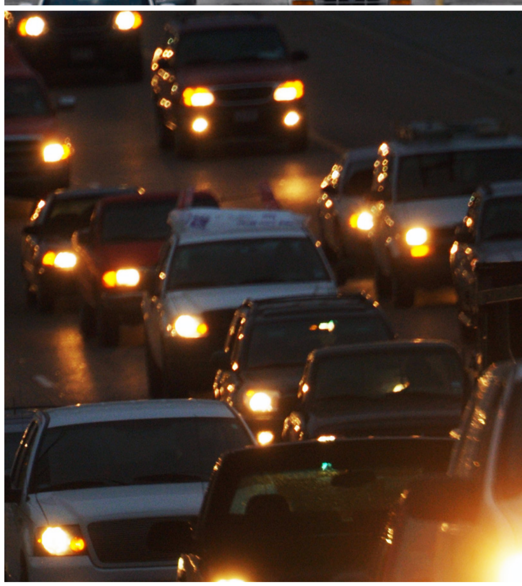
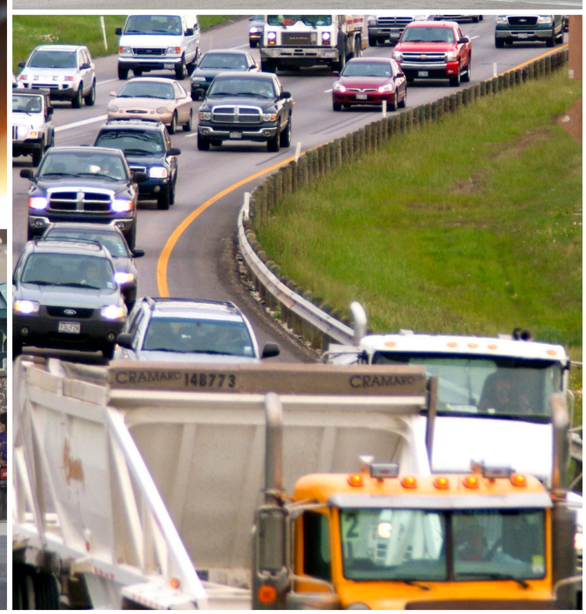
URBAN MOBILITY REPORT

2012

DECEMBER 2012





Texas A&M Transportation Institute

POWERED BY INRIX TRAFFIC

SOUTHWEST REGION UNIVERSITY TRANSPORTATION CENTER

TTI's 2012 URBAN MOBILITY REPORT
Powered by INRIX Traffic Data

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Table of Contents

Page

2012 Urban Mobility Report ... 1
Turning Congestion Data Into Knowledge ... 2
One Page of Congestion Problems ... 5
More Detail About Congestion Problems ... 6
The Trouble With Planning Your Trip ... 8
The Future of Congestion ... 11
Unreliable Travel Times ... 12
Air Quality Impacts of Congestion ... 13
Freight Congestion and Commodity Value ... 14
  Possible Solutions ... 15
  The Next Generation of Freight Measures ... 15
Congestion Relief – An Overview of the Strategies ... 17
Congestion Solutions – The Effects ... 18
  Benefits of Public Transportation Service ... 18
  Better Traffic Flow ... 19
  More Capacity ... 19
Total Peak Period Travel Time ... 21
  Calculation Methods ... 21
Using the Best Congestion Data & Analysis Methodologies ... 22
  Future Changes ... 22
Concluding Thoughts ... 23
  Solutions and Performance Measurement ... 23
References ... 63

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2012 Urban Mobility Report

Congestion levels in large and small urban areas were buffeted by several trends in 2011. Some caused congestion increases and others decreased stop-and-go traffic. For the complete report and congestion data on your city, see: http://mobility.tamu.edu/ums.

The 2011 data are consistent with one past trend, congestion will not go away by itself – action is needed! (see Exhibit 1)

- The problem is very large. In 2011, congestion caused urban Americans to travel 5.5 billion hours more and to purchase an extra 2.9 billion gallons of fuel for a congestion cost of $121 billion.
- Second, in order to arrive on time for important trips, travelers had to allow for 60 minutes to make a trip that takes 20 minutes in light traffic.
- Third, while congestion is below its peak in 2005, there is only a short-term cause for celebration. Prior to the economy slowing, just 5 years ago, congestion levels were much higher than a decade ago; these conditions will return as the economy improves.

The data show that congestion solutions are not being pursued aggressively enough. The most effective congestion reduction strategy, however, is one where agency actions are **complemented** by efforts of businesses, manufacturers, commuters and travelers. There is no **rigid prescription** for the "best way"—**each region** must identify the projects, programs and policies that achieve goals, solve problems and capitalize on opportunities.

Exhibit 1. Major Findings of the 2012 Urban Mobility Report (498 U.S. Urban Areas)

(Note: See page 2 for description of changes since the 2011 Report)

Measures of…	1982	2000	2005	2010	2011
… Individual Congestion					
Yearly delay per auto commuter (hours)	16	39	43	38	38
Travel Time Index	1.07	1.19	1.23	1.18	1.18
Planning Time Index (Freeway only)	--	--	--	--	3.09
"Wasted" fuel per auto commuter (gallons)	8	19	23	19	19
CO_2 per auto commuter during congestion (lbs)	160	388	451	376	380
Congestion cost per auto commuter (2011 dollars)	$342	$795	$924	$810	$818
… The Nation's Congestion Problem					
Travel delay (billion hours)	1.1	4.5	5.9	5.5	5.5
"Wasted" fuel (billion gallons)	0.5	2.4	3.2	2.9	2.9
CO_2 produced during congestion (billions of lbs)	10	47	62	56	56
Truck congestion cost (billions of 2011 dollars)	--	--	--	$27	$27
Congestion cost (billions of 2011 dollars)	$24	$94	$128	$120	$121
… The Effect of Some Solutions					
Yearly travel delay saved by:					
Operational treatments (million hours)	9	215	368	370	374
Public transportation (million hours)	409	774	869	856	865
Yearly congestion costs saved by:					
Operational treatments (billions of 2011$)	$0.2	$3.6	$7.3	$8.3	$8.5
Public transportation (billions of 2011$)	$8.0	$14.0	$18.5	$20.2	$20.8

Yearly delay per auto commuter – The extra time spent traveling at congested speeds rather than free-flow speeds by private vehicle drivers and passengers who typically travel in the peak periods.

Travel Time Index (TTI) – The ratio of travel time in the peak period to travel time at free-flow conditions. A Travel Time Index of 1.30 indicates a 20-minute free-flow trip takes 26 minutes in the peak period.

Commuter Stress Index – The ratio of travel time for the peak direction to travel time at free-flow conditions. A TTI calculation for only the most congested direction in both peak periods.

Planning Time Index (PTI) – The ratio of travel time on the worst day of the month to travel time at free-flow conditions. A Planning Time Index of 1.80 indicates a traveler should plan for 36 minutes for a trip that takes 20 minutes in free-flow conditions (20 minutes x 1.80 = 36 minutes). The Planning Time Index is only computed for freeways only; it does not include arterials.

Wasted fuel – Extra fuel consumed during congested travel.

CO_2 per auto commuter during congestion –The extra CO_2 emitted at congested speeds rather than free-flow speed by private vehicle drivers and passenger who typically travel in the peak periods.

Congestion cost – The yearly value of delay time and wasted fuel.

Turning Congestion Data Into Knowledge
(And the New Data Providing a More Accurate View)

The *2012 Urban Mobility Report* is the 3rd prepared in partnership with INRIX (*1*), a leading private sector provider of travel time information for travelers and shippers. The data behind the *2012 Urban Mobility Report* are hundreds of speed data points on almost every mile of major road in urban America for almost every 15-minute period of the average day. For the congestion analyst, this means 600 million speeds on 875,000 miles across the U.S. – an awesome amount of information. For the policy analyst and transportation planner, this means congestion problems can be described in detail and solutions can be targeted with much greater specificity and accuracy. Exhibit 2 shows historical national congestion trend measures.

Key aspects of the *2012 UMR* are summarized below.

- Speeds collected every 15-minutes from a variety of sources every day of the year on most major roads are used in the study. For more information about INRIX, go to www.inrix.com.
- The data for all 24 hours makes it possible to track congestion problems for the midday, overnight and weekend time periods.
- A measure of the variation in travel time from day-to-day is introduced. The Planning Time Index (PTI) is based on the idea that travelers would want to be on-time for an important trip 19 out of 20 times; so one would be late only one day per month (on-time for 19 out of 20 work days each month). A PTI value of 3.00 indicates that a traveler should allow 60 minutes to make an important trip that takes 20 minutes in uncongested traffic. In essence, the 19th worst commute is affected by crashes, weather, special events, and other causes of unreliable travel and can be improved by a range of transportation improvement strategies.
- Truck freight congestion is explored in more detail thanks to research funding from the National Center for Freight and Infrastructure Research and Education (CFIRE) at the University of Wisconsin (http://www.wistrans.org/cfire/).
- Additional carbon dioxide (CO_2) greenhouse gas emissions due to congestion are included for the first time thanks to research funding from CFIRE and collaboration with researchers at the Energy Institute at the University of Wisconsin-Madison. The procedure is based on the Environmental Protection Agency's Motor Vehicle Emission Simulator (MOVES) modeling procedure.
- Wasted fuel is estimated using the additional carbon dioxide greenhouse gas emissions due to congestion for each urban area. For the first time, this method allows for consideration of urban area climate in emissions and fuel consumption calculations.
- More information on these new measures and data can be found at: http://mobility.tamu.edu/resources/

Exhibit 2. National Congestion Measures, 1982 to 2011

Year	Travel Time Index	Delay per Commuter (hours)	Total Delay (billion hours)	Fuel Wasted (billion gallons)	Total Cost (2011$ billion)	Hours Saved (million hours)		Gallons Saved (million gallons)		Dollars Saved (billions of 2011$)	
						Operational Treatments & HOV Lanes	Public Transp	Operational Treatments & HOV Lanes	Public Transp	Operational Treatments & HOV Lanes	Public Transp
1982	1.07	15.5	1.12	0.53	24.4	9	409	1	204	0.2	8.0
1983	1.07	17.7	1.23	0.58	26.5	11	418	4	208	0.2	8.3
1984	1.08	18.8	1.34	0.65	28.9	16	433	7	219	0.3	8.5
1985	1.09	21.0	1.56	0.75	33.3	21	459	9	235	0.3	8.8
1986	1.10	23.2	1.79	0.88	37.0	28	434	12	229	0.5	8.1
1987	1.11	25.4	1.99	1.00	41.2	36	447	16	236	0.7	8.4
1988	1.12	27.6	2.29	1.15	47.3	48	546	21	289	0.8	10.2
1989	1.14	29.8	2.51	1.28	52.1	58	585	25	314	0.9	11.1
1990	1.14	32.0	2.66	1.36	55.2	66	583	29	317	1.0	10.9
1991	1.14	32.0	2.73	1.41	56.4	69	576	31	317	1.2	10.8
1992	1.14	32.0	2.90	1.50	60.1	78	566	35	310	1.3	10.6
1993	1.15	33.1	3.06	1.57	63.1	87	559	40	305	1.4	10.5
1994	1.15	34.2	3.19	1.64	65.8	97	581	44	318	1.6	10.9
1995	1.16	35.4	3.42	1.78	71.0	114	612	51	340	2.0	11.5
1996	1.17	36.5	3.64	1.90	75.9	131	633	59	354	2.2	12.0
1997	1.17	37.6	3.85	2.02	79.7	149	652	67	365	2.6	12.3
1998	1.18	37.6	4.00	2.12	81.9	170	692	76	392	2.8	12.8
1999	1.19	38.7	4.30	2.28	87.9	196	734	87	418	3.3	13.6
2000	1.19	38.7	4.50	2.39	94.2	215	774	116	431	3.6	14.0
2001	1.20	39.8	4.70	2.51	98.2	243	805	131	450	4.3	15.0
2002	1.21	40.9	4.97	2.67	103.7	270	815	148	461	4.9	15.4
2003	1.21	40.9	5.27	2.83	109.8	312	814	169	456	5.6	15.5
2004	1.22	43.1	5.61	3.02	119.1	338	858	186	486	6.4	17.2
2005	1.23	43.1	5.91	3.17	128.5	368	869	198	493	7.3	18.5
2006	1.22	43.1	5.94	3.20	130.8	406	908	220	519	8.4	20.1
2007	1.22	42.0	5.88	3.23	131.2	411	955	223	546	8.8	22.0
2008	1.18	37.6	5.23	2.76	115.3	353	862	185	478	7.6	19.7
2009	1.18	37.6	5.43	2.81	120.0	363	842	188	459	7.8	19.2
2010	1.18	37.6	5.46	2.85	120.0	370	856	192	445	8.3	20.2
2011	1.18	38.0	5.52	2.88	121.2	374	865	194	450	8.5	20.8

Note: For more congestion information see Tables 1 to 10 and http://mobility.tamu.edu/ums.

One Page of Congestion Problems

In many regions, traffic jams can occur at any daylight hour, many nighttime hours and on weekends. The problems that travelers and shippers face include extra travel time, unreliable travel time and a system that is vulnerable to a variety of irregular congestion-producing occurrences. Some key descriptions are listed below. See data for your city at http://mobility.tamu.edu/ums/congestion_data.

Congestion costs are increasing. The congestion "invoice" for the cost of extra time and fuel in 498 urban areas was (all values in constant 2011 dollars):

- In 2011 – $121 billion
- In 2000 – $94 billion
- In 1982 – $24 billion

Congestion wastes a massive amount of time, fuel and money. In 2011:

- 5.5 billion hours of extra time (equivalent to the time businesses and individuals spend a year filing their taxes).
- 2.9 billion gallons of wasted fuel (enough to fill four New Orleans Superdomes).
- $121 billion of delay and fuel cost (the negative effect of uncertain or longer delivery times, missed meetings, business relocations and other congestion-related effects are not included) ($121 billion is equivalent to the lost productivity and direct medical expenses of 12 average flu seasons).
- 56 billion pounds of additional carbon dioxide (CO_2) greenhouse gas released into the atmosphere during urban congested conditions (equivalent to the liftoff weight of over 12,400 Space Shuttles with all fuel tanks full).
- 22% ($27 billion) of the delay cost was the effect of congestion on truck operations; this does not include any value for the goods being transported in the trucks.
- The cost to the average commuter was $818 in 2011 compared to an inflation-adjusted $342 in 1982.

Congestion affects people who travel during the peak period. The average commuter:

- Spent an extra 38 hours traveling in 2011, up from 16 hours in 1982.
- Wasted 19 gallons of fuel in 2011 – a week's worth of fuel for the average U.S. driver – up from 8 gallons in 1982.
- In areas with over three million persons, commuters experienced an average of 52 hours of delay in 2011.
- Suffered 6 hours of congested road conditions on the average weekday in areas over 3 million population.
- Fridays are the worst days to travel. The combination of work, school, leisure and other trips mean that urban residents earn their weekend after suffering over 20 percent more delay hours than on Mondays.
- And if all that isn't bad enough, folks making important trips had to plan for approximately three times as much travel time as in light traffic conditions in order to account for the effects of unexpected crashes, bad weather, special events and other irregular congestion causes.

Congestion is also a problem at other hours.

- Approximately 37 percent of total delay occurs in the midday and overnight (outside of the peak hours) times of day when travelers and shippers expect free-flow travel. Many manufacturing processes depend on a free-flow trip for efficient production and congested networks interfere with those operations.

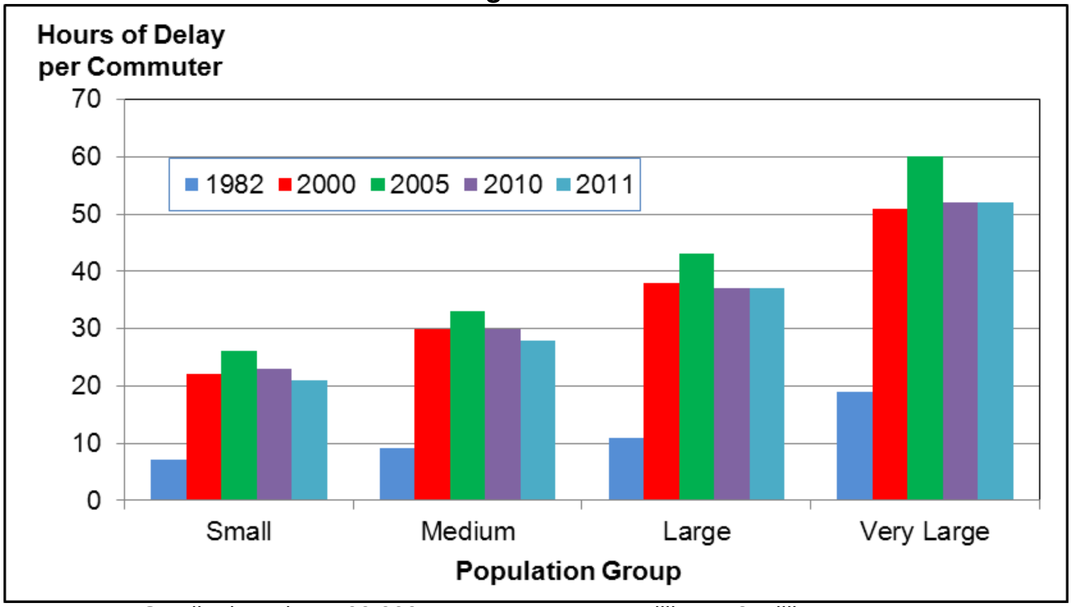
More Detail About Congestion Problems

Congestion, by every measure, has increased substantially over the 30 years covered in this report. And congestion is "recovering" from the improvements seen during the economic recession; many regions have seen congestion get worse as the economy gets better. As in past regional recessions (see California's dot com bubble in the early 2000s) when the economy recovers, so does traffic congestion and when unemployment lines shrank, lines of bumper-to-bumper traffic grew.

Recent trends show traffic congestion for commuters is relatively stable over the last few years after a decline at the start of the economic recession. The total congestion cost has risen as more commuters and freight shippers use the system. This trend is similar to past regional recessions and fuel price increases. Travel patterns change initially, and then travelers return to previous habits and congestion increases return to their previous pattern. There is still time to use this "reset" in the congestion trend, as well as the low prices for construction, to promote congestion reduction programs, policies and projects. But time is probably running out on the lower-cost construction period.

Congestion is worse in areas of every size – it is not just a big city problem. The growing delays also hit residents of smaller cities (Exhibit 3). Big towns and small cities alike cannot implement enough projects, programs and policies to meet the demands of growing population and jobs. Major projects, programs and funding efforts take 10 to 15 years to develop.

Exhibit 3. Congestion Growth Trend



Small = less than 500,000
Medium = 500,000 to 1 million
Large = 1 million to 3 million
Very Large = more than 3 million

Think of what else could be done with the 38 hours of extra time suffered by the average urban auto commuter in 2011:

- Almost 5 vacation days
- Equivalent to over one and a half times what Americans spend online shopping every year.
- Equivalent to the amount of time Americans spend over the winter holidays gift shopping, attending holiday parties and traveling to holiday parties.

Congestion builds through the week from Monday to Friday. The two weekend days have less delay than any weekday (Exhibit 4). Congestion is worse in the evening, but it can be a problem all day (Exhibit 5). Midday hours comprise a significant share of the congestion problem.

