URBAN MOBILITY REPORT 2019

Texas A&M Transportation Institute

Powered by INRIX

2019 URBAN MOBILITY REPORT

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The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the information presented herein.

Sponsorship

The authors would like to thank the Texas Department of Transportation for sponsorship of the *2019 Urban Mobility Report.*

The '2019 Urban Mobility Report' highlights the reality of how motorists in the largest urban areas across the U.S. are experiencing the negative effects of congestion levels in their daily lives. In 2017, the average commuter wasted nearly 7 full working days in extra traffic delay, which translated to over $1,000 in personal costs. These are real impacts to people and businesses in our cities, and the problem does not appear to be letting up, especially for fast-growing areas. This is why Texas launched its Texas Clear Lanes initiative to address the top chokepoints in the state's largest metro areas. Over the past 10 years, the total cost of delay in our nation's top urban areas has grown by nearly 47%. The value of investing in our nation's transportation infrastructure in a strategic and effective manner cannot be overstated as these added costs impact our national productivity, quality of life, economic efficiency and global competitiveness.

– *Marc Williams, Texas Department of Transportation*

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2019 Urban Mobility Report

Congestion is back to its growth pattern. The 8- to 10-year growing economy has brought traffic congestion to the highest measured levels in most U.S. cities. The myriad possible solutions – from more highways, streets and public transportation; better traffic operations; more travel options; new land development styles; advanced technology – have not worked.

For more information and congestion data on your city, see: https://mobility.tamu.edu/umr/.

The trends from 1982 to 2017 (see Exhibit 1) show that congestion is a persistently growing problem.

- The problem is larger than ever. In 2017, congestion caused urban Americans to travel an extra 8.8 billion hours and purchase an extra 3.3 billion gallons of fuel for a congestion cost of $166 billion.
- Trucks account for $21 billion (12 percent) of the cost, much more than their 7 percent of traffic.
- The average auto commuter spends 54 hours in congestion and wastes 21 gallons of fuel due to congestion at a cost of $1,010 in wasted time and fuel.
- The variation in congestion is often more difficult to deal with than the regular, predictable back-ups. To reliably arrive on time for important freeway trips, travelers had to allow 34 minutes to make a trip that takes 20 minutes in light traffic.
- Employment was up by 1.9 million jobs from 2016 to 2017, slower growth than the 2.3+ million job growth in 4 of the previous 5 years but substantial enough to cause congestion growth (*1*). Exhibit 2 shows the historical national congestion trend.
- More detailed speed data on more roads and more hours of the day from INRIX (*2*) a leading private sector provider of travel time information for travelers and shippers, have caused congestion estimates in most urban areas to be higher than in previous *Urban Mobility Reports*.

Each region should use the **combination of strategies that match its goals and vision**. There is no panacea. And the decade-long recovery from economic recession has proven that the problem will not solve itself.

Exhibit 1. Major Findings of the *2019 Urban Mobility Report* (494 U.S. Urban Areas)

(Note: See page 3 for description of changes since the 2015 report)

Measures of…	1982	2000	2012	2017	5-Yr Change
… Individual Congestion					
Yearly delay per auto commuter (hours)	20	38	47	54	15%
Travel Time Index	1.10	1.19	1.22	1.23	1 Point
Planning Time Index (Freeway only)	--	--	--	1.67	--
"Wasted" fuel per auto commuter (gallons)	5	16	20	21	5%
Congestion cost per auto commuter (2017 $)	$550	$860	$910	$1,010	11%
… The Nation's Congestion Problem					
Travel delay (billion hours)	1.8	5.3	7.7	8.8	14%
"Wasted" fuel (billion gallons)	0.8	2.5	3.2	3.3	3%
Truck congestion cost (billions of 2017 dollars)	$1.9	$7.1	$14.6	$20.5	40%
Congestion cost (billions of 2017 dollars)	$14	$71	$142	$166	17%

Yearly delay per auto commuter – The extra time spent during the year 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.

Planning Time Index (PTI) – The ratio of travel time on the worst day of the month to travel time in free-flow conditions.

Wasted fuel – Extra fuel consumed during congested travel.

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

Truck congestion cost - The yearly value of extra operating time and wasted fuel for commercial trucks.

Exhibit 2. National Congestion Measures, 1982 to 2017

Year	U.S. Jobs (Millions)	Delay Per Commuter (Hours)	Total Delay (Billion Hours)	Fuel Wasted (Billion Gallons)	Total Cost (Billions of 2017 Dollars)
5-Year Change	8%	15%	14%	3%	17%
2017	153.3	54	8.8	3.3	$166
2016	151.4	53	8.6	3.3	$157
2015	148.8	51	8.4	3.3	$153
2014	146.3	50	8.2	3.2	$152
2013	143.9	48	8.0	3.2	$148
2012	142.5	47	7.7	3.2	$142
2011	139.9	45	7.5	3.2	$133
2010	139.1	44	7.2	3.1	$124
2009	139.9	43	6.9	3.1	$116
2008	145.4	42	6.8	3.2	$119
2007	146.1	43	6.8	3.2	$113
2006	144.4	42	6.7	3.1	$108
2005	141.7	42	6.6	3.0	$101
2004	139.2	41	6.3	2.9	$94
2003	137.7	41	6.1	2.8	$86
2002	136.5	40	5.9	2.7	$81
2001	136.9	39	5.6	2.6	$77
2000	136.9	38	5.3	2.5	$71
1999	133.5	37	5.1	2.3	$65
1998	131.5	36	4.8	2.2	$60
1997	129.6	36	4.6	2.1	$56
1996	126.7	34	4.3	2.0	$52
1995	124.9	33	4.1	1.9	$48
1994	123.1	32	3.8	1.8	$44
1993	120.3	31	3.6	1.7	$40
1992	118.5	30	3.4	1.6	$37
1991	117.7	29	3.2	1.5	$34
1990	118.8	28	3.0	1.4	$30
1989	117.3	27	2.9	1.3	$27
1988	115.0	26	2.7	1.2	$25
1987	112.4	25	2.5	1.1	$22
1986	109.6	24	2.4	1.1	$20
1985	107.2	23	2.2	1.0	$19
1984	105.0	22	2.1	0.9	$17
1983	100.8	21	1.9	0.9	$15
1982	99.5	20	1.8	0.8	$14

Note: See Exhibit 1 for explanation of measures. For more congestion information see Tables 1 to 4. For congestion information on your city, see https://mobility.tamu.edu/umr/.

Better Congestion Data and Improved Analysis

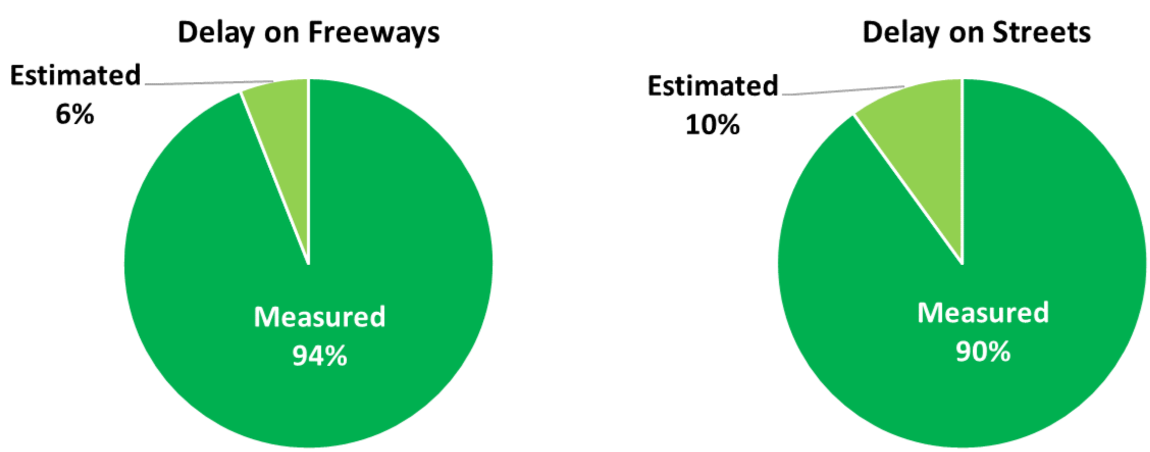
The *2019 Urban Mobility Report* is the 5th partnership between TTI and INRIX (*2*). The data behind the *2019 Report* are hundreds of speed data points for every 15 minutes of the average day of the week for almost every mile of major road in urban America. For the congestion analyst, this means about a billion speeds on about 1.5 million miles of U.S. streets and highways – 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.

Key aspects of the *2019 Urban Mobility Report* are summarized below.

- At least four years of congestion estimates are presented for each of the 494 U.S. urban areas. Improvements in the INRIX traffic speed data, and the data provided by the states to the Federal Highway Administration (*3*), means improved congestion measures in every urban area. Tables 1, 2, and 3 provide congestion estimates for the 101 urban areas that have been studied in many past reports; Table 4 displays 2017 congestion measures for the other 393 urban areas.
- Previous reports had estimated many speeds, especially on minor roads and in non-peak periods. The greatly expanded INRIX traffic speed dataset now means that more than 90 percent of the travel delay in the 2019 report is based on a measured traffic speed (Exhibit 3). The previous approach of using a conservative delay estimate means that the amount of urban travel delay increased substantially on some roads. The delay estimation methodology is described in Appendix A on the mobility study website (*4*).
- An updated vehicle occupancy value is used to reflect travel changes (*5*). (Appendix B)
- The value of congested travel time is measured by the median hourly wage for all job classifications in the Occupational Employment Statistics series by the Bureau of Labor Statistics (*6*). (Appendix C)
- Commercial truck operating cost estimates are drawn from the American Transportation Research Institute's annual survey of their membership (*6*). (Appendix C)

More information on the performance measures and data can be found at: https://mobility.tamu.edu/umr/report/#methodology. For more information about INRIX, go to www.inrix.com.

Exhibit 3. Percent of Delay Based on Measured Speeds



One Page of Congestion Problems

Rush-hour traffic jams are expected in big cities. When a large percentage of workers are on an 8 to 5 or 9 to 5 schedule, there will be travel delays on freeways, streets, and even public transportation. This results in a "rush hour" in the morning and afternoon. The problem obviously affects commuters, but it also affects many other trip types, manufacturers that rely on a reliable transportation system and companies who have delivery schedules and service calls. Some key measures are listed below. See data for your city at https://mobility.tamu.edu/umr/congestion-data/.

Congestion costs are increasing. The "invoice" for only two of the congestion effects – the cost of extra time and fuel – in the 494 U.S. urban areas was (all values in constant 2017 dollars):

- In 2017 – $166 billion
- In 2016 – $157 billion
- In 2000 – $71 billion
- In 1982 – $14 billion

Congestion wastes a massive amount of time and fuel and creates more uncertainty for travelers and freight. In 2017:

- 8.8 billion hours of extra travel time (in that time, 124 million couples could binge-watch all eight seasons of Game of Thrones).
- 3.3 billion gallons of wasted fuel (equal to a line of 18-wheel fuel trucks from Los Angeles to Boston).
- …and if all that isn't bad enough, travelers and freight shippers making important trips had to add nearly 70 percent more travel time compared with light traffic conditions to account for the effects of unexpected crashes, bad weather, special events and other irregular congestion causes.

Congestion is also a type of tax

- $166 billion of delay and fuel cost (equal to the cost of about 163 million summer vacations)
- The negative effect of uncertain or longer delivery times, missed meetings, business relocations and other congestion-related effects are not included.
- 12 percent ($21 billion) of the delay cost was the effect of congestion on truck operations (equivalent to the average grocery bills of 2.7 million families); this does not include any value for the goods being transported in the trucks.
- The cost to the average auto commuter was $1,010; it was an inflation-adjusted $550 in 1982.

