

2011 CONGESTED CORRIDORS REPORT



TTI's 2011 CONGESTED CORRIDORS REPORT

Powered by INRIX Traffic Data

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2011 Congested Corridors Report

<http://mobility.tamu.edu/corridors>

Congestion is a significant problem in America's urban areas. This is well documented in the Texas Transportation Institute's *Urban Mobility Report* (1). Powered by 2010 INRIX traffic data, the *2011 Congested Corridors Report* includes analysis along 328 specific (directional) freeway corridors in the United States. These corridors include many of the worst places for congestion in the United States, and the detailed data allow for more extensive analysis and a better picture of the locations, times and effects of stop-and-go traffic. The report doesn't list every bad location for congestion, but the issues explored here advance the understanding of when, how and where congestion occurs.

What did we find?

The 328 directional corridors account for:

- 6 percent of the national urban freeway lane-miles
- 36 percent of the urban freeway delay with only 10 percent of the national urban freeway vehicle-miles of travel
- 33 percent of the urban freeway truck delay with only 8 percent of the national urban freeway truck vehicle-miles of travel

These roads have more stop-and-go traffic than others, but perhaps more frustrating, it is also difficult to predict how much time the trips will take. For important trips, this forces motorists and truckers to plan much more time to ensure they will not be late.

What are the purposes of this report?

- We show congestion levels along specific corridors—the level where transportation improvements are determined. The very detailed hour-by-hour data shows when and where congestion occurs.
- We can suggest how much extra “buffer” time to allow. In addition to average congestion conditions, we include performance measures that describe the unreliability of congested corridors. While you know how long a trip will take on average, what about those days that you have to be on time? This report has a measure for that!

How did we perform the analysis?

We let the data tell these stories; we investigated all freeways and highways in the United States looking for traffic problems. As first explored in the *2010 INRIX National Traffic Scorecard* (2), a short directional roadway segment (less than 1 mile) with congestion for more than 10 hours in a week was the beginning of a congested corridor. (“Congestion” was having a speed less than half of the free-flow speed). Each directional, adjacent and upstream segment of roadway that was congested for 4 hours per week was included in the corridor. Four hours was chosen as the threshold after reviewing the data which showed that many upstream segments had some congestion nearly every weekday. Since it typically did not constitute every day of the week, choosing four hours allows one day per week to have a different queuing pattern. A minimum corridor length was set at 3 miles. This resulted in 328 directional freeway corridors. We combined traffic volume information from the states with the speed data to compute the performance measures along these corridors.

What measures are included?

The *2011 Congested Corridors Report* measures the extra travel time, increased fuel consumption and the congestion costs; it also measures the reliability problem — how much the congestion problems change from day to day. Tables illustrate the corridors with the most congestion or the worst reliability all day, in the morning, the mid-day, in the afternoon or on the weekends. The measures show conditions for all traffic and for trucks.

Can you tell me more about reliability?

A predictable transportation system is important to motorists and goods movers. Reliability describes the extra time you add to a trip to ensure you will be on time. Reliability is important if you have to be on time for work, to catch an airplane, to pick up a child at daycare, to ensure just-in-time deliveries are made—any trip when you simply can't be late. We all make important trips, and we add additional time over what a trip takes on a typical day so that we know we will make it on time. Reliability performance measures illustrate the variability in traffic congestion so that we can estimate the extra “buffer” time we need to add to be sure we are on time.

At the national level, the Federal Highway Administration (FHWA) is moving towards a greater focus on performance management in its programs. FHWA's Office of Operations has been focusing on supporting system reliability, and specifically, the use of travel-time based reliability measures (3). Many state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) are investigating the use of reliability measures. Some examples of FHWA's efforts supporting reliability measures are documented in:

- *2010 Urban Congestion Trends: Enhancing System Reliability with Operations*—produced annually to identify urban congestion trends (3), and
- *Urban Congestion Reports*—produced on a quarterly basis to characterize congestion and reliability trends both nationally and at the city level (4).
- *Travel Time Reliability: Making It There on Time, All the Time*—describes reliability measures and applications (5).

The *2011 Congested Corridors Report* highlights the use of similar congestion and reliability measures.

What can we do to fix these congestion problems?

We suggest that implementing congestion solutions would start at the “to” end of the corridors identified in the tables of this report; that's close to where the bottleneck is and where solutions would be most effective.

Once the start of the problem is located, the next step is identifying the types of congestion problems and when they occur. There are many types of congestion problems—too many travelers, not enough roads, buses, or rail capacity; crashes and stalled vehicles; or special events, to name a few. Each of these problems has different solutions.

As far as solutions go, there are many ways to address congestion problems identified on these specific corridors; the *Urban Mobility Report* data show that there is still work to do. The most effective strategy 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.

Travel Time Reliability

Concepts and Measures

"I've got to get to work on time today or Mr. NoLeeway will surely fire me!"

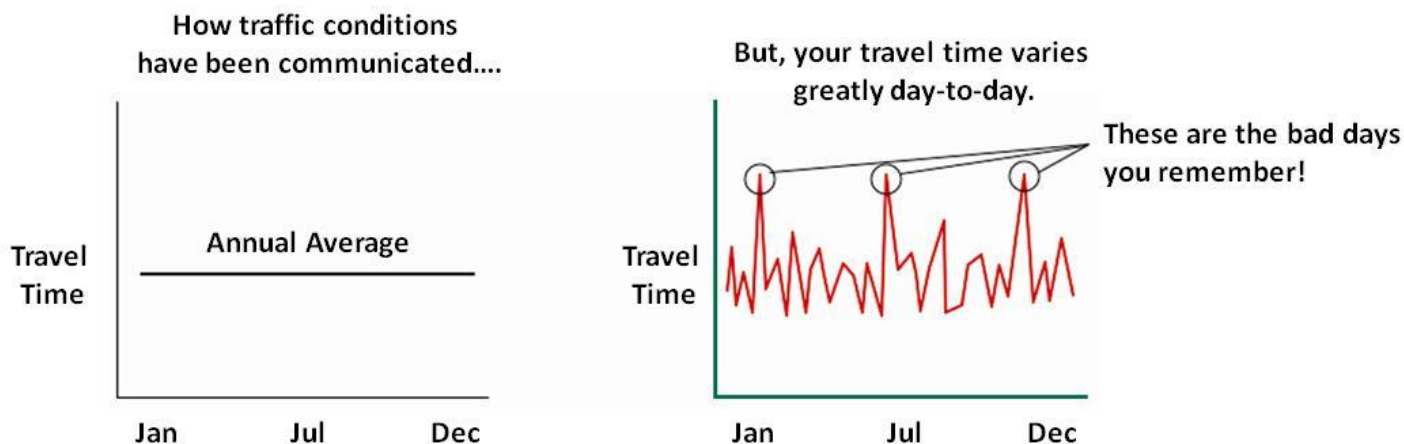
"If this delivery is late, the assembly line will shut down!"

"If I don't get to the daycare by 5:30 to pick up Zach, Ms. Timely will make me pay extra again!"

"I can't miss the start of my daughter's soccer game!"

Any of these sound familiar? We've all made urgent trips. Motorists and truckers make them every day. For trips that are not urgent, you have an expectation of how long it will take you to get there. On your daily commute trips, this is the average time it takes you based on your past experiences. For more urgent trips, you will add extra time to your average trip time to ensure you get there on time. That extra time "buffer" is what reliability performance measures are designed to help us understand.

As shown in the graphic below, your travel time can vary greatly from day to day. The "bad days" (very unreliable) are the ones you will remember. That's the day there was a crash, several stalled vehicles, a snowstorm, or construction that made the trip take much longer. When you have an urgent trip, you will use these "bad days" to help you estimate the extra buffer time you need to guarantee you get there on time.



Source: Federal Highway Administration (4)

The travel time index (TTI) is a congestion measure that captures average congestion levels. It compares travel conditions in the peak period to travel conditions during free-flow conditions. For example, a TTI of 1.50 means that a trip that takes 20-minutes in light traffic will take 30 minutes (on average) in the peak period ($20 \text{ minutes} \times 1.50 = 30 \text{ minutes}$).

We estimated reliability using 2 measures—the planning time index and the buffer index. With the INRIX speed data, we captured travel time values for every hour of every weekday (say 7 to 8 am); the reliability measures show the amount of variation in travel time between those weekdays.

The planning time index (PTI) represents the total travel time that you should plan for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. For example, a PTI of 2.25 means that for a 20-minute trip in light traffic, 45 minutes should be planned ($20 \text{ minutes} \times 2.25 = 45 \text{ minutes}$).

Both the TTI and PTI measure congestion relative to free-flow conditions.

The buffer index (BI) is a measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips (e.g., the time you would need to add to the average travel time so that you are only late for 1 trip out of 20). The BI is expressed as a percentage. For example, a BI of 50 percent means that for a trip that usually takes 30 minutes, you should plan for an extra 15 minutes of “buffer time” ($30 \text{ minutes} \times 50\% = 15 \text{ minutes}$). The BI identifies how much extra time you need to add to your average trip time.

Appendix B provides more details on the computation of all the congestion measures used in this report.

The Congested Corridor Rankings

The analysis is performed using several types of measures to examine the various congestion problems.

- **Total measures** (including hours of delay, gallons of fuel wasted, and congestion cost) are calculated on an hourly basis for each day of the week and then annualized by multiplying by 52 weeks.
- **Peak measures** (including peak period delay, buffer index, planning time index, travel time index) are based on travel during the peak period times (6 to 10 am and 3 to 7 pm).

Delay per mile is the primary ranking measure because the corridors in this analysis vary a great deal in length. This measure allows corridors of different lengths to be compared because this measure focuses on the intensity of the delay. The magnitude of the congestion problems in each corridor are further described with the total gallons of wasted fuel and the total congestion cost.

Several tabular groupings were created to show that the corridors in the study have different peaking characteristics. For example, some corridors have a greater proportion of their daily delay in the morning peak period, while others have more delay occurring on the weekend. The following tables are included in this report to show these various characteristics:

- Table 1 – Reliably Unreliable (top 40 corridors ranked by buffer index—see Appendix A for ranking of all 328 corridors)
- Table 2 – Congestion Leaders (top 40 corridors ranked by delay per mile—see Appendix A for ranking of all 328 corridors)
- Table 3 – 3-cup Mornings (top 40 corridors for morning peak period delay per mile)
- Table 4 – Dog Day Afternoon (top 40 corridors for afternoon peak period delay per mile)
- Table 5 – Lunch Bunch (top 40 corridors for mid-day delay per mile)
- Table 6 – Weekend Warriors (top 40 corridors for weekend delay per mile)
- Table 7 – Where the Big Trucks Are (top 40 corridors for truck delay per mile)
- Table 8 – One-Hit Wonders (corridors in cities with only one or 2 corridors from the 328 corridors)

The following pages include descriptions and performance measure values.

Reliably Unreliable (Table 1)

Table 1 shows the top 40 corridors from 2010 ranked by the buffer index (weekday peak period travel time reliability). The full ranking of these corridors is shown in Appendix A. Key findings of Table 1 are:

- The least reliable corridor is the southbound section of GA 400 in Atlanta between Toll Plaza and I-85. This corridor has a buffer index of 256 percent. This means that drivers have to allow 256 percent more time than the average to complete their trip on time 19 out of 20 times.
- The northbound Van Wyck Expressway in New York between Belt Parkway and Main Street ranked highest in the planning time index. The planning time index of 6.88 means that a driver has to add 588 percent more time to ensure on-time arrival for 95 percent of the trips. This is a very congested corridor; the travel time index of 3.72 shows that it takes 272 percent longer to make a peak period trip than the same trip at free-flow speeds.
- The New York area has 5 of the top 20 corridors for least reliable travel based on the buffer index. Atlanta and Washington, D.C. each have 2 corridors in the top 20.