Exhibit 4. Percent of Delay for Each Day

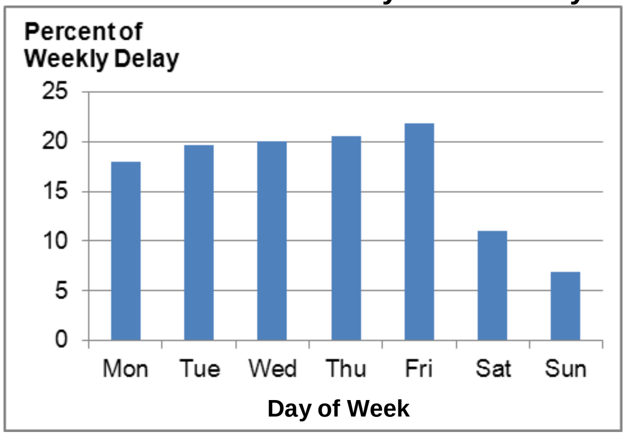
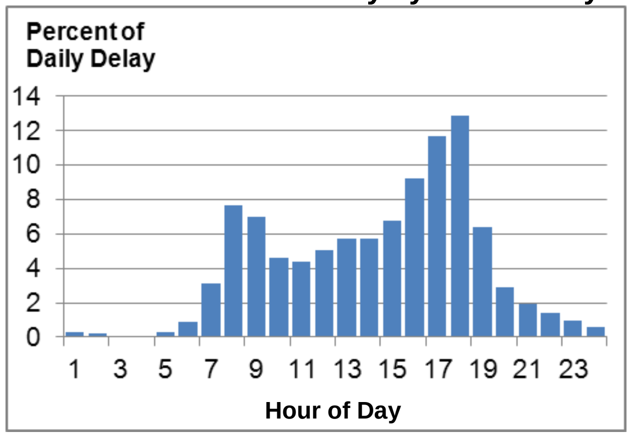
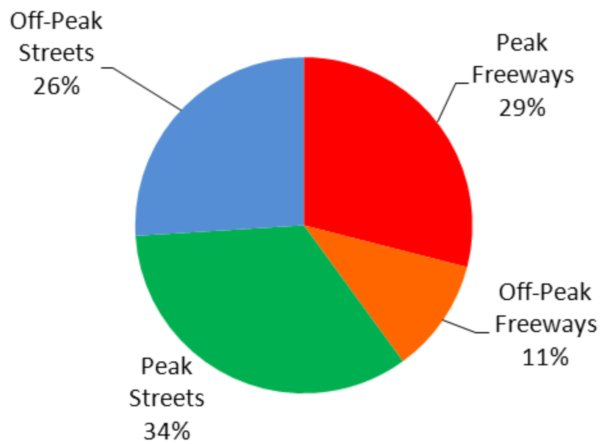


Exhibit 5. Percent of Delay by Time of Day



Streets have more delay than freeways (Exhibit 6).

Exhibit 6. Percent of Delay for Road Types



The "surprising" congestion levels have logical explanations in some regions. The urban area congestion level rankings shown in Tables 1 through 10 (pgs. 24-61) may surprise some readers. The areas listed below are examples of the reasons for higher than expected congestion levels.

- *Work zones* – Baton Rouge. Construction, even when it occurs in the off-peak, can increase traffic congestion.
- *Smaller urban areas with a major interstate highway* – Austin, Bridgeport, Salem. High volume highways running through smaller urban areas generate more traffic congestion than the local economy causes by itself.
- *Tourism* – Orlando, Las Vegas. The traffic congestion measures in these areas are divided by the local population numbers causing the per-commuter values to be higher than normal.
- *Geographic constraints* – Honolulu, Pittsburgh, Seattle. Water features, hills and other geographic elements cause more traffic congestion than regions with several alternative routes.

The Trouble With Planning Your Trip

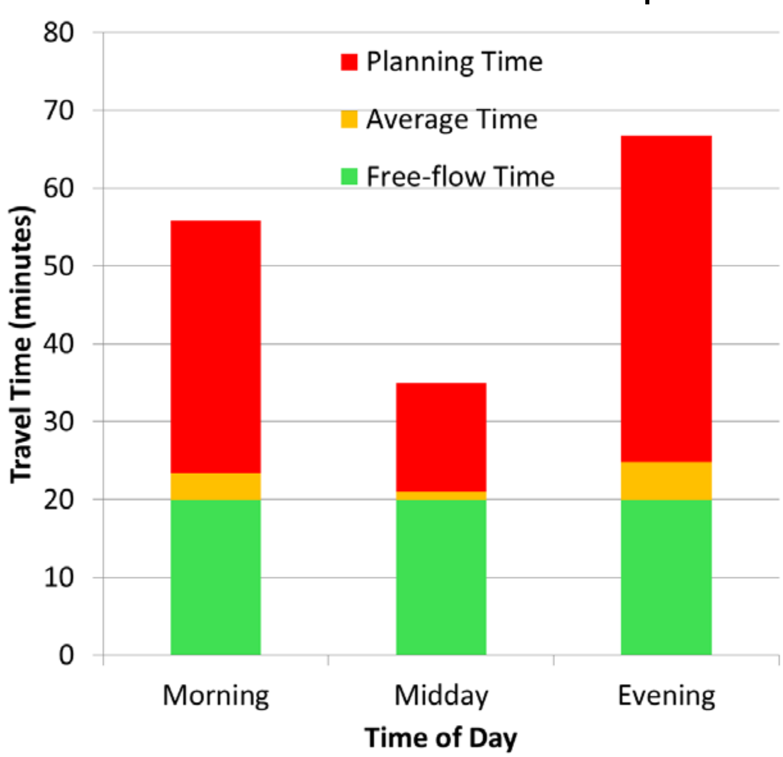
We've all made urgent trips—catching an airplane, getting to a medical appointment, or picking up a child at daycare on time. We know we need to leave a little early to make sure we are not late for these important trips, and we understand that these trips will take longer during the "rush hour." We are conditioned to add some extra time to these trips to make sure we make it, just in case there is an event that causes some unexpected congestion.

The need to add extra times isn't just a "rush hour" consideration. Trips during the off-peak can also take longer than expected. If we have to catch an airplane at 1 p.m. in the afternoon, we might still be inclined to add a little extra time, and the data indicate that our intuition is correct.

Exhibit 7 illustrates this idea. Say your typical trip takes 20 minutes when there are few other cars on the road. That is represented by the green bar across the morning, midday, and evening. Now imagine that your trip takes just a little longer, on average, whether that trip is in the morning, midday, or evening. This "average trip time" is shown in the solid yellow bar in Exhibit 7. Now consider that you have a very important trip to make during any of these time periods – there is additional "planning time" you must provide to ensure you make that trip on-time. And, as shown in Exhibit 7 (red bar), it isn't just a "rush hour" problem – it can happen any time of the day.

The analysis shown in the report (Table 3) indicates that folks making important trips on freeways during the peak periods had to plan for approximately three (3) times as much travel time as in light traffic conditions in order to account for the effects of unexpected crashes, bad weather, and other irregular congestion causes. Page 10 describes trip reliability in more detail.

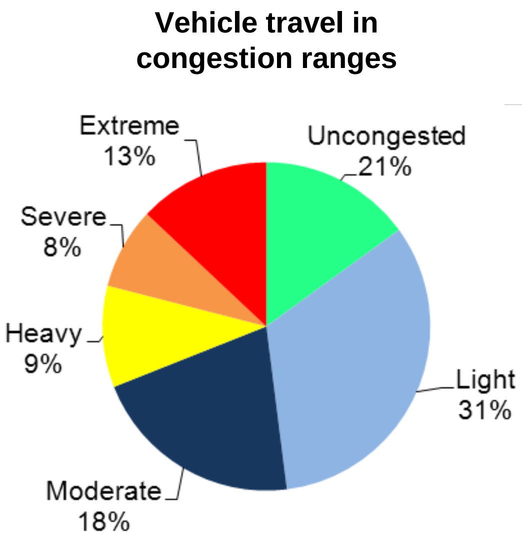
Exhibit 7. Extra Time to Make Important Trips.

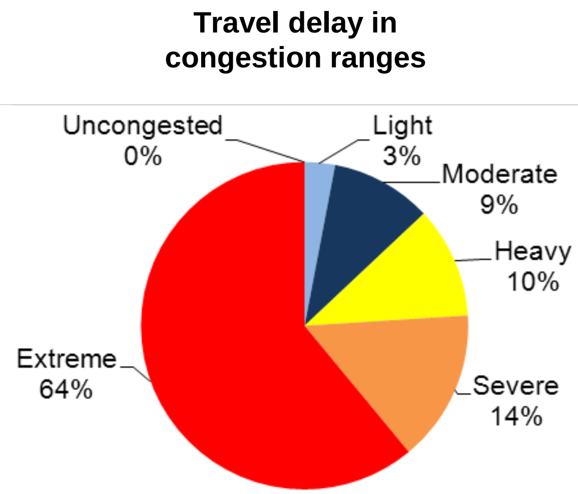


Travelers and shippers must plan around congestion more often.

- In all 498 urban areas, the worst congestion levels affected only 1 in 9 trips in 1982, but almost 1 in 4 trips in 2011 (Exhibit 8).
- The most congested sections of road account for 78% of peak period delays, with only 21% of the travel (Exhibit 8).
- Delay has grown about five times larger overall since 1982 (Exhibit 2).

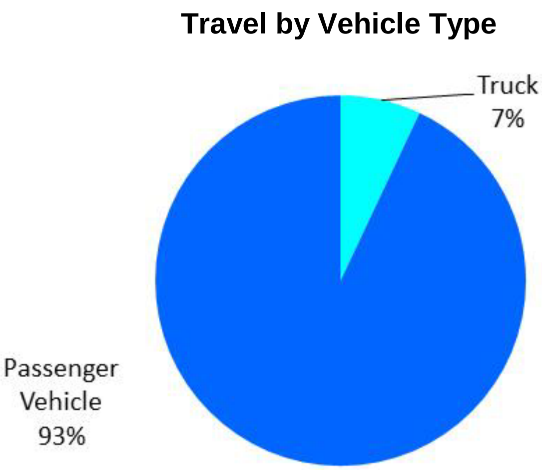
Exhibit 8. Peak Period Congestion and Congested Travel in 2011

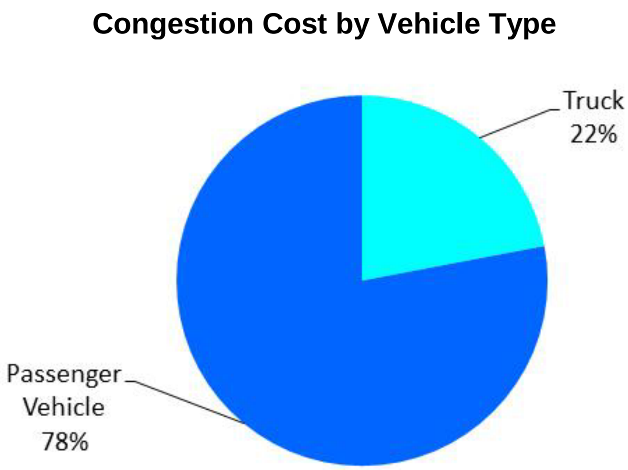




While **trucks** only account for about 7 percent of the miles traveled in urban areas, they are **almost 23 percent of the urban "congestion invoice."** In addition, the cost in Exhibit 9 only includes the cost to operate the truck in heavy traffic; the extra cost of the commodities is not included.

Exhibit 9. 2011 Congestion Cost for Urban Passenger and Freight Vehicles





The Future of Congestion

A few years ago, a congestion forecast of "more" would not be unusual. With the economic recession reducing congestion over the last few years, such predictions are more difficult. The 2012 Urban Mobility Report, however, uses expected population growth figures to provide some estimates to illustrate the near-future congestion problem. Congestion is the result of an imbalance between travel demand and the supply of transportation capacity; so if the number of people or jobs goes up, or the miles or trips that those people make increases, the road and transit systems also need to expand. As this report demonstrates, however, this is an infrequent occurrence, and travelers are paying the price for this inadequate response.

- Population and employment growth—two primary factors in rush hour travel demand—are projected to grow slightly slower from 2012 to 2020 than in the previous ten years.
- The combined role of the government and private sector will yield approximately the same rate of transportation system expansion (both roadway and public transportation). The analysis assumes that policies and funding levels will remain about the same.
- The growth in usage of any of the alternatives (biking, walking, work or shop at home) will continue at the same rate.
- Decisions as to the priorities and level of effort in solving transportation problems will continue as in the recent past.
- The period before the economic recession was used as the indicator of the effect of growth. These years had generally steady economic growth in most U.S. urban regions; these years are assumed to be a good indicator of the future level of investment in solutions and the resulting increase in congestion.

If this "status quo" benchmark is applied to the next five to ten years, a rough estimate of future congestion can be developed. The congestion estimate for any single region will be affected by the funding, project selections and operational strategies; the simplified estimation procedure used in this report will not capture these variations. Combining all the regions into one value for each population group, however, may result in a balance between estimates that are too high and those that are too low.

- The national congestion cost will grow from $121 billion to $199 billion in 2020 (in 2011 dollars).
- Delay will grow to 8.4 billion hours in 2020. Wasted fuel will increase to 4.5 billion gallons in 2020.
- The average commuter will see their cost grow to $1,010 in 2020 (in 2011 dollars). They will waste 45 hours and 25 gallons in 2020.
- If the price of gasoline grows to $5 per gallon, the congestion-related fuel cost would grow from about $10 billion in 2011 to approximately $22 billion in 2020 (in 2011 dollars).

Unreliable Travel Times

The Annoying Issue of not Knowing How Long Your Trip Will Take

Trips take longer in rush hour, we all "get" that. But when you really need to be somewhere at a specific time - whether it's a family dinner, a meeting, an airplane departure or a health care appointment - you have to plan for the possibility of an even longer trip. As bad as traffic jams are, it's even more frustrating that you can't depend on how bad the traffic will be.

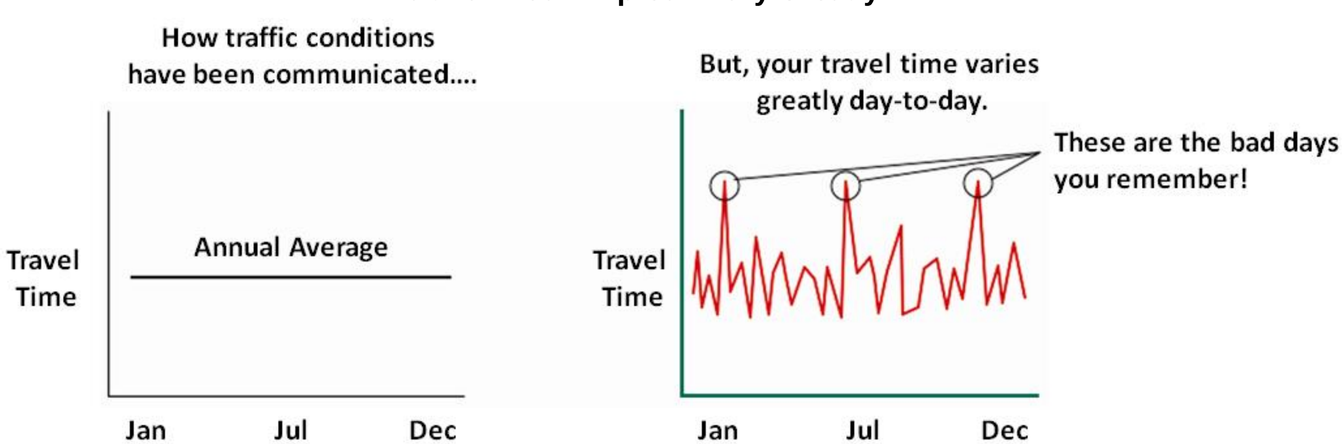
For the first time, the *Urban Mobility Report* includes a measure of this frustrating "extra" extra travel time – the amount of time you have to allow above the regular travel time. The INRIX dataset catalogs many trips taken on each road section; these have been analyzed to identify the longest trip times and present them in a measure similar to the Travel Time Index. The Planning Time Index (PTI) identifies the extra time that should be allowed to arrive on-time for a trip 19 times out of 20. Statistically, this is the 95th percentile and it speaks to the effects of a variety of events that make travel time unpredictable.

Exhibit 10 shows how traffic conditions have historically been communicated – with averages. As shown in Exhibit 10, we all know that traffic isn't "average" everyday, it varies greatly. When your travel time is very high due to a large crash, special event, bad weather, or unexpected construction, your trip can take much longer. This variability in traffic is what the PTI helps you understand. If the PTI for your trip is 3.00, that tells you to plan 60 minutes for a trip that takes 20 minutes when there are few other cars on the road (20 minutes x 3.00 = 60 minutes) to ensure you are on-time for a trip 19 out of 20 times. Here's another way to think about it – suppose your boss tells you that it is ok to be late for work only 1 day out of the 20 workdays per month, the PTI would help you understand how much time to allow to satisfy your boss' requirement.

In addition to PTI, Table 3 (pgs. 32-35) also includes a reliability performance measure designed for transportation agency evaluation. PTI_{80} shows the "worst trip of the week" – the extra time to ensure timely arrival for 4 out of 5 trips. The worst trip of the week is frequently caused by a crash; rapid removal of these can improve $PTI_{80.}$ Bad weather that causes several of the worst travel times must be planned for, but it's difficult to grade an agency on weather conditions.

The methodology in the appendix provides further discussion and explanation of PTI and $PTI_{80.}$

Exhibit 10. Your Trip Can Vary Greatly



Source: Federal Highway Administration (2)

Air Quality Impacts of Congestion

According to the Environmental Protection Agency (EPA), transportation is the second largest emitting sector of carbon dioxide (CO_2) greenhouse gases behind electricity generation (*3*). There is increasing interest in the impact of transportation on air quality. For the first time, the *2012 Urban Mobility Report* includes measures of the additional CO_2 emissions as a result of congestion.

With funding from the Center for Freight and Infrastructure Research and Education (CFIRE) at the University of Wisconsin-Madison, TTI researchers teamed with researchers at the Energy Institute at the University of Wisconsin to develop a methodology to include CO_2 emissions in the *UMR*.

The methodology uses data from three primary sources, 1) HPMS, 2) INRIX traffic speeds, and 3) the EPA's MObile Vehicle Emission Simulator (MOVES) model. MOVES provides emissions estimates for mobile sources. Researchers used MOVES extensively to develop CO_2 emission rates, which were used to calculate CO_2 emissions and subsequently wasted fuel estimates. More details regarding the methodology are shown in the appendix.

Table 4 (pgs. 36-39) shows additional CO_2 production due to congestion by urban area size. Additional CO_2 production due to congestion in pounds per auto commuter and in total pounds for each urban area is shown. The 498 urban area total CO_2 produced by congestion is 56 billion pounds (equivalent to the takeoff weight of 12,400 space shuttles at liftoff with full fuel tanks). Note that this is only the additional CO_2 production due to congestion – it does not include CO_2 production from auto commuters traveling when roadways are uncongested.

A number of assumptions are in the model based upon available national-level data as inputs. These assumptions allow for a relatively simple and replicable method for 498 urban areas. More detailed and localized inputs should be used where available to improve local estimates of CO_2 production.

Estimation of the additional CO_2 emissions due to congestion provides another important element to characterize the urban congestion problem. It provides useful information for decision-making and policy makers, and it points to the importance of implementing transportation improvements to mitigate congestion. Researchers plan to incorporate other air quality pollutants into future editions of the *UMR*.