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

- Spent an extra 54 hours traveling – more than a week of vacation - up from 20 hours in 1982.
- Wasted 21 gallons of fuel in 2017 – a week's worth of fuel for the average U.S. driver – up from 5 gallons in 1982.
- In areas with over <u>one million persons</u>, 2017 auto commuters experienced:
  - an average of 71 hours of extra travel time
  - a road network that was congested for about 6 hours of the average weekday
  - had a congestion tax of $1,330

Congestion is also a problem at other hours.

- Approximately 33 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.

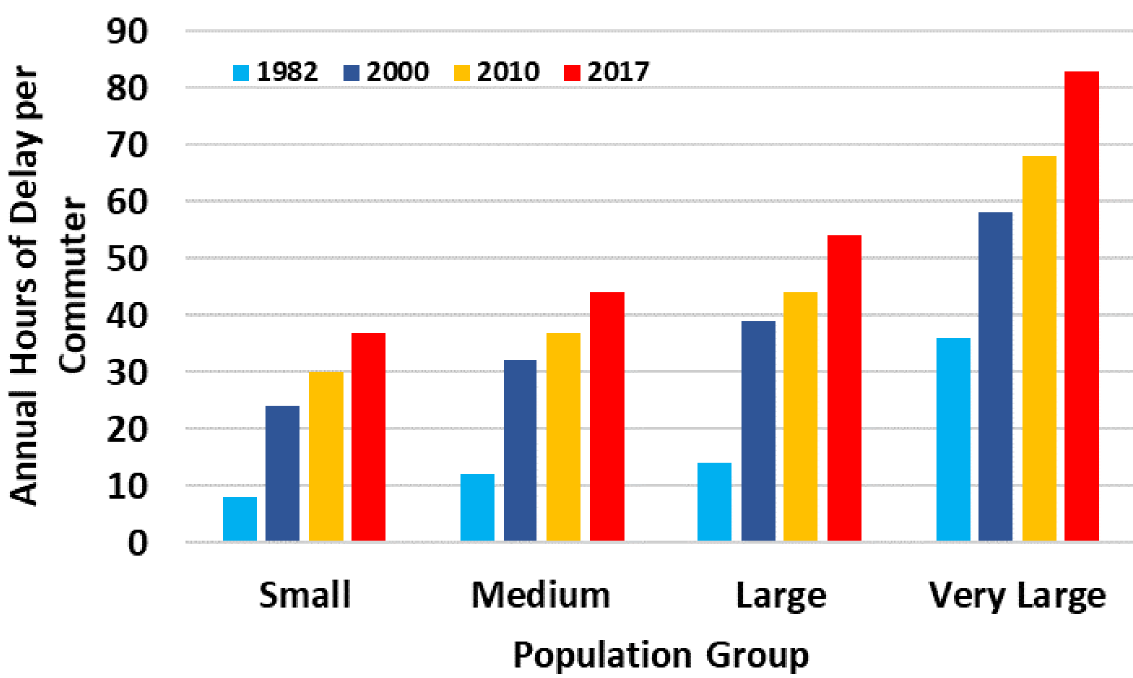
More Detail About Congestion Problems

Congestion, by every measure, has increased substantially over the 36 years covered in this report. Almost all regions have worse congestion than before the 2008 economic recession that caused a drop in traffic problems. Traffic problems as measured by per-commuter measures are worse than a decade ago, and because there are so many more commuters, and more congestion during off-peak hours, total delay has increased by two billion hours. The total congestion cost has also risen with more wasted hours, greater fuel consumption and more trucks stuck in stop-and-go traffic.

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 4). The growth trend looks similar for 2000, 2010 and 2017, but that final period is only 7 years long suggesting that if the economy does not enter another recession, congestion will be a much larger problem in 2020.

Big towns and small cities have congestion problems – every economy is different and smaller regions often count on good mobility as a quality-of-life aspect that allows them to compete with larger, more economically diverse regions. As the national economy improves, it is important to develop the consensus on action steps – major projects, programs and funding efforts take 10 to 15 years to develop.

Exhibit 4. Congestion Growth Trend – Hours of Delay per Auto Commuter



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

Congestion Patterns

- **Congestion builds through the week** from Monday to Friday in regions of all sizes. Thursday delay is almost as high as Fridays – suggesting the effect of flexible work day schedules. The two weekend days in regions under 1 million have about the same delay as a Monday (Exhibit 5).
- **Congestion is much worse in the evening**, but it can be a problem during any daylight hour (Exhibit 6). In regions over 1 million population, the hours on each side of the four-hour evening peak have as much delay as the morning rush hours. The trend is even more pronounced in smaller regions, with several midday hours having as much delay as the morning rush hour.

Exhibit 5. Percent of Delay for Each Day

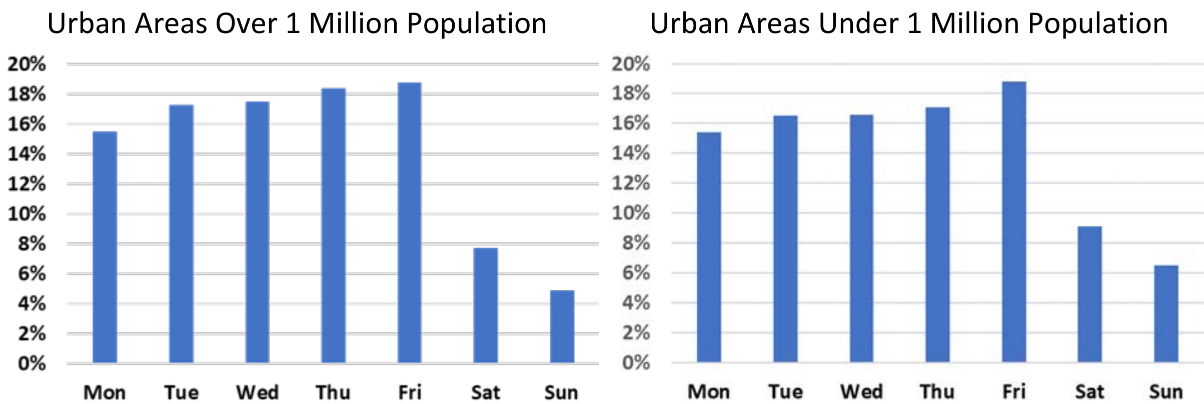
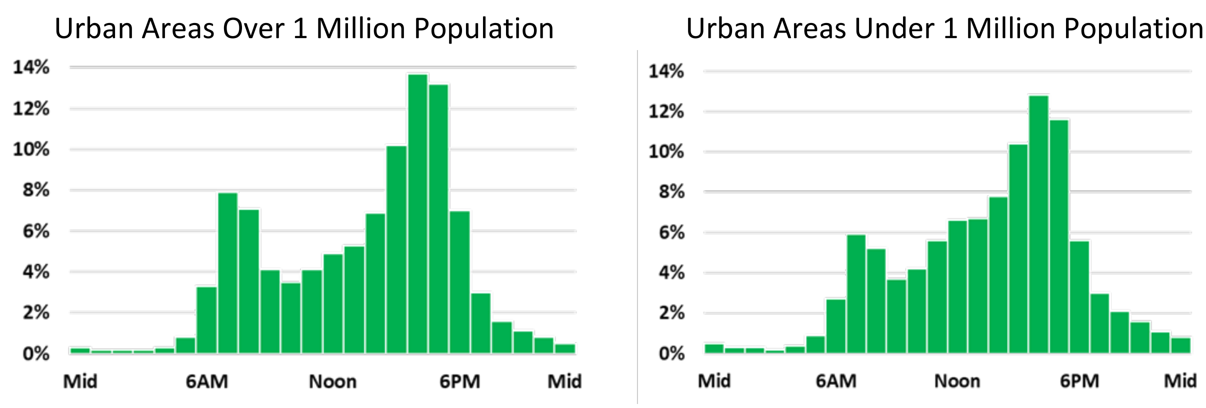


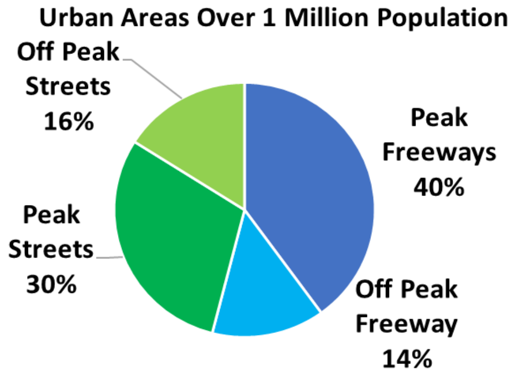
Exhibit 6. Percent of Delay for Hours of Day

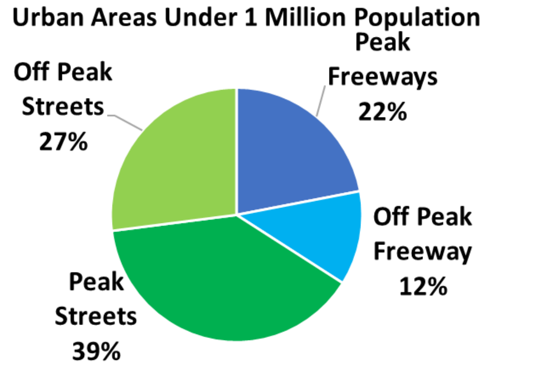


Congestion on Freeways and Streets

- Approximately 54 percent of large region travel delay is on freeways (Exhibit 7).
- Streets have more delay than freeways in smaller regions, but there are also many more miles of streets.
- Approximately 30 percent of delay occurs in off-peak hours in big regions. That value rises to 40 percent in smaller regions.
- Freeway congestion is much less of the problem in areas under 1 million population – about 1/3 of medium and small region delay is on freeways.

Exhibit 7. Percent of Delay - Road Type and Time of Day

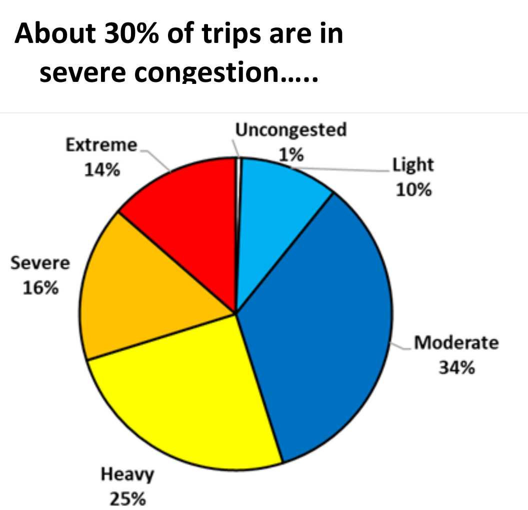


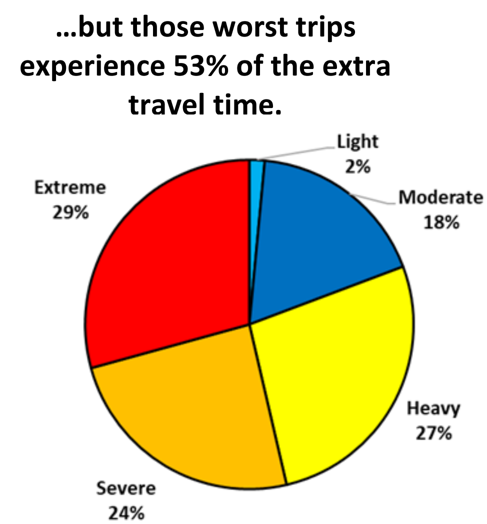


Rush Hour Congestion

- Severe and extreme congestion levels affected only **1 in 9 trips in 1982, but 1 in 4 trips in 2017**.
- The most congested trips account for **55% of peak period delays**, but only have **30% of the travel** (Exhibit 8).

