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Mass Money, Mass Roads, Mass Transportation

HOW MASSACHUSETTS CAN DO BETTER WITH TRANSPORTATION SPENDING

Acknowledgements

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Mark Bettinger
Neha Bhatt
John Deacon
Nat Garrett
Susan Hamilton
John Holtzclaw
John Lewis
James Bryan McCaffrey
Mary Ann Nelson
Eric Olson

WRITERS/EDITORS: Ben Wish, Jeremy Marin

DESIGN: Nina Moore

COVER PHOTOGRAPH: Lori DeSantis

RESEARCH, DATA AND EDITORIAL ASSISTANCE: Nat Garrett, John Holtzclaw, James Bryan McCaffrey, Eric Olson

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MASSACHUSETTS OFFICE: 100 Boylston Street, Boston, MA 02116 (617) 423-5775

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85 Second St., Second Floor • San Francisco, CA 94105 • (415) 977-5500
408 C St. NE • Washington, DC 20002 • (202) 547-1141
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Executive Summary

Massachusetts' capital spending on roads topped out at more than \$2.4 billion in 2000, more than seven times the amount spent on public transportation. Each year the Bay State spends more tax money on roads in the false hope that this investment will ease traffic congestion, increase speed of travel, and improve our quality of life. After billions of dollars spent trying to achieve these goals, the net effect has been exactly the opposite.

In spite of the billions spent annually by the state on roads, Massachusetts' traffic, already ranked 6th worst in the nation, is becoming increasingly worse.



In the 1990s, the average time each driver spent annually in Metro Boston traffic increased from 43 to 63 hours.

Studies across the country make it clear that new roads are not the answer to our traffic and pollution problems. Within four years 50-100 percent of new roads fill up with added traffic. In Massachusetts, Big Dig officials have predicted that by 2020, the new northbound tunnel could be just as congested as the Central Artery. Despite its failure to improve our traffic and the disturbing health problems that automobile air pollution causes, the state has continued to invest disproportionately in roads.

All this traffic is polluting our skies with dangerous toxins, such as formaldehyde, benzene, and



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carbon tetrachloride, further contributing to hazardous levels according to the EPA. The American Lung Association has put together more than 800 studies connecting air pollution to asthma attacks, hospitalization, premature births and various other problems.¹ Massachusetts already has the worst asthma levels in the country and has consistently received failing marks on air quality from the American Lung Association.

As a result of throwing good money after bad on new roads, public transportation spending lags far behind, and our wallets, quality of life, air, health, and ease of travel are suffering for it. Studies across the country have shown that investment in public transportation often returns its initial cost to the economy sixfold, creating twice as many jobs as investments in roads and bridges.² Further, proposed pub-

lic transportation projects in Massachusetts would take tens of thousands of cars off the roads every day, reducing traffic congestion and cleaning our air. This idea is bolstered by studies showing that 80 percent of commuters prefer convenient public transportation to driving.³

By tracking spending on roads in Massachusetts and then comparing these numbers with air quality, traffic congestion, and economic and environmental issues, we can see that our multi-billion dollar investments are limiting Massachusetts' potential. If the intent of state dollars spent on transportation is to relieve traffic congestion, help our economy, improve air quality, and fight global warming, then the logical step is to shift our funding priorities towards fast, convenient, and efficient public transportation.