Freight Congestion and Commodity Value

Trucks carry goods to suppliers, manufacturers and markets. They travel long and short distances in peak periods, middle of the day and overnight. Many of the trips conflict with commute trips, but many are also to warehouses, ports, industrial plants and other locations that are not on traditional suburb to office routes. Trucks are a key element in the just-in-time (or lean) manufacturing process; these business models use efficient delivery timing of components to reduce the amount of inventory warehouse space. As a consequence, however, trucks become a mobile warehouse; and if their arrival times are missed, production lines can be stopped, at a cost of many times the value of the truck delay times.

Congestion, then, affects truck productivity and delivery times and can also be caused by high volumes of trucks, just as with high car volumes. One difference between car and truck congestion costs is important; it is intuitive that some of the $27 billion in truck congestion costs in 2011was passed on to consumers in the form of higher prices. The congestion effects extend far beyond the region where the congestion occurs.

With funding from the National Center for Freight and Infrastructure Research and Education (CFIRE) at the University of Wisconsin and data from USDOT's Freight Analysis Framework (*4*), a methodology was developed to estimate the value of commodities being shipped by truck to and through urban areas and in rural regions. The commodity values were matched with truck delay estimates to identify regions where high values of commodities move on congested roadway networks.

Table 5 (pgs. 40-43) points to a correlation between commodity value and truck delay—higher commodity values are associated with more people; more people are associated with more traffic congestion. Bigger cities consume more goods, which means a higher value of freight movement. While there are many cities with large differences in commodity and delay ranks, only 23 urban areas are ranked with commodity values much higher than their delay ranking.

Table 5 also illustrates the role of long corridors with important roles in freight movement. Some of the smaller urban areas along major interstate highways along the east and west coast and through the central and Midwestern U.S., for example, have commodity value ranks much higher than their delay ranking. High commodity values and lower delay might sound advantageous—lower congestion levels with higher commodity values means there is less chance of congestion getting in the way of freight movement. At the areawide level, this reading of the data would be correct, but in the real world the problem often exists at the road or even intersection level—and solutions should be deployed in the same variety of ways.

Possible Solutions

Urban and rural corridors, ports, intermodal terminals, warehouse districts and manufacturing plants are all locations where truck congestion is a particular problem. Some of the solutions to these problems look like those deployed for person travel—new roads and rail lines, new lanes on existing roads, lanes dedicated to trucks, additional lanes and docking facilities at warehouses and distribution centers. New capacity to handle freight movement might be an even larger need in coming years than passenger travel capacity. Goods are delivered to retail and commercial stores by trucks that are affected by congestion. But "upstream" of the store shelves, many manufacturing operations use just-in-time processes that rely on the ability of trucks to maintain a reliable schedule. Traffic congestion at any time of day causes potentially costly disruptions. The solutions might be implemented in a broad scale to address freight traffic growth or targeted to road sections that cause freight bottlenecks.

Other strategies may consist of regulatory changes, operating practices or changes in the operating hours of freight facilities, delivery schedules or manufacturing plants. Addressing customs, immigration and security issues will reduce congestion at border ports-of-entry. These technology, operating and policy changes can be accomplished with attention to the needs of all stakeholders and can produce as much from the current systems and investments as possible.

The Next Generation of Freight Measures

The dataset used for Table 5 provides origin and destination information, but not routing paths. The *2012 Urban Mobility Report* developed an estimate of the value of commodities in each urban area, but better estimates of value will be possible when new freight models are examined. Those can be matched with the detailed speed data from INRIX to investigate individual congested freight corridors and their value to the economy.

Congestion Relief – An Overview of the Strategies

We recommend a ***balanced and diversified approach*** to reduce congestion – one that focuses on more of everything. It is clear that our current investment levels have not kept pace with the problems. Population growth will require more systems, better operations and an increased number of travel alternatives. And most urban regions have big problems now – more congestion, poorer pavement and bridge conditions and less public transportation service than they would like. There will be a different mix of solutions in metro regions, cities, neighborhoods, job centers and shopping areas. Some areas might be more amenable to construction solutions, other areas might use more travel options, productivity improvements, diversified land use patterns or redevelopment solutions. In all cases, the solutions need to work together to provide an interconnected network of transportation services.

More information on the possible solutions, places they have been implemented, the effects estimated in this report and the methodology used to capture those benefits can be found on the website http://mobility.tamu.edu/solutions or on the following websites below.

- **Get as much service as possible from what we have** – Many low-cost improvements have broad public support and can be rapidly deployed. These management programs require innovation, constant attention and adjustment, but they pay dividends in faster, safer and more reliable travel. Rapidly removing crashed vehicles, timing the traffic signals so that more vehicles see green lights, improving road and intersection designs, or adding a short section of roadway are relatively simple actions.
  - http://mobility.tamu.edu/mip/strategies.php#traffic
- **Add capacity in critical corridors** – Handling greater freight or person travel on freeways, streets, rail lines, buses or intermodal facilities often requires "more." Important corridors or growth regions can benefit from more road lanes, new streets and highways, new or expanded public transportation facilities, and larger bus and rail fleets.
  - http://mobility.tamu.edu/mip/strategies.php#additional
- **Change the usage patterns** – There are solutions that involve changes in the way employers and travelers conduct business to avoid traveling in the traditional "rush hours." Flexible work hours, internet connections or phones allow employees to choose work schedules that meet family needs and the needs of their jobs.
  - http://mobility.tamu.edu/mip/strategies.php#options
- **Provide choices** – This might involve different routes, travel modes or lanes that involve a toll for high-speed and reliable service—a greater number of options that allow travelers and shippers to customize their travel plans.
  - http://mobility.tamu.edu/mip/strategies.php#additional
- **Diversify the development patterns** – These typically involve denser developments with a mix of jobs, shops and homes, so that more people can walk, bike or take transit to more, and closer, destinations. Sustaining the "quality of life" and gaining economic development without the typical increment of mobility decline in each of these sub-regions appears to be part, but not all, of the solution.
  - http://mobility.tamu.edu/mip/strategies.php#options
- **Realistic expectations** are also part of the solution. Large urban areas will be congested. Some locations near key activity centers in smaller urban areas will also be congested. But congestion does not have to be an all-day event. Identifying solutions and funding sources that meet a variety of community goals is challenging enough without attempting to eliminate congestion in all locations at all times.
  - http://mobility.tamu.edu/mip/strategies.php#public

Congestion Solutions – The Effects

The *2012 Urban Mobility Report* database includes the effect of several widely implemented congestion solutions. These strategies provide faster and more reliable travel and make the most of the roads and public transportation systems that have been built. These solutions use a combination of information, technology, design changes, operating practices and construction programs to create value for travelers and shippers. There is a double benefit to efficient operations-travelers benefit from better conditions and the public sees that their tax dollars are being used wisely. The estimates described in the next few pages are a reflection of the benefits from these types of roadway operating strategies and public transportation systems.

Benefits of Public Transportation Service

Regular-route public transportation service on buses and trains provides a significant amount of peak-period travel in the most congested corridors and urban areas in the U.S. If public transportation service had been discontinued and the riders traveled in private vehicles in 2011, the 498 urban areas would have suffered an additional 865 million hours of delay and consumed 450 million more gallons of fuel (Exhibit 11). The value of the additional travel delay and fuel that would have been consumed if there were no public transportation service would be an additional $20.8 billion, a 15% increase over current congestion costs in the 498 urban areas.

There were approximately 56 billion passenger-miles of travel on public transportation systems in the 498 urban areas in 2011 (*5*). The benefits from public transportation vary by the amount of travel and the road congestion levels (Exhibit 11). More information on the effects for each urban area is included in Table 8 (pgs. 50-53).

Exhibit 11. Delay Increase in 2011 if Public Transportation Service Were Eliminated – 498 Areas

Population Group and Number of Areas	Average Annual Passenger-Miles of Travel (Million)	Reduction Due to Public Transportation			
		Hours of Delay Saved (Million)	Percent of Base Delay	Gallons of Fuel (Million)	Dollars Saved ($ Million)
Very Large (15)	43,203	721	24	398	17,415
Large (32)	6,407	80	5	34	1,939
Medium (33)	1,598	12	3	2	279
Small (21)	445	3	3	1	91
Other (397)	4,357	49	6	15	1,060
National Urban Total	56,010	865	15	450	$20,784

Source: Reference (*5*) and Review by Texas A&M Transportation Institute

Better Traffic Flow

Improving transportation systems is about more than just adding road lanes, transit routes, sidewalks and bike lanes. It is also about operating those systems efficiently. Not only does congestion cause slow speeds, it also decreases the traffic volume that can use the roadway; stop-and-go roads only carry half to two-thirds of the vehicles as a smoothly flowing road. This is why simple volume-to-capacity measures are not good indicators; actual traffic volumes are low in stop-and-go conditions, so a volume/capacity measure says there is no congestion problem. Several types of improvements have been widely deployed to improve traffic flow on existing roadways.

Five prominent types of operational treatments are estimated to relieve a total of 374 million hours of delay (7% of the total) with a value of $8.5 billion in 2011 (Exhibit 12). If the treatments were deployed on all major freeways and streets, the benefit would expand to almost 842 million hours of delay (15% of delay) and more than $19 billion would be saved. These are significant benefits, especially since these techniques can be enacted more quickly than significant roadway or public transportation system expansions can occur. The operational treatments, however, are not large enough to replace the need for those expansions.

Exhibit 12. Operational Improvement Summary for All 498 Urban Areas

Population Group and Number of Areas	Reduction Due to Current Projects			Delay Reduction if In Place on All Roads (Million Hours)
	Hours of Delay Saved (Million)	Gallons of Fuel Saved (Million)	Dollars Saved ($ Million)	
Very Large (15)	250	151	5,670	619
Large (33)	71	30	1,617	97
Medium (32)	16	4	358	42
Small (21)	4	1	89	9
Other (338)	33	8	750	75
TOTAL	374	194	$8,484	842

Note: This analysis uses nationally consistent data and relatively simple estimation procedures. Local or more detailed evaluations should be used where available. These estimates should be considered preliminary pending more extensive review and revision of information obtained from source databases (*6,7*).

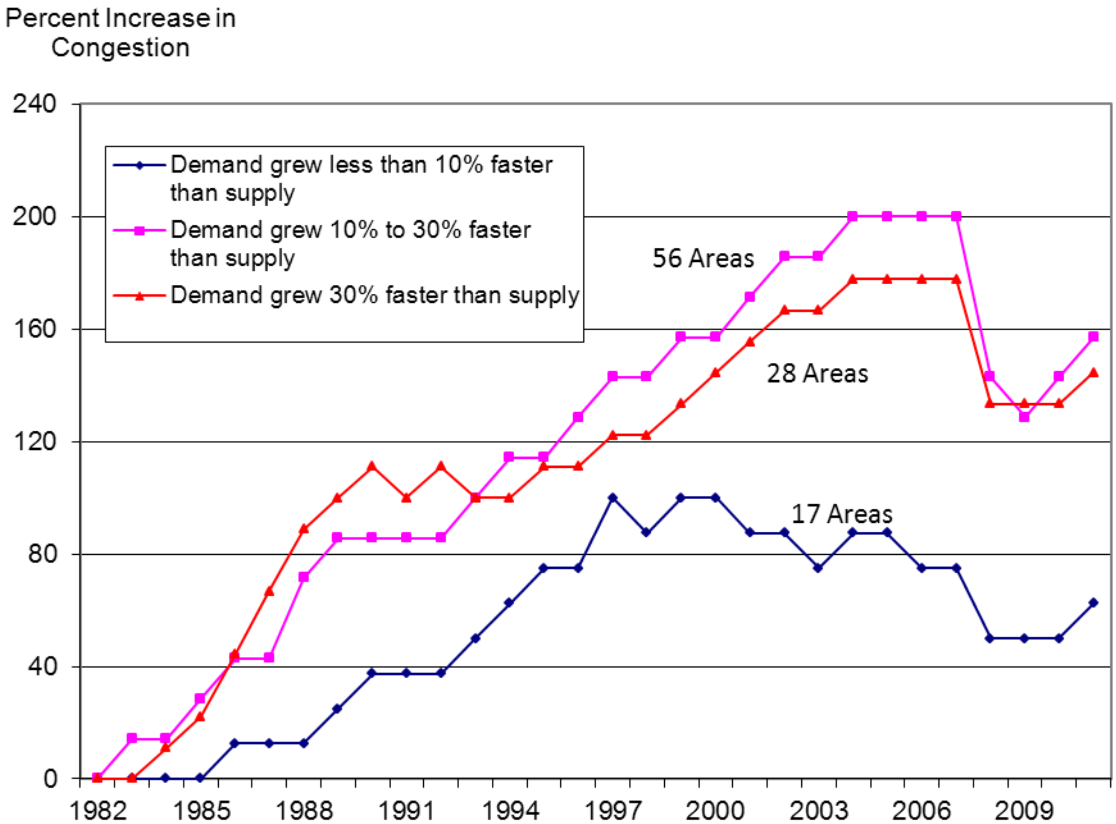
More information about the specific treatments and examples of regions and corridors where they have been implemented can be found at the website http://mobility.tamu.edu/resources/

More Capacity

Projects that provide more road lanes and more public transportation service are part of the congestion solution package in most growing urban regions. New streets and urban freeways will be needed to serve new developments, public transportation improvements are particularly important in congested corridors and to serve major activity centers, and toll highways and toll lanes are being used more frequently in urban corridors. Capacity expansions are also important additions for freeway-to-freeway interchanges and connections to ports, rail yards, intermodal terminals and other major activity centers for people and freight transportation.

Additional roadways reduce the rate of congestion increase. This is clear from comparisons between 1982 and 2011 (Exhibit 13). Urban areas where capacity increases matched the demand increase saw congestion grow much more slowly than regions where capacity lagged behind demand growth. It is also clear, however, that if only areas were able to accomplish that rate, there must be a broader and larger set of solutions applied to the problem. Most of these regions (listed in Table 11 on page 97) were not in locations of high economic growth, suggesting their challenges were not as great as in regions with booming job markets.

Exhibit 13. Road Growth and Mobility Level



Source: Texas A&M Transportation Institute analysis, see and http://mobility.tamu.edu/ums/methodology/

Total Peak Period Travel Time

Another approach to measuring some aspects of congestion is the total time spent traveling during the peak periods. The measure can be used with other *Urban Mobility Report* statistics in a balanced transportation and land use pattern evaluation program. As with any measure, the analyst must understand the components of the measure and the implications of its use. In the *Urban Mobility Report* context where trends are important, values for cities of similar size and/or congestion levels can be used as comparisons. Year-to-year changes for an area can also be used to help an evaluation of long-term policies. The total peak period travel time measure is particularly well-suited for long-range scenario planning as it shows the effect of the combination of different transportation investments and land use arrangements.

Some have used total travel time to suggest that it shows urban residents are making poor home and job location decisions or are not correctly evaluating their travel options. There are several factors that should be considered when examining values of total travel time.

- Travel delay – The extra travel time due to congestion
- Type of road network – The mix of high-speed freeways and slower streets
- Development patterns – The physical arrangement of living, working, shopping, medical, school and other activities
- Home and job location – Distance from home to work is a significant portion of commuting time
- Decisions and priorities – It is clear that congestion is not the only important factor in the location and travel decisions made by families

Individuals and families frequently trade one or two long daily commutes for other desirable features such as good schools, medical facilities, large homes or a myriad of other factors.

Total peak period travel time (see Table 7 on pgs. 46-49) can provide additional explanatory power to a set of mobility performance measures. It provides some of the desirable aspects of accessibility measures, while at the same time being a travel time quantity that can be developed from actual travel speeds. Regions that are developed in a relatively compact urban form will also score well, which is why the measure may be particularly well-suited to public discussions about regional plans and how transportation and land use investments can support the attainment of community goals.

Calculation Methods

The *2012 Urban Mobility Report* combines several datasets not traditionally used together to generate procedures and base data that produce a total travel time measure. Challenges clearly exist in creating a broader use for the data; additional development and refinement will address specific issues. For example, smaller cities ranking highly in Table 7 and larger cities ranking lower will require further clarification. This report measures total travel time in minutes of peak-period road travel per auto commuter. Though capable of being a door-to-door metric in the future, values in Table 7 represent all travel only in automobiles and may appear to be less than average trip to work times reported by the US Census Bureau's American Community Survey (ACS) (*8*). The measure distinctly differs from the ACS by using real speed data instead of perceived travel times to generate a value for each urban area. The measure now includes delay and speeds (reference and congested) for local streets in its calculation. Other methodological refinements and a preliminary process for accounting for through trips have also been added. Researchers will continue to refine estimates of commuters, through trips, and local street travel as well as include other transportation modes.

More information about the total peak period travel time measure can be found at: http://mobility.tamu.edu/resources/

Using the Best Congestion Data & Analysis Methodologies

The base data for the *2012 Urban Mobility Report* come from INRIX, the U.S. Department of Transportation and the states (*1,6*). Several analytical processes are used to develop the final measures, but the biggest improvement in the last two decades is provided by INRIX data. The speed data covering most major roads in U.S. urban regions eliminates the difficult process of estimating speeds and dramatically improves the accuracy and level of understanding about the congestion problems facing US travelers.

The methodology is described in a series of technical reports (*9, 10, 11, 12*) that are posted on the mobility report website: http://mobility.tamu.edu/ums/methodology/.

- The INRIX traffic speeds are collected from a variety of sources and compiled in their National Average Speed (NAS) database. Agreements with fleet operators who have location devices on their vehicles feed time and location data points to INRIX. Individuals who have downloaded the INRIX application to their smart phones also contribute time/location data. The proprietary process filters inappropriate data (e.g., pedestrians walking next to a street) and compiles a dataset of average speeds for each road segment. TTI was provided a dataset of hourly average speeds for each link of major roadway covered in the NAS database for 2011 (approximately 875,000 directional miles in 2011).
- Hourly travel volume statistics were developed with a set of procedures developed from computer models and studies of real-world travel time and volume data. The congestion methodology uses daily traffic volume converted to average 15-minute volumes using a set of estimation curves developed from a national traffic count dataset (*13*).
- The 15-minute INRIX speeds were matched to the 15-minute volume data for each road section on the FHWA maps.
- An estimation procedure was also developed for the INRIX data that was not matched with an FHWA road section. The INRIX sections were ranked according to congestion level (using the Travel Time Index); those sections were matched with a similar list of most to least congested sections according to volume per lane (as developed from the FHWA data) (*2*). Delay was calculated by combining the lists of volume and speed.
- The effect of operational treatments and public transportation services were estimated using methods similar to previous *Urban Mobility Reports*.

Future Changes

There will be other changes in the report methodology over the next few years. There is more information available every year from freeways, streets and public transportation systems that provides more descriptive travel time and volume data. Congested corridor data and travel time reliability statistics are two examples of how the improved data and analysis procedures can be used. In addition to the travel speed information from INRIX, some advanced transit operating systems monitor passenger volume, travel time and schedule information. These data can be used to more accurately describe congestion problems on public transportation and roadway systems.

Concluding Thoughts

Congestion has gotten worse in many ways:

- Trips take longer and are less reliable.
- Congestion affects more of the day.
- Congestion affects weekend travel and rural areas.
- Congestion affects more personal trips and freight shipments.

The *2012 Urban Mobility Report* points to a $121 billion congestion cost, $27 billion of which is due to truck congestion—and that is only the value of wasted time, fuel and truck operating costs. Congestion causes the average urban resident to spend an extra 38 hours of travel time and use 19 extra gallons of fuel, which amounts to an average cost of $818 per commuter. The report includes a comprehensive picture of congestion in all 498 U.S. urban areas and provides an indication of how the problem affects travel choices, arrival times, shipment routes, manufacturing processes and location decisions.