Exhibit 8. Peak Period Congestion in 2017

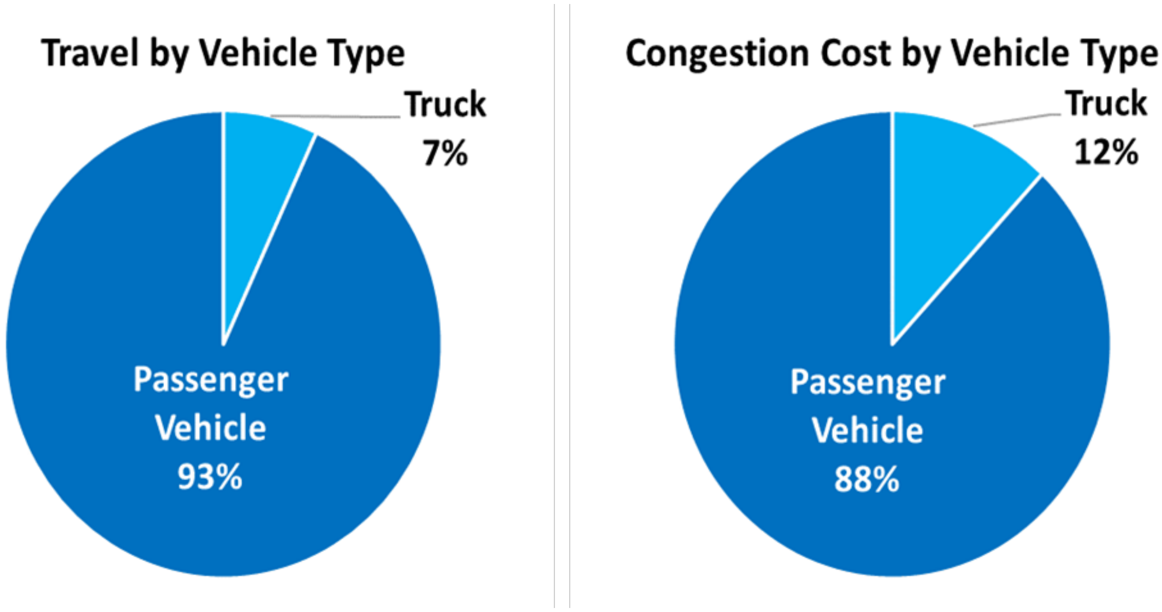




Truck Congestion

- Trucks account for 12 percent of the urban "congestion invoice" although they only represent 7 percent of urban travel (Exhibit 9).
- The costs in Exhibit 9 do not include the extra costs borne by private companies who build additional distribution centers, buy more trucks and build more satellite office centers to allow them to overcome the problems caused by a congested and inefficient transportation network.

Exhibit 9. 2017 Congestion Cost for Urban Passenger and Freight Vehicles



The Trouble With Planning Your Trip

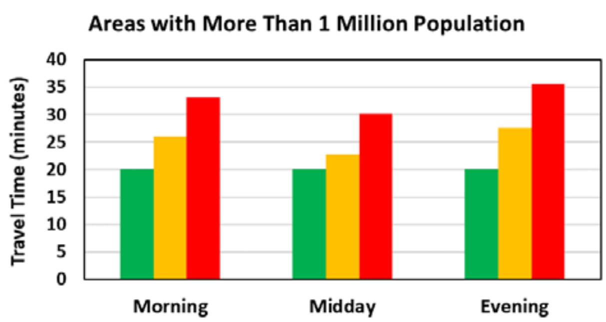
Many urban residents, travelers, and freight movers have given up on having congestion-free trips in rush hours; they would just like some dependability in their travel times. The variation in travel time from day-to-day is often more frustrating than expected congestion. We know that for those urgent trips—catching an airplane, getting to a medical appointment, or picking up a child at daycare on time – we need to leave a little earlier to make sure we are not late. And this need to add extra time isn't just a "rush hour" consideration.

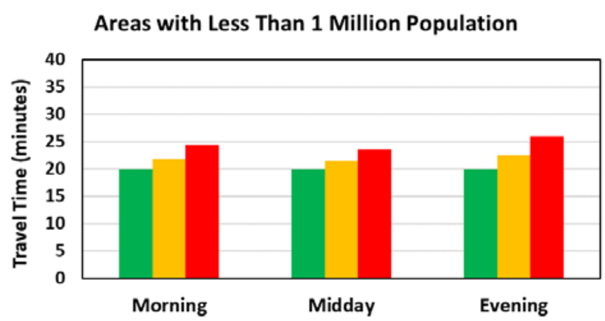
Exhibit 10 illustrates this problem. Say your typical trip takes 20 minutes when there are few other cars on the road. That is represented by the green bars. Your trip usually takes longer, on average, whether that trip is in the morning, midday, or evening. This "average trip time" is shown in the yellow bars in Exhibit 10 – in 2017 the average big city auto commute was 26 minutes in the morning and 28 minutes in the evening peak.

Now, if you must make a very important trip during any of these time periods there is additional "planning time" you must allow to reliably arrive on-time. As shown in the red bars in Exhibit 10, your 20-minute trip means you should plan for around 33 minutes in the morning and 36 minutes in the evening, and even 30 minutes in the midday.

This is not just a "big city rush hour" problem; the planning time averages 24 minutes in the morning and 26 minutes in the evening for the smaller regions. Data for individual urban areas is presented in Table 3 in the back of this report

Exhibit 10. How Much Time Must You Allow to Be 'On-Time' for a 20-Minute Trip?





Green Bar – No congestion
Yellow Bar – Average congestion
Red Bar – Plan around this congestion if you're making an important trip

The Future of Congestion

Following the recovery from the 2008/2009 economic recession, congestion began increasing at between 1 and 3 percent every year – which meant that extra travel time for the average commuter increased at over 1 hour every year. Since the end of the economic recession, congestion has gotten worse in each of the last several years. Congestion growth is the result of an imbalance between growth in travel demand and the supply of transportation capacity – whether that is freeway lanes, bus seats or rail cars. As the number of residents or jobs goes up in an improving economy, or the miles or trips that those people make increases, the road and transit systems also need a combination of expansion and more efficient operation. As the rising congestion levels in this report demonstrate, however, this is an infrequent occurrence. Travelers are not only paying the price for this inadequate response, but traffic congestion can also become a drain on further economic growth.

As one estimate of congestion in the near future, this report uses the expected population growth and congestion trends from the period of sustained economic growth between 2012 and 2017 to get an idea of what the next several years might hold. The basic input and analysis features are:

- The period following the economic recession (from 2012 to 2017) 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 the best indicator of the future level of investment in solutions and the resulting increase in congestion for each urban area.
- 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.

The congestion estimate for any single region will be affected by the local, regional and state funding, project selections and operational strategies; the simplified estimation procedure used in this report did not capture these variations. Using this simplified approach, the following offers an idea of the national congestion problem in 2025.

- The national congestion cost will grow from $166 billion in 2017 to $200 billion in 2025 (in 2017 dollars) — a 20% increase.
- Delay will grow to 10 billion hours in 2025 — a 14% increase.
- Wasted fuel will increase to 3.6 billion gallons in 2025 — a 9% increase.
- The average commuter's congestion cost will grow from $1,010 in 2017 to $1,140 in 2025 (in 2017 dollars) — a 13% increase.
- The average commuter will waste 62 hours (almost 8 vacation days) and 23 gallons of fuel in 2025 — a 15% increase in wasted time.

Congestion Relief – An Overview of the Strategies

We recommend a ***balanced and diversified approach*** to reduce congestion – one that focuses on more of everything; more policies, programs, projects, flexibility, options and understanding. It is clear that the solution investments have not kept pace with the problems. Most urban regions have big problems now – more congestion, poorer pavement and bridge conditions and less public transportation service than they would like.

What is the right solution to a specific congestion problem? The answer is usually found in one word:

Context.

Almost every solution strategy works somewhere in some situation. And almost every strategy is the wrong treatment in some places and times. ***Anyone who tells you there is a single solution that can solve congestion, be supported and implemented everywhere (or even in most locations) is exaggerating the effect of their idea.***

Some solutions need more congestion before they are fully effective, and some can be very useful before congestion is a big problem. There is almost always a role for providing more travel options and operating the system more efficiently. Their effects are important but, especially in growing regions, they will not be enough to meet community mobility goals. The private sector, the market and government regulations all play a role. Some cities see growth near downtowns that provide good home and work options, but rarely dominate the regional growth trends. Governments have been streamlining regulations to make near-town development as easy to do as suburban developments. More information on the possible solutions, places they have been implemented and their effects can be found on the website: https://policy.tti.tamu.edu/congestion/how-to-fix-congestion/.

None of these ideas are the whole mobility solution, but they can all play a role.

- **Get as much as possible from what we have** – "Get the best bang for the buck" is the theme here. Many low-cost improvements have broad public support and can be rapidly deployed. These operations programs require innovation, new monitoring technologies and staffing plans, 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, and improving road and intersection designs are relatively simple actions. More complex changes such as traffic signals that rapidly adapt to different traffic patterns, systems that smooth traffic flow and reduce traffic collisions and communication technologies that assist travelers (in all modes) and the transportation network also play a role.
- **Provide choices** – "Customize your trip" might involve different travel routes, departure times, travel modes or lanes that involve a toll for high-speed and reliable service. These options allow travelers and shippers to make trips when, where and in a form that best suits their needs and wants. There are many sources of travel information involving displays of existing travel times, locations of roadwork or crashes, transit ridership and arrival information and a variety of trip

planner resources. The solutions also 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. Companies have seen productivity increase when workers are able to adjust their hours and commute trips to meet family or other obligations.

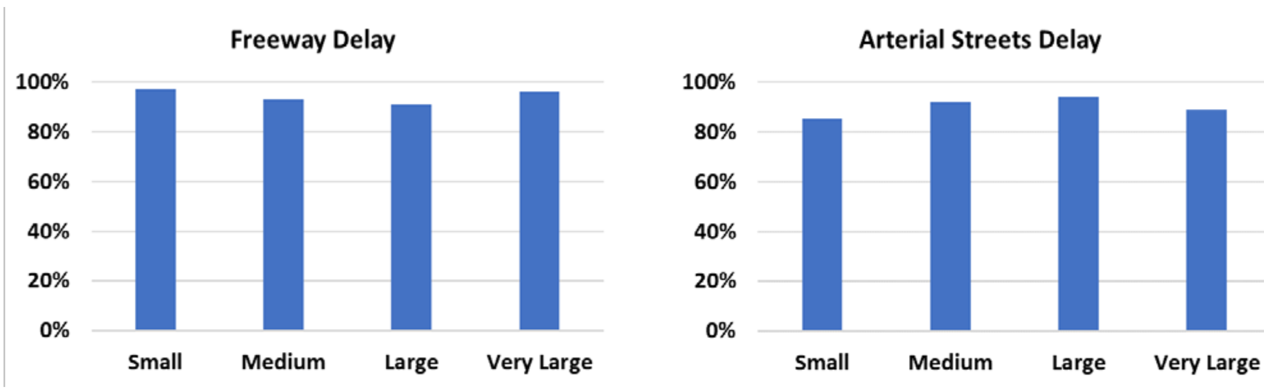
- **Add capacity in critical corridors** – "We just need more" in some places. Increases in freight and person movement often requires new or expanded facilities. Important corridors or growing regions can benefit from more street and highway lanes, new or expanded public transportation facilities, and larger bus and rail fleets. Some of the "more" will also be in the form of advancements in connected and autonomous vehicles – cars, trucks, buses and trains that communicate with each other and with the transportation network – that will reduce crashes and congestion.
- **Diversify the development patterns** – "Everyone doesn't want to live in <fill in the blank>" is a discussion in most urban regions. It is always true – because there is no unified home type desire. The market is diverse for the same reasons as the U.S. culture, economy and society is varied. The "real market" includes 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) urban residential patterns of moderate density single-family and multi-family buildings, and suburban residential and commercial developments. Sustaining the quality-of-life and gaining economic development without the typical increment of congestion in each of these sub-regions appears to be part, but not all, of the mobility solution. Recognizing that many home and job location choices are the result of choices about family, elementary and secondary education quality, entertainment and cultural sites allows planners to adjust projects and policies to meet these varied markets.
- **Technology advances** also hold promise as solutions. While we are not yet at the "Meet George Jetson" level of technology, the technology disruptors coming to market every week will alter the urban mobility landscape. Crowdsourced data from INRIX have improved this report, and an increasingly-connected world will offer more opportunities to understand and improve the movement of people, goods and the data itself. Connected vehicles "talking" to each other, the traffic signals and other systems – and providing this information to decision-makers – will provide unprecedented data and insights to identify and fix mobility problems. Newer model vehicles sense and adjust to their surroundings. Increasing safety and efficient movement of goods and people. Other technologies such as The Internet of Things (IoT) ("connected things"), 3D printers, Blockchain, and Artificial Intelligence (AI) will impact transportation systems of the future. Will the mobility improvements of these technologies offset induced trips or other unforeseen mobility consequences? In many cases, it will. Again, *context* is the key, and the jury is still out on the evolving impacts.
- **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. 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. Congestion does not have to be an all-day event, and in many cases improving travel time awareness and predictability can be a positive first step towards improving urban mobility.