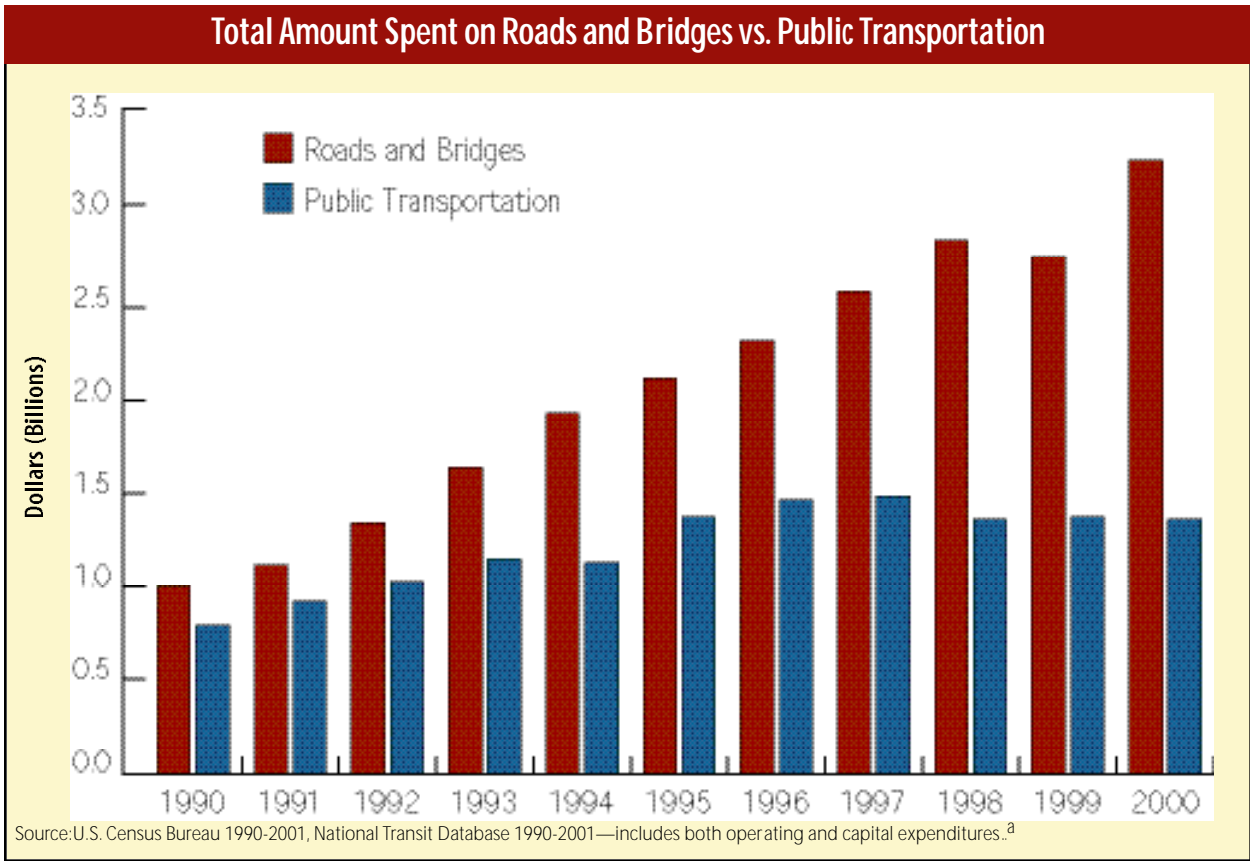
Where Your Money is Going

Public transportation funding offers substantial economic, health, and traffic reduction benefits over road construction, yet the majority of transportation money spent in Massachusetts has been put toward roads. The disparity between the two has grown at a staggering rate. In 1990, for instance, the difference between money spent on roads versus public transportation was \$205 million. By 2000 that difference had grown by almost 900 percent to \$1.76 billion.⁴

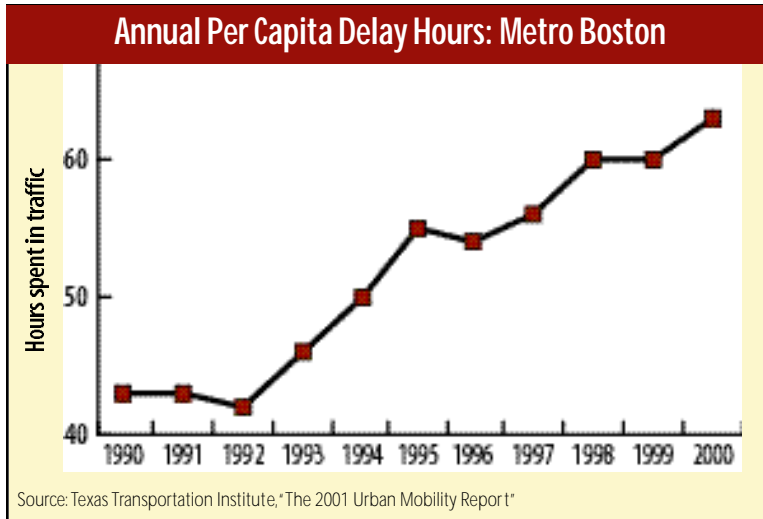
As seen in the chart below, capital dollars spent on roads in 2000 was more than seven times greater than the capital spent on public transportation. Clearly, priority has been given to roads in Massachusetts, and this preeminence has grown stronger over the years despite the noted advantages of public transportation.

Mass Money and Mass Congestion

Traffic congestion eats up our time, money, patience, and gasoline. Around the Boston area in 2000, drivers burned an extra 130 million gallons of fuel sitting in traffic. That amounted to \$1,125 per person.⁵ Across Massachusetts, and across the country, tremendous amounts of tax dollars have been dedicated to roads in a Sisyphean effort to unclog our traffic. In 2000, for example, Massachusetts spent nearly \$2.5 billion on capital projects for roads and bridges, compared with just \$3.3 million for public transportation. Unfortunately, the vast majority of this money is doing little to alleviate the traffic problem.



Spending on roads and bridges continues to grow, while funding of public transportation has dropped



Time spent sitting behind the wheel continues to increase

Running Over Reality

As a result of increasing traffic delays, Metro Boston now ranks 6th worst nationally for time spent in traffic.⁶ No matter how much we spend on roads, the traffic keeps getting worse. This traffic increase has resulted in a rise in the time that Boston drivers spend in traffic annually, from 43 hours in 1990 to 63 in 1999.⁷ This represents a 46 percent increase in less than a decade.