Congestion Leaders (Table 2)

Table 2 contains the top 40 corridors from 2010 ranked by annual delay per mile. Also shown in the table are the annual gallons of wasted fuel and the annual congestion cost associated with the delay and fuel. The full ranking of these corridors is shown in Appendix A. Key findings of Table 2 are:

- The highest ranked corridor for delay per mile is the Harbor Freeway (northbound) in Los Angeles from I-10 to Stadium Way. While this corridor ranks first in delay per mile, it ranks 27th in total congestion cost because it is one of the shorter corridors in the study. This corridor has about 1.4 million hours of delay per mile.
- 7 of the 10 most congested corridors in the U.S. are found in the Los Angeles region.
- The top 21 corridors in this list had at least a half million hours of delay per mile in 2010.
- 284 corridors contained at least 100,000 hours of delay per mile in 2010.
- The most wasted fuel and highest congestion cost occurred on US 101 southbound in Los Angeles between Ventura Boulevard and Vignes Street. This is a long corridor (approximately 27 miles) so it is not surprising that it would rank near the top of the magnitude measures in the table.

Highlights when comparing the “Reliably Unreliable” (Table 1) with the “Congestion Leaders” (Table 2) rankings:

- There are more regions represented in the “Reliably Unreliable” (Table 1) list than the “Congestion Leaders” (Table 2). Unreliability is a more distributed problem.
- The corridors with geographic or operational challenges (e.g., narrow roads, bridges, tunnels, toll plazas, etc) may rank worse in reliability than some of their more congested counterparts because a crash or bad weather event can have more affect on these constrained corridors.

3-Cup Mornings (Table 3)

Table 3 shows the corridors with the largest delay per mile in the morning peak period (6 am to 10 am). This table includes the same measures as Table 2, but it is based only on traffic during the morning peak period. Key findings of this table include:

- The southbound I-405 (San Diego Freeway) in Los Angeles from Nordhoff Street to Mulholland Drive tops this list with about 365,000 hours of delay per mile in the morning peak period for 2010.
- The top 9 corridors had at least 200,000 hours of delay per mile.
- 16 different urban areas have at least one corridor appearing in this top 40 list with delay per mile values ranging from about 120,000 hours to 365,000 hours.
- The total morning peak period congestion cost in these corridors ranged from about \$10 million to just over \$83 million in 2010.

Dog Day Afternoons (Table 4)

Table 4 shows the corridors with the worst afternoon congestion (3 to 7 pm). This table includes the same measures as Table 2, but it is based only on traffic during the afternoon peak period. Key findings of this table include:

- The northbound Harbor Freeway (CA-110) in Los Angeles from I-10 to Stadium Way tops the list with about 756,000 hours of delay in 2010.
- The top 24 corridors had at least 300,000 hours of delay per mile.
- 9 urban areas have corridors included in the top 40 list.
- Delay per mile ranges from about 256,000 hours to 756,000 hours.
- Total congestion cost in the top 40 ranged from about \$17 million to about \$189 million.
- *Congestion problems are much greater in the afternoon peak period than the morning peak period;* compare the delay per mile values in Tables 3 and 4. The top 40 afternoon peak period delay per mile values are all higher than 250,000 hours per mile, while only the top 3 corridors are over 250,000 hours per mile in the morning peak period.

Lunch Bunch (Table 5)

Table 5 shows the congestion problem in corridors through the midday hours (10 am to 3 pm). While one may not think that congestion is a problem on freeway corridors in the middle of the day, proximity to lunch locations, shopping areas, medical centers, and other activity centers can cause slow traffic. This table includes the same measures as Table 2, but it is based only on traffic during the midday hours. Key findings of this table include:

- The northbound Harbor Freeway (CA-110) from I-10 to Stadium Way in Los Angeles led the list with about 226,000 hours of delay per mile in 2010 during the midday hours.
- 11 corridors had at least 100,000 hours of delay per mile.
- 10 different urban areas have at least one corridor in the top 40 list with Los Angeles topping the list with 14 corridors. New York is second with 11 corridors.
- The highest ranking corridor in this list has less delay per mile (226,000 hours) than the number 40th ranked corridor in afternoon peak period delay (see Table 4).

Weekend Warriors (Table 6)

Table 6 shows weekend congestion problems. Congestion is rarely a stop-and-go speeds type of problem on freeway corridors on Saturdays and Sundays, but it can occur near major shopping areas, sporting arenas, and other recreational activity centers. This table includes the same measures as Table 2, but it is based only on traffic during the weekends. Key findings of this table include:

- The northbound Harbor Freeway (CA-110) from I-10 to Stadium Way in Los Angeles led the list with about 253,000 hours of delay per mile in 2010 on the weekends, more than during the weekday midday periods.
- 6 urban areas have at least 100,000 hours of delay per mile.
- Total congestion cost ranged from about \$4 million to about \$40 million in the corridors included in this list.
- 10 urban areas have corridors in this list.

Where the Big Trucks Are (Table 7)

Table 7 includes the amount of daily truck travel on each corridor into the congestion measures. This table includes the same measures as Table 2, but it is based entirely on truck travel. Key findings of this table include:

- The northbound Harbor Freeway in Los Angeles between I-10 and Stadium Way has the most truck delay per mile at just under 100,000 hours per mile in 2010.
- The US-101 southbound in Los Angeles between Ventura Boulevard and Vignes Street ranked first for wasted diesel by trucks with over 1.5 million gallons.
- The Riverside Freeway (CA-91) eastbound in Los Angeles between CA-55 and McKinley Street ranked number one for truck congestion cost at over \$67 million in 2010.
- The Los Angeles area had 16 corridors ranked in the top 40 for truck delay. New York had the second most corridors ranked for truck delay with 9, while Chicago was third with 4 corridors. Each of these regions has significant truck traffic due to large populations and proximity to ports and intermodal facilities.
- Significant truck congestion was not limited to corridors in the largest metropolitan regions. For example, Baton Rouge with eastbound I-12 and Austin with both northbound and southbound I-35 were included in the top 40 corridors.

One-Hit Wonders (Table 8)

Table 8 is a subset of Table 2. It includes urban areas that only have one or 2 corridors included in Table 2. Key findings of this table include:

- The list contains 26 urban areas.
- Southbound I-275 in Tampa from Floribruska Avenue to US-92 tops this list with about 278,000 hours of delay per mile in 2010.
- 10 corridors have at least 200,000 hours of delay per mile while 28 corridors have at least 100,000 hour of delay per mile.
- Total congestion costs range from just over \$1 million to about \$75 million.

Using the Best Congestion Data & Analysis Methodologies

The base data for the *2011 Congested Corridors Report* come from INRIX and FHWA (6, 7). The methodology and analysis procedures are described in more detail in Appendix B.

- 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 by day of week for each link of major roadway covered in the NAS database for 2010. This covered about 1 million centerline miles in 2010.
- We let the data tell these stories; we investigated all freeways and highways in the United States looking for traffic problems. As first explored in the *2010 INRIX National Traffic Scorecard* (2), a short directional roadway segment (less than 1 mile) with congestion for more than 10 hours in a week was the beginning of a congested corridor. (“Congestion” was having a speed less than half of the free-flow speed). Each directional, adjacent and upstream segment of roadway that was congested for 4 hours per week was included in the corridor. Four hours was chosen as the threshold after reviewing the data which showed that many upstream segments had some congestion nearly every weekday. Since it typically did not constitute every day of the week, choosing four hours allows one day per week to have a different queuing pattern. A minimum corridor length was set at 3 miles. This resulted in 328 directional freeway corridors. We combined traffic volume information from the states with the speed data to compute the performance measures along these corridors.
- 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 hourly volumes using a set of estimation curves developed from a national traffic count dataset (8).
- The hourly INRIX speeds were matched to the hourly volume data for each congested corridor.
- Performance measures were then computed including delay per mile, planning time index, buffer index, travel time index, gallons of wasted fuel, and congestion cost. A number of different tables and rankings were produced to illustrate the most congestion or the worst reliability all day, in the morning, the mid-day, in the afternoon or on the weekends. The measures show conditions for all traffic and for trucks.

Future Changes

There will be other changes in the report methodology over the next few years. There is more information available every year that provides more descriptive travel time and volume data. This report will begin a dialogue for computing and ranking corridors with reliability measures. Improved data will yield more precision in corridor analyses. The authors are considering further investigation of:

- Long sections with multiple bottlenecks
- The sensitivity of altering the value of 10 hours in a week that indicates the start of the congested corridor
- Seasonality changes in the congestion levels.

We would like to hear your ideas for more detailed analyses. What do you want to know? What do you care about? What decisions are you making with related data and measures?

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 and the places they have been implemented can be found on the website <http://mobility.tamu.edu/solutions>.

- **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, adding a short section of roadway, and providing traveler information while ensuring alternate routes parallel to the freeways are operating efficiently (timing the traffic signals so that more vehicles see green lights, improving road and intersection designs) are all relatively simple actions.
- **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.
- **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.
- **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.
- **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 appear to be part, but not all, of the solution.
- **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.

Concluding Thoughts

The *2011 Congested Corridors Report* identified many of the worst places for freeway congestion in the United States. The 328 corridors account for only 6 percent of the urban freeway miles and 10 percent of the traffic, but have 36 percent of the urban congestion. The detailed data allow for more extensive analysis and a better picture of the location, time and effects of stop-and-go traffic.

Solutions and Performance Measurement

So what can be done to fix these congestion problems? There are solutions that work. There are also significant benefits from aggressively attacking congestion problems. Performance measures and detailed data like those used in the *2011 Congested Corridors Report* can guide those investments, identify operating changes 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. In many of these corridors additional capacity is needed to move people and freight more rapidly and reliably. Getting more productivity out of the existing road and public transportation systems is also 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.”

The good news from the *2011 Congested Corridors Report* is that the data can improve decisions and communication about the problems and the effect of solutions. 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.

At the national level, the Federal Highway Administration (FHWA) is moving towards a greater focus on performance management in its programs. FHWA’s Office of Operations has been focusing on supporting system reliability, and specifically, the use of travel-time based reliability measures through a number of efforts (3, 4, 5).

Tables of Rankings

- Table 1. Reliably Unreliable (Top 40)
- Table 2. Congestion Leaders (Top 40)
- Table 3. 3-Cup Mornings (Top 40)
- Table 4. Dog Day Afternoons (Top 40)
- Table 5. Lunch Bunch (Top 40)
- Table 6. Weekend Warriors (Top 40)
- Table 7. Where the Big Trucks Are (Top 40)
- Table 8. One-Hit Wonders (Top 40)

Note: Tables 1 through 8 contain the “Top 40” for each category. Appendix A contains the ranking of all 328 corridors for Table 1 and Table 2.