Case studies, analytical methods and data are available to support development of these strategies and monitor the effectiveness of deployments. There are also many good state and regional mobility reports that provide ideas for communicating the findings of the data analysis.

Using the Best Congestion Data & Analysis Methodologies

The base data for the *2019 Urban Mobility Report* came from INRIX, the U.S. Department of Transportation and the states (*2, 3*). Several analytical processes were used to develop the final measures, but the biggest improvement in the last two decades is provided by the INRIX data. The speed data covering most travel on 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. More than 90 percent of the 2017 freeway delay in all urban area size groups are based on a measured speed (Exhibit 11), with the highest values in very large and small regions. Arterial street delay from measured speeds is a slightly lower value – more than 85 percent in all population groups, peaking at almost 95 percent in large regions.

Exhibit 11. Percent of Delay Developed With Measured Speeds



The methodology is described in a technical report (*4*) on the mobility report website: https://mobility.tamu.edu/umr/report/#methodology.

- The INRIX traffic speeds are collected from a variety of sources and compiled in their Historical Profile database. Commercial vehicles, smart phones and connected cars with location devices feed time and location data points to INRIX.
- 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 15-minute average speeds for each link of major roadway covered in the Historical Profile database (approximately 1.5 million miles in 2017).
- Traffic volume estimates 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 state DOT-provided daily traffic volume converted to 15-minute volumes (*7*).
- The 15-minute INRIX speeds were matched to the 15-minute volume estimates for each road section on the Federal Highway Administration (FHWA) maps.
- An estimation procedure for the sections of road that did not have INRIX data is described in the methodology (Appendix A) (*4*).

Where Should the Congestion Solutions Be Implemented?

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 technology to promote and facilitate travel options, operational improvements, or land use redevelopment. In all cases, the solutions need to work together to provide an interconnected network of smart transportation services as well as improve the quality-of-life.

There will also be a range of congestion targets. Many large urban areas, for example, use a target speed of 35 mph or 45 mph for their freeways; if speeds are above that level, there is not a 'congestion problem.' Smaller metro areas, however, typically decide that good mobility is one part of their quality-of-life goals and have higher speed expectations. Even within a metro region, the congestion target will typically be different between downtown and the remote suburbs, different for freeways and streets, and different for rush hours than midday travel.

The level of congestion deemed unacceptable is a local decision. The Urban Mobility Report uses one consistent, easily understood comparison level. But that level is not 'the goal,' it is only an expression of the problem. The Report is only one of many pieces of information that should be considered when determining how much of the problem to solve.

Better data can play a valuable role in all of the analyses. Advancements in volume collection, travel speed data and origin to destination travel paths for people and freight allow transportation agencies at all government levels and the private sector to better identify existing chokepoints, possible alternatives and growth patterns. The solution begins with better understanding of the challenges, problems, possibilities and opportunities – where, when, how and how often mobility problems occur – and moves into similar questions about solutions – where, when, how can mobility be improved. These data will allow travelers to capitalize on new transportation services, identify novel programs, have better travel time reliability and improve their access to information.

Delivering the Goods: And Your Role in the Congestion Impacts on Trucking

What causes all the trucks on the road anyway?

Do you eat anything or buy anything? Of course you do. We all do. And getting all that stuff to you requires trucks.

The consumer expectation to "get it now" has resulted in a boom in e-commerce. This e-commerce growth will continue. Booming economies and growing areas require goods and services, and the trucks to provide them.

What are the impacts of congestion on trucking and trucking on congestion?

The price tag for truck congestion cost is over $20 billion in wasted time and fuel. Truck congestion is 12% of the total congestion cost, but only 7% of the traffic. Only half of the $20 billion truck congestion cost is in the largest 15 urban areas, illustrating that truck congestion is a problem spread throughout all urban areas. Furthermore, the share of truck cost to the total congestion cost has gone up from 10% in 2012 to 12% in 2017.

Being on-time is particularly important for truck deliveries. Just-in-time manufacturing and on-time parcel deliveries make travel time predictability a critical need. On average in the 101 most congested urban areas, we find that to ensure an on-time delivery for the most important trips, truckers need to add 15 minutes to a trip that typically takes 20 minutes in light traffic (see Table 3). In Los Angeles, nearly 40 additional minutes are needed for urgent trips. This unreliability in the transportation system is especially detrimental for the trucking community and service companies.

There are many other costs incurred by shippers and carriers due to a congested and unreliable transportation system, which are not captured in our congestion costs. Companies need more trucks to make deliveries and service calls, they invest more time and technology to "beat the traffic" and more distribution centers are needed to fulfill demand.

What can be done?

In many dense urban areas, there is daily competition where the battle trenches are the curb space along our urban streets. It is here that freight delivery vehicles jockey with cars, buses, on-demand transportation services and other activities. The congestion, and the battle at the curb, puts a tremendous strain on shippers and carriers looking to gain any competitive edge, as well as motorists, cyclists and the other users.

Managing the time spent in loading zones can help mitigate the problem; common delivery areas (lockers) provide one possible solution in urban areas. Transportation providers are also testing technologies such as automated vehicles, delivery robots or drones for deliveries, as well as cargo cycles and other transport methods.

Concluding Thoughts

The national economy has improved since the last *Urban Mobility Report*, but unfortunately congestion has gotten worse. This has been the case in the past – the economy-congestion linkage is as dependable as gravity. Some analysts had touted the decline in driving per capita and dip in congestion levels that accompanied the 2008/9 recession as a sign that traffic congestion would, in essence, fix itself. That is not happening.

The other seemingly dependable trend – not enough of any solution being deployed – also appears to be holding in most growing regions. That is really the lesson from this series of reports. The **mix of solutions** that are used is relatively less important than the **amount of solution** being implemented. All the potential congestion-reducing strategies should be considered, and there is a role and location for most of the strategies.

- 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 work schedules, freight delivery procedures, traveling times and travel modes to avoid the peak periods, use less vehicle travel and increase the amount of electronic "travel."
- In growth corridors, there also may be a role for additional road and public transportation capacity to move people and freight more rapidly and reliably.
- Some areas are seeing renewed interest in higher density living in neighborhoods with a mix of residential, office, shopping and other developments. These places can promote shorter trips that are more amenable to walking, cycling or public transportation modes.

The *2019 Urban Mobility Report* points to national measures of the congestion problem for the 494 urban areas in 2017:

- $166 billion of wasted time and fuel
- Including $21 billion of extra truck operating time and fuel
- An extra 8.8 billion hours of travel
- 3.3 billion gallons of fuel consumed

The average urban commuter in 2017:

- Spent an extra 54 hours of travel time on roads than if the travel was done in low-volume conditions,
- Used 21 extra gallons of fuel,
- Which amounted to an average value of $1,010 per commuter.

States and cities have been addressing the congestion problems they face with a variety of strategies and more detailed data analysis. Some of the solution lies in using the smart data systems and range of technologies, projects and programs to achieve results and communicate the effects to assure the public that their project dollars are being spent wisely. And a component of the solution lies in identifying mobility level targets and implementing a range of solutions to achieve them in service to broader quality of life and economic productivity goals.

References

1. *Current Employment Statistics,* U.S. Bureau of Labor Statistics, U.S. Department of Labor, Washington D.C. Accessed 2019. http://www.bls.gov/ces/home.htm

2. *National Average Speed Database*, 2009 to 2014. INRIX. Kirkland, WA. http://www.inrix.com/

3. *Federal Highway Administration. "Highway Performance Monitoring System," 1982 to 2017 Data. November 2018. Available: http://www.fhwa.dot.gov/policyinformation/hpms.cfm*

4. *Appendix A: Urban Mobility Report Methodology. Texas A&M Transportation Institute, College Station, Texas. 2019. Available: https://mobility.tamu.edu/umr/report/#methodology*

5. Phil Lasley. *Appendix B: Change in Vehicle Occupancy Used in Mobility Monitoring Efforts*, Texas A&M Transportation Institute, July 2019. https://mobility.tamu.edu/umr/report/#appx-b

6. David R. Ellis and Brianne A. Glover. *Appendix C: Value of Delay Time for Use in Mobility Monitoring Efforts.* Texas A&M Transportation Institute, July 2019. https://mobility.tamu.edu/umr/report/#appx-c

7. *Development of Diurnal Traffic Distribution and Daily, Peak and Off-Peak Vehicle Speed Estimation Procedures for Air Quality Planning.* Final Report, Work Order B-94-06, Prepared for Federal Highway Administration, April 1996.

National Congestion Tables

Table 1. What Congestion Means to You, 2017

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)	**83**		**1.35**		**32**		**1,580**	
Los Angeles-Long Beach-Anaheim CA	119	1	1.51	1	35	4	2,440	1
San Francisco-Oakland CA	103	2	1.50	2	45	1	2,390	2
Washington DC-VA-MD	102	3	1.35	7	38	2	1,840	3
New York-Newark NY-NJ-CT	92	4	1.35	7	38	2	1,780	4
Boston MA-NH-RI	80	6	1.30	19	31	7	1,440	8
Seattle WA	78	7	1.37	5	31	7	1,410	9
Atlanta GA	77	8	1.30	19	31	7	1,510	5
Houston TX	75	9	1.34	11	31	7	1,380	10
Chicago IL-IN	73	10	1.32	16	30	12	1,310	11
Miami FL	69	12	1.31	17	34	5	1,289	12
Dallas-Fort Worth-Arlington TX	67	13	1.26	23	25	20	1,160	18
San Diego CA	64	16	1.35	7	24	27	1,440	7
Philadelphia PA-NJ-DE-MD	62	18	1.25	25	26	15	1,100	22
Phoenix-Mesa AZ	62	18	1.27	22	26	15	990	30
Detroit MI	61	20	1.24	28	25	20	1,030	25

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 $18.29 per hour of person travel and $54.94 per hour of truck time) and excess fuel consumption (estimated using state average cost per gallon for gasoline and diesel). Values are rounded to nearest $10; ranking based on calculated value. But see Note below.

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. The best congestion comparisons are made between similar urban areas.