Recent trends show traffic congestion for commuters is relatively stable over the last few years after a decline at the start of the economic recession. The total congestion cost has risen, as more commuters and freight shippers use the system. This trend is similar to past regional recessions and fuel price increases. Travel patterns change initially, and then travelers return to previous habits and congestion increases return to their previous pattern.

Solutions and Performance Measurement

There are solutions that work. There are significant benefits from aggressively attacking congestion problems—whether they are large or small, in big metropolitan regions or smaller urban areas and no matter the cause. Performance measures and detailed data like those used in the *2012 Urban Mobility Report* can guide those investments, identify operating changes that should be made, and provide the public with the assurance that their dollars are being spent wisely. Decision-makers and project planners alike should use the comprehensive congestion data to describe the problems and solutions in ways that resonate with traveler experiences and frustrations.

All of the potential congestion-reducing strategies are needed. Getting more productivity out of the existing road and public transportation systems is vital to reducing congestion and improving travel time reliability. Businesses and employees can use a variety of strategies to modify their times and modes of travel to avoid the peak periods or to use less vehicle travel and more electronic “travel.” In many corridors, however, there is a need for additional capacity to move people and freight more rapidly and reliably.

The good news from the *2012 Urban Mobility Report* is that the data can improve decisions and the methods used to communicate the effects of actions. The information can be used to study congestion problems in detail and decide how to fund and implement projects, programs and policies to attack the problems. And because the data relate to everyone’s travel experiences, the measures are relatively easy to understand and use to develop solutions that satisfy the transportation needs of a range of travelers, freight shippers, manufacturers and others.

National Congestion Tables

Table 1. What Congestion Means to You, 2011

Urban Area	Yearly Delay per Auto Commuter		Travel Time Index		Excess Fuel per Auto Commuter		Congestion Cost per Auto Commuter	
	Hours	Rank	Value	Rank	Gallons	Rank	Dollars	Rank
Very Large Average (15 areas)	**52**		**1.27**		**24**		**1,128**	
Washington DC-VA-MD	67	1	1.32	4	32	1	1,398	1
Los Angeles-Long Beach-Santa Ana CA	61	2	1.37	1	27	3	1,300	2
San Francisco-Oakland CA	61	2	1.22	23	25	6	1,266	4
New York-Newark NY-NJ-CT	59	4	1.33	3	28	2	1,281	3
Boston MA-NH-RI	53	5	1.28	6	26	4	1,147	6
Houston TX	52	6	1.26	10	23	12	1,090	8
Atlanta GA	51	7	1.24	17	23	12	1,120	7
Chicago IL-IN	51	7	1.25	14	24	8	1,153	5
Philadelphia PA-NJ-DE-MD	48	9	1.26	10	23	12	1,018	12
Seattle WA	48	9	1.26	10	22	15	1,050	10
Miami FL	47	11	1.25	14	25	6	993	13
Dallas-Fort Worth-Arlington TX	45	13	1.26	10	20	19	957	15
Detroit MI	40	25	1.18	37	18	30	859	27
San Diego CA	37	37	1.18	37	15	48	774	41
Phoenix-Mesa AZ	35	40	1.18	37	20	19	837	30

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
Medium Urban Areas—over 500,000 and less than 1 million population.
Small Urban Areas—less than 500,000 population.
Yearly Delay per Auto Commuter—Extra travel time during the year divided by the number of people who commute in private vehicles in the urban area.
Travel Time Index—The ratio of travel time in the peak period to the travel time at free-flow conditions. A value of 1.30 indicates a 20-minute free-flow trip takes 26 minutes in the peak period.
Excess Fuel Consumed—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.
Congestion Cost—Value of travel time delay (estimated at $16.79 per hour of person travel and $86.81 per hour of truck time) and excess fuel consumption (estimated using state average cost per gallon for gasoline and diesel).
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 1. What Congestion Means to You, 2011, Continued

Urban Area	Yearly Delay per Auto Commuter		Travel Time Index		Excess Fuel per Auto Commuter		Congestion Cost per Auto Commuter	
	Hours	Rank	Value	Rank	Gallons	Rank	Dollars	Rank
Large Average (32 areas)	**37**		**1.20**		**17**		**780**	
Nashville-Davidson TN	47	11	1.23	20	24	8	1,034	11
Denver-Aurora CO	45	13	1.27	8	20	19	937	16
Orlando FL	45	13	1.20	27	22	15	984	14
Austin TX	44	17	1.32	4	20	19	930	18
Las Vegas NV	44	17	1.20	27	21	17	906	23
Portland OR-WA	44	17	1.28	6	21	17	937	16
Virginia Beach VA	43	20	1.20	27	19	24	877	26
Baltimore MD	41	23	1.23	20	19	24	908	22
Indianapolis IN	41	23	1.17	47	19	24	930	18
Charlotte NC-SC	40	25	1.20	27	20	19	898	25
Columbus OH	40	25	1.18	37	18	30	847	29
Pittsburgh PA	39	28	1.24	17	18	30	826	32
San Jose CA	39	28	1.24	17	17	40	800	35
Memphis TN-MS-AR	38	30	1.18	37	19	24	833	31
Riverside-San Bernardino CA	38	30	1.23	20	16	43	854	28
San Antonio TX	38	30	1.19	35	16	43	787	38
Tampa-St. Petersburg FL	38	30	1.20	27	18	30	791	37
Cincinnati OH-KY-IN	37	37	1.20	27	18	30	814	33
Louisville KY-IN	35	40	1.18	37	17	40	776	40
Minneapolis-St. Paul MN	34	44	1.21	25	12	69	695	45
Buffalo NY	33	45	1.17	47	18	30	718	43
Sacramento CA	32	47	1.20	27	13	60	669	50
Cleveland OH	31	50	1.16	51	15	48	642	57
St. Louis MO-IL	31	50	1.14	61	13	60	686	47
Jacksonville FL	30	53	1.14	61	13	60	635	58
Providence RI-MA	30	53	1.16	51	15	48	611	62
Salt Lake City UT	30	53	1.14	61	13	60	620	61
San Juan PR	29	60	1.25	14	15	48	625	60
Milwaukee WI	28	63	1.15	57	12	69	585	67
New Orleans LA	28	63	1.20	27	13	60	629	59
Kansas City MO-KS	27	68	1.13	68	12	69	584	68
Raleigh-Durham NC	23	83	1.14	61	11	80	502	82

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
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Yearly Delay per Auto Commuter—Extra travel time during the year divided by the number of people who commute in private vehicles in the urban area.
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Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 1. What Congestion Means to You, 2011, Continued

Urban Area	Yearly Delay per Auto Commuter		Travel Time Index		Excess Fuel per Auto Commuter		Congestion Cost per Auto Commuter	
	Hours	Rank	Value	Rank	Gallons	Rank	Dollars	Rank
Medium Average (33 areas)	**29**		**1.15**		**14**		**628**	
Honolulu HI	45	13	1.36	2	24	8	928	20
Baton Rouge LA	42	21	1.22	23	26	4	1,052	9
Bridgeport-Stamford CT-NY	42	21	1.27	8	19	24	902	24
Hartford CT	38	30	1.18	37	18	30	781	39
Oklahoma City OK	38	30	1.15	57	18	30	803	34
Tucson AZ	38	30	1.16	51	24	8	921	21
Knoxville TN	37	37	1.16	51	18	30	792	36
Birmingham AL	35	40	1.19	35	18	30	773	42
New Haven CT	35	40	1.17	47	16	43	717	44
El Paso TX-NM	32	47	1.21	25	17	40	688	46
Tulsa OK	32	47	1.12	74	15	48	668	51
Albany NY	31	50	1.16	51	19	24	682	48
Allentown-Bethlehem PA-NJ	30	53	1.17	47	14	57	656	54
Charleston-North Charleston SC	30	53	1.15	57	14	57	647	55
Albuquerque NM	29	60	1.10	87	15	48	658	53
Richmond VA	29	60	1.11	79	12	69	581	69
McAllen TX	28	63	1.16	51	16	43	599	63
Rochester NY	28	63	1.13	68	13	60	590	65
Springfield MA-CT	28	63	1.13	68	15	48	575	71
Colorado Springs CO	26	71	1.13	68	11	80	530	78
Oxnard CA	26	71	1.10	87	10	86	543	75
Toledo OH-MI	26	71	1.13	68	12	69	555	73
Poughkeepsie-Newburgh NY	25	75	1.12	74	13	60	531	76
Dayton OH	24	80	1.11	79	12	69	507	81
Grand Rapids MI	24	80	1.09	93	11	80	501	83
Omaha NE-IA	24	80	1.11	79	11	80	494	84
Akron OH	23	83	1.12	74	10	86	483	85
Sarasota-Bradenton FL	21	88	1.12	74	11	80	444	87
Wichita KS	20	89	1.09	93	8	91	405	92
Fresno CA	15	95	1.08	95	7	95	337	94
Indio-Cathedral City-Palm Springs CA	15	95	1.08	95	7	95	331	96
Lancaster-Palmdale CA	15	95	1.08	95	6	97	317	97
Bakersfield CA	12	100	1.11	79	6	97	298	98

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
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Yearly Delay per Auto Commuter—Extra travel time during the year divided by the number of people who commute in private vehicles in the urban area.
Travel Time Index—The ratio of travel time in the peak period to the travel time at free-flow conditions. A value of 1.30 indicates a 20-minute free-flow trip takes 26 minutes in the peak period.
Excess Fuel Consumed—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.
Congestion Cost—Value of travel time delay (estimated at $16.79 per hour of person travel and $86.81 per hour of truck time) and excess fuel consumption (estimated using state average cost per gallon for gasoline and diesel).
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 1. What Congestion Means to You, 2011, Continued

Urban Area	Yearly Delay per Auto Commuter		Travel Time Index		Excess Fuel per Auto Commuter		Congestion Cost per Auto Commuter	
	Hours	Rank	Value	Rank	Gallons	Rank	Dollars	Rank
Small Average (21 areas)	**23**		**1.11**		**11**		**497**	
Worcester MA-CT	33	45	1.13	68	16	43	677	49
Cape Coral FL	30	53	1.15	57	15	48	645	56
Columbia SC	30	53	1.11	79	14	57	663	52
Greensboro NC	27	68	1.10	87	12	69	588	66
Salem OR	27	68	1.14	61	12	69	580	70
Little Rock AR	26	71	1.07	99	12	69	545	74
Beaumont TX	25	75	1.10	87	12	69	531	76
Brownsville TX	25	75	1.18	37	15	48	565	72
Jackson MS	25	75	1.10	87	13	60	594	64
Provo-Orem UT	25	75	1.14	61	10	86	514	80
Spokane WA-ID	23	83	1.12	74	13	60	518	79
Boulder CO	22	86	1.18	37	12	69	436	88
Pensacola FL-AL	22	86	1.11	79	11	80	463	86
Madison WI	20	89	1.11	79	10	86	436	88
Winston-Salem NC	20	89	1.11	79	9	90	435	90
Laredo TX	19	92	1.14	61	8	91	418	91
Anchorage AK	17	93	1.18	37	8	91	367	93
Boise ID	16	94	1.06	100	8	91	334	95
Corpus Christi TX	14	98	1.04	101	6	97	287	100
Eugene OR	13	99	1.08	95	6	97	284	101
Stockton CA	12	100	1.10	87	5	101	293	99
101 Area Average	**43**		**1.23**		**20**		**922**	
Remaining Areas Average	**21**		**1.10**		**18**		**486**	
All 498 Area Average	**38**		**1.18**		**19**		**818**	

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Yearly Delay per Auto Commuter—Extra travel time during the year divided by the number of people who commute in private vehicles in the urban area.
Travel Time Index—The ratio of travel time in the peak period to the travel time at free-flow conditions. A value of 1.30 indicates a 20-minute free-flow trip takes 26 minutes in the peak period.
Excess Fuel Consumed—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.
Congestion Cost—Value of travel time delay (estimated at $16.79 per hour of person travel and $86.81 per hour of truck time) and excess fuel consumption (estimated using state average cost per gallon for gasoline and diesel).
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 2. What Congestion Means to Your Town, 2011

Urban Area	*Travel Delay*		*Excess Fuel Consumed*		*Truck Congestion Cost*		*Total Congestion Cost*	
	(1,000 Hours)	Rank	(1,000 Gallons)	Rank	($ million)	Rank	($ million)	Rank
Very Large Average (15 areas)	**195,831**		**90,936**		**933**		**4,253**	
New York-Newark NY-NJ-CT	544,063	1	255,798	1	2,541	1	11,837	1
Los Angeles-Long Beach-Santa Ana CA	501,881	2	219,710	2	2,290	2	10,785	2
Chicago IL-IN	271,718	3	127,016	3	1,716	3	6,214	3
Washington DC-VA-MD	179,331	4	85,103	5	656	8	3,771	4
Miami FL	174,612	5	93,863	4	739	5	3,749	5
Dallas-Fort Worth-Arlington TX	167,718	6	74,806	7	734	6	3,578	6
Philadelphia PA-NJ-DE-MD	156,027	7	75,558	6	730	7	3,387	7
San Francisco-Oakland CA	155,157	8	64,509	10	643	10	3,279	8
Houston TX	145,832	9	65,852	9	646	9	3,120	10
Atlanta GA	142,041	10	63,521	11	775	4	3,135	9
Boston MA-NH-RI	136,966	11	66,615	8	561	12	2,922	11
Detroit MI	106,434	12	48,705	12	475	14	2,287	12
Seattle WA	100,802	13	47,156	13	546	13	2,241	13
Phoenix-Mesa AZ	82,554	14	46,166	14	627	11	1,969	14
San Diego CA	72,331	16	29,666	18	314	17	1,537	17

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Travel Delay—Value of extra travel time during the year (estimated at $16.79 per hour of person travel).
Excess Fuel Consumed—Value of increased fuel consumption due to travel in congested conditions rather than free-flow conditions (estimated using state average cost per gallon).
Truck Congestion Cost—Value of increased travel time and other operating costs of large trucks (estimated at $86.81 per hour of truck time) and the extra diesel consumed (estimated using state average cost per gallon).
Congestion Cost—Value of delay, fuel and truck congestion cost.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 2. What Congestion Means to Your Town, 2011, Continued

Urban Area	Travel Delay		Excess Fuel Consumed		Truck Congestion Cost		Total Congestion Cost	
	(1,000 Hours)	Rank	(1,000 Gallons)	Rank	($ million)	Rank	($ million)	Rank
Large Average (32 areas)	**39,747**		**18,265**		**182**		**856**	
Denver-Aurora CO	76,154	15	34,510	15	316	16	1,612	15
Baltimore MD	70,263	17	33,060	16	379	15	1,557	16
Tampa-St. Petersburg FL	62,876	18	30,539	17	246	21	1,325	18
Minneapolis-St. Paul MN	60,788	19	22,100	22	232	24	1,260	19
Portland OR-WA	51,987	20	24,949	19	244	22	1,130	21
Riverside-San Bernardino CA	51,195	21	21,243	26	310	18	1,152	20
St. Louis MO-IL	49,605	22	21,572	23	300	19	1,116	22
San Jose CA	47,385	23	20,028	28	153	33	971	26
Pittsburgh PA	46,725	24	21,443	25	213	26	1,007	24
Orlando FL	46,607	25	23,336	21	248	20	1,031	23
Virginia Beach VA	46,172	26	19,633	29	131	41	932	28
San Juan PR	45,991	27	24,095	20	176	28	980	25
Las Vegas NV	45,419	28	21,491	24	137	40	931	29
Cincinnati OH-KY-IN	42,785	29	20,783	27	230	25	947	27
San Antonio TX	39,998	30	16,776	33	139	39	825	31
Sacramento CA	39,138	31	16,384	35	172	29	834	30
Austin TX	38,307	32	17,075	32	157	31	810	33
Nashville-Davidson TN	35,781	33	18,652	30	199	27	801	34
Columbus OH	35,689	34	15,494	36	145	37	753	35
Indianapolis IN	35,186	35	16,748	34	241	23	817	32
Cleveland OH	34,980	36	17,481	31	130	43	736	36
Kansas City MO-KS	29,448	37	12,660	39	148	35	640	38
Charlotte NC-SC	28,974	38	14,599	37	168	30	653	37
Memphis TN-MS-AR	28,700	39	14,440	38	153	33	636	39
Milwaukee WI	27,755	40	11,797	45	131	41	599	40
Louisville KY-IN	26,253	42	12,507	40	145	37	584	41
Providence RI-MA	24,618	44	12,148	42	69	55	503	44
Jacksonville FL	22,629	46	10,300	50	103	48	486	45
Salt Lake City UT	21,903	47	9,266	53	71	54	449	50
Buffalo NY	21,545	48	11,611	46	102	49	474	47
New Orleans LA	19,125	52	9,353	52	127	44	441	51
Raleigh-Durham NC	17,923	54	8,407	55	96	50	396	55

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Table 2. What Congestion Means to Your Town, 2011, Continued

Urban Area	Travel Delay		Excess Fuel Consumed		Truck Congestion Cost		Total Congestion Cost	
	(1,000 Hours)	Rank	(1,000 Gallons)	Rank	($ million)	Rank	($ million)	Rank
Medium Average (33 areas)	**13,516**		**6,634**		**62**		**293**	
Bridgeport-Stamford CT-NY	26,503	41	12,226	41	111	46	566	42
Oklahoma City OK	25,182	43	12,035	44	115	45	543	43
Hartford CT	22,995	45	11,299	47	75	53	479	46
Birmingham AL	20,903	49	10,304	49	107	47	458	49
Honolulu HI	20,873	50	11,298	48	53	65	427	52
Richmond VA	19,499	51	7,944	57	62	61	398	54
Tucson AZ	19,078	53	12,125	43	155	32	466	48
Baton Rouge LA	17,122	55	10,201	51	148	35	424	53
El Paso TX-NM	15,990	56	8,500	54	81	52	353	56
Tulsa OK	15,500	57	7,242	58	67	57	331	57
Rochester NY	14,850	58	6,719	60	51	68	309	58
New Haven CT	14,560	59	6,966	59	50	69	304	59
Allentown-Bethlehem PA-NJ	13,247	60	6,339	64	69	55	292	61
Knoxville TN	13,247	60	6,339	64	63	59	287	63
Albany NY	13,092	62	8,032	56	64	58	293	60
Albuquerque NM	12,488	63	6,408	62	82	51	288	62
Oxnard CA	12,445	64	5,029	71	55	64	265	64
Dayton OH	12,442	65	6,106	66	52	67	265	64
Springfield MA-CT	12,084	66	6,403	63	40	78	253	66
McAllen TX	11,469	67	6,487	61	44	71	245	67
Charleston-North Charleston SC	10,885	68	5,108	70	58	62	240	68
Omaha NE-IA	10,721	69	4,737	74	32	86	219	72
Sarasota-Bradenton FL	10,523	70	5,301	67	41	75	222	70
Grand Rapids MI	10,016	73	4,572	75	44	71	215	73
Colorado Springs CO	9,941	75	4,128	78	36	81	205	77
Akron OH	9,789	76	4,147	77	44	71	209	76
Poughkeepsie-Newburgh NY	9,787	77	4,965	72	42	74	212	74
Toledo OH-MI	9,195	78	4,176	76	48	70	202	78
Fresno CA	7,376	82	3,124	83	41	75	164	82
Wichita KS	6,906	83	2,887	85	25	90	143	84
Lancaster-Palmdale CA	6,541	85	2,744	88	24	91	136	87
Indio-Cathedral City-Palm Springs CA	6,036	87	2,781	86	37	80	138	86
Bakersfield CA	4,752	91	2,240	92	41	75	117	91