Table 1. Reliably Unreliable (Top 40)

Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Atlanta	GA-400 SB	Toll Plaza I-85/Exit 87	4.1	256	1	4.83	15	1.63	216
Atlanta	I-75 SB	Mount Zion Pkwy/Exit 231 Hudson Bridge Rd/Exit 224	6.7	253	2	4.68	23	1.34	314
New York	Hutchinson River Pkwy NB	Cross County Pkwy/Exit 15 Mamaroneck Rd/Exit 22	4.5	215	3	4.69	22	1.49	273
New York	Bronx Whitestone Brg NB Whitestone Expy NB	Linden Pl/Exit 14 Toll Plaza	3.4	215	3	4.62	24	1.80	130
Norfolk	Hampton Roads Beltway/I-64 EB	Rip Rap Rd/Exit 265 Hampton Roads Brg Tunl(Hampton)	3.1	198	5	5.28	6	1.89	98
New York	Pulaski Skwy NB	I-95/Exp US-1 Tonnele Ave	3.3	197	6	4.29	29	1.70	179
New Haven	I-84 WB	I-691 (Cheshire) (West) Austin Rd/Exit 25A	3.4	189	7	4.26	33	1.64	213
Houston	N Loop W Fwy/I-610 EB	US-290 Yale St	4.0	188	8	4.03	58	2.23	34
Pittsburgh	Penn Lincoln Pkwy/I-376 EB	Lydia St/Exit 2 US-19 TK RT/PA-51/Exit 5	3.4	186	9	6.84	2	3.12	3
Riverside	Ontario Fwy/I-15 NB	I-210/Exit 115 Glen Helen Pkwy	6.2	182	10	3.23	167	1.26	321
New York	Major Deegan Expy SB	Van Cortlandt Park/Exit 11 I-95/Cross Bronx Expy/Exit 7	3.5	173	11	4.96	9	1.89	98
Washington, DC	I-70 WB	MD-144/Exit 59 US-15/US-340/Exit 52	6.8	173	11	3.31	148	1.27	320
New Orleans	I-10 EB	Loyola Dr Veterans Memorial Blvd	3.5	170	13	4.45	26	1.75	153
Louisville	I-64 WB	Cannons Ln/Exit 10 I-71/Exit 6	4.4	170	13	4.18	42	1.64	213
Washington, DC	I-95 SB	I-395 Russell Rd/Exit 148	23.9	165	15	4.71	21	1.89	98
New York	I-95 SB (NE Thwy, Bruckner/Cross Bronx Expys)	Conner St/Exit 13 Hudson Ter	22.7	161	16	5.58	3	2.74	6
San Francisco	California Delta Hwy/CA-4 EB	Bailey Rd Somersville Rd	5.8	161	16	5.39	4	2.08	52
Baltimore	John Hanson Hwy/US-50/US-301 EB	I-97/Exit 21 MD-70/Rowe Blvd/Exit 24	3.4	161	16	4.09	51	1.67	198
Baton Rouge	I-10 EB	LA-415/Exit 151 Dalrymple Dr/Exit 156	4.7	157	19	4.12	49	1.67	198
Chicago	I-55 NB	IL-53/Exit 267 IL-83/Kingery Hwy/Exit 274	8.9	155	20	3.66	90	1.49	273
New Haven	I-95 NB	Marsh Hill Rd/Exit 41 Ella T Grasso Blvd/Exit 45	4.0	151	21	4.29	29	1.85	110

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 1. Reliably Unreliable (Top 40), continued

Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Cincinnati	I-75 SB	I-74/US-52/US-27/Exit 4 W 7th St/Exit 1	3.4	151	21	4.09	51	1.89	98
Birmingham	I-65 SB	US-31/Montgomery Hwy/Exit 252 Jefferson/Shelby County Line	3.5	151	21	2.66	270	1.36	310
Chicago	Stevenson Expy/I-55 SB	IL-43/Harlem Ave/Exit 283 County Line Rd/Exit 276A	7.3	150	24	4.07	53	1.69	189
Baton Rouge	I-10 WB	Siegen Ln/Exit 163 Perkins Rd/Exit 157	6.4	150	24	3.70	86	1.48	277
San Francisco	I-580 EB	Eden Canyon Rd El Charro Rd/Fallon Rd	9.6	147	26	4.24	35	1.92	92
Chicago	Eisenhower Expy/I-290 EB	IL-72/Higgins Rd/Exit 1 Austin Blvd/Exit 23A	21.5	144	27	4.61	25	1.99	75
Washington, DC	Capital Beltway/I-495 Inner Loop	I-95/I-395/Exit 57 MD-650/New Hampshire Ave/Exit 28	41.4	144	27	4.29	29	2.06	59
Cincinnati	I-75 SB	OH-126/Exit 14 Ronald Reagan Cross County Hwy/Exit 10	3.9	140	29	3.83	76	1.68	195
Chicago	Eisenhower Expy/I-290 WB	S Ashland Ave/Exit 28B 9th Ave/Exit 19B	8.9	139	30	4.87	12	2.07	56
Charlotte	I-85 NB	University City Blvd Speedway Blvd/Exit 49	6.2	134	31	3.28	153	1.40	304
Los Angeles	I-710 NB	Alondra Blvd Imperial Hwy	3.0	133	32	3.83	76	1.70	179
Boston	I-495 NB	MA-110/Chelmsford St/Exit 34 Woburn St/Exit 37	3.0	132	33	3.94	71	1.77	147
Atlanta	I-75/I-85 NB	GA-166 US-78/US-278/US-29/Exit 249	7.6	132	33	3.27	156	1.78	143
New York	Major Deegan Expy/I-87 NB	I-278/Bruckner Expy I-95/Cross Bronx Expy/Exit 7	4.1	131	35	4.75	19	2.19	38
Dallas-Fort Worth	Thornton Fwy/I-30 WB	Saint Francis Ave/Exit 52 Griffin St	7.2	130	36	4.13	48	1.96	80
Houston	I-10 EB	T C Jester Blvd/Exit 765 McKee St/San Jacinto St	4.4	129	37	4.18	42	2.17	42
Chicago	I-290 WB	I-88/Exit 15A IL-83/Exit 10A	6.0	128	38	3.95	68	1.69	189
Atlanta	I-85 SB	GA-13/Exit 86 (East) I-75/Exit 85	2.5	127	39	5.30	5	2.37	23
New York	Henry Hudson Pkwy NB	W 72nd St I-95/Riverside Dr/Exit 14-15	6.2	126	40	4.20	38	1.79	137
New York	FDR Dr NB	I-495/Tunnel Exit St/Queens Midtown Tunnel 116th St/Exit 16	4.0	126	40	3.93	72	1.88	103
Seattle	I-5 SB	84th St/Hosmer St/Exit 128 41st Division Dr/Exit 120	7.9	126	40	3.16	173	1.47	280

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 2. Congestion Leaders (Top 40)

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	Harbor Fwy/CA-110 NB	I-10/Santa Monica Fwy Stadium Way/Exit 24C	3.1	1,440	1	2,170	28	95,020	27
Los Angeles	Harbor Fwy/I-110 NB	111th Pl I-110/I-10/Santa Monica Fwy	6.5	1,126	2	3,665	13	158,173	14
Los Angeles	San Diego Fwy/I-405 NB	I-105/Imperial Hwy Getty Center Dr	13.1	965	3	6,057	2	269,925	2
New York	Van Wyck Expy/I-678 NB	Belt Pkwy/Exit 1 Main St/Exit 8	3.1	690	4	1,086	68	46,928	69
Los Angeles	San Gabriel River Fwy/I-605 SB	Beverly Blvd Florence Ave	4.8	681	5	1,644	43	70,454	43
Los Angeles	Santa Monica Fwy/I-10 EB	CA-1/Lincoln Blvd/Exit 1B Alameda St	14.9	640	6	4,664	8	203,998	8
Los Angeles	Santa Monica Fwy/I-10 WB	I-5/Golden State Fwy National Blvd	12.6	633	7	3,831	11	169,842	11
San Francisco	I-80 EB (James Lick Fwy/Bay Brdg)	US-101 Treasure Island Rd	3.6	600	8	1,005	76	43,711	79
San Francisco	Grove Shafter Fwy/CA-24 WB	Saint Stephens Dr Caldecott Tunnel	3.5	600	8	934	84	43,359	82
Los Angeles	I-110 SB	W Vernon Ave 51st St	2.5	582	10	670	124	30,929	114
New York	I-278 EB (Gowanus Expy/Brooklyn Queens)	92nd St/Exit 17 Apollo St/Meeker Ave/Exit 34	11.6	581	11	3,618	15	149,860	15
Los Angeles	Riverside Fwy/CA-91 EB	CA-55/Costa Mesa Fwy Mckinley St	20.7	576	12	5,698	3	260,647	3
New York	I-278 WB (Brooklyn Queens/Gowanus Expy)	NY-25A/Northern Blvd/Exit 41 NY-27/Prospect Expy/Exit 24	10.2	550	13	2,966	19	124,355	20
Austin	I-35 SB	US-183/Exit 239-240 Woodland Ave	6.7	546	14	1,698	38	77,880	37
San Francisco	Eastshore Fwy/I-80 EB/I-580 WB	Cypress St University Ave	3.3	538	15	847	91	36,568	98
Austin	I-35 NB	Shelby Ln/St Elmo Rd/Exit 230 Martin Luther King Blvd/19th St/Exit 235	4.7	536	16	1,243	58	54,236	61
Los Angeles	CA-110 SB (Pasadena/Harbor Fwys)	Avenue 60 Olympic Blvd/9th St	6.6	526	17	1,679	40	73,700	41
Los Angeles	I-5 SB (Santa Ana/Golden St Fwys)	East Ceasar Chavez Ave Valley View Ave	17.5	523	18	4,541	9	196,333	9
New York	Van Wyck Expy/I-678 SB	Horace Harding Expy/Exit 12A Linden Blvd/Exit 3	6.2	520	19	1,625	44	70,308	44
San Francisco	Eastshore Fwy/I-80 WB/I-580 EB	Cutting Blvd Bay Bridge Toll Plz	8.5	515	20	2,122	29	90,264	29

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. Wasted Fuel—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. Congestion Cost—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 2. Congestion Leaders (Top 40), continued