If You Build It, They Will Come

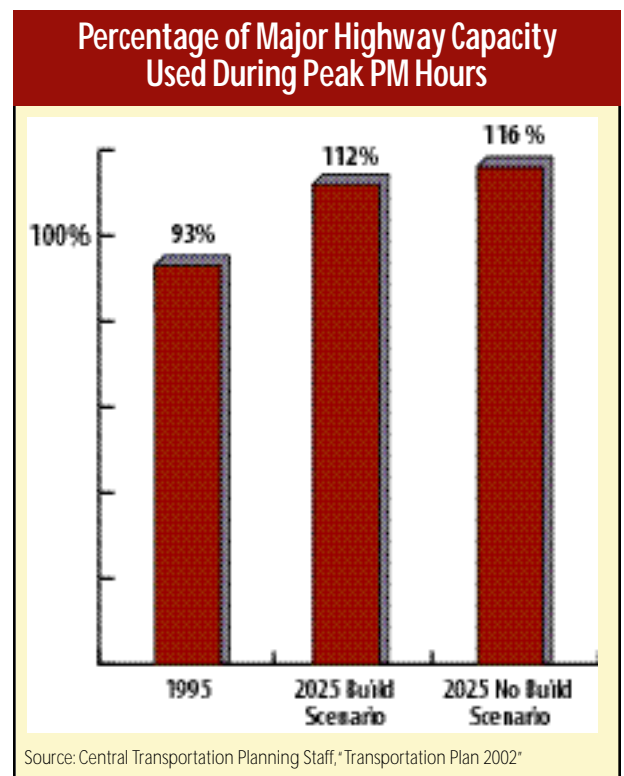
According to the Boston Metropolitan Planning Organization's Transportation Plan, future money and improvements will fail to help Massachusetts' traffic situation. In 2025, if the proposed road upgrades have been completed, traffic will be 23 percent worse than it was in 1995. This is only 4 percent less than if no new projects were pursued.⁸

In some cases, traffic would actually be better if no improvements were made. Two notable highway projects that will fail to relieve traffic congestion, even after suggested construction is completed, are interchange improvements on I-93, both north and south of I-95/128. In these instances, traffic congestion will worsen by 24 percent and 32 percent respectively from 1995 to 2025

under the build scenario.⁹

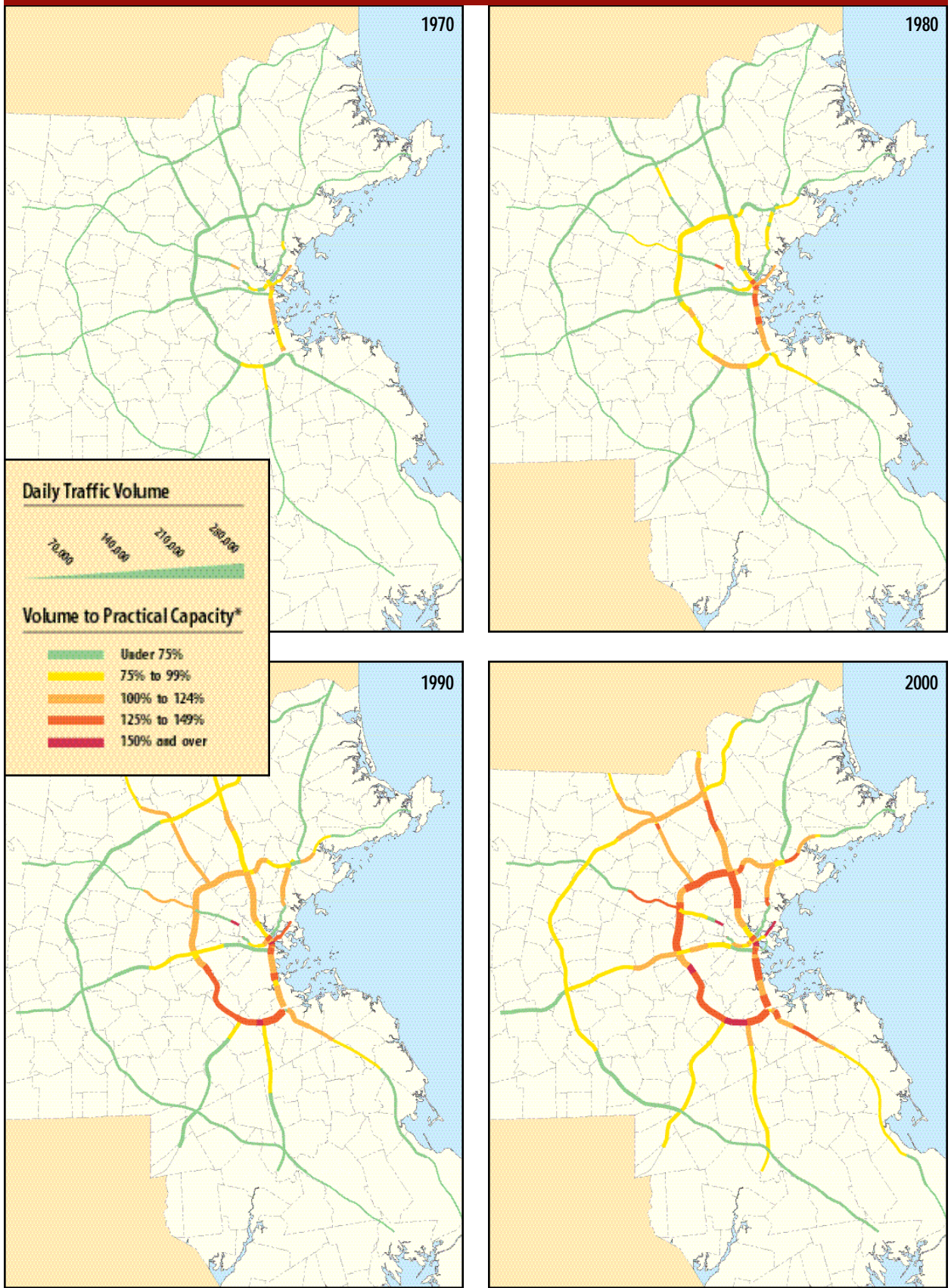
Multiple studies have shown that new or expanded roads are quickly filled by additional drivers, continually renewing congestion problems. This phenomenon is called "induced traffic," and it "immediately consumes 10-50 percent of new road capacity and 50-100 percent in four years."¹⁰ Locally, Big Dig officials say that by the year 2020, the new northbound tunnel could be just as congested and slow as the Central Artery it replaced.¹¹ In addition, the Boston Indicators Report

