradigm shift, striving for a 10-percent annual growth rate in public transportation, we would need to invest 10 times more than we do today: \$134.2 billion in capital costs and \$102.3 billion in operating costs per year (in 2008 dollars) for at least the next 20 years.^{xxiii}

This includes overall investments to improve the quality of traveler information, system management, and fare collection, so that we maintain attractive, easy-to-use, modern systems. and it includes investments in energy-efficient technology to increase the annual fuel savings from current public transportation services.

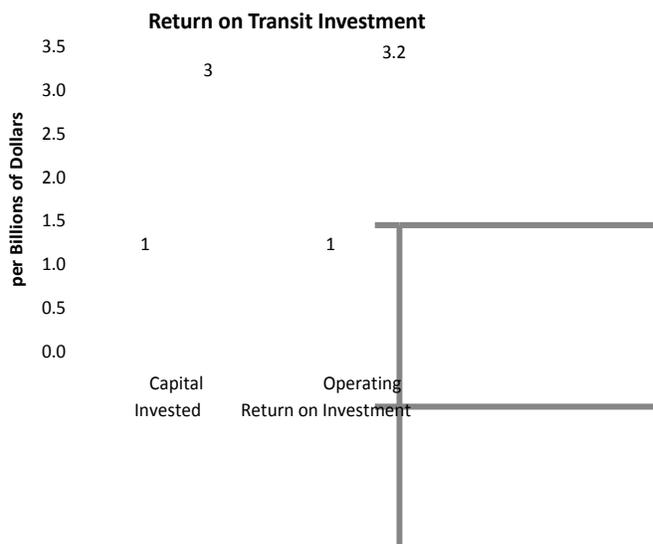
Although these investment levels may seem large in absolute terms, they are quite small when compared with what America spends each year on road passenger transport, which is over \$982 billion.^{xxiv} And put in the context of the \$14-trillion U.S. economy, the annual capital and operating investment would only be less than 1 percent of our national GDP for maintaining a 5.5-percent growth rate. And to maintain a 10 percent growth rate would require only 1.6 percent of our GDP—a small price to pay for transforming one of the most fuel-consuming sectors.^{xxv} And far less than the more than 10.5 percent that transportation-related goods and services contribute to GDP overall.^{xxvi} Spain, which already has more extensive operations than the U.S., is spending about 1 percent of its GDP a year on inter-city and urban rail infrastructure and rolling stock^{xxvii}.

This investment, to come from a combination of federal, state and local public resources and the private sector, would be reinvested directly into the U.S. economy. **With the generally accepted ratio of an average return of 6:1, such an investment would create millions of American jobs, generate enormous public and private revenue, and make the country more economically and environmentally-efficient.** At a time when our economy needs a large stimulus, sustaining a 5.5-percent growth rate in public transportation could support 4.4 million jobs. And a 10 percent growth rate could support 7.4 million jobs.^{xxviii}



By 2030, a 10-percent growth rate in public transportation would mean an average annual savings of \$2,830 for each American household, using public transportation or not, and a significant reduction in the nation’s transportation expenditures.^{xxix} The reduction in fuel consumption enabled by these investments would significantly reduce the amount of money leaving the United States and significantly improve the U.S. trade deficit.

Moreover, it is estimated that every \$1 billion in capital investment in public transportation yields \$3 billion in increased business sales, and every \$1 billion in operating investment in public transportation yields \$3.2 billion in increased business sales.^{xxx} \$134.2 billion in capital investment and \$102.3 billion in operating costs in public transportation would yield \$730 billion in increased business sales. Such investments would pay far-reaching dividends at a time when our economy needs a large stimulus.