Table 1. What Congestion Means to You, 2017, 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)	**54**		**1.24**		**22**		**$950**	
San Jose CA	81	5	1.45	3	32	6	1,500	6
Riverside-San Bernardino CA	70	11	1.34	11	20	47	1,180	16
Austin TX	66	14	1.34	11	25	20	1,270	13
Portland OR-WA	66	14	1.35	7	31	7	1,190	15
Denver-Aurora CO	61	20	1.31	17	25	20	1,060	23
Baltimore MD	59	22	1.25	25	22	32	960	32
Sacramento CA	59	22	1.28	21	24	27	1,020	26
Nashville-Davidson TN	58	24	1.22	33	26	15	1,110	20
San Juan PR	58	24	1.33	15	28	14	1,170	17
Charlotte NC-SC	57	28	1.22	33	22	32	1,160	19
Orlando FL	57	28	1.24	28	22	32	1,010	29
Minneapolis-St. Paul MN-WI	56	31	1.25	25	18	63	890	35
Cincinnati OH-KY-IN	52	32	1.17	49	25	20	1,010	27
Las Vegas-Henderson NV	51	34	1.26	23	20	47	850	41
San Antonio TX	51	34	1.23	30	22	32	880	38
Columbus OH	50	37	1.19	41	21	41	960	31
Oklahoma City OK	50	37	1.19	41	21	41	770	48
Tampa-St. Petersburg FL	50	37	1.22	33	20	47	900	34
Indianapolis IN	48	42	1.18	45	22	32	740	56
Memphis TN-MS-AR	48	42	1.18	45	18	63	590	87
Providence RI-MA	48	42	1.17	49	19	55	760	53
Kansas City MO-KS	47	46	1.15	71	15	84	760	50
Cleveland OH	46	47	1.15	71	23	29	890	36
Jacksonville FL	46	47	1.19	41	15	84	810	44
Louisville-Jefferson County KY-IN	46	47	1.18	45	18	63	660	74
Milwaukee WI	46	47	1.17	49	23	29	790	46
Pittsburgh PA	46	47	1.19	41	21	41	830	42
St. Louis MO-IL	46	47	1.15	71	19	55	820	43
Virginia Beach VA	46	47	1.17	49	15	84	690	66
Salt Lake City-West Valley City UT	45	55	1.18	45	25	20	760	51
Raleigh NC	42	67	1.17	49	16	77	730	57
Richmond VA	35	90	1.12	93	17	68	580	88

Large Urban Areas—over 1 million and less than 3 million 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 $18.29 per hour of person travel and $54.94 per hour of truck time) and excess fuel consumption (estimated using state average cost per gallon for gasoline and diesel). Values are rounded to nearest $10; ranking based on calculated value. But see Note below.
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. The best congestion comparisons are made between similar urban areas.

Table 1. What Congestion Means to You, 2017, 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 (32 areas)	**44**		**1.18**		**19**		**$750**	
Honolulu HI	64	16	1.40	4	29	13	1,260	14
New Orleans LA	58	24	1.23	30	26	20	1,100	28
Baton Rouge LA	58	24	1.36	6	25	15	1,010	21
Bridgeport-Stamford CT-NY	57	28	1.34	11	22	32	910	33
Tucson AZ	52	32	1.21	37	20	47	760	52
Charleston-North Charleston SC	51	34	1.23	30	22	32	870	39
Hartford CT	50	37	1.17	49	20	47	800	45
Albany-Schenectady NY	49	41	1.17	49	21	41	670	71
Buffalo NY	48	42	1.16	61	23	29	880	37
Tulsa OK	46	47	1.15	71	17	68	670	73
New Haven CT	45	55	1.16	61	18	63	700	63
Albuquerque NM	44	59	1.20	39	20	47	860	40
Columbia SC	44	59	1.15	71	19	55	700	65
Knoxville TN	44	59	1.13	83	18	63	770	48
Colorado Springs CO	43	63	1.15	71	19	55	720	59
El Paso TX-NM	41	70	1.16	61	17	68	720	58
Grand Rapids MI	41	70	1.13	83	16	77	650	77
Springfield MA-CT	41	70	1.12	93	19	55	660	74
Birmingham AL	40	75	1.13	83	16	77	750	55
Fresno CA	40	75	1.16	61	19	55	710	60
Rochester NY	40	75	1.16	61	20	47	700	62
Toledo OH-MI	40	75	1.14	80	21	41	690	67
Allentown PA-NJ	38	80	1.20	39	16	77	600	86
McAllen TX	38	80	1.16	61	13	93	640	81
Omaha NE-IA	38	80	1.17	49	17	68	620	84
Akron OH	37	86	1.10	99	17	68	620	83
Cape Coral FL	37	86	1.17	49	14	90	670	71
Wichita KS	36	89	1.14	80	16	77	460	96
Sarasota-Bradenton FL	33	92	1.16	61	14	90	550	92
Dayton OH	32	93	1.12	93	13	93	550	93
Provo-Orem UT	25	98	1.11	96	15	84	430	99
Bakersfield CA	24	99	1.13	83	10	98	460	96

Medium Urban Areas—over 500,000 and less than 1 million 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—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 and excess fuel consumption (estimated using state average cost per gallon for gasoline and diesel). Values are rounded to nearest $10; ranking based on calculated value. But see Note below.
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. The best congestion comparisons are made between similar urban areas.

Table 1. What Congestion Means to You, 2017, 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 (22 areas)	**37**		**1.14**		**16**		**$620**	
Boise ID	45	55	1.16	61	20	47	700	61
Spokane WA	45	55	1.16	61	26	15	770	47
Boulder CO	44	59	1.21	37	22	32	700	63
Little Rock AR	43	63	1.13	83	14	90	680	68
Pensacola FL-AL	43	63	1.17	49	16	77	600	85
Worcester MA-CT	43	63	1.14	80	17	68	750	54
Anchorage AK	42	67	1.22	33	22	32	1,050	24
Jackson MS	42	67	1.13	83	13	93	630	82
Beaumont TX	41	70	1.13	83	16	77	660	76
Salem OR	41	70	1.15	71	21	41	680	70
Eugene OR	40	75	1.17	49	19	55	650	79
Corpus Christi TX	38	80	1.13	83	17	68	680	69
Greensboro NC	38	80	1.13	83	15	84	580	89
Madison WI	38	80	1.15	71	17	68	580	90
Poughkeepsie-Newburgh NY-NJ	37	86	1.11	96	19	55	560	91
Oxnard CA	34	91	1.16	61	11	97	650	78
Laredo TX	32	93	1.17	49	15	84	540	94
Stockton CA	32	93	1.15	71	17	68	640	80
Brownsville TX	29	96	1.13	83	12	96	520	95
Winston-Salem NC	27	97	1.11	96	10	98	450	98
Lancaster-Palmdale CA	21	100	1.10	99	6	101	370	101
Indio-Cathedral City CA	14	101	1.10	99	7	100	400	100
101 Area Average	**66**		**1.28**		**26**		**$1,210**	
Remaining Areas Average	**22**		**1.11**		**10**		**$490**	
All 494 Area Average	**54**		**1.23**		**21**		**$1,010**	

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 $18.29 per hour of person travel and $54.94 per hour of truck time) and excess fuel consumption (estimated using state average cost per gallon for gasoline and diesel). Values are rounded to nearest $10; ranking based on calculated value. But see Note below.

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. The best congestion comparisons are made between similar urban areas.

Table 2. What Congestion Means to Your Town, 2017

Urban Area	Travel Delay (1,000 Hours)	Rank	Excess Fuel Consumed (1,000 Gallons)	Rank	Truck Congestion Cost ($ million)	Rank	Total Congestion Cost ($ million)	Rank
Very Large Average (15 areas)	**309,400**		**110,000**		**$690**		**$5,700**	
Los Angeles-Long Beach-Anaheim CA	971,478	1	256,931	2	2,127	1	17,784	1
New York-Newark NY-NJ-CT	811,609	2	323,712	1	1,828	2	15,040	2
Chicago IL-IN	352,759	3	144,987	3	790	3	6,530	3
Miami FL	265,947	4	103,239	4	593	4	4,900	4
San Francisco-Oakland CA	253,838	5	95,037	6	573	5	4,729	5
Washington DC-VA-MD	247,811	6	89,885	7	552	6	4,575	6
Houston TX	247,440	7	95,940	5	548	7	4,547	7
Atlanta GA	237,405	8	76,874	10	521	8	4,337	8
Dallas-Fort Worth-Arlington TX	224,883	9	79,677	9	494	9	4,116	9
Philadelphia PA-NJ-DE-MD	194,655	10	80,817	8	444	10	3,625	10
Boston MA-NH-RI	189,426	11	74,143	11	424	11	3,497	11
Seattle WA	167,384	12	62,742	14	377	12	3,111	12
Detroit MI	165,339	13	66,322	13	371	13	3,062	13
Phoenix-Mesa AZ	163,247	14	67,117	12	365	14	3,013	14
San Diego CA	148,503	15	32,686	21	321	15	2,699	15

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 Delay—Extra travel time during the year.
Excess Fuel Consumed—Value of increased fuel consumption due to travel in congested conditions rather than free-flow conditions (using state average cost per gallon).
Truck Congestion Cost—Value of increased travel time and other operating costs of large trucks (estimated at $94.04 per hour of truck time) and the extra diesel consumed (using state average cost per gallon).
Congestion Cost—Value of delay and fuel cost (estimated at $18.29 per hour of person travel, $54.94 per hour of truck time and state average fuel 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. The best congestion comparisons are made between similar urban areas.

Table 2. What Congestion Means to Your Town, 2017, 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)	**61,500**		**24,000**		**$140**		**$1,140**	
San Jose CA	126,774	16	44,956	15	285	16	2,355	16
Denver-Aurora CO	107,463	17	44,449	16	240	17	1,988	17
Riverside-San Bernardino CA	107,411	18	28,106	24	235	18	1,965	18
Minneapolis-St. Paul MN-WI	103,695	19	33,726	20	228	19	1,896	19
Baltimore MD	93,815	20	37,067	18	210	20	1,732	20
Portland OR-WA	88,009	21	40,780	17	201	22	1,652	21
San Juan PR	86,079	22	36,188	19	205	21	1,627	22
Tampa-St. Petersburg FL	85,860	23	31,952	22	191	23	1,579	23
Sacramento CA	76,437	24	28,106	24	172	24	1,423	24
St. Louis MO-IL	71,481	25	28,919	23	159	25	1,316	25
San Antonio TX	69,982	26	26,044	29	154	26	1,284	26
Austin TX	68,187	27	24,195	31	150	28	1,248	28
Las Vegas-Henderson NV	67,761	28	26,830	27	152	27	1,258	27
Cincinnati OH-KY-IN	64,061	29	27,950	26	145	29	1,188	29
Orlando FL	63,205	30	24,203	30	141	30	1,164	30
Cleveland OH	56,070	31	26,716	28	128	31	1,045	31
Nashville-Davidson TN	52,249	33	21,765	34	117	34	963	33
Columbus OH	51,381	34	21,452	35	116	35	951	35
Pittsburgh PA	51,370	35	23,298	32	118	33	962	34
Charlotte NC-SC	50,641	36	17,213	39	111	36	926	36
Kansas City MO-KS	48,328	37	19,224	38	107	37	889	37
Oklahoma City OK	43,448	38	16,913	40	96	39	798	39
Indianapolis IN	43,003	39	19,705	37	98	38	801	38
Milwaukee WI	42,146	40	20,847	36	96	39	788	40
Virginia Beach VA	40,510	41	14,149	45	89	41	741	41
Providence RI-MA	36,273	44	15,214	43	82	44	672	44
Jacksonville FL	34,792	45	11,921	50	77	45	637	45
Salt Lake City-West Valley City UT	29,739	48	15,546	42	69	48	560	48
Louisville-Jefferson County KY-IN	29,392	49	12,370	49	66	49	544	49
Memphis TN-MS-AR	28,015	51	11,597	51	62	51	516	51
Raleigh NC	27,243	53	9,067	57	60	53	498	53
Richmond VA	24,461	55	8,496	60	54	55	447	55

Very Large Urban Areas—over 3 million population.
Large Urban Areas—over 1 million and less than 3 million population.
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Travel Delay—Extra travel time during the year.
Excess Fuel Consumed—Value of increased fuel consumption due to travel in congested conditions rather than free-flow conditions (using state average cost per gallon).
Truck Congestion Cost—Value of increased travel time and other operating costs of large trucks (estimated at $94.04 per hour of truck time) and the extra diesel consumed (using state average cost per gallon).
Congestion Cost—Value of delay and fuel cost (estimated at $18.29 per hour of person travel, $54.94 per hour of truck time and state average fuel 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. The best congestion comparisons are made between similar urban areas.