2002 found that, "although the Big Dig is nearing completion and other improvements are underway, it is projected that travel time and congestion will continue to increase unless lifestyles and development patterns



Regardless of how many roads we build our highway system could be pushed beyond its capacity.

Regional Gridlock: Boston-Area Arteries Are Filled to Capacity—and Beyond



Over the last four decades traffic on most of Boston roads has increased consistently.

Source: MassHighway

change markedly in Metro Boston."¹² The change must include an increase in public transportation choices.

The maps on page 5 provide the best visual evidence of how traffic congestion has dramatically worsened even after spending billions of dollars on road construction. In 1970, the only major road within the Boston area filled to capacity was route 93. By 1990, roads throughout the area had swelled with traffic, many exceeding capacity. When 2000 rolled around, there were precious few miles of road left that were not at, near, or above capacity.

After spending \$15.8 billion on roads and bridges in the '90s, traffic congestion worsened dramatically, with more and more roadways exceeding their capacity. We effectively purchased larger parking lots.

Public Transportation Can Do the Job

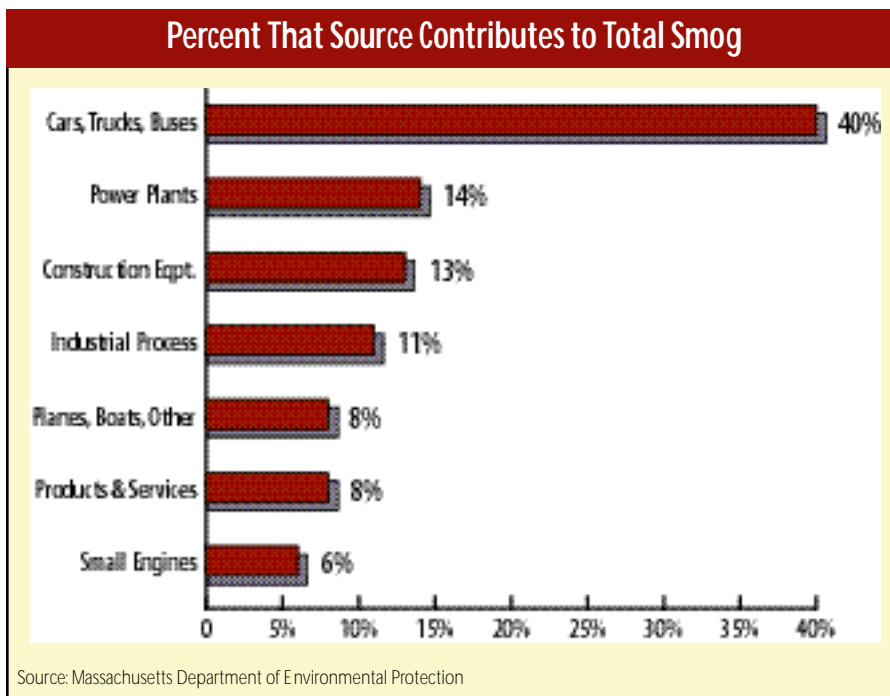
If more and better public transportation choices are offered, more people will take that choice. A 2001 study published in the Journal of American Medicine showed

that by offering better public transportation choices, traffic dropped 22 percent.¹³ Here in Massachusetts, the MBTA has reported that the proposed North-South Rail Link would eliminate 55,000 vehicle trips daily and take more than 583 tons of carbon dioxide out of the air every day.¹⁴ The MBTA has also found that the proposed Fall River-New Bedford Commuter Rail Line would take almost 6,000 vehicle trips off already overcrowded Routes 24, I-93 and I-95 every day.¹⁵ As one of the country's most densely populated states, with 87 percent of residents living in urban areas, increased investment in public transportation can reap great rewards in the Bay State.¹⁶ Increased public transportation is a realistic solution to traffic congestion, a problem that billions of dollars spent on roads has been unable to resolve.