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Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 2. What Congestion Means to Your Town, 2011, Continued

Urban Area	Travel Delay		Excess Fuel Consumed		Truck Congestion Cost		Total Congestion Cost	
	(1,000 Hours)	Rank	(1,000 Gallons)	Rank	($ million)	Rank	($ million)	Rank
Small Average (21 areas)	**5,586**		**2,702**		**29**		**123**	
Worcester MA-CT	10,139	71	5,117	69	35	82	212	74
Columbia SC	10,081	72	4,850	73	58	62	225	69
Cape Coral FL	9,964	74	5,118	68	53	65	220	71
Provo-Orem UT	8,312	79	3,459	81	30	87	172	80
Little Rock AR	8,132	80	3,591	80	33	85	171	81
Jackson MS	7,535	81	4,024	79	63	59	183	79
Greensboro NC	6,625	84	3,005	84	35	82	146	83
Spokane WA-ID	6,107	86	3,457	82	38	79	141	85
Pensacola FL-AL	5,655	88	2,755	87	22	94	119	88
Winston-Salem NC	5,385	89	2,456	90	29	88	119	88
Madison WI	5,349	90	2,609	89	29	88	119	88
Salem OR	4,593	92	2,106	93	24	91	101	92
Beaumont TX	4,205	93	2,089	94	19	96	91	93
Brownsville TX	3,697	94	2,292	91	23	93	85	95
Boise ID	3,636	95	1,662	96	10	100	74	97
Anchorage AK	3,627	96	1,770	95	16	97	78	96
Stockton CA	3,519	97	1,415	98	35	82	90	94
Corpus Christi TX	3,160	98	1,340	99	14	98	67	99
Laredo TX	3,074	99	1,423	97	20	95	71	98
Eugene OR	2,271	100	1,002	101	14	98	51	100
Boulder CO	2,237	101	1,193	100	5	101	45	101
101 Area Total	**4,772,711**		**2,224,165**		**22,460**		**103,405**	
101 Area Average	**47,255**		**22,021**		**222**		**1,024**	
Remaining Area Total	**747,494**		**660,020**		**4,580**		**17,781**	
Remaining Area Average	**1,883**		**1,663**		**12**		**45**	
All 498 Area Total	**5,520,205**		**2,884,185**		**27,042**		**121,188**	
All 498 Area Average	**11,085**		**5,792**		**54**		**243**	

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Congestion Cost—Value of delay, fuel and truck congestion cost.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 3. How Reliable is Freeway Travel in Your Town, 2011

Urban Area	Freeway Planning Time Index				Freeway Travel Time Index	
	PTI		PTI_{80}		TTI	
	Value	Rank	Value	Rank	Value	Rank
Very Large Average (15 areas)	**4.08**		**2.03**		**1.31**	
Washington DC-VA-MD	5.72	1	2.56	1	1.38	4
Los Angeles-Long Beach-Santa Ana CA	4.95	2	2.50	2	1.54	1
New York-Newark NY-NJ-CT	4.44	3	2.13	6	1.32	6
Boston MA-NH-RI	4.25	8	2.02	8	1.29	10
Dallas-Fort Worth-Arlington TX	4.00	11	1.94	14	1.29	10
Seattle WA	3.99	12	2.02	8	1.31	8
Chicago IL-IN	3.95	13	2.02	8	1.30	9
San Francisco-Oakland CA	3.74	17	2.00	12	1.28	14
Atlanta GA	3.71	19	1.79	21	1.23	24
Houston TX	3.67	21	1.84	19	1.28	14
Miami FL	3.60	23	1.72	28	1.20	28
Philadelphia PA-NJ-DE-MD	3.46	24	1.75	27	1.22	26
Detroit MI	3.22	30	1.63	36	1.17	35
Phoenix-Mesa AZ	3.19	33	1.63	36	1.18	33
San Diego CA	2.90	48	1.66	31	1.20	28

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Planning Time Index—A travel time reliability measure that represents the total travel time that should be planned for a trip. Computed with the 95th percentile travel time, it represents the amount of time that should be planned for a trip to be late for only 1 day a month. Computed with the 80th percentile travel time (PTI_{80}), it represents the amount of time that should be planned for a trip to be late for only 1 day a week. A PTI of 3.00 means that for a 20-minute trip in light traffic, 60 minutes should be planned (20 minutes x 3.00 = 60 minutes).

Travel Time Index—The ratio of travel time in the peak period to the travel time at free-flow conditions. A value of 1.30 indicates a 20-minute free-flow trip takes 26 minutes in the peak period (20 minutes x 1.30 = 26 minutes). Note that the TTI reported in Table 3 is only for freeway facilities to compare to the freeway-only PTI values in Table 3. Note that the TTI value in Table 1 includes both arterial and freeway roads.

Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.

Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas. Note that only 1 year of PTI values are available at this time.

Table 3. How Reliable is Freeway Travel in Your Town, 2011, Continued

Urban Area	Freeway Planning Time Index				Freeway Travel Time Index	
	PTI		PTI_{80}		TTI	
	Value	Rank	Value	Rank	Value	Rank
Large Average (32 areas)	**3.12**		**1.66**		**1.20**	
Austin TX	4.26	6	2.15	4	1.40	3
Portland OR-WA	4.26	6	2.15	4	1.34	5
Denver-Aurora CO	4.08	9	2.01	11	1.32	6
San Juan PR	4.06	10	1.96	13	1.29	10
Baltimore MD	3.81	15	1.88	16	1.23	24
New Orleans LA	3.80	16	1.88	16	1.25	19
Nashville-Davidson TN	3.63	22	1.79	21	1.20	28
San Jose CA	3.45	25	1.93	15	1.29	10
Virginia Beach VA	3.41	26	1.65	33	1.17	35
Riverside-San Bernardino CA	3.31	28	1.81	20	1.27	17
Charlotte NC-SC	3.20	31	1.61	39	1.15	42
Cincinnati OH-KY-IN	3.20	31	1.65	33	1.19	31
Milwaukee WI	3.15	34	1.66	31	1.18	33
Las Vegas NV	3.14	35	1.63	36	1.17	35
Minneapolis-St. Paul MN	3.14	35	1.79	21	1.27	17
Pittsburgh PA	3.14	35	1.77	26	1.24	21
Louisville KY-IN	3.09	38	1.64	35	1.16	39
Sacramento CA	3.01	41	1.68	30	1.24	21
Memphis TN-MS-AR	3.00	43	1.53	46	1.16	39
San Antonio TX	2.91	47	1.60	40	1.19	31
Tampa-St. Petersburg FL	2.90	48	1.54	44	1.15	42
Columbus OH	2.86	50	1.51	50	1.14	47
Providence RI-MA	2.86	50	1.55	43	1.15	42
Buffalo NY	2.79	52	1.48	52	1.15	42
Kansas City MO-KS	2.64	55	1.44	57	1.12	63
St. Louis MO-IL	2.64	55	1.44	57	1.13	56
Orlando FL	2.58	59	1.42	60	1.13	56
Indianapolis IN	2.50	62	1.41	61	1.16	39
Cleveland OH	2.49	63	1.48	52	1.14	47
Jacksonville FL	2.45	65	1.35	67	1.10	68
Raleigh-Durham NC	2.34	68	1.33	68	1.07	80
Salt Lake City UT	2.02	84	1.30	76	1.08	76

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Planning Time Index—A travel time reliability measure that represents the total travel time that should be planned for a trip. Computed with the 95th percentile travel time, it represents the amount of time that should be planned for a trip to be late for only 1 day a month. Computed with the 80th percentile travel time (PTI_{80}), it represents the amount of time that should be planned for a trip to be late for only 1 day a week. A PTI of 3.00 means that for a 20-minute trip in light traffic, 60 minutes should be planned (20 minutes x 3.00 = 60 minutes).

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Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 3. How Reliable is Freeway Travel in Your Town, 2011, Continued

Urban Area	Freeway Planning Time Index				Freeway Travel Time Index	
	PTI		PTI_{80}		TTI	
	Value	Rank	Value	Rank	Value	Rank
Medium Average (33 areas)	**2.66**		**1.47**		**1.13**	
Bridgeport-Stamford CT-NY	4.40	4	2.05	7	1.28	14
Honolulu HI	3.92	14	2.25	3	1.41	2
Baton Rouge LA	3.74	17	1.87	18	1.25	19
El Paso TX-NM	3.37	27	1.70	29	1.24	21
Charleston-North Charleston SC	3.24	29	1.56	41	1.13	56
Colorado Springs CO	3.06	39	1.47	55	1.13	56
New Haven CT	3.02	40	1.56	41	1.13	56
McAllen TX	3.01	41	1.44	57	1.14	47
Birmingham AL	2.97	44	1.52	48	1.14	47
Hartford CT	2.79	52	1.53	46	1.13	56
Albuquerque NM	2.70	54	1.52	48	1.04	95
Toledo OH-MI	2.64	55	1.37	66	1.10	68
Allentown-Bethlehem PA-NJ	2.61	58	1.39	64	1.14	47
Albany NY	2.57	60	1.40	63	1.10	68
Wichita KS	2.57	60	1.31	73	1.08	76
Oklahoma City OK	2.48	64	1.46	56	1.14	47
Oxnard CA	2.44	66	1.48	52	1.14	47
Dayton OH	2.37	67	1.31	73	1.07	80
Bakersfield CA	2.28	70	1.33	68	1.14	47
Akron OH	2.23	71	1.33	68	1.10	68
Richmond VA	2.22	72	1.28	80	1.07	80
Springfield MA-CT	2.16	76	1.27	82	1.06	89
Omaha NE-IA	2.15	77	1.29	78	1.08	76
Poughkeepsie-Newburgh NY	2.13	79	1.21	91	1.05	92
Tulsa OK	2.07	81	1.31	73	1.09	73
Tucson AZ	2.06	83	1.24	88	1.07	80
Knoxville TN	2.02	84	1.33	68	1.13	56
Grand Rapids MI	1.99	86	1.26	84	1.05	92
Rochester NY	1.96	87	1.28	80	1.08	76
Indio-Cathedral City-Palm Springs CA	1.88	90	1.21	91	1.10	68
Fresno CA	1.79	92	1.23	89	1.09	73
Sarasota-Bradenton FL	1.49	97	1.05	101	1.01	101
Lancaster-Palmdale CA	1.48	98	1.18	94	1.07	80

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Table 3. How Reliable is Freeway Travel in Your Town, 2011, Continued

Urban Area	Freeway Planning Time Index				Freeway Travel Time Index	
	PTI		PTI_{80}		TTI	
	Value	Rank	Value	Rank	Value	Rank
Small Average (21 areas)	**2.09**		**1.27**		**1.07**	
Provo-Orem UT	4.39	5	1.54	44	1.11	64
Boulder CO	3.68	20	1.79	21	1.17	35
Spokane WA-ID	2.95	45	1.51	50	1.15	42
Anchorage AK	2.93	46	1.79	21	1.22	26
Madison WI	2.30	69	1.38	65	1.09	73
Worcester MA-CT	2.21	73	1.30	76	1.07	80
Jackson MS	2.20	74	1.27	82	1.06	89
Little Rock AR	2.20	74	1.33	68	1.05	92
Salem OR	2.15	77	1.29	78	1.11	64
Winston-Salem NC	2.09	80	1.25	86	1.07	80
Laredo TX	2.07	81	1.41	61	1.14	47
Columbia SC	1.95	88	1.21	91	1.06	89
Beaumont TX	1.90	89	1.22	90	1.07	80
Cape Coral FL	1.86	91	1.13	98	1.02	98
Stockton CA	1.74	93	1.25	86	1.11	64
Eugene OR	1.73	94	1.26	84	1.11	64
Boise ID	1.67	95	1.17	96	1.03	96
Greensboro NC	1.59	96	1.14	97	1.03	96
Brownsville TX	1.46	99	1.18	94	1.07	80
Corpus Christi TX	1.44	100	1.10	99	1.02	98
Pensacola FL-AL	1.31	101	1.09	100	1.02	98
101 Area Average	**3.54**		**1.82**		**1.25**	
Remaining Area Average	**2.09**		**1.27**		**1.07**	
All 498 Area Average	**3.09**		**1.65**		**1.19**	

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Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 4. Annual Urban Area CO_2 Production on Freeways and Arterial Streets, 2011

Urban Area	Pounds per Auto Commuter (CO_2 Produced During Congestion Only)	Rank	Pounds (millions) (CO_2 Produced During Congestion Only)	Rank	Pounds (millions) (CO_2 Produced During Free-flow)	Rank	Percent of CO_2 Production During Congestion Relative to Free-Flow
Very Large Average (15 areas)	**464**		**1,747**		**38,692**		**4.5**
Washington DC-VA-MD	631	1	1,703	5	29,916	9	5.7
New York-Newark NY-NJ-CT	557	2	5,146	1	76,858	2	6.7
Boston MA-NH-RI	526	3	1,338	8	26,161	12	5.1
San Francisco-Oakland CA	503	5	1,298	10	44,642	4	2.9
Miami FL	498	6	1,885	4	33,583	8	5.6
Houston TX	463	10	1,324	9	34,175	7	3.9
Atlanta GA	462	11	1,284	11	34,442	6	3.7
Philadelphia PA-NJ-DE-MD	458	12	1,520	6	28,549	10	5.3
Seattle WA	447	14	955	13	21,696	14	4.4
Los Angeles-Long Beach-Santa Ana CA	436	15	3,578	2	84,264	1	4.2
Chicago IL-IN	434	16	2,320	3	53,395	3	4.3
Dallas-Fort Worth-Arlington TX	405	20	1,505	7	39,098	5	3.8
Phoenix-Mesa AZ	401	22	944	14	25,668	13	3.7
Detroit MI	370	30	982	12	28,024	11	3.5
San Diego CA	218	76	427	25	19,905	15	2.1

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Small Urban Areas—less than 500,000 population.

A number of assumptions are in the model using national-level data as inputs. This allows for a relatively simple and replicable methodology for 498 urban areas. More detailed and localized inputs should be used where available to improve local estimates of CO_2 production.

See the CO_2 emissions estimation methodology in the appendix for further details.

Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.

Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 4. Annual Additional CO_2 Production due to Roadway Congestion, 2011, continued

Urban Area	Pounds per Auto Commuter (CO_2 Produced During Congestion Only)	Rank	Pounds (millions) (CO_2 Produced During Congestion Only)	Rank	Pounds (millions) (CO_2 Produced During Free-flow)	Rank	Percent of CO_2 Production During Congestion Relative to Free-Flow
Large Average (32 areas)	**329**		**359**		**10,537**		**3.4**
Nashville-Davidson TN	491	7	377	28	10,638	29	3.5
Orlando FL	450	13	471	20	10,968	28	4.3
Las Vegas NV	417	17	429	24	9,358	34	4.6
Portland OR-WA	415	18	503	18	10,346	31	4.9
Charlotte NC-SC	412	19	296	36	9,012	38	3.3
Denver-Aurora CO	403	21	695	15	14,835	20	4.7
Austin TX	398	23	343	30	8,308	41	4.1
Indianapolis IN	393	24	340	31	11,314	25	3.0
Baltimore MD	392	25	667	16	16,029	18	4.2
Memphis TN-MS-AR	384	27	291	37	7,996	42	3.6
Virginia Beach VA	373	29	392	27	10,382	30	3.8
Tampa-St. Petersburg FL	366	32	613	17	14,924	19	4.1
Cincinnati OH-KY-IN	364	33	421	26	12,549	22	3.4
Buffalo NY	357	35	234	46	5,683	54	4.1
Pittsburgh PA	355	37	431	23	9,100	35	4.7
Columbus OH	353	39	311	34	10,153	32	3.1
Louisville KY-IN	340	40	253	40	8,311	40	3.0
San Antonio TX	323	44	336	33	11,637	24	2.9
Cleveland OH	308	46	350	29	11,079	27	3.2
San Juan PR	306	48	486	19	9,078	36	5.4
Providence RI-MA	293	51	242	43	7,506	45	3.2
St. Louis MO-IL	272	56	437	22	19,243	16	2.3
Jacksonville FL	271	57	207	51	7,777	43	2.7
New Orleans LA	270	58	190	52	4,980	57	3.8
Riverside-San Bernardino CA	257	60	339	32	13,471	21	2.5
Salt Lake City UT	257	60	185	53	5,534	55	3.3
Minneapolis-St. Paul MN	249	65	444	21	18,031	17	2.5
San Jose CA	249	65	302	35	11,113	26	2.7
Kansas City MO-KS	235	70	256	38	11,951	23	2.1
Milwaukee WI	232	74	237	45	9,046	37	2.6
Raleigh-Durham NC	217	77	170	55	6,779	47	2.5
Sacramento CA	207	84	254	39	10,047	33	2.5

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Table 4. Annual Additional CO2 Production due to Roadway Congestion, 2011, continued

Urban Area	Pounds per Auto Commuter (CO_2 Produced During Congestion Only)	Rank	Pounds (millions) (CO_2 Produced During Congestion Only)	Rank	Pounds (millions) (CO_2 Produced During Free-flow)	Rank	Percent of CO_2 Production During Congestion Relative to Free-Flow
Medium Average (33 areas)	**278**		**129**		**4,533**		**2.8**
Baton Rouge LA	526	3	210	49	5,791	52	3.6
Tucson AZ	491	7	248	41	6,053	50	4.1
Honolulu HI	485	9	225	48	3,254	79	6.9
Bridgeport-Stamford CT-NY	392	25	246	42	5,879	51	4.2
Albany NY	379	28	162	56	4,399	61	3.7
Hartford CT	368	31	226	47	6,620	49	3.4
Oklahoma City OK	362	34	242	43	8,642	39	2.8
Birmingham AL	356	36	208	50	6,775	48	3.1
Knoxville TN	355	37	128	62	4,356	62	2.9
El Paso TX-NM	335	41	171	54	4,341	63	3.9
New Haven CT	327	43	139	59	4,191	67	3.3
McAllen TX	320	45	130	61	3,359	76	3.9
Tulsa OK	298	50	145	58	5,765	53	2.5
Springfield MA-CT	292	52	128	62	4,023	69	3.2
Allentown-Bethlehem PA-NJ	289	54	128	62	4,020	70	3.2
Charleston-North Charleston SC	280	55	103	67	3,690	72	2.8
Rochester NY	257	60	134	60	4,252	66	3.2
Poughkeepsie-Newburgh NY	251	64	100	70	3,628	74	2.8
Dayton OH	235	70	123	65	5,291	56	2.3
Richmond VA	234	72	159	57	7,670	44	2.1
Toledo OH-MI	234	72	84	75	3,263	78	2.6
Omaha NE-IA	217	77	95	72	4,164	68	2.3
Grand Rapids MI	216	79	92	73	4,775	60	1.9
Colorado Springs CO	214	81	83	76	3,315	77	2.5
Sarasota-Bradenton FL	212	82	107	66	3,195	81	3.3
Akron OH	195	85	83	76	3,865	71	2.1
Oxnard CA	182	88	87	74	6,891	46	1.3
Albuquerque NM	170	90	74	79	4,826	59	1.5
Wichita KS	166	91	58	83	3,253	80	1.8
Bakersfield CA	118	95	45	89	2,684	84	1.7
Fresno CA	85	97	40	92	3,684	73	1.1
Indio-Cathedral City-Palm Springs CA	61	99	25	96	2,025	93	1.2
Lancaster-Palmdale CA	50	100	21	98	1,658	95	1.3