Table 2. What Congestion Means to Your Town, 2017, 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 (32 areas)	**21,700**		**9,080**		**$50**		**$400**	
New Orleans LA	55,833	32	23,206	33	124	32	1,029	32
Bridgeport-Stamford CT-NY	38,789	42	14,746	44	87	42	717	42
Honolulu HI	36,378	43	15,689	41	87	42	689	43
Tucson AZ	32,305	46	14,004	47	73	46	598	46
Buffalo NY	31,977	47	14,094	46	73	46	596	47
Baton Rouge LA	28,362	50	12,679	48	64	50	525	50
Hartford CT	27,436	52	10,963	52	62	51	508	52
Tulsa OK	25,228	54	9,940	54	56	54	464	54
Albuquerque NM	23,302	56	10,629	53	53	56	433	56
Birmingham AL	22,877	57	9,090	56	51	57	421	57
El Paso TX-NM	22,711	58	9,238	55	50	58	418	58
Charleston-North Charleston SC	21,087	59	8,782	58	47	59	388	59
Rochester NY	19,886	60	8,574	59	45	60	370	60
Grand Rapids MI	19,417	61	8,032	62	44	61	360	62
Fresno CA	19,311	62	7,844	63	44	61	362	61
Omaha NE-IA	19,117	63	8,415	61	43	63	355	63
McAllen TX	19,111	64	6,802	73	42	64	350	64
Allentown PA-NJ	18,068	65	7,793	64	41	65	337	65
Knoxville TN	18,020	66	7,356	67	40	66	332	66
Colorado Springs CO	17,883	67	7,223	69	40	66	330	67
Springfield MA-CT	17,561	68	7,524	65	40	66	326	68
Albany-Schenectady NY	17,489	69	7,341	68	40	66	325	69
Dayton OH	17,377	70	7,467	66	39	70	322	70
Columbia SC	16,331	71	6,802	73	36	71	301	71
Sarasota-Bradenton FL	15,886	72	6,261	76	35	72	293	72
Cape Coral FL	15,733	73	5,762	78	35	72	289	73
New Haven CT	15,574	74	6,379	75	35	72	289	73
Toledo OH-MI	15,407	75	6,978	71	35	72	286	75
Akron OH	15,352	76	6,949	72	35	72	285	76
Wichita KS	12,081	81	5,200	80	27	81	224	81
Bakersfield CA	8,896	90	3,521	90	20	91	166	90
Provo-Orem UT	8,701	91	5,235	79	21	87	166	90

Travel Delay—Extra travel time during the year.
Excess Fuel Consumed—Value of increased fuel consumption due to travel in congested conditions rather than free-flow conditions (using state average cost per gallon).
Truck Congestion Cost—Value of increased travel time and other operating costs of large trucks (estimated at $94.04 per hour of truck time) and the extra diesel consumed (using state average cost per gallon).
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Table 2. What Congestion Means to Your Town, 2017, 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 (22 areas)	**9,100**		**3,600**		**20**		**170**	
Little Rock AR	14,823	77	4,502	83	32	77	269	77
Worcester MA-CT	14,173	78	5,849	77	32	77	262	79
Spokane WA	13,900	79	7,154	70	32	77	264	78
Boise ID	12,254	80	4,869	82	28	80	227	80
Anchorage AK	11,149	82	4,900	81	25	82	209	82
Jackson MS	10,999	83	3,697	88	24	83	201	83
Poughkeepsie-Newburgh NY-NJ	10,379	84	3,908	86	23	84	192	84
Stockton CA	9,928	85	3,475	91	22	85	184	85
Madison WI	9,664	86	4,238	84	22	85	179	86
Oxnard CA	9,548	87	2,880	96	21	87	176	87
Pensacola FL-AL	9,520	88	3,722	87	21	87	175	88
Corpus Christi TX	9,458	89	4,112	85	21	87	175	88
Beaumont TX	8,493	92	3,194	93	19	92	156	92
Winston-Salem NC	7,930	93	2,618	97	17	94	145	93
Greensboro NC	7,896	94	2,977	94	18	93	145	93
Salem OR	7,131	95	3,691	89	17	94	135	95
Eugene OR	6,589	96	3,279	92	15	96	124	96
Laredo TX	6,312	97	2,907	95	14	97	117	97
Indio-Cathedral City CA	5,795	98	1,931	99	13	98	107	98
Lancaster-Palmdale CA	5,127	99	1,268	101	11	99	94	99
Brownsville TX	4,629	100	1,871	100	10	100	85	100
Boulder CO	4,464	101	2,021	98	10	100	83	101
101 Area Total	**7,504,700**		**2,788,700**		**16,750**		**138,540**	
101 Area Average	**74,300**		**27,600**		**170**		**1,370**	
Remaining Area Total	**1,305,300**		**552,200**		**3,710**		**27,380**	
Remaining Area Average	**3,320**		**1,410**		**9**		**70**	
All 494 Area Total	**8,809,900**		**3,340,900**		**20,460**		**165,900**	
All 494 Area Average	**17,800**		**6,760**		**40**		**340**	

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Table 3. How Reliable is Freeway Travel in Your Town, 2017

Urban Area	Freeway Planning Time Index		Freeway Commuter Stress Index		Freeway Travel Time Index	
	Value	Rank	Value	Rank	Value	Rank
Very Large Average (15 areas)	**2.13**		**1.55**		**1.44**	
Los Angeles-Long Beach-Anaheim CA	2.87	1	1.93	2	1.80	1
San Francisco-Oakland CA	2.69	2	1.97	1	1.67	2
San Diego CA	2.28	7	1.54	9	1.47	9
Seattle WA	2.28	7	1.62	6	1.48	7
Washington DC-VA-MD	2.27	9	1.54	9	1.45	10
Atlanta GA	2.10	12	1.46	17	1.37	14
New York-Newark NY-NJ-CT	2.05	14	1.49	14	1.40	12
Miami FL	2.02	15	1.47	16	1.34	18
Phoenix-Mesa AZ	1.97	17	1.54	9	1.37	14
Houston TX	1.92	19	1.44	18	1.35	16
Boston MA-NH-RI	1.89	20	1.37	22	1.28	24
Chicago IL-IN	1.85	21	1.37	22	1.34	18
Dallas-Fort Worth-Arlington TX	1.79	26	1.35	24	1.28	24
Detroit MI	1.72	30	1.39	20	1.29	22
Philadelphia PA-NJ-DE-MD	1.65	34	1.27	36	1.21	38

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Freeway Planning Time Index—A travel time reliability measure that represents the total travel time that should be planned for a trip to be late for only 1 work trip per month. A PTI of 2.00 means that 40 minutes should be planned for a 20-minute trip in light traffic (20 minutes x 2.00 = 40 minutes).

Freeway Travel Time Index—The ratio of travel time in the peak period to the travel time at low volume 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.

Freeway Commuter Stress Index – The travel time index calculated for only the peak direction in each peak period (a measure of the extra travel time for a commuter).

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.

Table 3. How Reliable is Freeway Travel in Your Town, 2017, Continued

Urban Area	Freeway Planning Time Index		Freeway Commuter Stress Index		Freeway Travel Time Index	
	Value	Rank	Value	Rank	Value	Rank
Large Average (32 areas)	**1.71**		**1.31**		**1.21**	
San Jose CA	2.60	3	1.90	3	1.59	4
San Juan PR	2.50	4	1.87	4	1.65	3
Portland OR-WA	2.37	5	1.62	6	1.53	6
Austin TX	2.15	11	1.50	13	1.40	12
Riverside-San Bernardino CA	2.10	12	1.51	12	1.44	11
Sacramento CA	1.97	17	1.48	15	1.35	16
Denver-Aurora CO	1.83	23	1.34	25	1.33	20
Tampa-St. Petersburg FL	1.83	23	1.33	28	1.24	31
San Antonio TX	1.74	28	1.32	30	1.23	34
Baltimore MD	1.73	29	1.28	35	1.26	27
Nashville-Davidson TN	1.70	31	1.34	25	1.22	36
Jacksonville FL	1.68	32	1.27	36	1.20	40
Charlotte NC-SC	1.66	33	1.24	41	1.21	38
Las Vegas-Henderson NV	1.63	36	1.31	32	1.25	29
Minneapolis-St. Paul MN-WI	1.61	37	1.31	32	1.24	31
Orlando FL	1.61	37	1.25	40	1.20	40
Columbus OH	1.59	40	1.22	45	1.12	61
Raleigh NC	1.58	41	1.18	54	1.15	49
Salt Lake City-West Valley City UT	1.57	42	1.26	38	1.19	43
Cincinnati OH-KY-IN	1.53	43	1.20	48	1.12	61
Milwaukee WI	1.52	45	1.26	38	1.20	40
Virginia Beach VA	1.46	47	1.20	48	1.15	49
Oklahoma City OK	1.45	49	1.21	46	1.17	46
Pittsburgh PA	1.44	50	1.19	51	1.12	61
St. Louis MO-IL	1.40	54	1.15	61	1.15	49
Kansas City MO-KS	1.37	59	1.18	54	1.14	52
Providence RI-MA	1.37	59	1.16	59	1.14	52
Louisville-Jefferson County KY-IN	1.36	63	1.14	65	1.12	61
Cleveland OH	1.35	64	1.16	59	1.09	75
Indianapolis IN	1.30	70	1.12	73	1.11	71
Memphis TN-MS-AR	1.27	78	1.10	83	1.09	75
Richmond VA	1.20	92	1.12	73	1.07	87

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Table 3. How Reliable is Freeway Travel in Your Town, 2017, Continued

Urban Area	Freeway Planning Time Index		Freeway Commuter Stress Index		Freeway Travel Time Index	
	Value	Rank	Value	Rank	Value	Rank
Medium Average (32 areas)	**1.45**		**1.20**		**1.15**	
Honolulu HI	2.29	6	1.55	8	1.48	7
New Orleans LA	2.18	10	1.69	5	1.56	5
Bridgeport-Stamford CT-NY	1.99	16	1.39	20	1.31	21
Baton Rouge LA	1.84	22	1.40	19	1.29	22
Charleston-North Charleston SC	1.75	27	1.32	30	1.25	29
Sarasota-Bradenton FL	1.53	43	1.20	48	1.14	52
Hartford CT	1.48	46	1.18	54	1.14	52
Albuquerque NM	1.46	47	1.23	44	1.18	44
Buffalo NY	1.44	50	1.21	46	1.17	46
Fresno CA	1.39	55	1.19	51	1.16	48
Birmingham AL	1.38	57	1.14	65	1.10	72
Knoxville TN	1.38	57	1.13	70	1.13	58
Bakersfield CA	1.37	59	1.15	61	1.13	58
Colorado Springs CO	1.37	59	1.19	51	1.18	44
El Paso TX-NM	1.35	64	1.15	61	1.12	61
Cape Coral FL	1.33	66	1.13	70	1.09	75
Columbia SC	1.33	66	1.10	83	1.08	79
McAllen TX	1.33	66	1.18	54	1.12	61
New Haven CT	1.30	70	1.11	77	1.10	72
Omaha NE-IA	1.29	72	1.13	69	1.12	61
Albany-Schenectady NY	1.28	75	1.11	77	1.08	79
Tulsa OK	1.28	75	1.14	65	1.12	61
Akron OH	1.27	78	1.11	77	1.06	90
Allentown PA-NJ	1.27	78	1.10	83	1.08	79
Provo-Orem UT	1.27	78	1.11	77	1.08	79
Rochester NY	1.26	82	1.10	83	1.07	87
Wichita KS	1.26	82	1.15	61	1.14	52
Grand Rapids MI	1.25	84	1.09	87	1.08	79
Tucson AZ	1.25	84	1.13	70	1.12	61
Springfield MA-CT	1.21	90	1.09	87	1.09	75
Toledo OH-MI	1.21	90	1.09	87	1.05	94
Dayton OH	1.19	93	1.08	90	1.05	94