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	US-101 NB (Santa Ana/Hollywood Fwys)	I-5/CA-60 Haskell Ave	21.5	503	21	5,386	6	232,387	6
Los Angeles	San Diego Fwy/I-405 NB	Macarthur Blvd Brookhurst St	7.8	497	22	1,777	37	81,506	35
Los Angeles	I-5 NB (Santa Ana/Golden St Fwys)	CA-39/Beach Blvd Riverside Dr	22.5	487	23	5,442	5	235,356	5
Los Angeles	San Bernadino Fwy/I-10 EB	City Terrace Dr/Herbert Ave Baldwin Park Blvd	12.8	487	23	3,041	18	132,990	17
Los Angeles	US-101 SB (Ventura/Hollywood Fwys)	Ventura Blvd/Shoup Ave Vignes St/Exit 2B	26.7	485	25	6,262	1	277,782	1
Houston	I-10 EB	T C Jester Blvd/Exit 765 McKee St/San Jacinto St	4.4	475	26	951	81	43,270	83
Boston	Southeast Expy/I-93 NB	MA-28/Randolph Ave/Exit 5 Columbia Rd/Exit 15	10.4	470	27	2,442	22	105,165	22
Washington, DC	Capital Beltway/I-495 Outer Loop	US-1/Baltimore Ave/Exit 25 MD-97/Georgia Ave/Exit 31	6.3	465	28	1,360	55	61,030	54
Houston	N Loop W Fwy/I-610 EB	US-290 Yale St	4.0	460	29	885	89	39,255	90
Los Angeles	San Diego Fwy/I-405 SB	Nordhoff St Mulholland Dr	8.1	458	30	1,793	36	79,085	36
Houston	US-59 NB (Southwest/Eastex Fwys)	Buffalo Speedway I-45	4.8	453	31	1,025	74	45,426	72
New York	Major Deegan Expy/I-87 NB	I-278/Bruckner Expy I-95/Cross Bronx Expy/Exit 7	4.1	452	32	975	80	41,142	86
Seattle	I-5 SB	WA-523/145th St/Exit 175 Union St/Exit 165	8.9	441	33	1,930	32	84,806	33
Pittsburgh	Penn Lincoln Pkwy/I-376 EB	Lydia St/Exit 2 US-19 TK RT/PA-51/Exit 5	3.4	433	34	728	107	33,336	108
Miami	Dolphin Expy/SR 836 EB	107th Ave FL-959/Red Rd	5.0	431	35	1,105	67	45,316	73
New York	Long Island Expy/I-495 EB	Maurice Ave/Exit 18 Mineola Ave/Willis Ave/Exit 37	16.0	426	36	3,506	16	149,511	16
New York	I-95 SB (NE Thwy, Bruckner/Cross Bronx Expys)	Conner St/Exit 13 Hudson Ter	22.7	425	37	4,907	7	213,006	7
Los Angeles	I-605 NB	Beverly Blvd Valley Blvd	5.0	423	38	1,038	71	44,997	74
Chicago	Stevenson Expy/I-55 SB	State St/Exit 293C Pulaski Rd/Exit 287	5.7	414	39	1,249	56	55,001	59
New York	Goethals Brg EB/I-278 EB	Meeker Ave/Forest Ave/Exit 4 Bradley Ave/Exit 11	3.3	414	39	716	111	30,094	124

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 3. 3-Cup Mornings (Top 40)

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 Morning Peak Period Congestion (6 to -10 am)					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	San Diego Fwy/I-405 SB	Nordhoff St Mulholland Dr	8.1	365	1	1,449	3	63,088	4
Los Angeles	Harbor Fwy/I-110 NB	111th Pl I-110/I-10/Santa Monica Fwy	6.5	352	2	1,167	7	49,422	7
Washington, DC	Capital Beltway/I-495 Outer Loop	US-1/Baltimore Ave/Exit 25 MD-97/Georgia Ave/Exit 31	6.3	290	3	891	12	38,119	13
Los Angeles	Santa Monica Fwy/I-10 WB	I-5/Golden State Fwy National Blvd	12.6	245	4	1,516	2	65,587	3
Pittsburgh	Penn Lincoln Pkwy/I-376 EB	Lydia St/Exit 2 US-19 TK RT/PA-51/Exit 5	3.4	245	4	355	45	18,852	37
Riverside	Riverside Fwy/CA-91 WB	McKinley St Auto Center Dr/Serfas Club Dr	5.6	228	6	653	22	29,083	21
Boston	Southeast Expy/I-93 NB	MA-28/Randolph Ave/Exit 5 Columbia Rd/Exit 15	10.4	224	7	1,192	6	50,213	6
Los Angeles	Pomona Fwy/CA-60 WB	Fairway Dr Peck Rd	10.4	207	8	1,082	8	45,686	8
Los Angeles	I-10 WB	Citrus St Baldwin Park Blvd	5.2	203	9	537	26	22,645	29
Los Angeles	I-405 NB	Avalon Blvd Inglewood Ave	7.3	195	10	684	18	29,942	20
New York	Van Wyck Expy/I-678 NB	Belt Pkwy/Exit 1 Main St/Exit 8	3.1	195	10	296	58	13,270	58
Los Angeles	I-210 WB	I-605 Baldwin Ave	5.5	192	12	535	27	22,437	30
San Francisco	Nimitz Fwy/I-880 SB	I-238/Washington Ave CA-92/Jackson St	4.3	191	13	397	39	16,718	43
Houston	I-45 NB	Clearwood Dr/Edgebrook St Broadway St/Park Place Blvd/Exit 39	3.8	191	13	340	49	14,856	50
Los Angeles	I-10 WB	Valley Blvd Atlantic Blvd	6.4	185	15	606	24	25,354	24
Boston	I-93 SB	I-95/MA-128/Exit 37 US-1/Exit 27	9.8	182	16	889	13	38,112	14
Philadelphia	Delaware Expy/I-95 SB	Academy Rd/Exit 32 Girard Ave/Exit 23	8.3	179	17	744	17	32,085	17
Miami	Dolphin Expy/SR 836 EB	107th Ave FL-959/Red Rd	5.0	172	18	430	37	18,092	39
Los Angeles	I-405 SB	Valley View St Warner Ave	6.6	170	19	510	30	23,422	27
Los Angeles	CA-55 SB	Katella Ave McFadden Ave	6.0	167	20	470	34	20,967	32

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 3. 3-Cup Mornings (Top 40), continued

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 Morning Peak Period Congestion (6 to 10 am)					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	CA-110 SB (Pasadena/Harbor Fwys)	Avenue 60 Olympic Blvd/9th St	6.6	159	21	513	29	22,216	31
Houston	I-45 SB	Tidwell Rd Cavalcade St/Exit 50	3.4	156	22	247	67	11,324	66
Houston	Eastex Fwy/US-59 SB	Quitman St/Liberty Rd TX-288	4.1	154	23	301	57	12,984	60
San Francisco	California Delta Hwy/CA-4 WB	Hillcrest Ave Somerville Rd	3.0	151	24	211	78	9,591	75
Los Angeles	San Diego Fwy/I-405 NB	I-105/Imperial Hwy Getty Center Dr	13.1	149	25	960	11	41,596	11
Pittsburgh	Penn Lincoln Pkwy/I-376 WB	US-22 Bus/Exit 10 Squirrel Hill Tunl	5.3	146	26	367	42	17,583	40
Los Angeles	US-101 SB (Ventura/Hollywood Fwys)	Ventura Blvd/Shoup Ave Vignes St/Exit 2B	26.7	145	27	1,911	1	82,964	2
Chicago	Stevenson Expy/I-55 NB	US-20/US-45/US-12/Exit 279A Pulaski Rd/Exit 287	8.9	140	28	670	21	29,044	22
New York	Long Island Expy/I-495 WB	Glen Cove Rd/Exit 39 Woodhaven Blvd	14.9	139	29	1,052	9	45,597	9
New York	Laurelton/Belt/Shore Pkwy WB	Francis Lewis Blvd/Exit 24 Nassau Expy/Exit 19	4.9	138	30	350	47	14,876	49
New York	I-278 EB (Gowanus Expy/Brooklyn Queens)	92nd St/Exit 17 Apollo St/Meeker Ave/Exit 34	11.6	137	31	823	15	35,237	16
Los Angeles	Century Fwy/I-105 WB	Bellflower Blvd Crenshaw Blvd	12.5	136	32	810	16	35,797	15
Bridgeport	Connecticut Turnpike/I-95 SB	Stratford Ave/Exit 28 Round Hill Rd/Exit 22	4.9	131	33	330	51	14,209	51
Dallas-Fort Worth	TX-183 EB	I-820 Bedford Rd	4.0	129	34	239	69	10,902	68
Los Angeles	San Gabriel River Fwy/I-605 SB	Beverly Blvd Florence Ave	4.8	128	35	307	56	13,280	57
Seattle	I-5 NB	Albro Pl/Swift Ave/Exit 161 James St/Exit 164	4.1	128	35	271	63	11,405	65
Los Angeles	I-5 NB (Santa Ana/Golden St Fwys)	CA-39/Beach Blvd Riverside Dr	22.5	126	37	1,405	4	60,634	5
New York	Goethals Brg EB/I-278 EB	Meeker Ave/Forest Ave/Exit 4 Bradley Ave/Exit 11	3.3	126	37	216	76	9,145	79
San Jose	Sinclair Fwy/I-280 NB	CA-87/Guadalupe Pkwy I-880/CA-17	3.7	123	39	200	80	9,023	81
Atlanta	GA-400/US-19 SB	GA-120/Old Milton Pkwy/Exit 10 GA-140/Holcomb Bridge Rd/Exit 7	4.7	120	40	289	59	12,808	61

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 4. Dog Day Afternoons (Top 40)

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 Afternoon Peak Period Congestion (3 to 7 pm)					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	Harbor Fwy/CA-110 NB	I-10/Santa Monica Fwy Stadium Way/Exit 24C	3.1	756	1	1,095	31	49,904	31
Los Angeles	San Diego Fwy/I-405 NB	I-105/Imperial Hwy Getty Center Dr	13.1	494	2	3,016	2	138,164	2
Los Angeles	San Diego Fwy/I-405 NB	MacArthur Blvd Brookhurst St	7.8	433	3	1,619	17	70,940	18
Los Angeles	I-110 SB	W Vernon Ave 51st St	2.5	422	4	525	90	22,417	93
San Francisco	Eastshore Fwy/I-80 EB/I-580 WB	Cypress St University Ave	3.3	419	5	673	70	28,469	71
Los Angeles	Riverside Fwy/CA-91 EB	CA-55/Costa Mesa Fwy McKinley St	20.7	418	6	4,132	1	188,902	1
Austin	I-35 SB	US-183/Exit 239-240 Woodland Ave	6.7	384	7	1,168	29	54,806	27
Los Angeles	San Gabriel River Fwy/I-605 SB	Beverly Blvd Florence Ave	4.8	383	8	937	41	39,574	42
San Francisco	I-80 EB (James Lick Fwy/Bay Brdg)	US-101 Treasure Island Rd	3.6	366	9	586	81	26,648	77
Los Angeles	Harbor Fwy/I-110 NB	111th Pl I-110/I-10/Santa Monica Fwy	6.5	364	10	1,138	30	51,185	30
Houston	I-10 EB	T C Jester Blvd/Exit 765 McKee St/San Jacinto St	4.4	356	11	711	65	32,425	60
Los Angeles	Santa Monica Fwy/I-10 EB	CA-1/Lincoln Blvd/Exit 1B Alameda St	14.9	350	12	2,617	6	111,451	6
Houston	US-59 NB (Southwest/Eastex Fwys)	Buffalo Speedway I-45	4.8	349	13	804	52	35,011	53
Los Angeles	San Bernadino Fwy/I-10 EB	City Terrace Dr/Herbert Ave Baldwin Park Blvd	12.8	342	14	2,165	9	93,561	12
Dallas-Fort Worth	TX-360 SB	Post N Paddock St Division St	3.0	329	15	477	102	20,485	104
Los Angeles	I-5 SB (Santa Ana/Golden St Fwys)	East Cesar Chavez Ave Valley View Ave	17.5	325	16	2,849	4	121,882	4
Los Angeles	I-710 SB	Floral Dr Atlantic Blvd/Bandini Blvd	3.7	320	17	596	77	24,884	86
New York	Van Wyck Expy/I-678 SB	Horace Harding Expy/Exit 12A Linden Blvd/Exit 3	6.2	314	18	953	40	42,489	37
Houston	Gulf Fwy/I-45 SB	Dumble St I-610/Exit 40	3.6	309	19	535	89	22,768	92
Austin	I-35 NB	Shelby Ln/St Elmo Rd/Exit 230 Martin Luther King Blvd/19th St/Exit 235	4.7	306	20	700	67	30,982	66

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 4. Dog Day Afternoons (Top 40), continued