Studies have also shown that the greater the modal split for public transportation, walking, and cycling, and the greater the urban density, the less the cost of passenger travel (public and private) as a percentage of a metropolitan area’s GDP, and the less energy used per person. In short, the cost of transport for the community in cities with a high modal share of public transport is far less than in cities where the use of the private car is dominant.^{xxxii}

Impact of public transportation on the cost of travel and energy demand

Cities	Density (inhab/ha)	% walking + cycling + PT	Journey cost (% of GDP)	Energy (Mj/inhab)
Houston	9	5 %	14.1 %	86,000
Sydney	19	25 %	11.0 %	30,000
London	59	51 %	7.1 %	14,500
Paris	48	56 %	6.7 %	15,500
Munich	56	60 %	5.8 %	17,500
Tokyo	88	68 %	5.0 %	11,500
Hong Kong	320	82 %	5.0 %	6,500

Due to high auto use, the average American household spends 17.6 percent of its budget on transportation,^{xxxiii} while the average European Union household spends just 11.9 percent^{xxxiii}. Even more significant is that the lower the income of an American family, the more of its budget it must spend on transportation. America’s poorest families spend more than 40 percent of their take-home pay just to get around—an expenditure that has risen 33 percent since 1992.

The meaning of high public transportation growth to cities and regions

Growing ridership means increasing capacity in not only high-growth areas and large urban areas, but also in areas that want reliable and frequent public transportation service but have few options. This means starting with an expansion of existing systems, including significant core capacity improvements for the largest urban rail systems and new rail and bus rapid transit lines in growing urban centers. These are the major corridors and “transit highways” that need to be put in place to carry more people and move them faster through congested cities. To grow ridership, we must follow this with an investment in smaller urbanized areas, where consistent high-quality bus and para-transit service must be brought in and meaningful connections made for residents in rural areas with the attractions and services of urban centers.

National economies depend on the economic vibrancy of communities and how well infrastructure functions. **An ambitious reinvestment plan in public transportation infrastructure and operations in communities across the country, reintroducing convenient public transportation options, bikeways, and pedestrian paths, would dramatically reduce the need for single-occupant automobile trips.** It would also allow for a significant alteration of land-use patterns reducing the current dependence on automobiles.

A 5.5-percent growth rate for public transportation in the United States would result in double the market share for public transportation by 2020 and a level of public transportation market share on par with that of the European Union by 2045.

This would mean that in the largest metropolitan areas of the United States, with populations over 3 million (e.g., New York, Chicago, Houston, Phoenix, Seattle, and Los Angeles), public transportation would provide a majority of all travel for work and a third of all travel overall. Light-, heavy-, and commuter-rail systems would be extensive and act as the high-capacity backbone of the urban transportation system. These would be supplemented by high-frequency streetcar and bus systems covering a large area of each city and surrounding region, ensuring not only connections to the city center but between urban sub-centers.

Metropolitan areas with populations between 1 million and 3 million (such as San Diego, Portland, Austin, Denver, Pittsburgh, and Richmond) would have commuter rail, light-rail, streetcar, and bus rapid transit systems. This would include an extensive and integrated bus and paratransit network able to provide connections across the region, carrying over a third of all work journeys and almost a fifth of travel overall.

Metropolitan areas with populations between 500,000 and 1 million people (such as Bakersfield, El Paso; Knoxville; Madison, Wisconsin; Charleston; and Springfield, Massachusetts) public transportation systems would primarily consist of a dense network of high-quality street car, bus rapid transit, and bus and paratransit systems providing frequent service.

In smaller metropolitan areas, between 100,000 and 500,000 (e.g., Ithaca; Mobile; Peoria; and Eugene, Oregon), high-quality streetcar, bus, bus rapid transit and paratransit systems would provide attractive, reliable service.

In small metropolitan communities, public transportation would be based on excellent fixed-route bus and paratransit service, while rural services would primarily be served by flexible services tailored to meet local need. Expanded intercity bus and passenger rail service would link all areas.

This would generate more than 15 times more passenger miles of rail use (heavy, light, and commuter) in the United States, more than 6 times more passenger miles of bus use, and at least 10 times greater use of demand-responsive paratransit service.