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Table 4. Annual Additional CO_2 Production due to Roadway Congestion, 2011, continued

Urban Area	Pounds per Auto Commuter (CO_2 Produced During Congestion Only)	Rank	Pounds (millions) (CO_2 Produced During Congestion Only)	Rank	Pounds (millions) (CO_2 Produced During Free-flow)	Rank	Percent of CO_2 Production During Congestion Relative to Free-Flow
Small Average (21 areas)	**209**		**51**		**2,355**		**2.2**
Worcester MA-CT	329	42	103	67	3,504	75	2.9
Brownsville TX	308	46	46	88	919	99	5.0
Cape Coral FL	302	49	103	67	2,815	83	3.7
Columbia SC	291	53	98	71	4,289	64	2.3
Jackson MS	269	59	83	76	4,254	65	2.0
Spokane WA-ID	257	60	70	80	2,448	86	2.9
Beaumont TX	248	67	42	90	2,374	89	1.8
Greensboro NC	245	68	60	82	2,995	82	2.0
Salem OR	244	69	42	90	1,365	96	3.1
Boulder CO	229	75	24	97	563	101	4.3
Pensacola FL-AL	215	80	55	84	2,285	91	2.4
Provo-Orem UT	208	83	69	81	2,395	88	2.9
Madison WI	194	86	53	85	2,310	90	2.3
Winston-Salem NC	183	87	50	86	2,437	87	2.1
Laredo TX	171	89	29	94	1,005	98	2.9
Little Rock AR	158	92	49	87	4,877	58	1.0
Anchorage AK	144	93	31	93	732	100	4.2
Boise ID	120	94	26	95	1,953	94	1.3
Eugene OR	114	96	20	99	1,324	97	1.5
Stockton CA	67	98	19	100	2,549	85	0.7
Corpus Christi TX	39	101	9	101	2,059	92	0.4
101 Area Total			**43,043**		**1,116,603**		**3.9**
101 Area Average	**385**		**426**		**11,055**		
Remaining Area Total			**13,352**		**641,134**		**2.1**
Remaining Area Average	**366**		**34**		**1,614**		
All 498 Area Total			**56,396**		**1,757,737**		**3.2**
All 498 Area Average	**380**		**113**		**3,529**		

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Table 5. Truck Commodity Value and Truck Delay, 2011

Urban Area	Total Annual Delay (1,000 Hours)	Total Annual Delay Rank	Annual Truck Delay (1,000 Hours)	Annual Truck Delay Rank	Congestion Cost ($ million)	Truck Commodity Value ($ million)	Truck Commodity Value Rank
Very Large Average (15 areas)	**195,831**		**12,292**		**933**	**208,893**	
New York-Newark NY-NJ-CT	544,063	1	33,433	1	2,541	481,177	1
Los Angeles-Long Beach-S. Ana CA	501,881	2	29,936	2	2,290	412,152	2
Chicago IL-IN	271,718	3	22,818	3	1,716	362,328	3
Atlanta GA	142,041	10	10,326	4	775	191,563	6
Dallas-Fort Worth-Arlington TX	167,718	6	9,750	5	734	230,466	5
Miami FL	174,612	5	9,682	6	739	155,425	9
Philadelphia PA-NJ-DE-MD	156,027	7	9,637	7	730	175,393	7
Washington DC-VA-MD	179,331	4	8,628	8	656	97,285	18
Houston TX	145,832	9	8,599	9	646	233,723	4
San Francisco-Oakland CA	155,157	8	8,442	10	643	132,539	11
Phoenix-Mesa AZ	82,554	14	8,213	11	627	131,234	12
Boston MA-NH-RI	136,966	11	7,372	12	561	129,308	13
Seattle WA	100,802	13	7,154	13	546	152,596	10
Detroit MI	106,434	12	6,266	14	475	161,391	8
San Diego CA	72,331	16	4,123	18	314	86,817	20

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Travel Delay—Travel time above that needed to complete a trip at free-flow speeds for all vehicles.
Truck Delay—Travel time above that needed to complete a trip at free-flow speeds for large trucks.
Truck Commodity Value—Value of all commodities moved by truck estimated to be traveling in the urban area.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
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Table 5. Truck Commodity Value and Truck Delay, 2011, continued

Urban Area	Total Annual Delay		Annual Truck Delay			Truck Commodity Value	
	(1,000 Hours)	Rank	(1,000 Hours)	Rank	Congestion Cost ($million)	($ million)	Rank
Large Average (32 areas)	**39,747**		**2,402**		**182**	**63,077**	
Baltimore MD	70,263	17	5,017	15	379	96,445	19
Denver-Aurora CO	76,154	15	4,162	16	316	76,748	22
Riverside-San Bernardino CA	51,195	21	4,124	17	310	109,604	14
St. Louis MO-IL	49,605	22	4,028	19	300	107,500	15
Orlando FL	46,607	25	3,265	20	248	63,858	32
Tampa-St. Petersburg FL	62,876	18	3,223	21	246	62,643	33
Indianapolis IN	35,186	35	3,222	22	241	85,407	21
Portland OR-WA	51,987	20	3,178	23	244	65,610	30
Minneapolis-St. Paul MN	60,788	19	3,110	24	232	97,828	17
Cincinnati OH-KY-IN	42,785	29	3,039	25	230	65,182	31
Pittsburgh PA	46,725	24	2,833	26	213	70,352	25
Nashville-Davidson TN	35,781	33	2,635	27	199	66,124	29
Sacramento CA	39,138	31	2,268	28	172	52,561	37
Charlotte NC-SC	28,974	38	2,222	29	168	69,136	26
San Juan PR	45,991	27	2,213	30	176	23,406	60
Austin TX	38,307	32	2,083	31	157	33,256	52
Memphis TN-MS-AR	28,700	39	2,027	32	153	99,459	16
San Jose CA	47,385	23	1,990	34	153	52,751	36
Kansas City MO-KS	29,448	37	1,974	35	148	72,882	23
Columbus OH	35,689	34	1,944	36	145	70,584	24
Louisville KY-IN	26,253	42	1,930	38	145	55,941	35
San Antonio TX	39,998	30	1,865	39	139	51,263	39
Las Vegas NV	45,419	28	1,806	40	137	36,032	49
Milwaukee WI	27,755	40	1,746	41	131	67,328	28
Virginia Beach VA	46,172	26	1,741	42	131	43,521	42
Cleveland OH	34,980	36	1,729	43	130	68,720	27
New Orleans LA	19,125	52	1,690	44	127	34,397	50
Jacksonville FL	22,629	46	1,366	48	103	42,002	44
Buffalo NY	21,545	48	1,315	49	102	48,933	41
Raleigh-Durham NC	17,923	54	1,268	50	96	50,194	40
Salt Lake City UT	21,903	47	949	54	71	56,934	34
Providence RI-MA	24,618	44	893	56	69	21,863	61

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Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas

Table 5. Truck Commodity Value and Truck Delay, 2011, continued

Urban Area	Total Annual Delay		Annual Truck Delay			Truck Commodity Value	
	(1,000 Hours)	Rank	(1,000 Hours)	Rank	Congestion Cost ($ million)	($ million)	Rank
Medium Average (33 areas)	**13,516**		**822**		**62**	**18,666**	
Tucson AZ	19,078	53	2,014	33	155	28,934	58
Baton Rouge LA	17,122	55	1,940	37	148	32,671	54
Oklahoma City OK	25,182	43	1,531	45	115	38,161	46
Bridgeport-Stamford CT-NY	26,503	41	1,465	46	111	11,199	73
Birmingham AL	20,903	49	1,415	47	107	38,716	45
Albuquerque NM	12,488	63	1,083	51	82	14,125	67
El Paso TX-NM	15,990	56	1,071	52	81	32,105	55
Hartford CT	22,995	45	983	53	75	42,754	43
Allentown-Bethlehem PA-NJ	13,247	60	912	55	69	16,118	65
Tulsa OK	15,500	57	888	57	67	29,127	57
Richmond VA	19,499	51	839	58	62	38,036	47
Knoxville TN	13,247	60	831	59	63	12,104	72
Albany NY	13,092	62	820	60	64	33,017	53
Charleston-North Charleston SC	10,885	68	774	62	58	10,677	76
Oxnard CA	12,445	64	723	64	55	9,320	82
Dayton OH	12,442	65	686	66	52	34,109	51
Honolulu HI	20,873	50	668	67	53	10,246	78
Rochester NY	14,850	58	667	68	51	26,369	59
New Haven CT	14,560	59	660	69	50	8,271	86
Toledo OH-MI	9,195	78	648	70	48	11,123	74
Akron OH	9,789	76	590	71	44	9,983	80
Grand Rapids MI	10,016	73	578	72	44	38,029	48
McAllen TX	11,469	67	578	72	44	7,788	88
Bakersfield CA	4,752	91	553	74	41	10,995	75
Poughkeepsie-Newburgh NY	9,787	77	551	75	42	13,850	68
Fresno CA	7,376	82	547	76	41	9,612	81
Sarasota-Bradenton FL	10,523	70	532	77	41	7,682	89
Springfield MA-CT	12,084	66	525	78	40	9,279	83
Indio-Cathedral City-Palm Springs CA	6,036	87	504	79	37	5,534	94
Colorado Springs CO	9,941	75	473	82	36	6,588	91
Omaha NE-IA	10,721	69	424	86	32	8,764	85
Wichita KS	6,906	83	330	90	25	7,918	87
Lancaster-Palmdale CA	6,541	85	312	92	24	2,767	99

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Table 5. Truck Commodity Value and Truck Delay, 2011, continued

Urban Area	Total Annual Delay		Annual Truck Delay			Truck Commodity Value	
	(1,000 Hours)	Rank	(1,000 Hours)	Rank	Congestion Cost ($ million)	($ million)	Rank
Small Average (21 areas)	**5,586**		**381**		**29**	**12,424**	
Jackson MS	7,535	81	820	60	63	17,253	64
Columbia SC	10,081	72	771	63	58	12,552	70
Cape Coral FL	9,964	74	688	65	53	6,033	93
Spokane WA-ID	6,107	86	494	80	38	7,292	90
Stockton CA	3,519	97	483	81	35	10,413	77
Greensboro NC	6,625	84	472	83	35	51,616	38
Worcester MA-CT	10,139	71	449	84	35	10,171	79
Little Rock AR	8,132	80	442	85	33	15,286	66
Provo-Orem UT	8,312	79	403	87	30	12,905	69
Winston-Salem NC	5,385	89	390	88	29	8,821	84
Madison WI	5,349	90	381	89	29	17,534	63
Salem OR	4,593	92	320	91	24	3,889	97
Brownsville TX	3,697	94	299	93	23	2,414	100
Pensacola FL-AL	5,655	88	292	94	22	6,415	92
Laredo TX	3,074	99	276	95	20	31,171	56
Beaumont TX	4,205	93	249	96	19	20,767	62
Anchorage AK	3,627	96	206	97	16	4,507	96
Corpus Christi TX	3,160	98	188	98	14	12,484	71
Eugene OR	2,271	100	182	99	14	3,682	98
Boise ID	3,636	95	139	100	10	4,879	95
Boulder CO	2,237	101	66	101	5	825	101
101 Area Average	**47,255**		**2,934**		**222**	**59,691**	
Remaining Area Average	**1,883**		**143**		**12**	**3,630**	
All 498 Area Average	**11,085**		**709**		**54**	**15,000**	

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Table 6. State Truck Commodity Value, 2011

State	Total Truck Commodity Value ($ million)	Urban Truck Commodity Value ($ million)	Rural Truck Commodity Value ($ million)
California	1,251,857	952,443	299,414
Texas	1,165,544	718,052	447,492
Florida	559,204	419,084	140,119
Illinois	554,964	378,263	176,701
New York	487,148	374,481	112,667
Ohio	454,118	273,551	180,567
Pennsylvania	451,679	252,392	199,286
Georgia	422,273	237,712	184,561
North Carolina	379,497	230,935	148,562
Indiana	375,891	172,466	203,425
Michigan	353,232	250,252	102,980
Tennessee	352,661	194,384	158,277
Wisconsin	330,022	137,929	192,093
New Jersey	299,452	286,397	13,055
Missouri	297,020	146,741	150,278
Washington	276,259	183,618	92,641
Arizona	269,498	166,548	102,950
Virginia	255,461	143,931	111,531
Alabama	226,777	85,686	141,091
Kentucky	225,535	76,833	148,702
Louisiana	216,348	115,854	100,494
Maryland	209,652	157,472	52,180
Oklahoma	207,180	68,143	139,037
Minnesota	194,957	105,183	89,774
South Carolina	194,942	96,013	98,929
Massachusetts	166,223	155,732	10,492
Arkansas	160,733	29,736	130,997
Mississippi	158,288	34,792	123,496
Iowa	158,272	26,466	131,807
Colorado	155,221	92,744	62,478
Oregon	154,598	71,916	82,683
Utah	145,454	84,242	61,212
Kansas	143,009	42,725	100,285
New Mexico	111,841	19,852	91,989

Total Truck Commodity Value—Value of all commodities moved by truck estimated to be traveling in the state.
Rural Truck Commodity Value—Value of all commodities moved by truck estimated to be traveling in the rural areas of the state.
Urban Truck Commodity Value—Value of all commodities moved by truck estimated to be traveling in the urban areas of the state.

Table 6. State Truck Commodity Value, 2011, Continued

State	Total Truck Commodity Value ($ million)	Urban Truck Commodity Value ($ million)	Rural Truck Commodity Value ($ million)
Connecticut	111,220	103,646	7,574
Nebraska	97,163	11,709	85,454
West Virginia	86,172	23,835	62,337
Nevada	80,061	42,149	37,911
Idaho	59,276	11,216	48,060
Wyoming	49,503	2,579	46,924
North Dakota	48,281	4,500	43,781
Maine	45,225	8,652	36,574
South Dakota	44,614	4,805	39,809
Montana	42,781	2,242	40,539
Puerto Rico	39,114	35,578	3,536
New Hampshire	39,110	15,520	23,589
Delaware	35,447	22,902	12,545
Vermont	24,446	2,540	21,906
Rhode Island	21,390	17,559	3,831
Alaska	17,366	5,140	12,226
Hawaii	16,501	10,842	5,659
District Of Columbia	9,167	9,167	-

Total Truck Commodity Value—Value of all commodities moved by truck estimated to be traveling in the state.
Rural Truck Commodity Value—Value of all commodities moved by truck estimated to be traveling in the rural areas of the state.
Urban Truck Commodity Value—Value of all commodities moved by truck estimated to be traveling in the urban areas of the state.

Table 7. Other Congestion Measures, 2011

Urban Area	Rank of Delay per Auto Commuter (See Table 1)	Total Peak Period Travel Time		Commuter Stress Index		Delay per Non-Peak Traveler	
		Minutes	Rank	Value	Rank	Hours	Rank
Very Large Average (15 areas)		**46**		**1.32**		**15**	
Washington DC-VA-MD	1	53	1	1.39	3	17	2
San Francisco-Oakland CA	2	47	9	1.22	37	18	1
Los Angeles-Long Beach-S Ana CA	2	48	6	1.34	9	15	5
New York-Newark NY-NJ-CT	4	50	3	1.40	2	15	5
Boston MA-NH-RI	5	48	6	1.35	5	14	15
Houston TX	6	44	24	1.35	5	15	5
Atlanta GA	7	50	3	1.33	13	15	5
Chicago IL-IN	7	44	24	1.31	16	15	5
Philadelphia PA-NJ-DE-MD	9	45	18	1.34	9	14	15
Seattle WA	9	44	24	1.33	13	13	21
Miami FL	11	45	18	1.35	5	15	5
Dallas-Fort Worth-Arlington TX	13	42	35	1.33	13	14	15
Detroit MI	25	48	6	1.22	37	13	21
San Diego CA	37	41	40	1.27	24	10	52
Phoenix-Mesa AZ	40	43	30	1.27	24	10	52

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Commuter Stress Index—The ratio of travel time in the peak period to the travel time at free-flow conditions for the peak directions of travel in both peak periods. A value of 1.40 indicates a 20-minute free-flow trip takes 28 minutes in the most congested directions of the peak periods.
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Table 7. Other Congestion Measures, 2011, Continued

Urban Area	Rank of Delay per Auto Commuter (See Table 1)	Total Peak Period Travel Time		Commuter Stress Index		Delay per Non-Peak Traveler	
		Minutes	Rank	Value	Rank	Hours	Rank
Large Average (32 areas)		**39**		**1.25**		**12**	
Nashville-Davidson TN	11	45	18	1.28	20	14	15
Orlando FL	13	48	6	1.27	24	16	4
Denver-Aurora CO	13	40	47	1.34	9	15	5
Las Vegas NV	17	39	52	1.28	20	17	2
Austin TX	17	35	72	1.38	4	11	39
Portland OR-WA	17	37	62	1.35	5	11	39
Virginia Beach VA	20	41	40	1.28	20	15	5
Indianapolis IN	23	47	9	1.22	37	15	5
Baltimore MD	23	37	62	1.29	18	13	21
Columbus OH	25	36	68	1.22	37	13	21
Charlotte NC-SC	25	45	18	1.26	28	12	30
Pittsburgh PA	28	34	75	1.30	17	13	21
San Jose CA	28	36	68	1.24	31	11	39
Memphis TN-MS-AR	30	41	40	1.23	32	15	5
Tampa-St. Petersburg FL	30	43	30	1.28	20	13	21
Riverside-San Bernardino CA	30	38	58	1.23	32	12	30
San Antonio TX	30	40	47	1.26	28	11	39
Cincinnati OH-KY-IN	37	39	52	1.23	32	12	30
Louisville KY-IN	40	38	58	1.22	37	12	30
Minneapolis-St. Paul MN	44	44	24	1.29	18	9	66
Buffalo NY	45	39	52	1.19	54	11	39
Sacramento CA	47	36	68	1.22	37	10	52
Cleveland OH	50	39	52	1.20	50	10	52
St. Louis MO-IL	50	46	13	1.17	62	10	52
Jacksonville FL	53	43	30	1.19	54	11	39
Salt Lake City UT	53	33	80	1.17	62	11	39
Providence RI-MA	53	36	68	1.19	54	9	66
San Juan PR	60	27	92	1.34	9	9	66
Milwaukee WI	63	38	58	1.19	54	9	66
New Orleans LA	63	37	62	1.22	37	9	66
Kansas City MO-KS	68	43	30	1.15	73	9	66
Raleigh-Durham NC	83	43	30	1.21	45	8	81

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Table 7. Other Congestion Measures, 2011, Continued