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 Afternoon Peak Period Congestion (3 to 7 pm)					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Seattle	I-405 SB	WA-520/Ne 14th St/Exit 14 SE Coal Creek Pkwy/Exit 10	4.5	304	21	702	66	29,467	69
Los Angeles	I-5 NB	Penrose St Osborne St	3.3	303	22	519	93	21,534	98
Chicago	Stevenson Expy/I-55 SB	State St/Exit 293C Pulaski Rd/Exit 287	5.7	300	23	888	43	39,822	41
Los Angeles	I-605 NB	Beverly Blvd Valley Blvd	5.0	300	23	757	59	31,865	63
Los Angeles	Santa Ana Fwy/I-5 NB	Sand Canyon Ave 17th St	8.4	297	25	1,245	27	53,271	29
Los Angeles	Foothill Fwy/I-210 EB	Lincoln Ave CA-39/Azusa Ave	17.2	295	26	2,560	7	108,140	7
Houston	N Loop W Fwy/I-610 EB	US-290 Yale St	4.0	292	27	560	88	24,892	85
New York	Van Wyck Expy/I-678 NB	Belt Pkwy/Exit 1 Main St/Exit 8	3.1	286	28	443	114	19,418	108
Los Angeles	Costa Mesa Fwy/CA-55 NB	CA-73 4th St/Irvine Blvd	6.5	276	29	846	51	37,666	45
New York	I-278 WB	New York Ave Slosson Ave/Exit 12	3.2	276	29	454	108	19,185	112
Los Angeles	Orange Fwy/CA-57 NB	I-5/CA-22/Chapman Ave (Orange) CA-60/Pomona Fwy	14.7	269	31	1,961	12	83,856	14
San Francisco	Grove Shafter Fwy/CA-24 WB	Saint Stephens Dr Caldecott Tunnel	3.5	267	32	399	125	19,300	111
Miami	Dolphin Expy/SR 836 WB	I-95 FL-959/Red Rd	5.5	266	33	720	63	29,658	68
Miami	Palmetto Expy/SR 826 SB	74th St 25th St	3.2	265	34	402	123	17,090	128
Los Angeles	Pomona Fwy/CA-60 EB	Whittier Blvd Brea Canyon Rd	21.7	264	35	2,914	3	121,982	3
New York	I-278 WB (Brooklyn Queens/Gowanus Expy)	NY-25A/Northern Blvd/Exit 41 NY-27/Prospect Expy/Exit 24	10.2	264	35	1,370	21	59,555	22
Los Angeles	I-5 SB	Alton Pkwy El Toro Rd	3.4	264	35	425	116	19,061	114
Dallas-Fort Worth	Stemmons Fwy/I-35E SB	Empire Central Dr/Exit 434A I-30/Exit 428	6.7	263	38	848	49	37,358	47
Atlanta	I-285 EB	Riverside Dr/Exit 24 I-85/Exit 33	9.1	260	39	1,230	28	54,343	28
Houston	W Loop Fwy/I-610 NB	Braeswood Blvd/S Post Oak Rd/Exit 4 Woodway Dr/Exit 10	5.8	256	40	688	69	31,048	65

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 5. Lunch Bunch (Top 40)

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 Midday Period Congestion (10 am to 3 pm)					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	Harbor Fwy/CA-110 NB	I-10/Santa Monica Fwy Stadium Way/Exit 24C	3.1	226	1	363	22	14,916	22
Los Angeles	Harbor Fwy/I-110 NB	111th Pl I-110/I-10/Santa Monica Fwy	6.5	198	2	662	9	27,826	10
New York	Major Deegan Expy/I-87 NB	I-278/Bruckner Expy I-95/Cross Bronx Expy/Exit 7	4.1	149	3	327	28	13,569	28
Los Angeles	San Diego Fwy/I-405 NB	I-105/Imperial Hwy Getty Center Dr	13.1	147	4	959	4	41,145	4
San Francisco	Grove Shafter Fwy/CA-24 WB	Saint Stephens Dr Caldecott Tunnel	3.5	144	5	240	39	10,418	39
New York	I-278 EB (Gowanus Expy/Brooklyn Queens)	92nd St/Exit 17 Apollo St/Meeker Ave/Exit 34	11.6	141	6	902	5	36,401	6
Los Angeles	San Gabriel River Fwy/I-605 SB	Beverly Blvd Florence Ave	4.8	138	7	335	25	14,243	25
Miami	Dolphin Expy/SR 836 EB	107th Ave FL-959/Red Rd	5.0	130	8	354	24	13,646	27
New York	I-278 WB (Brooklyn Queens/Gowanus Expy)	NY-25A/Northern Blvd/Exit 41 NY-27/Prospect Expy/Exit 24	10.2	117	9	679	8	26,479	12
New York	Major Deegan Expy SB	Van Cortlandt Park/Exit 11 I-95/Cross Bronx Expy/Exit 7	3.5	114	10	219	43	8,922	46
Los Angeles	Santa Monica Fwy/I-10 WB	I-5/Golden State Fwy National Blvd	12.6	109	11	658	10	29,301	9
Los Angeles	I-5 NB (Santa Ana/Golden St Fwys)	CA-39/Beach Blvd Riverside Dr	22.5	99	12	1,129	3	47,865	3
New York	I-95 SB (NE Thwy, Bruckner/Cross Bronx Expys)	Conner St/Exit 13 Hudson Ter	22.7	98	13	1,169	2	55,107	2
Los Angeles	US-101 SB (Ventura/Hollywood Fwys)	Ventura Blvd/Shoup Ave Vignes St/Exit 2B	26.7	97	14	1,263	1	55,621	1
New York	Van Wyck Expy/I-678 NB	Belt Pkwy/Exit 1 Main St/Exit 8	3.1	86	15	146	61	5,839	66
Houston	N Loop W Fwy/I-610 EB	US-290 Yale St	4.0	85	16	183	49	7,270	55
Los Angeles	Santa Monica Fwy/I-10 EB	CA-1/Lincoln Blvd/Exit 1B Alameda St	14.9	84	17	588	11	26,825	11
Los Angeles	I-5 SB (Santa Ana/Golden St Fwys)	East Cesar Chavez Ave Valley View Ave	17.5	83	18	717	7	31,080	8
New York	Van Wyck Expy/I-678 SB	Horace Harding Expy/Exit 12A Linden Blvd/Exit 3	6.2	82	19	273	34	11,044	37
Seattle	I-5 NB	Albro Pl/Swift Ave/Exit 161 James St/Exit 164	4.1	82	19	173	54	7,287	54

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. Wasted Fuel—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. Congestion Cost—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 5. Lunch Bunch (Top 40), continued

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 Midday Period Congestion (10 am to 3 pm)					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	US-101 NB (Santa Ana/Hollywood Fwys)	I-5/CA-60 Haskell Ave	21.5	80	21	857	6	36,963	5
Seattle	I-5 SB	WA-523/145th St/Exit 175 Union St/Exit 165	9.0	77	22	331	27	14,781	23
San Francisco	Eastshore Fwy/I-80 WB/I-580 EB	Cutting Blvd Bay Bridge Toll Plz	8.5	72	23	299	29	12,616	30
Austin	I-35 NB	Shelby Ln/St Elmo Rd/Exit 230 Martin Luther King Blvd/19th St/Exit 235	4.7	69	24	166	55	6,943	59
Los Angeles	I-605 NB	Beverly Blvd Valley Blvd	5.0	67	25	155	58	7,069	56
Los Angeles	I-110 SB	W Vernon Ave 51st St	2.5	67	25	64	117	3,535	104
New York	Long Island Expy/I-495 EB	Maurice Ave/Exit 18 Mineola Ave/Willis Ave/Exit 37	16.0	65	27	536	12	22,656	14
Los Angeles	San Diego Fwy/I-405 SB	Nordhoff St Mulholland Dr	8.1	65	27	263	35	11,176	36
New York	I-95 NB (Cross Bronx/Bruckner Expys)	I-80/NJ Tpke Pelham Pkwy/Exit 8	11.5	64	29	412	18	16,468	21
Houston	W Loop Fwy/I-610 SB	US-290/18th St Evergreen St/Exit 5	6.9	64	29	228	40	9,251	44
Pittsburgh	Penn Lincoln Pkwy/I-376 EB	Lydia St/Exit 2 US-19 TK RT/PA-51/Exit 5	3.4	63	31	137	64	4,827	76
Houston	I-45 SB	Tidwell Rd Cavalcade St/Exit 50	3.4	63	31	105	81	4,554	79
Boston	Southeast Expy/I-93 SB	I-90 Freeport St/Exit 13	3.7	62	33	116	74	4,900	75
Houston	I-45 NB (Gulf/North Fwys)	Dumble St Gulf Bank Rd/Exit 57	13.6	61	34	415	17	17,567	19
San Francisco	I-80 EB (James Lick Fwy/Bay Brdg)	US-101 Treasure Island Rd	3.6	61	34	112	75	4,464	82
Dallas-Fort Worth	Loop 820/I-820 WB	TX-26/Grapevine Hwy US-377/Denton Hwy/Exit 19	3.1	61	34	109	78	4,111	89
New York	Long Island Expy/I-495 WB	Glen Cove Rd/Exit 39 Woodhaven Blvd	14.9	59	37	444	16	19,184	16
Philadelphia	Schuylkill Expy/I-76 WB	Oregon Ave/Passyunk Ave/Exit 347 Belmont Ave/Exit 338	9.5	59	37	332	26	12,527	31
Los Angeles	CA-110 SB (Pasadena/Harbor Fwys)	Avenue 60 Olympic Blvd/9th St	6.6	58	39	182	50	8,191	47
New York	Belt Pkwy EB	Knapp St Pennsylvania Ave/Exit 14	7.5	55	40	212	44	9,031	45

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 6. Weekend Warriors (Top 40)

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 Weekend Congestion (Saturday and Sunday)					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	Harbor Fwy/CA-110 NB	I-10/Santa Monica Fwy Stadium Way/Exit 24C	3.07	253	1	398	18	16,667	19
Los Angeles	Harbor Fwy/I-110 NB	111th Pl I-110/I-10/Santa Monica Fwy	6.54	160	2	526	10	22,440	12
New York	Goethals Brg EB/I-278 EB	Meeker Ave/Forest Ave/Exit 4 Bradley Ave/Exit 11	3.3	120	3	210	30	8,733	34
San Francisco	Grove Shafter Fwy/CA-24 WB	Saint Stephens Dr Caldecott Tunnel	3.49	119	4	190	35	8,571	36
San Francisco	Eastshore Fwy/I-80 WB/I-580 EB	Cutting Blvd Bay Bridge Toll Plz	8.5	114	5	486	13	20,067	13
Los Angeles	San Diego Fwy/I-405 NB	I-105/Imperial Hwy Getty Center Dr	13.08	101	6	632	5	28,312	5
New York	I-278 EB (Gowanus Expy/Brooklyn Queens)	92nd St/Exit 17 Apollo St/Meeker Ave/Exit 34	11.61	97	7	617	7	25,100	7
New York	Van Wyck Expy/I-678 NB	Belt Pkwy/Exit 1 Main St/Exit 8	3.1	95	8	154	46	6,486	52
New York	I-95 NB (Cross Bronx/Bruckner Expys)	I-80/NJ Tpke Pelham Pkwy/Exit 8	11.54	93	9	568	8	23,789	8
San Francisco	I-80 EB (James Lick Fwy/Bay Brg)	US-101 Treasure Island Rd	3.55	93	9	166	41	6,781	49
Seattle	I-5 NB	72nd St/74th St/Exit 129 I-705/WA-7/Exit 133	4.21	92	11	196	34	8,331	37
New York	Bronx Whitestone Brg NB/Whitestone Expy NB	Linden Pl/Exit 14 Toll Plaza	3.41	85	12	161	43	6,494	51
New York	Cross Island Pkwy NB	Grand Central Pkwy/Exit 29 I-295/Throgs Neck Brg/Exit 33	4.67	84	13	205	32	8,657	35
Los Angeles	I-5 NB (Santa Ana/Golden St Fwys)	CA-39/Beach Blvd Riverside Dr	22.45	83	14	928	1	39,875	1
Los Angeles	US-101 NB (Santa Ana/Hollywood Fwys)	I-5/CA-60 Haskell Ave	21.51	81	15	860	2	37,464	3
Los Angeles	Santa Monica Fwy/I-10 EB	CA-1/Lincoln Blvd/Exit 1B Alameda St	14.89	73	16	507	12	23,116	11
Los Angeles	I-5 SB	CA-73 CA-1/Camino De Vis	5.79	73	16	208	31	9,135	31
New York	Laurelton/Belt/Shore Pkwy WB	Francis Lewis Blvd/Exit 24 Nassau Expy/Exit 19	4.89	73	16	190	35	7,902	40
Seattle	I-5 SB	WA-523/145th St/Exit 175 Union St/Exit 165	8.95	71	19	307	21	13,718	23
New York	Belt Pkwy EB	Knapp St Pennsylvania Ave/Exit 14	7.47	70	20	273	27	11,560	28