With a much more ambitious growth rate of 10 percent, we could achieve a public transportation market share on par with the EU before 2030 and achieve the vision described above much earlier. By 2040, public transportation could be a third of the market share for all trips in the United States. It would require 27 times more passenger miles of public transportation use by that time. And it would require an integrated regional approach to public transportation to interconnect much denser urban communities. Regions with over 1 million in population would have a public transportation market share of over 60 percent with very high physical, network, fare, information, and institutional integration.

Can this be done? Communities around the world are doing it

Many cities and communities around the world have chosen to invest in public transportation, significantly and steadily shifting trips to public transportation, walking, and cycling, and away from automobiles.

- Madrid has been able to grow its transportation ridership by 70 percent in the past 20 years, staying ahead of a 25-percent increase in population in the same period. This has succeeded primarily because of coordinated planning with all municipal stakeholders, broad-scale fare and passenger information integration, and massive investments in the quality of service and infrastructure of rail and bus transportation. The latter includes new rolling stock, increased headways, and more high-quality modal interchanges. Madrid has also reallocated road space for pedestrian use; 51 percent of all trips are made by public transport in the Madrid metropolitan region.
- Barcelona was able to reduce the market share of automobile trips by 3 percent from 1999 to 2002 by investing in public transportation, integrating fares and ticketing, restricting access and parking for automobiles, and reallocating road space to pedestrians as well as maintaining high land use density, a good mix of land-use and good pedestrian facilities. The city spends about 2 percent of its GDP on transportation infrastructure and will add 157 more miles of commuter rail and subway by 2010 from 2001.
- London, like Barcelona, has been successful in reducing car dependency, reducing the modal share of automobiles by 0.8 percent per year on average between 1999 and 2003. It did this by expanding the bus network and increasing bus priority, as well as restricting automobile use through congestion pricing. As a result, bus use increased by 50 percent during that period.
- Extensions to exclusive rights-of-way and service densification, along with an urban planning policy incorporating public transport development, allowed the network in Vienna to consolidate its leading position in Western Europe over the years. Of the total trips taken on weekdays, 35 percent are made by public transport.
- Due to large investments by its government to pursue better service integration, including a systematic approach to implementing a package measure for multi-modal travel, Singapore has also considerably grown its public transportation network while managing automobile use. It enjoys a public transportation modal share of 63 percent.
- And closer to home, the carbon footprint of the average New Yorker is a quarter of the national average, in large part due to its public transportation system, which provides more than 54 percent of metropolitan area trips to work.^{xxxiv}
- Residents of Portland, Oregon, with its environmentally conscious transportation and land-use policies, drive about 20 percent fewer miles per day than Americans living in similar sized cities in the United States and spend 4 percent less of their household

budget on transportation^{xxxv}. At the same time, it is an area of the country where public transportation ridership has been rising per capita for the past decades.

- The 6 counties covering the metropolitan area around Salt Lake City have seen ridership grow by over 45percent between 1998 and 2007. Large jumps in ridership have coincided with the opening of new lines and facilities.
- Thanks to significant investment in public-transportation infrastructure, Arlington, Virginia's ridership is up 37.5 percent in the last 10 years.
- And in Lansing, Michigan, the Car Capital, with a service area population of 277,000, a new annual record of 11.3 million rides was set in its fiscal year ending in September 2008, a 5.8percent increase over its fiscal year 2007. The trend continues with October 2008 ridership rising 9 percent over the same month last year. This was the all-time largest monthly ridership increase for Lansing.

Many cities and countries across the globe are now making public transportation a key part of their transportation and climate-change strategies.

