



The Commuter's Challenge:
The impact of traffic congestion in the U.S.

2009 Commuter Pain Survey

IBM Corporation
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Foreward

When the average driver in the U.S. spends more than 100 hours a year commuting (U.S. Census Bureau), it's inevitable: at some point they will experience the anger, stress and frustration associated with traffic congestion. Although a recent nationwide study suggests that the weakened economy is having a marginally positive impact on road congestion, the problem is by no means alleviated. In some cases, it is worse than ever.

This paper summarizes survey results from over four thousand drivers in 10 major U.S. cities. Although there are many well-documented congestion studies using government statistics and sophisticated data estimation techniques, including one issued in 2009, few explore the issues from the perspective of the commuter. As a result, IBM commissioned its second annual study in an effort to better understand the effects of traffic congestion from the perspective of U.S. commuters.

The causes of traffic congestion are many, and experts agree there is no "one size fits all" solution. For years, growth, prosperity and opportunity encouraged Americans to flock to big cities and urban areas around the country -- more than 70% of our U.S. population now lives in cities -- and our infrastructures can no longer keep up with the demand that naturally comes along with a population increase.

And let's not forget about the environmental, societal and business challenges caused by commuting: emissions increase air pollution, tired commuters cause accidents and struggle to perform well at work, and businesses lose millions of dollars a year when employees are stuck in traffic.

The recent Federal Government stimulus dollars injected into our nation, earmarked for public transportation improvements, provide an exciting opportunity for many states to embark upon projects that address critical transportation issues.

Citizens are doing their part, too -- banding together to carpool, vanpool or rideshare: some are even relying on public transportation such as buses and subways or walking or riding bikes.

Companies are helping to reduce the carbon footprints of their workers by giving them the option of telecommuting one or more days a week. A February study by "WorldatWork Telework Trendlines 2009, data from The Dieringer Research Group," cited the rise of employee telecommuters who worked from home at least one day a month from 12.4 million in 2006 to 17.2 million in 2008. Our study found that 44% of respondents are now able to work from home one or more days a week.

Doing its part to help the nation's traffic congestion, IBM is developing smart transportation systems that leverage sophisticated sensors combined with powerful

analytics and computer capabilities. These systems are already making a positive difference.

For example, in Singapore, controllers receive real-time data through sensors to model and predict traffic flows with 90 percent accuracy.

In Stockholm, a dynamic toll system based on the flow of vehicles into and out of the city has reduced traffic by 20 percent, decreased wait time by 25 percent and cut emissions by more than 10 percent.

In Kyoto, city planners simulate large-scale traffic situations involving millions of vehicles to analyze urban impact. The system can optimize traffic lights to reduce jams and predict the effect a new shopping mall or traffic regulation will have on a community's traffic.

Special thanks to the more than 4,000 commuters who participated in the 2009 Commuter Pain Survey and shared your pain and frustration. Findings from this year's survey will be used to further IBM's intelligent transportation research as scientists better understand commuters' pain points and traffic concerns.

“Americans will put up with anything provided it doesn't block traffic.”

-- Dan Rather

For U.S. citizens living in urban areas, traffic is a daily problem. And the toll of traffic congestion isn't just on commuters' vehicles: multiple studies over several years have related the stress of commuting to an increased risk of high blood pressure, absenteeism from work and an increased level of stress hormones. And more time in the car means less time for activities such as exercising and spending time with family.

The 2009 Urban Mobility Report, issued by the Texas Transportation Institute, revealed that in 2007, congestion caused urban Americans to travel 4.2 billion hours more and to purchase an extra 2.8 billion gallons of fuel for a congestion cost of \$87.2 billion – an increase of more than 50% over the previous decade.

Although there are many well-documented studies on traffic congestion – some cited in this report—few tackle the issue from the commuter's perspective. Therefore, in an effort to better understand consumer thinking toward traffic congestion, IBM conducted a survey of adult drivers in 10 major U.S. cities during August 2009—repeating a similar survey done in May 2008.

The study gathered drivers' opinions about local traffic and related issues in Atlanta, Boston, Chicago, Dallas-Forth Worth, Los Angeles, Miami-Ft Lauderdale, Minneapolis-St Paul, New York, San Francisco-Oakland-San Jose, and Washington, DC. The survey was fielded by Survey Sampling International (SSI). 4,446 consumers responded -- at least 400 in each city. The male to female balance was even. The results have a 2-point margin of error overall, and a 5-point margin of error when comparing cities.