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 6. Weekend Warriors (Top 40), continued

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 Weekend Congestion (Saturday and Sunday)					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
New York	Major Deegan Expy SB	Van Cortlandt Park/Exit 11 I-95/Cross Bronx Expy/Exit 7	3.5	70	20	134	52	5,431	60
Los Angeles	US-101 SB (Ventura/Hollywood Fwys)	Ventura Blvd/Shoup Ave Vignes St/Exit 2B	26.73	68	22	859	3	38,756	2
Austin	I-35 NB	Shelby Ln/St Elmo Rd/Exit 230 Martin Luther King Blvd/19th St/Exit 235	4.71	67	23	160	44	6,812	48
San Francisco	I-80 WB	Hillcrest Rd US-101	3.51	67	23	115	62	4,881	66
San Francisco	Eastshore Fwy/I-80 EB/I-580 WB	Cypress St University Ave	3.33	66	25	103	70	4,462	71
Los Angeles	CA-110 SB (Pasadena/Harbor Fwys)	Avenue 60 Olympic Blvd/9th St	6.56	64	26	200	33	9,007	32
Los Angeles	Riverside Fwy/CA-91 EB	CA-55/Costa Mesa Fwy McKinley St	20.72	62	27	618	6	28,247	6
Los Angeles	I-5 SB (Santa Ana/Golden St Fwys)	East Cesar Chavez Ave Valley View Ave	17.52	62	27	532	9	23,458	10
Seattle	I-5 NB	Albro Pl/Swift Ave/Exit 161 James St/Exit 164	4.12	61	29	131	53	5,480	58
Washington, DC	I-95 SB	I-395 Russell Rd/Exit 148	23.94	60	30	650	4	29,677	4
Houston	I-45 SB	Sam Houston Tollway/Exit 32 FM-2351/Exit 29	3.65	59	31	104	68	4,557	69
Chicago	Eisenhower Expy/I-290 WB	S Ashland Ave/Exit 28B 9th Ave/Exit 19B	8.87	57	32	295	24	12,110	26
New York	Van Wyck Expy/I-678 SB	Horace Harding Expy/Exit 12A Linden Blvd/Exit 3	6.15	57	32	182	39	7,688	42
New York	Long Island Expy/I-495 WB	Glen Cove Rd/Exit 39 Woodhaven Blvd	14.92	56	34	419	15	18,291	15
Philadelphia	Schuylkill Expy/I-76 WB	Oregon Ave/Passyunk Ave/Exit 347 Belmont Ave/Exit 338	9.48	55	35	291	26	11,797	27
New York	Long Island Expy/I-495 EB	Maurice Ave/Exit 18 Mineola Ave/Willis Ave/Exit 37	15.97	54	36	441	14	18,795	14
Los Angeles	Santa Monica Fwy/I-10 WB	I-5/Golden State Fwy National Blvd	12.55	53	37	299	23	14,119	22
Dallas-Fort Worth	Loop 820/I-820 WB	TX-26/Grapevine Hwy US-377/Denton Hwy/Exit 19	3.13	53	37	85	80	3,583	87
New York	Belt/Shore/Laurelton Pkwy EB	I-678/Van Wyck Expy/Exit 20 Merrick Blvd/Exit 24	3.56	51	39	90	75	3,971	80
Los Angeles	San Bernadino Fwy/I-10 EB	City Terrace Dr/Herbert Ave Baldwin Park Blvd	12.8	50	40	304	22	13,693	24
Austin	I-35 SB	US-183/Exit 239-240 Woodland Ave	6.69	50	40	165	42	7,169	44
Los Angeles	I-10 WB	Citrus St Baldwin Park Blvd	5.22	50	40	117	60	5,594	57

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 7. Where the Big Trucks Are (Top 40)

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 All-day Everyday Truck Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	Harbor Fwy/CA-110 NB	I-10/Santa Monica Fwy Stadium Way/Exit 24C	3.1	98	1	469	34	22,655	33
Los Angeles	Harbor Fwy/I-110 NB	111th Pl I-110/I-10/Santa Monica Fwy	6.5	76	2	806	16	37,507	16
Los Angeles	San Diego Fwy/I-405 NB	I-105/Imperial Hwy Getty Center Dr	13.1	64	3	1,340	3	63,503	3
New York	Van Wyck Expy/I-678 NB	Belt Pkwy/Exit 1 Main St/Exit 8	3.1	52	4	244	78	12,200	65
New York	I-278 EB (Gowanus Expy/Brooklyn Queens)	92nd St/Exit 17 Apollo St/Meeker Ave/Exit 34	11.6	46	5	827	15	40,450	12
Los Angeles	San Gabriel River Fwy/I-605 SB	Beverly Blvd Florence Ave	4.8	45	6	365	50	16,435	49
Los Angeles	Riverside Fwy/CA-91 EB	CA-55/Costa Mesa Fwy McKinley St	20.7	43	7	1,485	2	67,672	1
New York	I-278 WB (Brooklyn Queens/Gowanus Expy)	NY-25A/Northern Blvd/Exit 41 NY-27/Prospect Expy/Exit 24	10.2	43	7	681	19	33,105	18
Los Angeles	Santa Monica Fwy/I-10 EB	CA-1/Lincoln Blvd/Exit 1B Alameda St	14.9	42	9	1,075	9	47,961	9
Los Angeles	Santa Monica Fwy/I-10 WB	I-5/Golden State Fwy National Blvd	12.6	42	9	893	12	39,895	13
Chicago	Stevenson Expy/I-55 SB	State St/Exit 293C Pulaski Rd/Exit 287	5.7	42	9	385	44	18,063	43
Chicago	Eisenhower Expy/I-290 WB	S Ashland Ave/Exit 28B 9th Ave/Exit 19B	8.9	40	12	606	25	26,869	24
New York	Van Wyck Expy/I-678 SB	Horace Harding Expy/Exit 12A Linden Blvd/Exit 3	6.2	40	12	377	47	18,496	38
Pittsburgh	Penn Lincoln Pkwy/I-376 EB	Lydia St/Exit 2 US-19 TK RT/PA-51/Exit 5	3.4	40	12	209	97	10,241	81
Austin	I-35 SB	US-183/Exit 239-240 Woodland Ave	6.7	38	15	397	40	19,202	37
Baton Rouge	I-12 EB	Essen Ln O'Neal Ln	5.8	38	15	343	52	16,632	47
Austin	I-35 NB	Shelby Ln/St Elmo Rd/Exit 230 Martin Luther King Blvd/19th St/Exit 235	4.7	38	15	293	61	13,596	57
Los Angeles	I-110 SB	W Vernon Ave 51st St	2.5	38	15	167	126	7,206	127
Chicago	Eisenhower Expy/I-290 EB	IL-72/Higgins Rd/Exit 1 Austin Blvd/Exit 23A	21.5	36	19	1,340	3	59,182	4
Chicago	I-90/I-94 EB (Kennedy/Dan Ryan Expys)	I-294/Tri State Tollway Ruble St/Exit 52B	15.9	36	19	903	11	42,869	11

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 7. Where the Big Trucks Are (Top 40), continued

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 All-day Everyday Truck Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
New York	Major Deegan Expy/I-87 NB	I-278/Bruckner Expy I-95/Cross Bronx Expy/Exit 7	4.1	36	19	232	84	11,249	74
Los Angeles	I-5 SB (Santa Ana/Golden St Fwys)	East Cesar Chavez Ave Valley View Ave Conner St/Exit 13	17.5	35	22	1,017	10	46,126	10
New York	I-95 SB (NE Thwy, Bruckner/Cross Bronx Expys)	Hudson Ter	22.7	34	23	1,153	8	57,540	5
Los Angeles	US-101 NB (Santa Ana/Hollywood Fwys)	I-5/CA-60 Haskell Ave	21.5	34	23	1,223	6	55,039	7
Philadelphia	Schuylkill Expy/I-76 WB	Oregon Ave/Passyunk Ave/Exit 347 Belmont Ave/Exit 338	9.5	34	23	545	30	24,557	29
Los Angeles	CA-110 SB (Pasadena/Harbor Fwys)	Avenue 60 Olympic Blvd/9th St	6.6	34	23	375	48	17,134	45
Los Angeles	I-5 NB (Santa Ana/Golden St Fwys)	CA-39/Beach Blvd Riverside Dr	22.5	33	27	1,256	5	56,422	6
Boston	Southeast Expy/I-93 NB	MA-28/Randolph Ave/Exit 5 Columbia Rd/Exit 15	10.4	33	27	569	28	26,031	26
San Francisco	Grove Shafter Fwy/CA-24 WB	Saint Stephens Dr Caldecott Tunnel	3.5	33	27	181	115	8,815	103
Los Angeles	US-101 SB (Ventura/Hollywood Fwys)	Ventura Blvd/Shoup Ave Vignes St/Exit 2B	26.7	32	30	1,513	1	66,000	2
New York	Long Island Expy/I-495 EB	Maurice Ave/Exit 18 Mineola Ave/Willis Ave/Exit 37	16.0	32	30	855	14	39,269	14
Los Angeles	San Bernadino Fwy/I-10 EB	City Terrace Dr/Herbert Ave Baldwin Park Blvd	12.8	32	30	662	21	30,872	19
New York	Goethals Brg EB/I-278 EB	Meeker Ave/Forest Ave/Exit 4 Bradley Ave/Exit 11	3.3	32	30	169	124	7,946	117
Los Angeles	San Diego Fwy/I-405 NB	MacArthur Blvd Brookhurst St	7.8	31	34	416	38	18,489	39
Houston	N Loop W Fwy/I-610 EB	US-290 Yale St	4.0	31	34	216	92	9,446	95
San Francisco	I-80 EB (James Lick Fwy/Bay Brg)	US-101 Treasure Island Rd	3.6	31	34	171	122	8,256	111
Seattle	I-5 SB	WA-523/145th St/Exit 175 Union St/Exit 165	9.0	30	37	469	34	20,537	35
Atlanta	I-285 EB	Riverside Dr/Exit 24 I-85/Exit 33	9.1	30	37	461	36	20,503	36
Los Angeles	San Diego Fwy/I-405 SB	Nordhoff St Mulholland Dr	8.1	30	37	382	46	18,151	42
New York	Major Deegan Expy SB	Van Cortlandt Park/Exit 11 I-95/Cross Bronx Expy/Exit 7	3.5	30	37	172	121	8,035	116
New York	I-95 NB (Cross Bronx/Bruckner Expys)	I-80/NJ Tpke Pelham Pkwy/Exit 8	11.5	29	41	538	31	25,256	27
New York	I-278 WB	New York Ave Slosson Ave/Exit 12	3.2	29	41	145	137	6,853	132