- In the United States, cities such as Minneapolis, Albuquerque, Chattanooga, and Charlotte have embraced increasing transit use as a key element of their city-wide carbon-reduction strategies.
- As part of its statewide effort to reduce GHG emissions to 1990 levels by 2020, California SB375 law is requiring regions to develop land-use and transportation plans to show they can meet their GHG reduction targets.
- India adopted a National Urban Transport Policy in April of 2006 to ensure safe, affordable, quick, comfortable, reliable, and sustainable access for the growing number of urban residents. Improved public transportation is a central pillar of that policy, as is reducing travel demand through a better integration of land use and transport planning.
- Since 1995, China has had an urban public transportation policy that focuses on investing in bus and rail projects. Shanghai, one of its fastest growing cities, set out a plan in 2002 to increase trips made by public transportation from 21 percent in 2000 to 35 percent by 2020. This includes quadrupling rail trips between 2005 and 2020 and increasing the average speed of buses in the Central Business District by 25 percent to 15km/hr (approximately 9 mph) by 2005.
- France, as part of its sustainability strategy, plans to add 950 miles of urban public transportation and bike lanes and double its high speed rail network in the next 10-15 years. This should reduce carbon emissions by 20 percent by 2020, bringing them back to 1990 levels.

- And Finland is actively promoting a modal shift to rail as part of its National Climate Change Strategy.

Creating a viable policy environment for a thriving new mobility culture

A number of policies contribute significantly to the success of transportation strategies in reducing VMT and increasing use of more sustainable modes of transportation.

These policies include:

- improving the reliability of public transportation;
- greatly increasing investment in public transportation to ensure networks with good coverage;
- coordinating transportation planning to integrate transportation infrastructure and systems, as well as fares and ticketing, so that journeys across networks and modes are seamless and that there is easy and safe access for cyclists and pedestrians;
- pricing automobile use to reflect its true resource consumption and costs to the environment, ensuring parking policies are in place that do not waste land with an oversupply;
- reallocating road space to encourage a mode shift to public transportation;
- integrating land-use with transportation policies and planning to create strong synergies between where people live, shop, play and work and the sustainability of their travel;
- supporting high-speed and inter-city rail investments;
- changing travel behavior through effective public awareness campaigns and grass-roots efforts.

A thriving new mobility culture in the United States will be supported by not only building public transportation in existing communities but also by building new communities around public transportation options. This will allow people to live closer to jobs, shopping, education, and leisure opportunities, where public transportation options are accessible by biking and walking.

Conclusion

Investing in our nation's transportation infrastructure is vital to maintaining our mobility, our quality of life, and our economic competitiveness. With these investments, our communities will continue to thrive, and we can protect the mobility of our citizens as well as take our energy and economic destiny into our own hands. Given expected increases in U.S. population, limited availability of land, an overburdened highway system, and long-term increases in energy prices, it is critical that we make the necessary strategic investments.

The decisions we make about our transportation system should be bold and forward-thinking, much like those made more than 50 years ago that led to the interstate highway system—or more than a century ago with building the rail systems in our great urban centers. **What we do within the next 10 years to reshape our transportation infrastructure will not only benefit our**

economy immediately by providing more jobs; we will also ensure economic prosperity and a healthy and safe environment for all Americans for decades to come. There are plenty of legislative opportunities in the coming year, whether on economic stimulus, transportation funding or climate change, to take steps to bolster the development of a sustainable transportation system. With the right leadership, vision, and investment, the generations ahead of us will look back at this effort as a bold move to ensure a sustainable future. And they will thank us for doing it now, while it is less expensive than it will ever be again.