The Commuter Pain Survey was conducted by IBM to better understand consumer thinking toward traffic congestion as the issue reaches crisis proportions nationwide and higher levels of auto emissions stir environmental concerns. These events are impacting communities in the U.S. and abroad, where governments, citizens and private sector organizations are looking beyond traditional remedies like additional roads and greater access to public transportation to reverse the negative impacts of increased road congestion.

The national U.S. average price for regular unleaded gasoline was \$2.64/gallon during this study (8/23/2009, Lundberg) and \$3.78/gallon during the 2008 study—a difference of \$1.14/gallon.

IBM is actively working in the area of 'Smarter Transportation' using a team of 150 scientists and a group of IT services professionals to research, test and deploy new traffic information management capabilities in cities such as Brisbane, London, Singapore and Stockholm. Findings from the Commuter Pain Survey will be used to assess citizen concerns about traffic and commuter issues; expand solutions like automated tolling, real-time traffic prediction, congestion charging, and intelligent route planning; and serve as a basis for pioneering innovative new approaches to traffic mitigation.

Research Findings:

The commuter's challenge

Let's face it: Americans love their cars and no surprise, driving is by far the predominant way that Americans get to work.

Sixty seven percent (67%) of the licensed drivers in this study drive to work or school alone—unchanged from last year at 68%. Fifty-three percent (53%) do so every workday; a drop of 5% points from 58% last year. The percentage is particularly high in Miami at 78% and Dallas-Forth Worth at 76%, and low in New York at 59% and San Francisco at 57%. Four percent (4%) of potential drivers report working from home full time, the same as last year.

With gas prices down more than \$1.00 from 2008, 23% of respondents have changed their commuting habits in favor of driving versus relying on public transportation or carpooling: 19% carpool less, 19% take public transportation less, and 17% work from home less. Atlanta reported the least amount of carpooling (26%), DC and San Francisco use public transportation the least (27% and 26% respectively), and respondents in Los Angeles (28%) work from home the least.

By comparison, 21% of respondents say that the recession has impacted the way they get to work. Seventeen percent (17%) carpool more, 30% work from home more, and 26% take public transportation more.

Atlanta is most affected by the recession in terms of commuting patterns: 27% have changed the way they commute. Boston is least affected with only 15% changing their commuting strategy. Carpooling is particularly high in DC at 28%. Public transportation use is high in Boston at 41%, DC at 37% and San Francisco at 32%. Public transportation is not as popular in Minneapolis at only 8%.

Ten percent (10%) of respondents said that they have both changed the way they get to work because of the recession and changed commuting habits since gas prices came down. Within this small group, 1% has switched from doing “more” or “less” to “less” or “more” carpooling, working from home, and using public transportation.

More than half of the drivers, 52%, believe that roadway traffic has gotten worse in the last three years, and 16% think it has gotten much worse – this is “better” than last year

- **The National Highway Traffic Safety Administration estimates that at least 100,000 road crashes are caused by driver fatigue each year.**
- **In a 2009 poll issued by the National Sleep Foundation, 54% of adult drivers said they had driven while drowsy during the past year; 28% said they had actually fallen asleep while driving.**
- **Younger drivers and those who have the longest commutes say they are most likely to talk on their cell phones and drive too fast on a daily basis.**

when these numbers were 63% and 24%, respectively. Even the “good” scores are not great: only 3% say traffic has improved substantially. San Francisco would win the most improved award -- 3% “improved substantially” and 21% “improved somewhat,” for a combined score of 24% versus the national average of 17%.

Despite some small improvements in traffic congestion, mostly due to the nationwide recession, commuting is still a stressful and frustrating experience for drivers. In fact, 29% (+2% points from 2008) report that roadway traffic has been so bad within the last three years that they turned around and went home. This figure is highest in Miami at 39% (+6% points from 2008), and Los Angeles at 36% (+4% points from 2008).

Commuting alternative	Percent who believe it would reduce travel stress
Working from home	30%*
Improved public transportation	25%
Accurate and timely road condition information	27%
Total:	82%

**44% of respondents now say they can work from home one or more days a week (up two points from 2008).*

What are the challenges today’s commuters are really up against? Commuters deal with much more than just the cost of car maintenance, gas prices and traffic. Commuting also takes a toll on their health and work performance.

According to the Center for Urban Horticulture, commuting may be one of the most stressful experiences of urban life. Increased blood pressure is associated with longer or more difficult commutes. Lowered job satisfaction, higher illness rates, absenteeism and lower performance on various cognitive tasks have also been found to be related to longer or more difficult commutes.