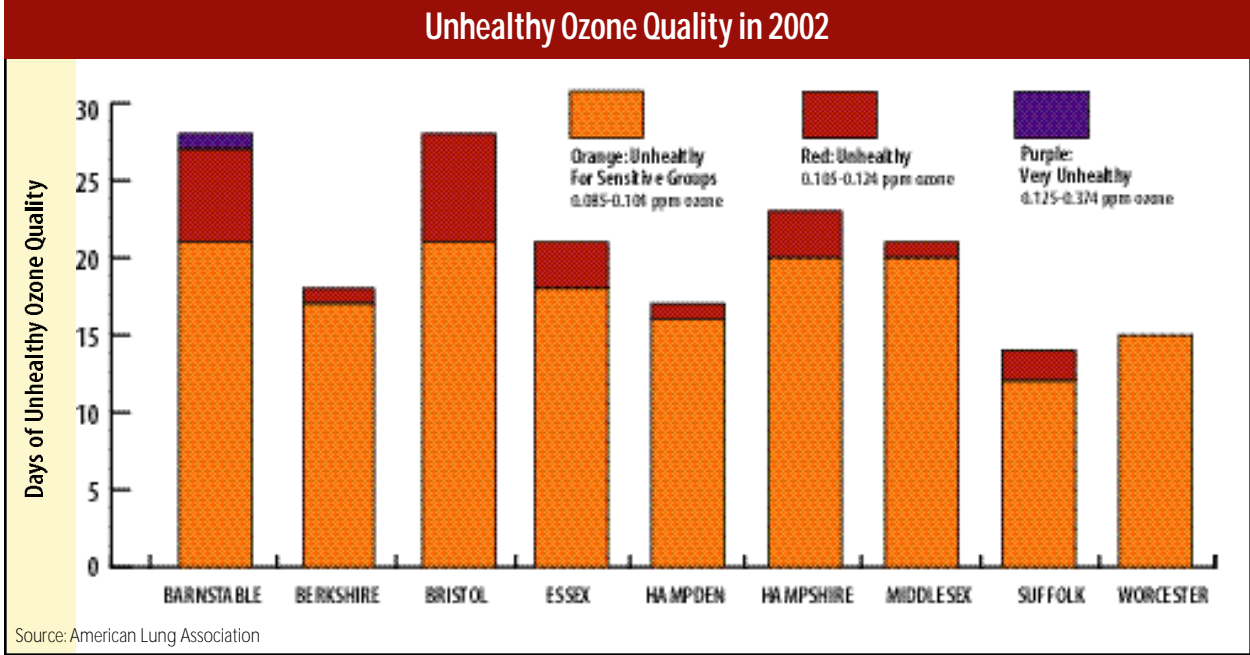
Driving Miss Hazy

Massachusetts has serious air pollution problems, and motor vehicles are a major source of those problems. The toxins in our air have been linked with lower

life expectancy, higher cancer rates, a greater number of hospital admissions, and increases in chronic respiratory illnesses such as asthma, bronchitis, and other lung diseases.¹⁷ According to the Massachusetts Department of Environmental Protection (DEP), "motor vehicle emissions account for up to 40 percent of the pollutants that are toxic or noxious to people."¹⁸ One way to keep toxins out of our air is to create better, more efficient public transportation systems. We will reap the rewards in fewer



Reducing the number of vehicles on the roads and hours driven will help reduce smog



Many towns in the Boston area suffer more than 25 days per year of unhealthy ozone levels.

miles driven and fewer toxins in our air, as studies have shown that 80 percent of commuters prefer convenient public transportation to driving.¹⁹

Uh-O-zone

Ground level ozone, known commonly as smog, is one pollutant that presents a serious health problem for Massachusetts' residents and visitors. The largest single source of smog is the 40 percent from motor vehicles.²⁰

Smog has several harmful effects, all of which increase as a person is exposed for longer periods of time.^b Smog has been shown to increase asthma attacks, including fatal ones. Smog also makes it easier for respiratory infections to take hold by weakening our lungs' defenses, making it more difficult for us to breathe and often damaging our lungs permanently.²¹ Finally, smog causes a greater number of visits to hospitals and more sick days. All of these concerns are acutely visible in Massachusetts according to the American Lung Association, which gave all nine counties in the state failing grades for our ozone levels.²²

The EPA has designated all of Massachusetts as a "serious non-attainment zone" for ozone. This means that Massachusetts is far below what the EPA considers a safe ozone level, and therefore its residents are at risk.²³



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Ozone Non-Attainment Areas in New England