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- ⁱ As of December 4, 2008
- ⁱⁱ Access is defined as living within one-quarter mile of rail and one-tenth of a mile from a bus stop, whereas limited or no access is living within 3 miles of rail and ¾ of a mile of bus - “The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reduction”, ICF, February 2008
- ⁱⁱⁱ “2008 Public Transportation Fact Book”, American Public Transportation Association
- ^{iv} Public Transportation Ridership Report 3rd Quarter 2008, APTA
- ^v National poll conducted by Wirthlin Worldwide, October 2003
- ^{vi} Center for Transportation Excellence, 2008 November Ballot Measures
- ^{vii} U.S. BTS. “National Transportation Statistics (NTS)”, U.S. Department of Transportation, Bureau of Transportation Statistics, 2006.
- ^{viii} Annual Energy Review 2007, Energy Information Administration, U.S. Department of Energy
- ^{ix} Monthly Energy Review, Energy Information Administration, U.S. Department of Energy, February 2008
- ^x U.S. BTS. “National Transportation Statistics (NTS)”, U.S. Department of Transportation, Bureau of Transportation Statistics, 2006.
- ^{xi} Transportation Energy Data Book, Edition 27-2008
- ^{xii} Projections of the Population and Components of Change for the United States: 2010 to 2050, U.S. Census Bureau 2008
- ^{xiii} Growing Cooler: The Evidence on Urban Development and Climate Change, October 2007
- ^{xiv} Federal Highway Administration’s “Traffic Volume Trends”
- ^{xv} “The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reduction”, ICF, February 2008. The study shows public transportation availability has a significant secondary effect on VMT beyond the primary effect of using transit. The secondary effect is mainly generated through land use patterns. The magnitude of the secondary effect is approximately twice as large as the primary effect of actual public transit trips.
- ^{xvi} Taking into account VMT growth at the rate of population growth
- ^{xvii} U.S. Census data
- ^{xviii} Estimates by the U.S. Minerals Management Service, 2000
- ^{xix} These figures take into account both the direct and indirect effects of more public transportation services including reduced congestion and reduced Vehicle Miles Traveled by individual cars. This projection is based on existing data from a study conducted by ICF in February 2008: “The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reduction”. This study takes into account how much each mile ridden on public transportation saves in gasoline and carbon emissions in comparison to the same mile taken by individual automobile. The study also identifies a multiplier effect from public transportation travel: land-use densities in areas with more public transportation, making trip destinations closer together, reducing the amount of miles driven by automobile by as much as three times and allowing for more walking and cycling. The assumption made with the multiplier effect of denser land-use with more public transportation availability is that the multiplier effect will start leveling off when public transportation carries 10percent of all personal travel miles and will no longer be valid when public transportation carries 50percent of all passenger miles.
- ^{xx} “On the Road to 2035: Reducing Transportation’s Petroleum Consumption and GHG Emissions”, July 2008, MIT Laboratory for Energy and the Environment
- ^{xxi} Urban Mobility Report, Texas Transportation Institute, September 2007
- ^{xxii} Crashes vs. Congestion - What's the Cost to Society?, AAA, May 2008
- ^{xxiii} State and National Public Transportation Needs Analysis, Cambridge Systematics 2008
- ^{xxiv} Eno Transportation Foundation, 2004
- ^{xxv} Current-dollar GDP for 3rd quarter 2008, U.S. Bureau of Economic Analysis
- ^{xxvi} U.S. DOT, RITA, Bureau of Transportation Statistics, U.S. Gross Domestic Product (GDP) Attributed to Transportation-Related Final Demand, 2006
- ^{xxvii} Plan Estratégico de Infraestructuras y Transportes, PEIT, Spain
- ^{xxviii} Job Impacts of Spending on Public Transportation: An Update, Economic Development Research Group, Inc., February 2009
- ^{xxix} Extrapolation of average household expenditure on personal transportation today versus average household transportation expenditure in 2030 when public transportation will have reached a market share on par with the EU, and hence an assumption that households will also have reduced percent of budget expenditure on transportation on par with the EU (see endnotes xxix and xxx)

^{xxx} Public Transportation and the Nation's Economy: A Quantitative Analysis of Public Transportation's Economic Impact. Washington: Cambridge Systematics, Inc., October 1999.

^{xxx}_i Millennium Cities Database, International Association of Public Transport (UITP), 2001

^{xxx}_{ii} Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey 2007

^{xxx}_{iii} Eurostat, Household Budget Survey 2005 in the EU 27

^{xxx}_{iv} U.S. Census Bureau, American Community Survey 2006, Table S0802

^{xxx}_v Portland's Green Dividend, CEOs for Cities, July 2008