Our study found that:

- 44% of all drivers surveyed report traffic congestion increases their stress levels (-1% point from 2008). 52% of LA drivers agree. Stress is up 9% points in Boston to 47% and down 9% points in Dallas to 44%.
- 25% of respondents report feelings of increased anger (-3% points from 2008). Anger is down 9% points to 27% in LA and down 8% points to 19% in Atlanta.
- 16% report that traffic challenges negatively affect work or school performance (-3% points from 2008).
- 11% reported getting less sleep due to travel time (-1% from 2008).

How would people spend their extra time if their commutes could be reduced?

- 52% would spend it with family/friends (+9% points from 2008)
- 37% would partake in recreation (+3% points from 2008)
- 37% would exercise (+6% points from 2008)
- 33% would sleep more (+2% points from 2008)

- 11% would work more (+2% points from 2008)

A new University of California Irvine study found that places with sluggish commutes -- usually an indication of economic prosperity -- tend to have slower subsequent job growth. The findings suggest that more efficient public infrastructure projects, while costly, can spur local economic growth.

Gas Prices:

The national average price for regular unleaded gasoline was \$2.64/gallon at the time of this study (down \$1.14 from \$3.78 when the study last fielded). Participants were given a range of gas prices and asked at what price per gallon would they seriously consider other commuting options.

Price per gallon	Percent who would make changes	Cumulative
\$3.00	11%	11%
\$3.50	10%	20%
\$4.00	19%	39%
\$4.50	11%	50%

Drivers are more price sensitive now – last year, 9% of commuters would reconsider driving if prices neared \$3.50, 31% cumulative at \$4.00, and 46% cumulative at \$4.50.

Like last year, drivers in Minneapolis are most likely to look for new options to driving as prices rise. Drivers in Chicago and San Francisco-Oakland-San Jose are least likely to look for alternatives.

Travel Habits:

For trips other than to work or school, 90% of the potential drivers in this study say that driving is their main mode of transportation (91% last year). The margin between cities is 14% points here, with New York at 82% and Dallas-Forth Worth at 96%.

Commuters believe the most frustrating things about commuting are start-stop traffic (45% agree versus 37% last year) and aggressive/rude drivers (32% agree versus 24% last year). Only 16% of drivers think there is nothing frustrating about the commuting experience (it was 15% last year). Start-stop traffic is especially bad in Los Angeles, 52%, Dallas, 46%, and Miami, 46%. Once again, a high percentage of respondents in Miami (40%, up from 35% last year) report aggressive/ rude drivers as an annoyance. New York scored a low 18% last year, but the percentage rose substantially this year to 32%.

Thirty-four percent (34%) of drivers reported that they have decided not to make a driving trip in the last month due to anticipated traffic – the same percentage as last year. The score is highest at 41% in Los Angeles, 5% points less than their score last year. These decisions have a major economic impact as the reported destinations of these cancelled driving trips are: 25% recreation, 25% shopping, 16% entertainment, 9% eating out, 8% work, and 6% vacation.

Vacation Travel:

With the Labor Day holiday approaching, respondents were asked about their propensity for taking car trips over the long weekend.

Fifty-five percent (55%) say they are unlikely to make a driving trip of more than 50 miles from home over Labor Day, and the very unlikely score is 41%. New Yorkers are most unlikely to take a long trip at 63%. Respondents in Minneapolis and Boston are most likely to travel over the holiday – 33% in Minneapolis, 32% in Boston.

What reasons were given for not traveling over Labor Day? Thirty percent (30%) say it's gas prices, particularly in Dallas at 37%. Drivers in New York at 23% and Boston at 24% say gas prices have less effect on their travel decisions. Twenty-one percent (21%) say it's the amount of traffic, but less so in Minneapolis with 14% and Chicago with 15%.

After Labor Day, 12% of respondents expect their amount of driving to increase, 11% expect it to decrease, and 77% expect it to remain the same. There are no significant differences among cities. Of those 12% that expect the amount of driving to increase, the majority (55%) is 20 miles or less. However, 19% do report that they will increase driving by 40 miles or more. Reasons for the additional driving are: 43% commuting to work, 27% driving children to school, and 27% recreation.

When asked the major causes of road rage, the most frequent responses were: bad/careless driving, such as cutting others off, speeding, tailgating, talking on cell phones, making obscene gestures and not using proper signals; people who are angry, stressed, frustrated, tired or had a bad day; people being in a hurry, impatient or running late; traffic problems, accidents, poor road conditions or construction; and inconsiderate, disrespectful, selfish drivers who think they own the road.