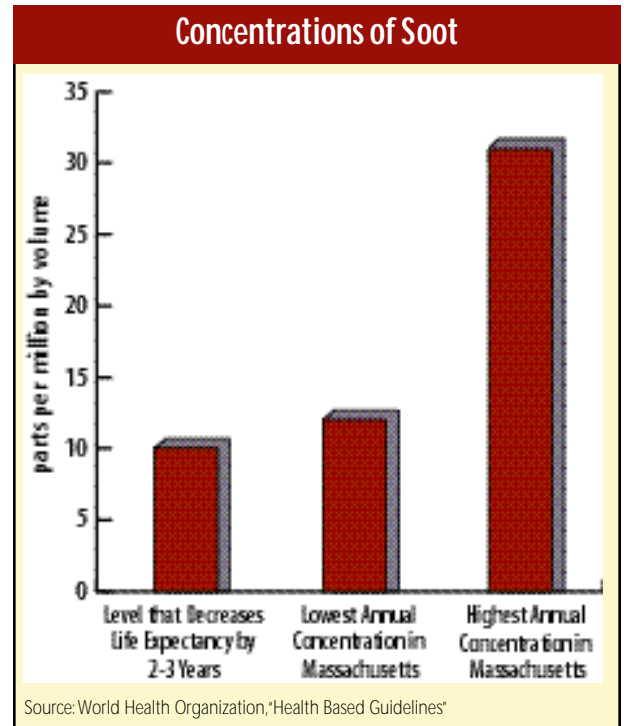
High ozone levels are a particularly serious issue in Massachusetts because of our disturbingly high asthma rates. A report conducted by the Asthma Regional Council in 2003 found that Massachusetts has the highest asthma rates in the country. At the time of the report, 9.5 percent of adults in the Bay State suffered from the disease.²⁴ Also, the number of hospital visits due to asthma are higher in Massachusetts than anywhere else in the country—81 percent higher than the average.²⁵

The combination of record asthma rates and dangerously high ozone levels means that more Massachusetts residents are put at unnecessarily high risk by increasing road spending, which encourages more driving and more air pollution.

Too Much Soot

Particulate matter, also called soot, is another pollutant widely present in Massachusetts. A third of soot comes from cars and other on-road traffic.²⁶ According to the World Health Organization (WHO), even low concentrations of soot over long periods of time worsen lung diseases (such as asthma, lung cancer and bronchitis), decrease the ability of our lungs to function, and can lead to higher mortality rates. The WHO refers to two studies that show a decrease in life expectancy of about 2-3 years in communities with concentrations as low as a 10 $\mu\text{g}/\text{m}^3$ of particulate matter.²⁷ In comparison, the EPA's most recent report on air quality in New England says that the highest annual concentration of soot in New England, found at Boston-City Square, is 31 $\mu\text{g}/\text{m}^3$, and the lowest annual level, recorded at the Quabbin Summit site, is 12 $\mu\text{g}/\text{m}^3$.²⁸ In short, every monitoring site in Massachusetts exceeds the level at which the WHO says life expectancy is decreased by 2-3 years. In Boston the levels are three times higher.

These numbers are alarming, but the EPA points to other toxins that may pose an even greater problem.



Even the lowest soot levels in the Bay State are harmful.

The Worst of The Worst Toxins

Both ozone and particulate matter are very real threats in Massachusetts, but the EPA points to 13 carcinogens as the "Air Toxins of Greatest Concern in New England."²⁹ In the Greater Boston area the concentration of carcinogens is greater than 75 times the "safe" level recommended by the EPA, and in some areas it is more than 300 times the EPA's standard.³⁰ These high levels are largely due to automobile traffic, as 93 percent of the Bay State's added cancer risk^c comes from mobile sources.³¹ It is clear that automobile traffic is driving up the cancer risk in Massachusetts.

Driving Up Health Risks

Every time a car is driven on Massachusetts' roads, it contributes to dangerous levels of toxins in our air, and we are driving far more than in the past. In 1999, 51.83 billion miles were driven in Massachusetts, a jump of 4 billion in just three years.³²



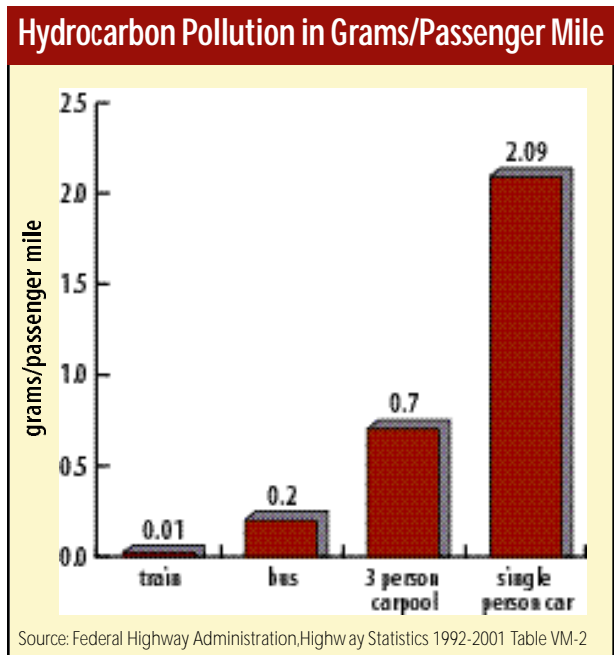
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That ascent is expected to continue, making our roads more congested and our air more polluted. The Boston Metropolitan Planning Organization estimates that, “between 1995 and 2025, miles traveled in Metro Boston will increase by 33 percent.”³³ This means more smog, more soot, more carcinogens, and more of the problems that they bring. One way to help ameliorate this problem is to provide better public transportation choices—effectively reducing the number of cars on the road and pollutants in the air. Measured per person/per miles, an automobile carrying one passenger generates 10 times as many toxins as one person in a bus, and more than 200 times as many as one person riding rail transit.³⁴