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Table 3. How Reliable is Freeway Travel in Your Town, 2017, Continued

Urban Area	Freeway Planning Time Index		Freeway Commuter Stress Index		Freeway Travel Time Index	
	Value	Rank	Value	Rank	Value	Rank
Small Average (22 areas)	**1.27**		**1.11**		**1.09**	
Boulder CO	1.81	25	1.33	28	1.26	27
Anchorage AK	1.64	35	1.34	25	1.28	24
Oxnard CA	1.60	39	1.29	34	1.24	31
Laredo TX	1.43	52	1.24	41	1.23	34
Stockton CA	1.41	53	1.24	41	1.22	36
Madison WI	1.39	55	1.17	58	1.13	58
Eugene OR	1.31	69	1.14	65	1.14	52
Little Rock AR	1.29	72	1.11	77	1.08	79
Spokane WA	1.29	72	1.11	77	1.10	72
Boise ID	1.28	75	1.12	73	1.08	79
Beaumont TX	1.25	84	1.08	90	1.06	90
Salem OR	1.24	87	1.12	73	1.12	61
Winston-Salem NC	1.24	87	1.08	90	1.08	79
Worcester MA-CT	1.24	87	1.08	90	1.07	87
Jackson MS	1.17	94	1.06	97	1.04	97
Corpus Christi TX	1.16	95	1.07	94	1.05	94
Brownsville TX	1.12	96	1.07	94	1.06	90
Greensboro NC	1.12	96	1.04	99	1.04	97
Indio-Cathedral City CA	1.12	96	1.07	94	1.06	90
Pensacola FL-AL	1.12	96	1.05	98	1.04	97
Poughkeepsie-Newburgh NY-NJ	1.10	100	1.04	99	1.03	100
Lancaster-Palmdale CA	1.06	101	1.02	101	1.02	101
101 Area Average	**1.86**		**1.41**		**1.30**	
Remaining Area Average	**1.19**		**1.13**		**1.11**	
All 494 Area Average	**1.67**		**1.35**		**1.28**	

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Table 4. Key Congestion Measures for 393 Urban Areas, 2017

Urban Area	Annual Hours of Delay Total (000)	Annual Hours of Delay Per Auto Commuter	Annual Congestion Cost Total (Million $)	Annual Congestion Cost $ per Auto Commuter
Aberdeen-Bel Air S-Bel Air N MD	5,249	23	110	481
Abilene TX	2,075	17	43	357
Aguadilla-Isabela-San Sebastian PR	4,659	15	122	399
Albany GA	1,870	18	39	379
Albany OR	800	8	17	171
Alexandria LA	2,483	27	55	584
Alton IL-MO	8	1	0	17
Altoona PA	1,512	18	31	373
Amarillo TX	4,475	20	95	422
Ames IA	962	9	19	172
Anderson IN	1,103	12	24	249
Anderson SC	1,544	18	33	392
Ann Arbor MI	7,020	22	146	466
Anniston-Oxford AL	1,370	16	28	322
Antioch CA	9,435	33	192	665
Appleton WI	3,584	15	77	322
Arecibo PR	3,327	23	85	583
Arroyo Grande-Grover Beach CA	1,450	14	31	309
Asheville NC	8,194	27	167	553
Athens-Clarke County GA	3,800	27	77	548
Atlantic City NJ	5,700	21	118	436
Auburn AL	2,101	25	43	509
Augusta-Richmond County GA-SC	10,050	25	205	500
Avondale-Goodyear AZ	4,566	20	93	411
Bangor ME	1,580	26	34	557
Barnstable Town MA	5,284	20	109	419
Battle Creek MI	1,211	14	25	301
Bay City MI	1,081	15	22	306
Beckley WV	765	8	18	183
Bellingham WA	3,593	30	74	616
Beloit WI-IL	673	10	15	220
Bend OR	1,949	21	43	456
Benton Harbor-St. Joseph-Fair Plain MI	770	14	17	301
Billings MT	2,175	17	44	341
Binghamton NY-PA	2,745	16	58	351
Bismarck ND	1,610	17	33	338
Blacksburg VA	1,439	15	29	292
Bloomington IN	1,790	15	38	321
Bloomington-Normal IL	1,284	9	26	185
Bloomsburg-Berwick PA	950	12	20	272
Bonita Springs FL	9,448	27	192	551
Bowling Green KY	3,186	36	68	770
Bremerton WA	5,302	26	109	536
Bristol TN-VA	1,776	23	39	503
Brunswick GA	1,488	21	31	433
Burlington NC	1,843	14	38	278
Burlington VT	3,379	28	69	583
Camarillo CA	2,559	35	51	710
Canton OH	7,016	24	145	495

Table 4. Key Congestion Measures for 393 Urban Areas, 2017 (continued)

Urban Area	Annual Hours of Delay		Annual Congestion Cost	
	Total (000)	Per Auto Commuter	Total (Million $)	$ per Auto Commuter
Cape Girardeau MO-IL	1,326	19	28	392
Carbondale IL	735	10	15	204
Carson City NV	1,301	14	27	296
Cartersville GA	1,332	20	28	425
Casa Grande AZ	771	9	17	191
Casper WY	987	13	20	263
Cedar Rapids IA	3,369	17	69	346
Chambersburg PA	895	9	19	195
Champaign IL	1,716	11	35	225
Charleston WV	2,212	14	50	310
Charlottesville VA	4,495	43	89	855
Chattanooga TN-GA	11,188	28	245	609
Cheyenne WY	1,016	12	21	258
Chico CA	1,859	18	38	362
Clarksville TN-KY	3,723	21	80	462
Cleveland TN	1,758	23	39	516
Coeur d'Alene ID	2,197	20	45	400
College Station-Bryan TX	5,453	32	114	658
Columbia MO	2,692	19	56	404
Columbus GA-AL	5,894	21	123	433
Columbus IN	680	8	15	174
Concord CA	46,293	50	953	1,027
Concord NC	5,882	26	123	542
Conroe-The Woodlands TX	7,924	29	162	595
Conway AR	1,769	24	36	482
Corvallis OR	811	10	17	211
Cumberland MD-WV-PA	1,283	20	28	419
Dalton GA	1,689	19	35	394
Danbury CT-NY	3,846	22	79	446
Danville IL	,496	8	10	173
Daphne-Fairhope AL	2,053	21	42	418
Davenport IA-IL	4,102	14	85	284
Davis CA	3,280	41	67	848
DeKalb IL	663	9	13	178
Decatur AL	1,550	20	32	414
Decatur IL	1,133	11	24	237
Delano CA	1,518	20	36	475
Deltona FL	3,145	16	65	326
Denton-Lewisville TX	11,593	30	240	624
Des Moines IA	8,998	18	184	371
Dothan AL	2,717	32	57	673
Dover DE	3,015	24	63	500
Dover-Rochester NH-ME	1,863	20	38	417
Dubuque IA-IL	809	11	17	230
Duluth MN-WI	1,873	15	38	308
Durham NC	12,231	33	245	662
East Stoudsburg PA-NJ	1,894	10	39	205
Eau Claire WI	1,329	12	28	254
El Centro-Calexico CA	1,822	15	38	321
El Paso de Robles-Atascadero CA	2,617	36	56	776
Elizabethtown-Radcliff KY	1,316	14	28	297
Elkhart IN-MI	2,031	13	45	295

Table 4. Key Congestion Measures for 393 Urban Areas, 2017 (continued)

Urban Area	Annual Hours of Delay Total (000)	Annual Hours of Delay Per Auto Commuter	Annual Congestion Cost Total (Million $)	Annual Congestion Cost $ per Auto Commuter
Elmira NY	835	12	18	244
Erie PA	3,888	19	80	385
Evansville IN-KY	3,982	17	84	351
Fairbanks AK	2,455	34	52	721
Fairfield CA	8,559	43	175	878
Fajardo PR	631	7	17	173
Farmington NM	920	12	19	249
Fayetteville NC	6,624	20	133	397
Fayetteville-Springdale-Rogers AR-MO	10,654	33	220	686
Flagstaff AZ	1,514	18	33	395
Flint MI	5,495	15	113	301
Florence AL	2,206	26	45	528
Florence SC	2,755	27	58	572
Florida-Imbrey-Barceloneta PR	661	9	17	228
Fond du Lac WI	673	9	14	183
Fort Collins CO	5,968	21	121	420
Fort Smith AR-OK	3,118	24	63	488
Fort Walton Beach-Navarre-Wright FL	4,953	23	100	461
Fort Wayne IN	5,892	18	124	376
Frederick MD	4,002	27	83	556
Fredericksburg VA	4,595	29	95	602
Gadsden AL	1,850	28	39	586
Gainesville FL	5,630	28	115	569
Gainesville GA	3,455	24	71	495
Galveston TX	1,176	13	23	260
Gastonia NC-SC	4,222	24	87	492
Gilroy-Morgan Hill CA	3,975	35	82	728
Glens Falls NY	1,633	22	34	459
Goldsboro NC	1,151	17	24	358
Grand Forks ND-MN	2,353	23	48	465
Grand Island NE	481	6	10	120
Grand Junction CO	1,512	11	30	214
Grants Pass OR	1,060	12	23	251
Great Falls MT	939	13	19	264
Greeley CO	2,858	23	59	473
Green Bay WI	3,421	15	72	316
Greenville NC	3,994	30	81	609
Greenville SC	12,221	28	262	599
Guayama PR	974	12	26	276
Gulfport MS	4,920	21	99	422
Hagerstown MD-WV-PA	2,667	13	60	293
Hammond LA	1,582	20	36	394
Hanford CA	944	10	20	193
Hanover PA	1,337	14	28	306
Harlingen TX	1,685	11	34	230
Harrisburg PA	14,785	33	313	693
Harrisonburg VA	1,859	24	38	485
Hattiesburg MS	2,366	27	48	553
Hazleton PA	1,049	20	22	428
Hemet CA	1,876	10	39	215
Hickory NC	4,060	18	83	363
High Point NC	2,651	14	54	295

Table 4. Key Congestion Measures for 393 Urban Areas, 2017 (continued)