Urban Area	Rank of Delay per Auto Commuter (See Table 1)	Total Peak Period Travel Time		Commuter Stress Index		Delay per Non-Peak Traveler	
		Minutes	Rank	Value	Rank	Hours	Rank
Medium Average (33 areas)		**36**		**1.17**		**10**	
Honolulu HI	13	31	86	1.51	1	11	39
Baton Rouge LA	21	40	47	1.26	28	13	21
Bridgeport-Stamford CT-NY	21	41	40	1.27	24	13	21
Tucson AZ	30	47	9	1.21	45	14	15
Oklahoma City OK	30	45	18	1.18	60	13	21
Hartford CT	30	41	40	1.21	45	12	30
Knoxville TN	37	43	30	1.19	54	14	15
Birmingham AL	40	45	18	1.23	32	12	30
New Haven CT	40	34	75	1.20	50	12	30
El Paso TX-NM	47	30	88	1.22	37	11	39
Tulsa OK	47	39	52	1.16	68	11	39
Albany NY	50	33	80	1.21	45	11	39
Allentown-Bethlehem PA-NJ	53	34	75	1.21	45	11	39
Charleston-North Charleston SC	53	38	58	1.18	60	10	52
Richmond VA	60	41	40	1.14	78	11	39
Albuquerque NM	60	36	68	1.06	101	10	52
McAllen TX	63	26	94	1.20	50	10	52
Rochester NY	63	34	75	1.17	62	10	52
Springfield MA-CT	63	39	52	1.17	62	10	52
Colorado Springs CO	71	36	68	1.16	68	9	66
Oxnard CA	71	32	83	1.11	93	9	66
Toledo OH-MI	71	36	68	1.16	68	9	66
Poughkeepsie-Newburgh NY	75	30	88	1.15	73	10	52
Dayton OH	80	38	58	1.13	81	9	66
Grand Rapids MI	80	40	47	1.12	88	8	81
Omaha NE-IA	80	41	40	1.13	81	8	81
Akron OH	83	29	90	1.13	81	8	81
Sarasota-Bradenton FL	88	31	86	1.17	62	9	66
Wichita KS	89	36	68	1.12	88	7	88
Fresno CA	95	34	75	1.08	99	6	92
Lancaster-Palmdale CA	95	29	90	1.11	93	6	92
Indio-Cathedral City-Palm Springs CA	95	23	99	1.11	93	5	97
Bakersfield CA	100	25	96	1.09	97	5	97

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Table 7. Other Congestion Measures, 2011, Continued

Urban Area	Rank of Delay per Auto Commuter (See Table 1)	Total Peak Period Travel Time		Commuter Stress Index		Delay per Non-Peak Traveler	
		Minutes	Rank	Value	Rank	Hours	Rank
Small Average (21 areas)		**35**		**1.13**		**8**	
Worcester MA-CT	45	44	24	1.15	73	12	30
Cape Coral FL	53	42	35	1.20	50	12	30
Columbia SC	53	46	13	1.14	78	10	52
Greensboro NC	68	43	30	1.13	81	10	52
Salem OR	68	29	90	1.17	62	10	52
Little Rock AR	71	46	13	1.07	100	8	81
Beaumont TX	75	41	40	1.13	81	9	66
Brownsville TX	75	25	96	1.19	54	9	66
Jackson MS	75	44	24	1.12	88	9	66
Provo-Orem UT	75	32	83	1.15	73	9	66
Spokane WA-ID	83	41	40	1.13	81	8	81
Pensacola FL-AL	86	46	13	1.16	68	8	81
Boulder CO	86	23	99	1.16	68	7	88
Winston-Salem NC	89	39	52	1.14	78	7	88
Madison WI	89	33	80	1.12	88	6	92
Laredo TX	92	25	96	1.15	73	7	88
Anchorage AK	93	22	101	1.23	32	6	92
Boise ID	94	32	83	1.12	88	6	92
Corpus Christi TX	98	33	80	1.11	93	5	97
Eugene OR	99	26	94	1.09	97	5	97
Stockton CA	100	23	99	1.13	81	5	97
101 Area Average		**39**		**1.33**		**13**	
Remaining Area Average		**34**		**1.18**		**8**	
All 498 Area Average		**38**		**1.29**		**12**	

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Table 8. Solutions to Congestion Problems, 2011

Urban Area	Operational Treatment Savings				Public Transportation Savings		
	Treatments	Delay (1,000 Hours)	Rank	Cost ($ Million)	Delay (1,000 Hours)	Rank	Cost ($ Million)
Very Large Average (15 areas)		**16,473**		**$356.3**	**49,465**		**1,076.5**
Los Angeles-Long Beach-Santa Ana CA	r,i,s,a,h	61,264	1	1,316.4	32,345	6	695.0
New York-Newark NY-NJ-CT	r,i,s,a,h	53,981	2	1,174.4	440,647	1	9,586.8
San Francisco-Oakland CA	r,i,s,a,h	18,956	3	400.6	36,714	4	775.9
Houston TX	r,i,s,a,h	15,113	4	323.4	6,733	13	144.1
Miami FL	i,s,a,h	15,073	5	323.6	11,589	9	248.8
Washington DC-VA-MD	r,i,s,a,h	14,185	6	298.3	33,810	5	711.0
Chicago IL-IN	r,i,s,a	11,710	7	267.8	67,432	2	1,542.1
Dallas-Fort Worth-Arlington TX	r,i,s,a,h	10,595	8	226.0	6,292	15	134.2
Philadelphia PA-NJ-DE-MD	r,i,s,a,h	10,237	9	222.2	30,167	7	654.9
Seattle WA	r,i,s,a,h	8,497	10	188.9	16,483	8	366.5
Atlanta GA	r,i,s,a,h	6,863	11	151.5	10,520	11	232.2
San Diego CA	r,i,s,a	6,282	12	133.5	6,401	14	136.0
Boston MA-NH-RI	i,s,a	5,827	14	124.3	37,943	3	809.4
Phoenix-Mesa AZ	r,i,s,a,h	4,660	15	111.2	2,541	23	60.6
Detroit MI	r,i,s,a	3,853	21	82.8	2,355	25	50.6

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Large Urban Areas—over 1 million and less than 3 million population.
Medium Urban Areas—over 500,000 and less than 1 million population.
Small Urban Areas—less than 500,000 population.
Operational Treatments—Freeway incident management (i), freeway ramp metering (r), arterial street signal coordination (s), arterial street access management (a) and high-occupancy vehicle lanes (h).
Public Transportation—Regular route service from all public transportation providers in an urban area.
Delay savings are affected by the amount of treatment or service in each area, as well as the amount of congestion and the urban area population.
Congestion Cost Savings—Value of delay, fuel and truck congestion cost.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 8. Solutions to Congestion Problems, 2011, Continued

Urban Area	Operational Treatment Savings				Public Transportation Savings		
	Treatments	Delay (1,000 Hours)	Rank	Cost ($ Million)	Delay (1,000 Hours)	Rank	Cost ($ Million)
Large Average (32 areas)		**2,194**		**$47.1**	**2,524**		**54.3**
Minneapolis-St. Paul MN	r,i,s,a,h	5,881	13	121.9	4,152	19	86.1
Portland OR-WA	r,i,s,a,h	4,610	16	100.2	6,951	12	151.1
Tampa-St. Petersburg FL	i,s,a	4,591	17	96.8	1,210	38	25.5
Riverside-San Bernardino CA	r,i,s,a,h	4,554	18	102.5	1,428	37	32.1
Denver-Aurora CO	r,i,s,a,h	4,447	19	94.1	6,007	16	127.1
San Jose CA	r,i,s,a	3,872	20	79.3	2,097	28	42.9
Baltimore MD	i,s,a	3,742	22	82.9	11,219	10	248.6
Virginia Beach VA	r,i,s,a,h	3,710	23	74.9	1,643	34	33.2
Sacramento CA	i,s,a	3,636	24	77.5	1,807	31	38.5
Orlando FL	i,s,a	2,746	25	60.8	1,704	33	37.7
Las Vegas NV	r,i,s,a	2,531	26	51.9	2,184	27	44.7
Milwaukee WI	i,s,a	2,113	27	45.6	1,922	29	41.5
St. Louis MO-IL	i,s,a	2,083	28	46.9	2,958	22	66.5
Austin TX	r,i,s,a,h	1,902	29	40.2	2,395	24	50.6
Pittsburgh PA	i,s,a	1,686	30	36.3	5,753	17	124.0
San Antonio TX	i,s,a	1,450	31	29.9	1,808	30	37.3
Nashville-Davidson TN	i,s,a	1,406	32	31.5	688	45	15.4
Kansas City MO-KS	i,s,a	1,395	33	30.3	538	54	11.7
Jacksonville FL	i,s,a	1,326	34	28.5	501	56	10.8
Charlotte NC-SC	i,s,a	1,313	35	29.6	1,087	41	24.5
Cincinnati OH-KY-IN	r,i,s,a	1,313	35	29.1	2,305	26	51.0
Cleveland OH	i,s,a	1,193	37	25.1	3,432	21	72.3
New Orleans LA	i,s,a	1,191	38	27.4	1,748	32	40.3
Columbus OH	r,i,s,a	1,150	39	24.3	755	43	15.9
San Juan PR	s,a	1,115	41	23.7	5,309	18	113.1
Memphis TN-MS-AR	i,s,a	1,104	43	24.5	690	44	15.3
Salt Lake City UT	r,i,s,a	905	49	18.6	3,877	20	79.6
Indianapolis IN	i,s,a	756	53	17.6	609	49	14.1
Raleigh-Durham NC	i,s,a	742	54	16.4	638	48	14.1
Louisville KY-IN	i,s,a	691	55	15.4	657	46	14.6
Buffalo NY	i,s,a	539	58	11.9	1,513	35	33.3
Providence RI-MA	i,s,a	513	60	10.5	1,184	39	24.2

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
Medium Urban Areas—over 500,000 and less than 1 million population.
Small Urban Areas—less than 500,000 population.
Operational Treatments—Freeway incident management (i), freeway ramp metering (r), arterial street signal coordination (s), arterial street access management (a) and high-occupancy vehicle lanes (h).
Public Transportation—Regular route service from all public transportation providers in an urban area.
Delay savings are affected by the amount of treatment or service in each area, as well as the amount of congestion and the urban area population.
Congestion Cost Savings—Value of delay, fuel and truck congestion cost.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 8. Solutions to Congestion Problems, 2011, Continued

	Operational Treatment Savings				Public Transportation Savings		
Urban Area	Treatments	Delay (1,000 Hours)	Rank	Cost ($ Million)	Delay (1,000 Hours)	Rank	Cost ($ Million)
Medium Average (33 areas)		**492**		**$10.7**	**372**		**8.0**
Tucson AZ	i,s,a	1,125	40	27.5	606	50	14.8
Bridgeport-Stamford CT-NY	i,s,a	1,107	42	23.7	382	58	8.2
Honolulu HI	i,s,a	1,065	44	21.8	643	47	13.1
Baton Rouge LA	i,s,a	1,024	45	25.3	165	85	4.1
El Paso TX-NM	i,s,a	1,009	46	22.3	1,169	40	25.8
Birmingham AL	i,s,a	983	47	21.5	261	70	5.7
Hartford CT	i,s,a	954	48	19.9	1,460	36	30.4
Albuquerque NM	i,s,a	841	50	19.4	252	72	5.8
Omaha NE-IA	i,s,a	792	51	16.2	175	81	3.6
Richmond VA	i,s,a	769	52	15.7	806	42	16.5
Sarasota-Bradenton FL	i,s,a	668	56	14.1	152	87	3.2
Knoxville TN	i,s,a	560	57	12.1	89	93	1.9
Fresno CA	r,i,s,a	527	59	11.7	227	76	5.0
New Haven CT	i,s,a	481	62	10.1	336	64	7.0
Rochester NY	i,s,a	388	64	8.0	514	55	10.7
Albany NY	i,s,a	369	65	8.3	567	52	12.7
Charleston-North Charleston SC	i,s,a	354	67	7.8	126	88	2.8
Colorado Springs CO	i,s,a	343	68	7.1	325	65	6.7
Oxnard CA	i,s,a	330	70	7.0	215	78	4.6
Allentown-Bethlehem PA-NJ	r,i,s,a	318	72	7.0	344	62	7.6
Dayton OH	s,a	275	73	5.9	347	61	7.4
Oklahoma City OK	i,s,a	274	74	5.9	170	83	3.7
Wichita KS	i,s,a	232	78	4.8	213	79	4.4
Springfield MA-CT	i,s,a	224	79	4.7	349	60	7.3
Grand Rapids MI	s,a	207	80	4.5	318	66	6.8
Indio-Cathedral City-Palm Springs CA	i,s,a	206	81	4.7	168	84	3.8
Bakersfield CA	i,s,a	187	82	4.6	238	74	5.9
Lancaster-Palmdale CA	s,a	140	85	2.9	541	53	11.3
Poughkeepsie-Newburgh NY	s,a	124	86	2.7	395	57	8.6
Toledo OH-MI	i,s,a	106	89	2.3	318	66	7.0
Tulsa OK	i,s,a	100	92	2.1	75	95	1.6
McAllen TX	s,a	73	95	1.6	110	91	2.4
Akron OH	i,s,a	68	97	1.4	226	77	4.8

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
Medium Urban Areas—over 500,000 and less than 1 million population.
Small Urban Areas—less than 500,000 population.
Operational Treatments—Freeway incident management (i), freeway ramp metering (r), arterial street signal coordination (s), arterial street access management (a) and high-occupancy vehicle lanes (h).
Public Transportation—Regular route service from all public transportation providers in an urban area.
Delay savings are affected by the amount of treatment or service in each area, as well as the amount of congestion and the urban area population.
Congestion Cost Savings—Value of delay, fuel and truck congestion cost.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined. Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 8. Solutions to Congestion Problems, 2011, Continued

	Operational Treatment Savings				Public Transportation Savings		
Urban Area	Treatments	Delay (1,000 Hours)	Rank	Cost ($ Million)	Delay (1,000 Hours)	Rank	Cost ($ Million)
Small Average (21 areas)		**193**		**$4.3**	**183**		**4.1**
Cape Coral FL	i,s,a	501	61	11.1	173	82	3.8
Little Rock AR	i,s,a	474	63	10.0	23	101	0.5
Provo-Orem UT	i,s,a	369	65	7.7	80	94	1.7
Greensboro NC	i,s,a	331	69	7.3	191	80	4.2
Worcester MA-CT	s,a	322	71	6.7	98	92	2.0
Spokane WA-ID	i,s,a	274	74	6.4	576	51	13.4
Winston-Salem NC	i,s,a	269	76	6.0	52	98	1.1
Jackson MS	s,a	260	77	6.3	72	96	1.8
Columbia SC	i,s,a	184	83	4.1	301	69	6.7
Stockton CA	i,s,a	160	84	4.1	237	75	6.1
Eugene OR	i,s,a	122	87	2.7	339	63	7.6
Madison WI	s,a	112	88	2.5	360	59	8.0
Salem OR	s,a	106	89	2.3	239	73	5.2
Anchorage AK	s,a	101	91	2.2	258	71	5.5
Beaumont TX	s,a	99	93	2.1	40	99	0.9
Pensacola FL-AL	s,a	89	94	1.9	54	97	1.2
Brownsville TX	s,a	69	96	1.6	316	68	7.3
Boise ID	i,s,a	64	98	1.3	35	100	0.7
Laredo TX	i,s,a	60	99	1.4	154	86	3.5
Boulder CO	s,a	50	100	1.0	116	90	2.4
Corpus Christi TX	s,a	30	101	0.6	122	89	2.6
101 Area Total		**337,571**		**7,294.9**	**838,859**		**18,237.1**
101 Area Average		**3,342**		**72.2**	**8,306**		**180.6**
All Urban Areas Total		**374,000**		**8,484.0**	**865,000**		**20,784.0**
All Urban Areas Average		**751**		**17.0**	**1,737**		**41.7**

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
Medium Urban Areas—over 500,000 and less than 1 million population.
Small Urban Areas—less than 500,000 population.
Operational Treatments—Freeway incident management (i), freeway ramp metering (r), arterial street signal coordination (s), arterial street access management (a) and high-occupancy vehicle lanes (h).
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Congestion Cost Savings—Value of delay, fuel and truck congestion cost.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 9. Congestion Trends – Wasted Hours (Yearly Delay per Auto Commuter, 1982 to 2011)

Urban Area	Yearly Hours of Delay per Auto Commuter					Long-Term Change 1982 to 2011	
	2011	2010	2005	2000	1982	Hours	Rank
Very Large Average (15 areas)	**52**	**52**	**60**	**51**	**19**	**33**	
Washington DC-VA-MD	67	66	74	65	18	49	1
New York-Newark NY-NJ-CT	59	59	55	38	11	48	2
Boston MA-NH-RI	53	53	64	49	15	38	3
Chicago IL-IN	51	51	55	39	13	38	3
Dallas-Fort Worth-Arlington TX	45	44	50	39	7	38	3
San Francisco-Oakland CA	61	60	89	72	24	37	6
Seattle WA	48	47	55	53	11	37	6
Atlanta GA	51	50	68	61	15	36	8
Miami FL	47	46	55	46	12	35	11
Philadelphia PA-NJ-DE-MD	48	48	48	36	14	34	12
Houston TX	52	51	49	40	22	30	23
San Diego CA	37	37	44	34	8	29	28
Los Angeles-Long Beach-Santa Ana CA	61	61	78	72	37	24	43
Detroit MI	40	40	50	44	17	23	47
Phoenix-Mesa AZ	35	35	43	34	24	11	91

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
Medium Urban Areas—over 500,000 and less than 1 million population.
Small Urban Areas—less than 500,000 population.
Yearly Delay per Auto Commuter—Extra travel time during the year divided by the number of people who commute in private vehicles in the urban area.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 9. Congestion Trends – Wasted Hours (Yearly Delay per Auto Commuter, 1982 to 2011), Continued

Urban Area	Yearly Hours of Delay per Auto Commuter					Long-Term Change 1982 to 2011	
	2011	2010	2005	2000	1982	Hours	Rank
Large Average (32 areas)	**37**	**37**	**43**	**38**	**11**	**26**	
Las Vegas NV	44	44	50	37	8	36	8
Columbus OH	40	40	42	33	4	36	8
Denver-Aurora CO	45	44	48	42	11	34	12
Austin TX	44	43	58	40	10	34	12
Riverside-San Bernardino CA	38	37	45	29	4	34	12
San Antonio TX	38	37	41	37	5	33	16
Orlando FL	45	44	51	55	13	32	17
Baltimore MD	41	41	45	32	9	32	17
Charlotte NC-SC	40	39	39	30	8	32	17
Portland OR-WA	44	43	49	45	13	31	21
Memphis TN-MS-AR	38	38	46	39	8	30	23
Cincinnati OH-KY-IN	37	37	49	51	7	30	23
Minneapolis-St. Paul MN	34	34	40	36	4	30	23
Providence RI-MA	30	30	41	30	3	27	31
Cleveland OH	31	31	26	31	5	26	33
Virginia Beach VA	43	43	52	47	18	25	38
Buffalo NY	33	33	41	31	8	25	38
San Juan PR	29	29	30	23	4	25	38
Nashville-Davidson TN	47	46	57	48	23	24	43
Indianapolis IN	41	41	51	52	17	24	43
Salt Lake City UT	30	30	27	30	7	23	47
Tampa-St. Petersburg FL	38	38	39	31	16	22	52
Kansas City MO-KS	27	27	35	38	5	22	52
San Jose CA	39	38	56	55	18	21	58
Louisville KY-IN	35	35	38	38	14	21	58
Sacramento CA	32	32	44	34	11	21	58
St. Louis MO-IL	31	31	39	45	11	20	65
Milwaukee WI	28	28	32	33	9	19	70
Jacksonville FL	30	30	37	31	12	18	74
Raleigh-Durham NC	23	23	28	23	5	18	74
Pittsburgh PA	39	39	46	44	23	16	80
New Orleans LA	28	28	21	20	13	15	82

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
Medium Urban Areas—over 500,000 and less than 1 million population.
Small Urban Areas—less than 500,000 population.
Yearly Delay per Auto Commuter—Extra travel time during the year divided by the number of people who commute in private vehicles in the urban area.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 9. Congestion Trends – Wasted Hours (Yearly Delay per Auto Commuter, 1982 to 2011), Continued