It's Gettin' Hot In Here

In 2000 the highly respected International Panel on Climate Change, a group of scientists that studies global warming, declared that, “There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities.”³⁵ There is a near consensus among scientists that global warming is a very real phenomenon, and that it is happening as a result of human activities. This consensus became even stronger in 2001 when new data from two differ-

ent space missions detected changes in the earth's temperature over the last 27 years, as well as increases in the greenhouse gases over that same period. The data clearly pointed to humans as the cause of the earth's current warming.³⁶ One way for us to combat the threat of global climate change is by investing in better and more complete public transportation systems,



Public transportation and even carpools pollute far less per person/per mile than a single driver in a car

thereby reducing the amount of greenhouse gases put into the air by travelers.

About a third of carbon dioxide, by far the most significant of the greenhouse gases, comes from the combustion of gasoline for transportation.³⁷ In Massachusetts, for instance, 53.48 pounds of carbon dioxide are emitted into the air daily for every licensed driver.^d Each gallon of gasoline burned produces about 28 pounds of carbon dioxide, when one includes the four to eight pounds of carbon dioxide that are produced during the production and transportation of gasoline.³⁸

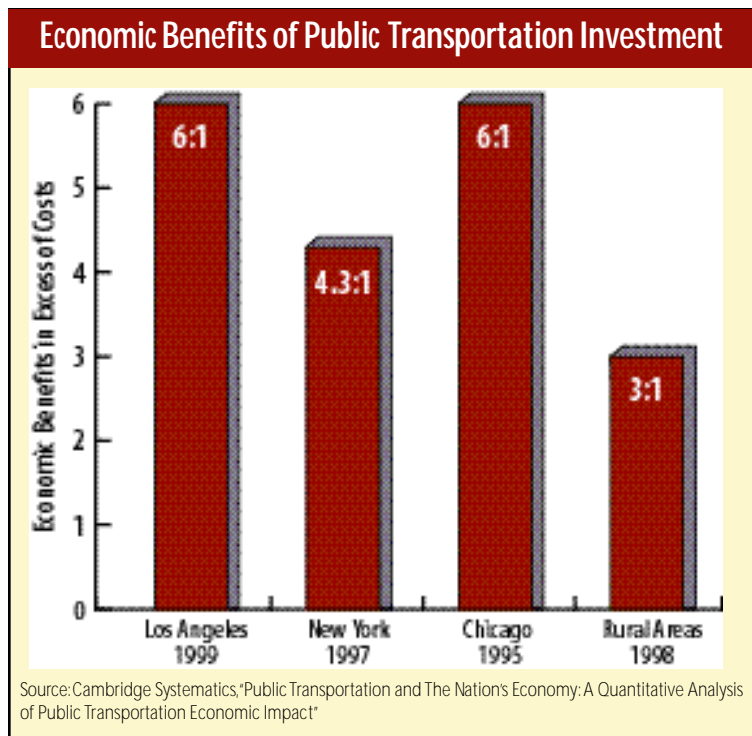
Public transportation is substantially cleaner than driving. A full bus is six times as fuel efficient as a one-person car, and a train car can take each individual fifteen times the distance on the same amount of fuel.³⁹

This means that by creating better, more convenient public transportation systems, Massachusetts can help to combat global warming and its deleterious effects.

Public Transit—Fueling Our Economy

While automobiles are giving us more traffic problems, creating unhealthy pollution levels, and costing ever-escalating amounts of money, public transportation gives a boost to our economy. In cities across the United States, it has been definitively shown that the economic benefits of investing in public transportation are far greater than the costs. In the graph above, one can see that the economic benefits of public transportation outweighed the costs sixfold in Los Angeles and Chicago, and even in rural areas the return on dollars invested was three times as great.⁴⁰

The American Public Transportation Association points out specific examples of public transportation projects that have been a boon to local economies. The