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 8. One-Hit Wonders (Top 40)

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Tampa	I-275 SB	Floribaska Ave/28th Ave/Exit 28 US-92/Dale Mabry Hwy/Exit 23	4.2	278	93	562	153	24,682	152
Las Vegas	I-15 NB	Tropicana Ave/Exit 37 Sahara Ave/Exit 40	3.2	273	100	427	190	18,787	194
Denver	I-25 SB	58th Ave/Exit 215 CO-2/Colorado Blvd/Exit 204	10.9	265	107	1,402	50	61,549	52
Phoenix	Papago Fwy/I-10 WB	AZ-51/AZ-202/Exit 147 35th Ave/Exit 141	6.2	253	118	784	102	33,970	107
Orlando	I-4 EB	Floridas Turnpike/Exit 31 FL-423/Lee Rd/Exit 46	9.8	252	119	1,149	63	51,759	63
Phoenix	I-10 EB (Papago/Maricopa Fwys)	Buckeye Rd/Exit 149 Broadway Rd/52nd St/Exit153B	6.1	252	119	759	105	33,067	110
Denver	I-25 NB	Evans Ave/Exit 203 84th Ave/Exit 219	15.1	235	132	1,679	40	75,464	40
Detroit	Edsel Ford Fwy/I-94 EB	Grand Blvd/Exit 213 Chene St/Exit 217	4.0	204	158	397	204	17,187	208
Norfolk	Hampton Roads Beltway/I-64 EB	Rip Rap Rd/Exit 265 Hampton Roads Brg Tunl(Hampton)	3.1	204	158	310	234	13,230	246
Santa Cruz	Cabrillo Hwy/CA-1 SB	CA-17 Park Ave	4.8	200	161	420	194	18,526	195
Norfolk	Hampton Roads Beltway/I-64 WB	VA-168/Tidewater Dr/Exit 277 Hampton Roads Brg Tunl(Norfolk)	6.4	195	167	587	147	25,823	147
Providence	I-95 SB	US-1/George St/Exit 27 RI-7/RI-146/Charles St/Exit 23	3.2	191	171	287	248	12,266	262
Orlando	I-4 WB	FL-423/Lee Rd/Exit 46 FL-408/Exit 36	5.7	190	172	497	170	22,645	167
Hartford	I-84 EB	S Main St/Exit 41 I-91/Exit 51-52	6.7	189	175	614	139	26,683	141
Tampa	I-275 NB	Howard Franklin Brg Lois Ave/Exit 22	3.4	182	186	283	249	12,891	249
Charlotte	I-485 EB	NC-49/Tryon St/Exit 1 NC-51/Exit 64	5.3	178	192	451	181	20,543	180
Providence	I-95 NB	US-1/Elmwood Ave/Exit 17 US-6/RI-10/Exit 22	4.0	173	197	331	224	14,014	235
Nashville	I-440 EB	TN-1/End Ave/Exit 1 US-31 Alt/US-41 Alt/Nolensville Pike/Exit6	4.8	160	212	414	197	17,674	206
Hartford	I-84 WB	US-5/Main St Flatbush Ave/Exit 45	5.5	148	224	396	205	16,818	211

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table 8. One-Hit Wonders (Top 40), continued

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Santa Barbara	US-101 SB	Mission St San Ysidro Rd	5.9	147	227	414	197	18,211	199
Santa Rosa CA	US-101 NB	Railroad Ave Commerce Blvd/Wilfred Ave	4.2	136	238	274	255	12,249	263
Charleston	I-26 WB	Dorchester Rd W Aviation Ave	4.3	132	247	270	259	12,485	256
Oxnard CA	Ventura Fwy/US-101 NB	Camarillo Springs Rd Las Posas Rd	5.2	128	255	320	229	14,503	228
St. Louis	I-270 SB	Ladue Rd/Exit 13 Dougherty Ferry Rd/Exit 8	5.1	124	259	294	245	13,642	243
San Antonio	I-410 EB	Starcrest Dr/Exit 25 Interchange Pkwy/Exit 26	1.1	121	261	63	327	2,682	327
Raleigh	I-40 EB	Airport Blvd/Exit 284 NC-54/Exit 290	6.9	116	265	371	213	17,992	200
Kansas City	I-70 EB	18th St/Exit 4 I-435/Exit 8	4.2	103	281	207	289	9,024	294
San Antonio	I-35 NB	Judson Rd/Exit 170 Evans Rd/Exit 174	3.8	100	285	147	310	7,606	301
Louisville	I-64 WB	Cannons Ln/Exit 10 I-71/Exit 6	4.4	92	289	203	290	9,093	292
Harrisburg	I-83 NB	3rd St/Exit 42 Union Deposit Rd/Exit 48	6.7	86	296	305	239	13,703	242
Dayton	I-75 NB	Dixie Hwy/Central Ave/Exit 47 Keowee St/Exit 55	7.2	83	298	329	225	14,291	232
Charlotte	I-85 NB	University City Blvd Speedway Blvd/Exit 49	6.2	78	304	219	284	10,708	275
Vallejo-Fairfield CA	I-80 EB	Suisun Valley Rd N Texas St	7.4	70	310	229	277	10,524	277
Birmingham	I-65 SB	US-31/Montgomery Hwy/Exit 252 Jefferson/Shelby County Line	3.5	66	311	108	320	5,365	318
Charleston	I-26 EB	US-78/University Blvd Dorchester Rd	10.5	52	320	240	271	12,230	264
Statesville- Mooresville NC	I-77 SB	NC-150/Exit 36 Iredell/Mecklenburg Co Line	8.8	44	324	176	296	8,528	297
Allentown PA-NJ	US-22 WB	15th St PA-145/Macarthur Rd	3.4	13	328	15	328	1,018	328

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length. **Wasted Fuel**—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions. **Congestion Cost**—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel). **Note:** Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

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Appendix A

Table A-1. Reliably Unreliable (All 328 Corridors)

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Atlanta	GA-400 SB	Toll Plaza I-85/Exit 87	4.1	256	1	4.83	15	1.63	216
Atlanta	I-75 SB	Mount Zion Pkwy/Exit 231 Hudson Bridge Rd/Exit 224	6.7	253	2	4.68	23	1.34	314
New York	Hutchinson River Pkwy NB	Cross County Pkwy/Exit 15 Mamaroneck Rd/Exit 22	4.5	215	3	4.69	22	1.49	273
New York	Bronx Whitestone Brg NB/Whitestone Expy NB	Linden Pl/Exit 14 Toll Plaza	3.4	215	3	4.62	24	1.80	130
Norfolk	Hampton Roads Beltway/I-64 EB	Rip Rap Rd/Exit 265 Hampton Roads Brg Tunl(Hampton)	3.1	198	5	5.28	6	1.89	98
New York	Pulaski Skwy NB	I-95/Exp US-1 Tonnele Ave	3.3	197	6	4.29	29	1.70	179
New Haven	I-84 WB	I-691 (Cheshire) (West) Austin Rd/Exit 25A	3.4	189	7	4.26	33	1.64	213
Houston	N Loop W Fwy/I-610 EB	US-290 Yale St	4.0	188	8	4.03	58	2.23	34
Pittsburgh	Penn Lincoln Pkwy/I-376 EB	Lydia St/Exit 2 US-19 TK RT/PA-51/Exit 5	3.4	186	9	6.84	2	3.12	3
Riverside	Ontario Fwy/I-15 NB	I-210/Exit 115 Glen Helen Pkwy	6.2	182	10	3.23	167	1.26	321
New York	Major Deegan Expy SB	Van Cortlandt Park/Exit 11 I-95/Cross Bronx Expy/Exit 7	3.5	173	11	4.96	9	1.89	98
Washington, DC	I-70 WB	MD-144/Exit 59 US-15/US-340/Exit 52	6.8	173	11	3.31	148	1.27	320
New Orleans	I-10 EB	Loyola Dr Veterans Memorial Blvd	3.5	170	13	4.45	26	1.75	153
Louisville	I-64 WB	Cannons Ln/Exit 10 I-71/Exit 6	4.4	170	13	4.18	42	1.64	213
Washington, DC	I-95 SB	I-395 Russell Rd/Exit 148	23.9	165	15	4.71	21	1.89	98
New York	I-95 SB (NE Thwy, Bruckner/Cross Bronx Expys)	Conner St/Exit 13 Hudson Ter	22.7	161	16	5.58	3	2.74	6
San Francisco	California Delta Hwy/CA-4 EB	Bailey Rd Somersville Rd	5.8	161	16	5.39	4	2.08	52
Baltimore	John Hanson Hwy/US-50/US-301 EB	I-97/Exit 21 MD-70/Rowe Blvd/Exit 24	3.4	161	16	4.09	51	1.67	198

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Baton Rouge	I-10 EB	LA-415/Exit 151 Dalrymple Dr/Exit 156	4.7	157	19	4.12	49	1.67	198
Chicago	I-55 NB	IL-53/Exit 267 IL-83/Kingery Hwy/Exit 274	8.9	155	20	3.66	90	1.49	273
New Haven	I-95 NB	Marsh Hill Rd/Exit 41 Ella T Grasso Blvd/Exit 45	4.0	151	21	4.29	29	1.85	110
Cincinnati	I-75 SB	I-74/US-52/US-27/Exit 4 W 7th St/Exit 1	3.4	151	21	4.09	51	1.89	98
Birmingham	I-65 SB	US-31/Montgomery Hwy/Exit 252 Jefferson/Shelby County Line	3.5	151	21	2.66	270	1.36	310
Chicago	Stevenson Expy/I-55 SB	IL-43/Harlem Ave/Exit 283 County Line Rd/Exit 276A	7.3	150	24	4.07	53	1.69	189
Baton Rouge	I-10 WB	Siegen Ln/Exit 163 Perkins Rd/Exit 157	6.4	150	24	3.70	86	1.48	277
San Francisco	I-580 EB	Eden Canyon Rd El Charro Rd/Fallon Rd	9.6	147	26	4.24	35	1.92	92
Chicago	Eisenhower Expy/I-290 EB	IL-72/Higgins Rd/Exit 1 Austin Blvd/Exit 23A	21.5	144	27	4.61	25	1.99	75
Washington, DC	Capital Beltway/I-495 Inner Loop	I-95/I-395/Exit 57 MD-650/New Hampshire Ave/Exit 28	41.4	144	27	4.29	29	2.06	59
Cincinnati	I-75 SB	OH-126/Exit 14 Ronald Reagan Cross County Hwy/Exit 10	3.9	140	29	3.83	76	1.68	195
Chicago	Eisenhower Expy/I-290 WB	S Ashland Ave/Exit 28B 9th Ave/Exit 19B	8.9	139	30	4.87	12	2.07	56
Charlotte	I-85 NB	University City Blvd Speedway Blvd/Exit 49	6.2	134	31	3.28	153	1.40	304
Los Angeles	I-710 NB	Alondra Blvd Imperial Hwy	3.0	133	32	3.83	76	1.70	179
Boston	I-495 NB	MA-110/Chelmsford St/Exit 34 Woburn St/Exit 37	3.0	132	33	3.94	71	1.77	147
Atlanta	I-75/I-85 NB	GA-166 US-78/US-278/US-29/Exit 249	7.6	132	33	3.27	156	1.78	143
New York	Major Deegan Expy/I-87 NB	I-278/Bruckner Expy I-95/Cross Bronx Expy/Exit 7	4.1	131	35	4.75	19	2.19	38
Dallas-Fort Worth	Thornton Fwy/I-30 WB	Saint Francis Ave/Exit 52 Griffin St	7.2	130	36	4.13	48	1.96	80