Urban Area	Annual Hours of Delay Total (000)	Annual Hours of Delay Per Auto Commuter	Annual Congestion Cost Total (Million $)	Annual Congestion Cost $ per Auto Commuter
Hilton Head Island SC	1,847	20	41	451
Hinesville GA	627	10	13	205
Holland MI	1,175	11	24	221
Homosassa Spr-Bev Hills-Citrus Spr FL	1,458	15	30	304
Hot Springs AR	1,305	20	26	397
Houma LA	2,806	18	61	399
Huntington WV-KY-OH	3,918	19	82	388
Huntsville AL	7,384	24	148	473
Idaho Falls ID	902	9	18	179
Iowa City IA	2,032	16	43	338
Ithaca NY	1,506	27	31	562
Jackson MI	1,461	16	31	330
Jackson TN	1,712	22	39	508
Jacksonville NC	2,084	19	42	380
Janesville WI	1,333	17	28	370
Jefferson City MO	1,660	23	34	470
Johnson City TN	2,207	16	45	331
Johnstown PA	823	12	17	251
Jonesboro AR	1,771	25	36	495
Joplin MO	1,801	21	37	438
Juana Díaz PR	186	3	5	87
Kahului HI	1,938	23	44	529
Kailua (Honolulu County)-Kaneohe HI	3,002	23	67	522
Kalamazoo MI	3,739	17	78	349
Kankakee IL	1,121	13	23	264
Kennewick-Pasco WA	3,267	15	69	314
Kenosha WI-IL	3,164	23	73	542
Killeen TX	3,315	14	68	295
Kingsport TN-VA	1,925	17	40	359
Kingston NY	2,308	24	48	496
Kissimmee FL	12,940	32	271	677
Kokomo IN	719	8	15	170
La Crosse WI-MN	1,757	16	37	342
Lady Lake-The Villages FL	1,658	13	35	265
Lafayette IN	2,844	18	61	375
Lafayette LA	8,375	31	187	691
Lafayette-Louisville-Erie CO	1,501	17	30	340
Lake Charles LA	4,904	32	113	733
Lake Havasu City AZ	505	6	10	128
Lake Jackson-Angleton TX	1,506	19	32	397
Lakeland FL	4,773	16	102	351
Lancaster PA	8,904	21	188	443
Lansing MI	4,945	15	102	312
Las Cruces NM	2,680	18	55	379
Lawrence KS	1,507	14	31	287
Lawton OK	618	6	13	126
Lebanon PA	683	8	14	171
Leesburg-Eustis-Tavares FL	2,751	18	57	383
Leominster-Fitchburg MA	2,590	21	53	434
Lewiston ID-WA	686	10	14	211
Lewiston ME	1,458	22	31	461
Lexington Park-Cal-Ches Ranch Est MD	1,326	27	27	541

Table 4. Key Congestion Measures for 393 Urban Areas, 2017 (continued)

Urban Area	Annual Hours of Delay Total (000)	Annual Hours of Delay Per Auto Commuter	Annual Congestion Cost Total (Million $)	Annual Congestion Cost $ per Auto Commuter
Lexington-Fayette KY	11,318	37	240	790
Lima OH	948	12	20	260
Lincoln NE	4,733	16	97	334
Livermore CA	3,978	46	83	965
Lodi CA	2,746	37	61	835
Logan UT	771	7	18	175
Lompoc CA	543	8	11	169
Longmont CO	2,513	25	50	505
Longview TX	2,958	29	61	596
Longview WA-OR	1,518	23	33	493
Lorain-Elyria OH	3,165	17	68	360
Los Lunas NM	720	8	15	173
Lubbock TX	4,739	19	99	395
Lynchburg VA	3,651	28	73	567
Macon GA	3,656	24	76	497
Madera CA	1,313	14	28	302
Manchester NH	3,750	22	77	453
Mandeville-Covington LA	3,801	35	80	728
Manhattan KS	780	10	16	196
Mankato MN	706	10	14	197
Mansfield OH	1,045	13	22	263
Manteca CA	3,285	36	70	767
Marysville WA	3,753	23	78	488
Mauldin-Simpsonville SC	3,573	27	78	593
Mayaguez PR	4,477	41	111	1,015
McKinney TX	3,485	19	73	406
Medford OR	2,462	14	53	302
Merced CA	2,176	14	47	306
Michigan City-La Porte IN-MI	709	10	16	217
Middletown OH	1,516	14	32	294
Midland MI	735	10	15	194
Midland TX	2,950	22	63	473
Mission Viejo-Lake Forest-San Clem CA	23,313	38	481	787
Missoula MT	2,162	23	44	462
Mobile AL	9,776	28	199	566
Modesto CA	11,287	30	240	633
Monessen-California PA	890	13	19	262
Monroe LA	2,247	18	48	378
Monroe MI	778	10	16	218
Montgomery AL	6,695	25	137	509
Morgantown WV	838	11	19	245
Morristown TN	1,151	21	23	421
Mount Vernon WA	1,490	25	31	517
Muncie IN	1,086	11	23	232
Murrieta-Temecula-Menifee CA	13,585	29	282	600
Muskegon MI	1,878	11	39	230
Myrtle Beach-Socastee SC-NC	8,268	33	173	693
Nampa ID	2,612	15	53	299
Napa CA	4,332	46	89	936
Nashua NH-MA	5,401	22	111	463
New Bedford MA	3,398	22	70	445
New Bern NC	841	11	17	235

Table 4. Key Congestion Measures for 393 Urban Areas, 2017 (continued)

Urban Area	Annual Hours of Delay Total (000)	Annual Hours of Delay Per Auto Commuter	Annual Congestion Cost Total (Million $)	Annual Congestion Cost $ per Auto Commuter
Newark OH	2,879	19	57	377
North Port-Port Charlotte FL	3,060	16	63	332
Norwich-New London CT-RI	3,983	24	84	506
Ocala FL	4,033	24	84	494
Odessa TX	3,710	31	78	649
Ogden-Layton UT	8,172	14	194	333
Olympia-Lacey WA	5,532	28	118	599
Oshkosh WI	980	12	21	248
Owensboro KY	1,237	15	27	337
Palm Bay-Melbourne FL	10,668	22	225	459
Palm Coast-Daytona Bch-Port Orange FL	6,860	20	142	418
Panama City FL	4,707	30	96	610
Parkersburg WV-OH	605	9	13	189
Pascagoula MS	818	15	17	302
Peoria IL	3,556	13	73	258
Petaluma CA	3,254	38	68	790
Pine Bluff AR	795	11	16	230
Pittsfield MA	1,143	14	23	289
Pocatello ID	977	13	20	264
Ponce PR	2,575	17	67	452
Port Arthur TX	3,449	23	72	482
Port Huron MI	1,554	17	34	363
Port St. Lucie FL	8,903	21	186	441
Porterville CA	495	7	10	136
Portland ME	5,854	28	123	578
Portsmouth NH-ME	3,094	30	64	621
Pottstown PA	1,647	15	34	311
Prescott Valley-Prescott AZ	1,965	20	41	426
Pueblo CO	3,045	20	62	411
Racine WI	2,884	20	65	454
Rapid City SD	1,927	20	40	420
Reading PA	5,548	21	117	435
Redding CA	3,110	23	65	489
Reno NV-CA	10,955	26	226	541
Roanoke VA	5,657	25	116	516
Rochester MN	2,304	19	47	390
Rock Hill SC	2,774	24	60	529
Rockford IL	5,643	18	125	402
Rocky Mount NC	1,199	18	24	358
Rome GA	2,648	33	55	683
Rd Lake Bch-McHenry-Grayslake IL-WI	369	1	8	26
Saginaw MI	2,195	17	46	363
Salinas CA	5,402	27	115	575
Salisbury MD-DE	2,000	19	42	403
San Angelo TX	1,886	18	39	367
San German-Cabo Rojo-Sabana Gra PR	1,216	10	31	246
San Luis Obispo CA	1,652	21	34	428
San Marcos TX	1,330	14	30	320
Santa Barbara CA	10,113	46	215	979
Santa Clarita CA	6,984	28	146	584
Santa Cruz CA	10,608	42	220	873
Santa Fe NM	2,679	28	57	591

Table 4. Key Congestion Measures for 393 Urban Areas, 2017 (continued)

Urban Area	Annual Hours of Delay Total (000)	Annual Hours of Delay Per Auto Commuter	Annual Congestion Cost Total (Million $)	Annual Congestion Cost $ per Auto Commuter
Santa Maria CA	2,200	15	47	328
Santa Rosa CA	18,599	53	383	1,094
Saratoga Springs NY	1,930	26	40	548
Savannah GA	10,021	35	206	713
Scranton PA	7,667	19	158	398
Seaside-Monterey CA	6,053	48	126	1,006
Sebastian-Vero Bch S-Florida Ridge FL	2,456	15	50	303
Sebring-Avon Park FL	1,072	12	23	253
Sheboygan WI	774	10	16	201
Sherman TX	968	12	20	248
Shreveport LA	8,678	28	204	653
Sierra Vista AZ	614	8	13	176
Simi Valley CA	2,598	20	53	414
Sioux City IA-NE-SD	1,549	14	33	285
Sioux Falls SD	3,274	18	68	376
Slidell LA	1,464	15	33	337
South Bend IN-MI	3,722	13	80	274
South Lyon-Howell MI	2,122	16	43	337
Spartanburg SC	5,253	26	112	552
Spring Hill FL	1,768	11	36	222
Springfield IL	2,504	14	53	297
Springfield MO	10,516	34	215	705
Springfield OH	858	9	17	190
St. Augustine FL	2,285	28	46	565
St. Cloud MN	2,025	17	42	359
St. George UT	1,200	11	30	264
St. Joseph MO-KS	1,278	14	27	303
State College PA	1,252	13	26	268
Staunton-Waynesboro VA	1,199	14	24	277
Sumter SC	1,402	18	31	398
Syracuse NY	7,744	18	161	382
Tallahassee FL	7,356	33	151	686
Temple TX	2,429	25	51	534
Terre Haute IN	1,656	17	36	380
Texarkana TX-AR	1,653	19	36	420
Texas City TX	1,999	17	41	342
Thousand Oaks CA	9,247	42	189	856
Titusville FL	742	10	15	213
Topeka KS	3,310	21	71	439
Tracy CA	3,476	36	77	794
Trenton NJ	8,393	28	173	584
Turlock CA	3,190	29	70	637
Tuscaloosa AL	4,600	30	95	624
Twin Rivers-Highstown NJ	1,831	27	37	547
Tyler TX	5,381	31	118	677
Uniontown-Connellsville PA	905	17	19	357
Utica NY	2,123	17	44	359
Vacaville CA	2,605	26	54	535
Valdosta GA	1,826	22	38	460
Vallejo CA	8,197	40	171	835
Victoria TX	2,091	29	45	625
Victorville-Hesperia CA	5,715	16	120	345

Table 4. Key Congestion Measures for 393 Urban Areas, 2017 (continued)

Urban Area	Annual Hours of Delay Total (000)	Annual Hours of Delay Per Auto Commuter	Annual Congestion Cost Total (Million $)	Annual Congestion Cost $ per Auto Commuter
Villas NJ	626	10	13	196
Vineland NJ	1,464	14	30	297
Visalia CA	4,215	17	92	375
Waco TX	3,422	18	73	394
Waldorf MD	2,903	23	60	472
Walla Walla-WA-OR	497	9	11	188
Warner Robins GA	2,599	18	53	367
Waterbury CT	4,013	20	85	430
Waterloo IA	1,021	8	22	174
Watertown NY	788	9	16	185
Watsonville CA	1,593	20	33	411
Wausau WI	1,132	14	24	302
Weirton-Steubenville WV-OH-PA	1,237	17	27	372
Wenatchee WA	1,996	26	41	549
West Bend WI	787	11	16	221
Westminster-Eldersburg MD	1,699	22	35	462
Wheeling WV-OH	2,215	26	51	586
Wichita Falls TX	1,306	13	28	270
Williamsburg VA	1,891	19	37	374
Williamsport PA	1,073	20	22	416
Wilmington NC	6,714	28	135	553
Winchester VA	2,644	32	58	700
Winter Haven FL	3,841	17	81	356
Woodland CA	959	12	20	239
Yakima WA	2,585	18	56	390
Yauco PR	548	6	14	143
York PA	5,221	21	110	448
Youngstown OH-PA	7,057	18	146	377
Yuba City CA	2,567	20	54	411
Yuma AZ-CA	2,693	19	58	413
Zephyrhills FL	1,223	19	26	399


URBAN MOBILITY REPORT 2019



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