Urban Area	Yearly Hours of Delay per Auto Commuter					Long-Term Change 1982 to 2011	
	2011	2010	2005	2000	1982	Hours	Rank
Medium Average (33 areas)	**28**	**30**	**33**	**30**	**9**	**19**	
Baton Rouge LA	42	42	43	36	10	32	17
Hartford CT	38	38	39	38	7	31	21
Oklahoma City OK	38	37	36	36	8	30	23
Bridgeport-Stamford CT-NY	42	42	54	51	13	29	28
El Paso TX-NM	32	31	42	30	4	28	30
Knoxville TN	37	37	40	45	10	27	31
Honolulu HI	45	45	43	34	19	26	33
Birmingham AL	35	35	40	39	9	26	33
New Haven CT	35	35	43	43	9	26	33
Albany NY	31	31	35	25	5	26	33
Tulsa OK	32	32	28	26	7	25	38
McAllen TX	28	27	27	23	4	24	43
Richmond VA	29	29	24	19	6	23	47
Oxnard CA	26	26	31	22	3	23	47
Rochester NY	28	28	28	26	6	22	52
Toledo OH-MI	26	26	37	41	4	22	52
Colorado Springs CO	26	26	44	37	5	21	58
Omaha NE-IA	24	24	20	18	3	21	58
Tucson AZ	38	38	46	31	18	20	65
Allentown-Bethlehem PA-NJ	30	30	33	33	10	20	65
Albuquerque NM	29	29	38	35	10	19	70
Grand Rapids MI	24	24	24	23	5	19	70
Charleston-North Charleston SC	30	29	33	29	12	18	74
Akron OH	23	23	29	34	5	18	74
Springfield MA-CT	28	28	30	28	14	14	84
Wichita KS	20	20	19	19	6	14	84
Poughkeepsie-Newburgh NY	25	25	25	20	12	13	88
Dayton OH	24	24	26	32	12	12	89
Bakersfield CA	12	12	8	5	1	11	91
Sarasota-Bradenton FL	21	21	26	25	12	9	93
Fresno CA	15	15	18	21	8	7	96
Lancaster-Palmdale CA	15	15	16	11	18	-3	100
Indio-Cathedral City-Palm Springs CA	15	15	21	16	23	-8	101

Very Large Urban Areas—over 3 million population.
Medium Urban Areas—over 500,000 and less than 1 million population.
Large Urban Areas—over 1 million and less than 3 million population.
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Yearly Delay per Auto Commuter—Extra travel time during the year divided by the number of people who commute in private vehicles in the urban area.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
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Table 9. Congestion Trends – Wasted Hours (Yearly Delay per Auto Commuter, 1982 to 2011), Continued

Urban Area	Yearly Hours of Delay per Auto Commuter					Long-Term Change 1982 to 2011	
	2011	2010	2005	2000	1982	Hours	Rank
Small Average (15 areas)	**21**	**23**	**26**	**22**	**7**	**14**	
Columbia SC	30	30	24	20	5	25	38
Brownsville TX	25	25	16	13	2	23	47
Greensboro NC	27	27	32	40	5	22	52
Salem OR	27	27	39	37	5	22	52
Little Rock AR	26	26	25	18	5	21	58
Jackson MS	25	25	26	16	4	21	58
Worcester MA-CT	33	33	40	40	13	20	65
Cape Coral FL	30	29	36	29	10	20	65
Beaumont TX	25	25	29	20	6	19	70
Pensacola FL-AL	22	22	25	19	4	18	74
Laredo TX	19	19	12	11	2	17	79
Provo-Orem UT	25	25	25	19	9	16	80
Winston-Salem NC	20	20	26	17	5	15	82
Spokane WA-ID	23	23	24	31	9	14	84
Boise ID	16	16	20	17	2	14	84
Madison WI	20	20	12	10	8	12	89
Boulder CO	22	22	41	41	13	9	93
Stockton CA	12	12	13	9	3	9	93
Corpus Christi TX	14	14	15	12	7	7	96
Eugene OR	13	13	23	24	8	5	98
Anchorage AK	17	17	25	24	19	-2	99
101 Area Average	**43**	**43**	**50**	**43**	**15**	**28**	
Remaining Area Average	**21**	**21**	**24**	**21**	**6**	**15**	
All 498 Area Average	**38**	**38**	**46**	**39**	**13**	**25**	

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
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Small Urban Areas—less than 500,000 population.
Yearly Delay per Auto Commuter—Extra travel time during the year divided by the number of people who commute in private vehicles in the urban area.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 10. Congestion Trends – Wasted Time (Travel Time Index, 1982 to 2011)

Urban Area	Travel Time Index					Point Change in Peak-Period Time Penalty 1982 to 2011	
	2011	2010	2005	2000	1982	Points	Rank
Very Large Average (15 areas)	**1.27**	**1.28**	**1.33**	**1.28**	**1.12**	**15**	
Washington DC-VA-MD	1.32	1.31	1.33	1.30	1.10	22	2
New York-Newark NY-NJ-CT	1.33	1.33	1.43	1.33	1.12	21	4
Dallas-Fort Worth-Arlington TX	1.26	1.25	1.30	1.22	1.06	20	6
Seattle WA	1.26	1.26	1.31	1.29	1.08	18	10
Los Angeles-Long Beach-Santa Ana CA	1.37	1.37	1.41	1.38	1.20	17	12
Chicago IL-IN	1.25	1.25	1.30	1.22	1.08	17	13
Boston MA-NH-RI	1.28	1.28	1.42	1.34	1.12	16	16
Atlanta GA	1.24	1.24	1.29	1.26	1.08	16	16
Miami FL	1.25	1.25	1.33	1.29	1.10	15	24
Philadelphia PA-NJ-DE-MD	1.26	1.26	1.27	1.22	1.11	15	25
San Diego CA	1.18	1.18	1.23	1.19	1.04	14	28
San Francisco-Oakland CA	1.22	1.22	1.31	1.26	1.10	12	36
Phoenix-Mesa AZ	1.18	1.18	1.18	1.15	1.08	10	46
Houston TX	1.26	1.26	1.31	1.25	1.17	9	57

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
Medium Urban Areas—over 500,000 and less than 1 million population.
Small Urban Areas—less than 500,000 population.

Travel Time Index—The ratio of travel time in the peak period to the travel time at free-flow conditions. A value of 1.30 indicates a 20-minute free-flow trip takes 26 minutes in the peak period.

Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.

Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 10. Congestion Trends – Wasted Time (Travel Time Index, 1982 to 2011), Continued

Urban Area	Travel Time Index					Point Change in Peak-Period Time Penalty 1982 to 2011	
	2011	2010	2005	2000	1982	Points	Rank
Large Average (32 areas)	**1.20**	**1.20**	**1.24**	**1.23**	**1.08**	**12**	
Austin TX	1.32	1.31	1.35	1.26	1.09	23	1
Riverside-San Bernardino CA	1.23	1.23	1.24	1.16	1.01	22	2
Portland OR-WA	1.28	1.28	1.30	1.29	1.07	21	4
Denver-Aurora CO	1.27	1.27	1.31	1.29	1.08	19	8
San Juan PR	1.25	1.25	1.24	1.21	1.07	18	10
Baltimore MD	1.23	1.23	1.23	1.17	1.06	17	13
Minneapolis-St. Paul MN	1.21	1.21	1.30	1.28	1.05	16	16
San Antonio TX	1.19	1.19	1.22	1.19	1.03	16	20
Cincinnati OH-KY-IN	1.20	1.20	1.21	1.23	1.05	15	21
Las Vegas NV	1.20	1.20	1.24	1.21	1.05	15	21
Sacramento CA	1.20	1.20	1.27	1.21	1.05	15	21
Columbus OH	1.18	1.18	1.18	1.15	1.03	15	25
San Jose CA	1.24	1.24	1.29	1.28	1.11	13	30
Charlotte NC-SC	1.20	1.20	1.23	1.22	1.07	13	30
Orlando FL	1.20	1.20	1.24	1.25	1.08	12	32
Providence RI-MA	1.16	1.16	1.24	1.20	1.04	12	32
Cleveland OH	1.16	1.16	1.19	1.24	1.05	11	40
Indianapolis IN	1.17	1.17	1.15	1.15	1.06	11	41
Memphis TN-MS-AR	1.18	1.18	1.27	1.27	1.07	11	42
Virginia Beach VA	1.20	1.20	1.27	1.23	1.10	10	44
Buffalo NY	1.17	1.17	1.22	1.19	1.07	10	46
Milwaukee WI	1.15	1.15	1.14	1.15	1.05	10	46
Raleigh-Durham NC	1.14	1.14	1.17	1.13	1.04	10	46
Nashville-Davidson TN	1.23	1.23	1.25	1.23	1.14	9	52
Kansas City MO-KS	1.13	1.13	1.18	1.21	1.05	8	64
Salt Lake City UT	1.14	1.14	1.20	1.23	1.06	8	65
Louisville KY-IN	1.18	1.18	1.21	1.20	1.11	7	73
Jacksonville FL	1.14	1.14	1.26	1.20	1.09	5	85
Pittsburgh PA	1.24	1.24	1.29	1.29	1.20	4	90
New Orleans LA	1.20	1.20	1.22	1.22	1.16	4	90
Tampa-St. Petersburg FL	1.20	1.20	1.22	1.19	1.16	4	90
St. Louis MO-IL	1.14	1.14	1.24	1.29	1.11	3	96

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Travel Time Index—The ratio of travel time in the peak period to the travel time at free-flow conditions. A value of 1.30 indicates a 20-minute free-flow trip takes 26 minutes in the peak period.
Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 10. Congestion Trends – Wasted Time (Travel Time Index, 1982 to 2011), Continued

Urban Area	Travel Time Index					Point Change in Peak-Period Time Penalty 1982 to 2011	
	2011	2010	2005	2000	1982	Points	Rank
Medium Average (33 areas)	**1.15**	**1.15**	**1.16**	**1.15**	**1.06**	**9**	
Bridgeport-Stamford CT-NY	1.27	1.27	1.26	1.24	1.07	20	6
Honolulu HI	1.36	1.36	1.36	1.30	1.18	18	9
El Paso TX-NM	1.21	1.21	1.23	1.21	1.04	17	13
Baton Rouge LA	1.22	1.22	1.18	1.17	1.06	16	19
McAllen TX	1.16	1.16	1.13	1.11	1.02	14	27
Birmingham AL	1.19	1.19	1.19	1.15	1.05	14	28
New Haven CT	1.17	1.17	1.20	1.20	1.05	12	32
Oklahoma City OK	1.15	1.15	1.10	1.10	1.03	12	32
Hartford CT	1.18	1.18	1.20	1.22	1.06	12	36
Albany NY	1.16	1.16	1.20	1.14	1.06	10	44
Colorado Springs CO	1.13	1.13	1.18	1.18	1.03	10	46
Toledo OH-MI	1.13	1.13	1.18	1.21	1.03	10	46
Bakersfield CA	1.11	1.11	1.12	1.08	1.02	9	53
Omaha NE-IA	1.11	1.11	1.12	1.10	1.02	9	53
Tulsa OK	1.12	1.12	1.07	1.09	1.03	9	57
Oxnard CA	1.10	1.10	1.10	1.07	1.01	9	57
Akron OH	1.12	1.12	1.19	1.22	1.05	7	68
Allentown-Bethlehem PA-NJ	1.17	1.17	1.19	1.22	1.10	7	70
Charleston-North Charleston SC	1.15	1.15	1.16	1.15	1.08	7	70
Richmond VA	1.11	1.11	1.13	1.11	1.05	6	74
Tucson AZ	1.16	1.16	1.22	1.17	1.10	6	78
Albuquerque NM	1.10	1.10	1.16	1.17	1.05	5	79
Fresno CA	1.08	1.08	1.09	1.11	1.03	5	79
Grand Rapids MI	1.09	1.09	1.09	1.11	1.04	5	83
Wichita KS	1.09	1.09	1.08	1.08	1.04	5	83
Knoxville TN	1.16	1.16	1.24	1.26	1.11	5	85
Rochester NY	1.13	1.13	1.18	1.16	1.08	5	85
Springfield MA-CT	1.13	1.13	1.15	1.15	1.08	5	85
Sarasota-Bradenton FL	1.12	1.12	1.15	1.15	1.08	4	90
Indio-Cathedral City-Palm Springs CA	1.08	1.08	1.09	1.06	1.04	4	90
Poughkeepsie-Newburgh NY	1.12	1.12	1.15	1.12	1.09	3	95
Dayton OH	1.11	1.11	1.13	1.15	1.09	2	97
Lancaster-Palmdale CA	1.08	1.08	1.08	1.06	1.06	2	98

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Also note: The best congestion comparisons use multi-year trends and are made between similar urban areas.

Table 10 Congestion Trends – Wasted Time (Travel Time Index, 1982 to 2011), Continued

Urban Area	Travel Time Index					Point Change in Peak-Period Time Penalty 1982 to 2011	
	2011	2010	2005	2000	1982	Points	Rank
Small Average (21 areas)	**1.11**	**1.11**	**1.13**	**1.12**	**1.04**	**7**	
Boulder CO	1.18	1.18	1.18	1.19	1.06	12	36
Laredo TX	1.14	1.14	1.12	1.10	1.02	12	36
Provo-Orem UT	1.14	1.14	1.09	1.07	1.03	11	42
Columbia SC	1.11	1.11	1.08	1.07	1.02	9	53
Winston-Salem NC	1.11	1.11	1.13	1.09	1.02	9	53
Brownsville TX	1.18	1.18	1.31	1.31	1.09	9	60
Salem OR	1.14	1.14	1.19	1.19	1.05	9	60
Beaumont TX	1.10	1.10	1.07	1.06	1.02	8	62
Greensboro NC	1.10	1.10	1.12	1.13	1.02	8	62
Pensacola FL-AL	1.11	1.11	1.14	1.12	1.04	7	67
Jackson MS	1.10	1.10	1.15	1.10	1.03	7	68
Worcester MA-CT	1.13	1.13	1.19	1.19	1.06	7	70
Madison WI	1.11	1.11	1.09	1.09	1.05	6	74
Spokane WA-ID	1.12	1.12	1.12	1.17	1.06	6	76
Little Rock AR	1.07	1.07	1.06	1.05	1.01	6	76
Stockton CA	1.10	1.10	1.25	1.15	1.05	5	79
Boise ID	1.06	1.06	1.09	1.07	1.01	5	79
Cape Coral FL	1.15	1.15	1.18	1.15	1.10	5	85
Corpus Christi TX	1.04	1.04	1.04	1.03	1.02	2	98
Eugene OR	1.08	1.08	1.17	1.17	1.07	1	100
Anchorage AK	1.18	1.18	1.21	1.18	1.18	0	101
101 Area Average	**1.23**	**1.23**	**1.27**	**1.24**	**1.10**	**13**	
Remaining Area Average	**1.10**	**1.10**	**1.12**	**1.09**	**1.03**	**7**	
All 498 Area Average	**1.18**	**1.18**	**1.24**	**1.20**	**1.08**	**10**	

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Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference in congestion between areas ranked (for example) 6th and 12th. The actual measure values should also be examined.
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Table 11. Urban Area Demand and Roadway Growth Trends

Less Than 10% Faster (17)	**10% to 30%Faster(cont.)**	**10% to 30% Faster (cont.)**	**More Than 30% Faster (28)**	**More Than 30% Faster (cont.)**
Anchorage AK	Boulder CO	Memphis TN-MS-AR	Akron OH	Sarasota-Bradenton FL
Cleveland OH	Bridgeport-Stamford CT-NY	Milwaukee WI	Albany-Schenectady NY	Stockton CA
Dayton OH	Brownsville TX	Nashville-Davidson TN	Albuquerque NM	Washington DC-VA-MD
Eugene OR	Buffalo NY	New Haven CT	Atlanta GA	
Greensboro NC	Cape Coral FL	New York-Newark NY-NJ-CT	Baltimore MD	
Lancaster-Palmdale CA	Charleston-N Charleston SC	Oklahoma City OK	Birmingham AL	
Madison WI	Charlotte NC-SC	Omaha NE-IA	Boise ID	
New Orleans LA	Colorado Springs CO	Orlando FL	Chicago IL-IN	
Phoenix AZ	Corpus Christi TX	Pensacola FL-AL	Cincinnati OH-KY-IN	
Pittsburgh PA	Denver-Aurora CO	Philadelphia PA-NJ-DE-MD	Columbia SC	
Poughkeepsie-Newburgh NY	Detroit MI	Portland OR-WA	Columbus OH	
Provo UT	El Paso TX-NM	Providence RI-MA	Dallas-Ft Worth-Arlington TX	
St. Louis MO-IL	Fresno CA	Raleigh-Durham NC	Laredo TX	
Tulsa OK	Grand Rapids MI	Richmond VA	Las Vegas NV	
Wichita KS	Hartford CT	Rochester NY	Los Angeles-L Beach-S Ana CA	
Winston-Salem NC	Honolulu HI	Salem OR	McAllen TX	
Worcester MA	Houston TX	Salt Lake City UT	Miami FL	
	Indianapolis IN	San Jose CA	Minneapolis-St. Paul MN	
10% to 30% Faster (56)	Indio-Palm Springs CA	Seattle WA	Oxnard-Ventura CA	
Allentown-Bethlehem PA-NJ	Jackson MS	Spokane WA	Riverside-San Bernardino CA	
Austin TX	Jacksonville FL	Springfield MA-CT	Sacramento CA	
Bakersfield CA	Kansas City MO-KS	Tampa-St. Petersburg FL	San Antonio TX	
Baton Rouge LA	Knoxville TN	Toledo OH-MI	San Diego CA	
Beaumont TX	Little Rock AR	Tucson AZ	San Francisco-Oakland CA	
Boston MA-NH-RI	Louisville KY-IN	Virginia Beach VA	San Juan PR	

Note: See Exhibit 12 for comparison of growth in demand, road supply and congestion.

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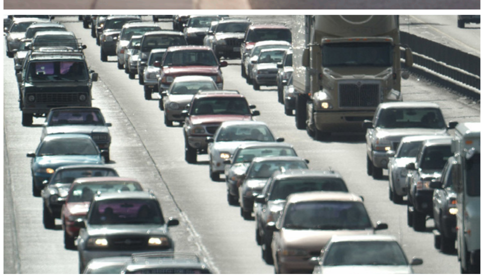

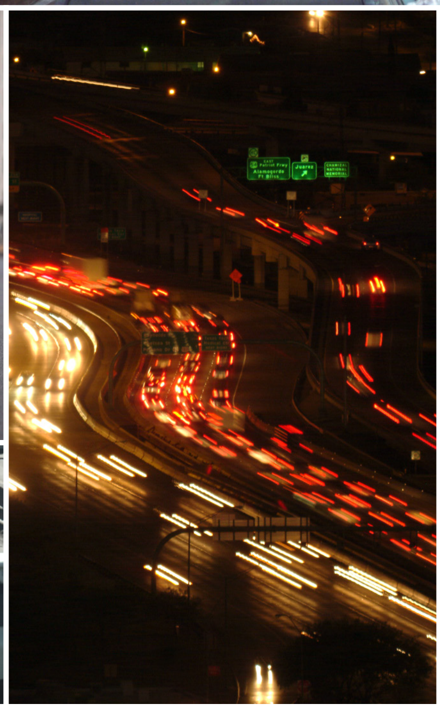

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