Source: 2009 Driver's Seat Road Rage Survey conducted by AutoVantage.

Commute time and cost:

The typical commute for survey respondents is 16.7 miles or 31 minutes: this is the same number of miles with one minute less commute time than 2008. Atlanta has the longest average commute at 18 miles. New York, DC, Boston and Chicago have the longest average commute times at 33 minutes.

Most (67%) of commuting to work is done between 6:00 a.m. and 9:00 a.m., which is unchanged from last year. That general pattern is observed in all areas, except in New York where traffic is particularly heavy between 8:00 a.m. – 9:00 a.m. (27%). The majority (51%) of return commutes occur between 4:00 p.m. and 6:00 p.m.

Morning Commute	Percent Traveling each Hour	Evening Commute	Percent Traveling each Hour
6:00 a.m. – 7:00 a.m.	20%	4:00 p.m. – 5:00 p.m.	24%
7:00 a.m. – 8:00 a.m.	29%	5:00 p.m. – 6:00 p.m.	27%
8:00 a.m. – 9:00 a.m.	18%		
Total:	67%	Total:	51%

The volume from 5:00 p.m. – 6:00 p.m. is higher than 4:00 p.m. – 5:00 p.m. in every city, except in Minneapolis where 33% report 4:00 p.m. – 5:00 p.m. and 20% report 5:00 p.m. – 6:00 p.m. (a significant change from 2008’s findings in this city, when there was no difference between these two time periods).

In the last three years, 86% of the respondents have been stuck in roadway traffic -- compared to 88% last year. Like 2008, the average delay is one hour. Also like last year, Washington, DC, has the highest average delay at 74 minutes (one minute less than 2008). The only area noticeably under one hour is Minneapolis at 49 minutes. Minneapolis also recorded last years’ low at 53 minutes.

The value of time consumed commuting is enormous. Like last year, 75% of respondents say that every 15 minutes stuck in traffic is worth \$10-20 or more -- that’s a minimum of \$40/hour. The 10 area average is at least \$70.80/hour (versus \$73.22/hour in 2008). Washington, DC, and Los Angeles are highest with \$76.80 and 76.00/hour, respectively.

According to the [2009 Urban Mobility Report](#) conducted by the Texas Transportation Institute, congestion costs are increasing. The congestion “invoice” for the cost of extra time and fuel in 439 urban areas (all values in constant 2007 dollars):

- In 2007 – \$87.2 billion
- In 2000 – \$63.1 billion
- In 1982 – \$16.7 billion

Worst Roads:

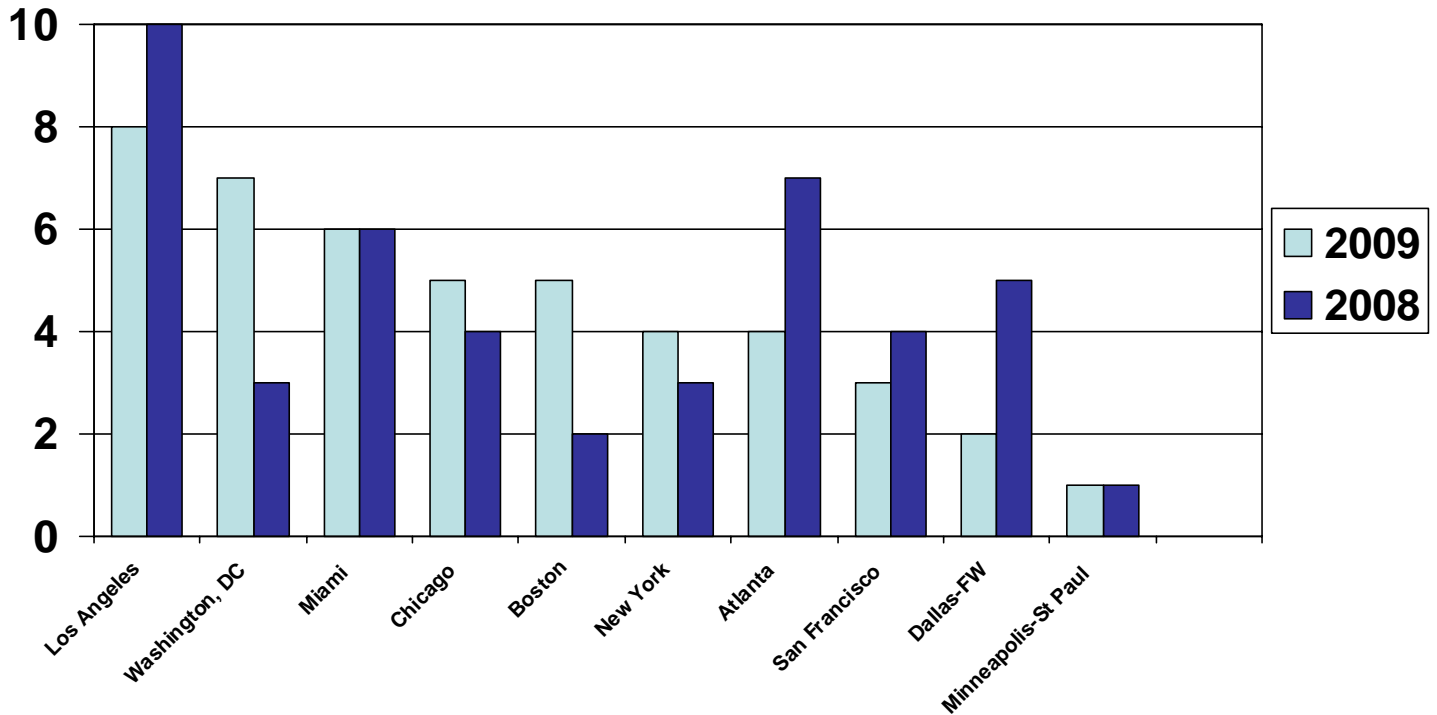
Respondents were asked to report the worst roads for traffic in their areas. The list by city includes significant mentions of the following roads:

City	Worst Roads
Atlanta	I-85, I-75, I-285 (especially where these roads intersect); GA-400, “downtown”
Boston	I-93, Routes 95, 128 and 495, “downtown”
Chicago	I-55, I-80, Route 59, Kennedy Expressway, “downtown”
Dallas	I-30, I-35, 635, 820, “downtown”
Los Angeles	I-405, San Diego Freeway, I-10, Pacific Coast Highway, Routes 5 and 60, 91 freeway, “freeways”
Miami	I-95, 826 turnpike/Palmetto Expressway, US-1, Kendall Drive, 441, 595
Minneapolis	35, 169, I-94, 10, 494, “downtown”
New York	“Midtown,” I-95, Route 80, Garden State Parkway, Long Island Expressway, GW Bridge
San Francisco	Route 101, Bay Bridge, Route 880, 580/680 corridor, Highways 4 and 80
Washington, DC	I-95, Beltway/495, 270, I-66

Consumer Pain Index:

The Commuter Pain Index is derived from the survey scores for each city on ten key issues. Scores significantly above or below average are weighted. The average score for each city is converted to a ten point scale.

Commuter Pain Index



The index is comprised of 10 issues: 1) commuting time, 2) time stuck in traffic, 3) value of time; agreement that: 4) traffic has gotten worse, 5) start-stop traffic is a problem, 6) driving causes stress, 7) driving causes anger, 8) traffic affects work, 9) traffic so bad driving stopped, and 10) decided not to make trip due to traffic.

Conclusions & Recommendations: Where do we go from here?

In a 2007 Baltimore Sun article entitled “How to Fix Traffic,” Anastasia Loukaitou-Sideris, a professor and chairwoman of the UCLA Department of Urban Planning, summed up the problems of traffic congestion in LA when she said: “Our traffic nightmare didn’t spring up overnight, nor can commuters expect an easy, quick fix. It will take coordinated efforts on the part of city officials, transportation planners and engineers, employers and commuters.”

Despite the fact that the comment was aimed at Los Angeles, Anastasia’s words ring true across the U.S. The nation’s transportation problems did not occur overnight and it will take time -- along with targeted, state-by-state solutions -- to fix them.

Investments in smart transportation solutions, coupled with intelligent fleet management principles such as better route planning, off-peak freight movement, alternative fuel vehicles, and hybrid vehicles, are among the many strategies that can help.

Commuters too, will have to do their part. Continued use of public transportation, carpooling, vanpooling, and alternate forms of transportation like walking or biking will help ease the burden on our roads.

Perhaps the biggest challenge we face is getting public officials and private citizens to agree on the best ideas for their city or state. The alternative is continued frustration, stress, health problems, poor business performance and a lack of time with family and friends.

To alleviate the congestion crisis, the answer is a compendium of solutions – a comprehensive portfolio of traditional methods coupled with new innovations and political will.

Commuters are eager for change. Now is the time to invest in the future of smart transportation.