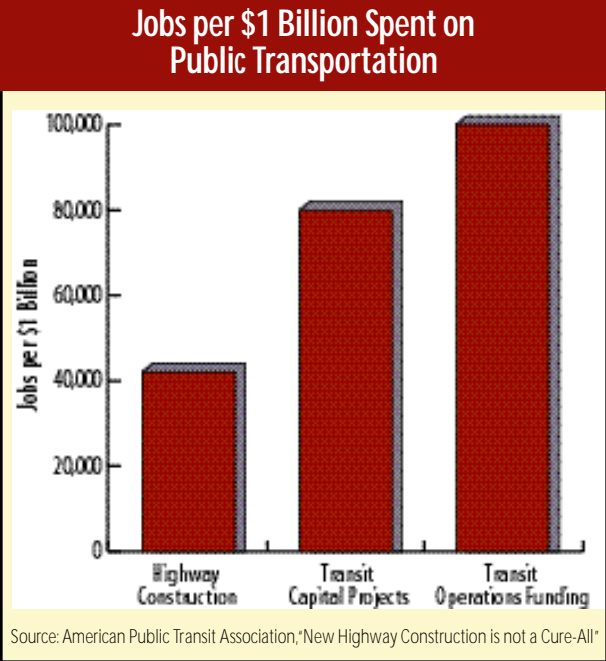


Public transportation generates more jobs than roads

DART system in downtown Dallas served as the catalyst for a 33 percent spike in retail sales compared with only 3 percent growth over the entire city. Also, in Washington, DC, the Metrorail has created almost \$15 billion in nearby private development.⁴¹

In addition to aiding the economy through encouraging new development and other investments, public transportation gives local economies a leg up by helping welfare recipients get back into the work force. About 94 percent of welfare recipients do not own a car, and so rely on public transportation to reach their jobs.⁴² With better, more convenient systems, more people can become permanent members of the workforce, contributing to the tax base and gaining independence from public assistance. This benefits our entire society.

Public transportation's contribution to the economy is even more impressive when compared with that of highways. Investing in public transportation generates twice as many jobs as highway investments.⁴³



Investments in public transportation generate twice as many jobs as highway investments

The potential of highway construction projects like the Big Dig to help the economy was actually so dismal that a U.S. Department of Transportation study said, "no strong evidence exists that beltways [highways] improve a metropolitan area's competitive advantage."⁴⁴ Of course, owning a car is also extremely expensive for the individual.⁶ In order to help our struggling economy, one smart choice is to shift funding from roads to public transportation.

Conclusion

During the 1990s, Massachusetts spent \$15.8 billion on roads and bridges, compared with just \$4.4 billion on public transportation. After years of giving preference to automobiles, the effects on the Bay State are clear. Traffic has dramatically worsened, with the average Metro Boston driver spending 46 percent more time stuck in gridlock per year than in 1990. The air quality in Massachusetts is frighteningly poor, in large part due to vehicle emissions, spurred on by road expenditures.

Counties in the Boston area suffer from levels of carcinogens more than 75 times the EPA's standards, the most dangerous of these toxins coming primarily from motor vehicles. Massachusetts has not invested enough in expanding public transportation choices to allow greater segments of the population to use these health- and time-saving measures.

Public transportation offers many benefits, each of which can improve our quality of life. If Massachusetts transfers funding from roads to public transportation, traffic will improve as travelers are offered better, more convenient, and more efficient alternatives to the gridlocked auto commute. There is great potential for public transportation in Massachusetts: 87 percent of residents live in urban areas, offering a built-in clientele. For instance, the proposed North-South Rail Link would take 55,000 vehicle trips off the roads each day. By taking cars off the road, better public transportation systems would also take toxins out of our air, aiding in the fight to keep smog, soot, and carcinogens from reaching our lungs. By giving people the choice of public transportation, Massachusetts can challenge global warming, as a subway car is 15 times as fuel efficient as an automobile. In addition, by investing in public transportation, we invest in our economy. In other cities, such as Los Angeles and Chicago, the economic benefits of public transportation, as compared to the initial costs, have been 6 to 1.

Massachusetts can and should be making the choice to alleviate the problems of air pollution and traffic congestion, to promote economic benefits and to combat global climate change. Massachusetts should be making the choice for a better future for our children. That choice requires shifting our investments in roads and bridges toward better public transportation.

If Massachusetts is going to be serious about clearing our roads, clearing our air, and providing a better quality of life, then we must get serious about improving public transportation choices.



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End Notes

- a. The U.S. Census Bureau did not have road-spending data available for the year 2001.
 - b. Ground level ozone is produced through the interaction of volatile organic compounds (VOCs) and Nitrogen Oxides in the presence of sunlight and heat. Therefore, ozone levels are highest during the summer months.
 - c. Added cancer risk: The additional risk for an individual getting cancer as a result of carcinogens.
 - d. This number was drawn from data in the Massachusetts Transportation Fact Book 2001, including the number of licensed drivers, miles driven per year, and average fuel efficiency of vehicles in Massachusetts.
 - e. The issues of car ownership costs are large and complex, and therefore are not fully described here. The average American family spends 19.3 cents of every dollar earned on transportation, ahead of food and second only to shelter. Of that 19.3 cents, 98 percent goes toward automobiles, compared with only 2 percent spent on public transportation. In contrast to cars, which cost between \$4,826 and \$9,685 per year to own according to the American Automobile Association, using public transportation costs between \$200 and \$2,000. For more information see: The Surface Transportation Policy Project's "Driven to Spend" and the Public Transportation Partnership for Tomorrow's "Benefits of Public Transportation."
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