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Houston	I-10 EB	T C Jester Blvd/Exit 765 McKee St/San Jacinto St	4.4	129	37	4.18	42	2.17	42
Chicago	I-290 WB	I-88/Exit 15A IL-83/Exit 10A	6.0	128	38	3.95	68	1.69	189
Atlanta	I-85 SB	GA-13/Exit 86 (East) I-75/Exit 85	2.5	127	39	5.30	5	2.37	23
New York	Henry Hudson Pkwy NB	W 72nd St I-95/Riverside Dr/Exit 14-15	6.2	126	40	4.20	38	1.79	137
New York	FDR Dr NB	I-495/Tunnel Exit St/Queens Midtown Tunnl 116th St/Exit 16	4.0	126	40	3.93	72	1.88	103
Seattle	I-5 SB	84th St/Hosmer St/Exit 128 41st Division Dr/Exit 120	7.9	126	40	3.16	173	1.47	280
New York	Garden State Pkwy SB	Watchung Ave/Exit 151 Walnut St/Exit 147	4.5	125	43	3.27	156	1.58	235
Boston	I-93 NB	MA-213/Exit 48 Pelham Rd/Exit 2	7.3	125	43	2.98	213	1.38	308
Boston	Southeast Expy/I-93 NB	MA-28/Randolph Ave/Exit 5 Columbia Rd/Exit 15	10.4	124	45	4.84	14	2.45	16
New York	Goethals Brg EB/I-278 EB	Meeker Ave/Forest Ave/Exit 4 Bradley Ave/Exit 11	3.3	124	45	4.80	17	2.33	27
Washington, DC	Capital Beltway/I-495 Outer Loop	US-1/Baltimore Ave/Exit 25 MD-97/Georgia Ave/Exit 31	6.3	124	45	4.73	20	2.26	31
Chicago	Stevenson Expy/I-55 NB	US-20/US-45/US-12/Exit 279A Pulaski Rd/Exit 287	8.9	123	48	4.20	38	1.93	91
Dayton	I-75 NB	Dixie Hwy/Central Ave/Exit 47 Keowee St/Exit 55	7.2	123	48	3.16	173	1.43	295
San Francisco	I-680 NB	Scott Creek Rd Andrade Rd/Mission Rd	9.5	122	50	3.53	109	1.67	198
Dallas-Fort Worth	North Fwy/I-35W NB	Rosedale St/Exit 49B Western Center Blvd/Exit 58	9.5	121	51	4.19	40	2.01	69
New York	I-287 NB	Randolphville Rd/Exit 7 Easton Ave/Exit 10	3.4	121	51	3.93	72	1.78	143
Baltimore	Baltimore Beltway Outer Loop/I-695 SB	MD-140/Reisterstown Rd/Exit20 US-40/Exit 15	7.1	121	51	3.67	89	1.67	198
Norfolk	Hampton Roads Beltway/I-64 WB	VA-168/Tidewater Dr/Exit 277 Hampton Roads Brg Tunnl(Norfolk)	6.4	120	54	4.14	46	1.96	80

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Boston	I-93 SB	I-95/MA-128/Exit 37 US-1/Exit 27	9.8	120	54	3.41	126	1.95	85
New York	Cross Island Pkwy NB	Grand Central Pkwy/Exit 29 I-295/Throgs Neck Brg/Exit 33	4.7	120	54	3.04	201	1.41	301
Seattle	I-5 SB	WA-523/145th St/Exit 175 Union St/Exit 165	9.0	118	57	4.05	57	1.94	89
New York	I-278 EB (Gowanus Expy/Brooklyn Queens)	92nd St/Exit 17 Apollo St/Meeker Ave/Exit 34	11.6	117	58	4.82	16	2.46	15
Seattle	WA-520 WB	148th Ave 84th Ave	4.2	117	58	3.33	140	2.00	70
Washington, DC	I-270 NB	Middlebrook Rd/Exit 13 MD-109/Exit 22	8.5	117	58	3.26	160	1.45	288
Dallas-Fort Worth	North Fwy/I-35W SB	Golden Triangle Blvd/Exit 64 TX-121/Exit 52	11.8	116	61	4.01	61	1.96	80
Dallas-Fort Worth	I-635 WB	US-75/Exit 19 Josey Ln/Exit 26	8.3	116	61	3.51	114	1.65	210
Philadelphia	Schuylkill Expy/I-76 WB	Oregon Ave/Passyunk Ave/Exit 347 Belmont Ave/Exit 338	9.5	115	63	4.02	59	2.14	45
Bridgeport	Connecticut Turnpike/I-95 SB	Brookside Dr US-1/Exit 5	4.3	115	63	3.32	143	1.56	243
Houston	Eastex Fwy/US-59 SB	Quitman St/Liberty Rd TX-288	4.1	114	65	4.02	59	1.95	85
Portland	US-26 EB	OR-217/Exit 69 Canyon Rd/Exit 73	4.2	114	65	3.72	84	1.83	119
Santa Barbara	US-101 SB	Mission St San Ysidro Rd	5.9	114	65	3.64	91	1.68	195
New York	Belt Pkwy EB	Knapp St Pennsylvania Ave/Exit 14	7.5	114	65	3.62	96	1.62	224
Los Angeles	I-5 SB	Buena Vista St Mission Rd	12.6	114	65	2.92	224	1.54	252
Hartford	I-84 EB	S Main St/Exit 41 I-91/Exit 51-52	6.7	111	70	3.73	82	1.77	147
New Orleans	Pontchartrain Expy WB	Whitney Ave Oretha C Haley Blvd	3.6	111	70	3.64	91	1.84	114
Dallas-Fort Worth	I-35E NB	Hundley Dr/Exit 457B Post Oak Dr/Exit 461	3.8	111	70	3.59	99	1.79	137

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
New York	Belt Pkwy WB	Ocean Pkwy Bay 8th St/Exit 4	3.5	111	70	2.90	226	1.36	310
New York	Van Wyck Expy/I-678 NB	Belt Pkwy/Exit 1 Main St/Exit 8	3.1	110	74	6.88	1	3.72	1
Boston	I-95/MA-128 NB	Neponset St/Exit 11 MA-1A/Exit 15	6.0	110	74	3.46	121	1.47	280
Bridgeport	Merritt Pkwy/CT-15 NB	Den Rd/Exit 33 CT-57/Exit 42	12.8	110	74	3.38	130	1.55	245
Philadelphia	Delaware Expy/I-95 NB	I-495/DE-92/Naamans Rd/Exit 11 US-322/Exit2/Exit3	3.2	109	77	3.06	195	1.55	245
Washington, DC	Shirley Hwy/I-395 NB	I-95/I-495 Southwest Fwy	21.6	108	78	4.00	63	1.82	123
Washington, DC	I-95 NB	Dale Blvd/Smoketown Rd/Eb Exit 156 VA-123/Exit 160	4.8	108	78	2.94	220	1.42	297
New York	Harlem River Dr NB	Willis Avenue Brg/Exit 18 I-95/Amsterdam Ave/Exit 23	3.2	107	80	4.80	17	2.37	23
New York	Cross Island Pkwy SB	14th Ave/Exit 35 NY-25/Exit 27	7.5	107	80	3.76	80	1.80	130
Riverside	Riverside Fwy/CA-91 EB	Van Buren Blvd Central Ave (East)	4.2	107	80	2.96	218	1.44	289
Baton Rouge	I-12 EB	Essen Ln O'Neal Ln	5.8	106	83	5.17	8	2.44	17
Los Angeles	Riverside Fwy/CA-91 EB	CA-55/Costa Mesa Fwy McKinley St	20.7	106	83	4.10	50	2.12	47
Chicago	Edens Expy/I-94 EB	Tower Rd/Exit 31 I-90/Kennedy Expy	11.0	106	83	3.87	75	2.12	47
Orlando	I-4 WB	FL-423/Lee Rd/Exit 46 FL-408/Exit 36	5.7	106	83	2.99	208	1.51	266
New York	I-287 WB	I-87/I-287 (Irvington) NY-303/Exit 12	7.9	106	83	2.81	241	1.44	289
Seattle	I-5 NB	Albro Pl/Swift Ave/Exit 161 James St/Exit 164	4.1	105	88	3.88	74	1.92	92
New York	Laurelton/Belt/Shore Pkwy WB	Francis Lewis Blvd/Exit 24 Nassau Expy/Exit 19	4.9	105	88	3.58	102	2.08	52
New York	Grand Central Pkwy WB	Little Neck Pkwy/Exit 24 Homelawn St/Exit 17/Exit 18	4.6	105	88	3.40	127	1.64	213

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Philadelphia	Schuylkill Expy/I-76 EB	I-276 South St/Exit 346	18.9	105	88	3.24	166	1.78	143
Austin	I-35 SB	US-183/Exit 239-240 Woodland Ave	6.7	104	92	4.87	12	2.79	5
Chicago	I-90/I-94 WB (Dan Ryan/Kennedy Expys)	Pershing Rd/Exit 55B Sayre Ave/Exit 81B	15.4	104	92	4.25	34	2.50	13
Riverside	Riverside Fwy/CA-91 WB	McKinley St Auto Center Dr/Serfas Club Dr	5.6	104	92	3.69	88	1.66	204
New York	Southern State Pkwy EB	Franklin Ave/Exit 16 Wantagh Ave/Exit 28	10.3	104	92	3.64	91	1.80	130
Dallas-Fort Worth	I-30 EB	Hampton Rd/Exit 42 Barry Ave/Exit 48	6.9	104	92	3.55	106	1.70	179
Portland	I-5 SB	OR-99W/Barbur Blvd/Exit 294 Elligsen Rd/Exit 286	7.7	104	92	2.66	270	1.33	318
New York	I-278 WB (Brooklyn Queens/Gowanus Expy)	NY-25A/Northern Blvd/Exit 41 NY-27/Prospect Expy/Exit 24	10.2	103	98	4.88	11	2.61	10
Miami	Palmetto Expy/SR 826 SB	74th St 25th St	3.2	103	98	4.07	53	1.99	75
Baltimore	Baltimore Beltway Inner Loop/I-695 EB	MD-140/Reisterstown Rd/Exit 20 MD-542/Loch Raven Blvd/Exit 29	10.2	103	98	3.52	112	1.72	165
San Francisco	Grove Shafter Fwy/CA-24 WB	Saint Stephens Dr Caldecott Tunnel	3.5	102	101	4.22	36	2.43	18
Dallas-Fort Worth	Loop 820/I-820 EB	Mark IV Pkwy/Exit 16 Rufe Snow Dr/Exit 20	5.2	102	101	3.99	64	2.08	52
Riverside	Ontario Fwy/I-15 NB	Limonite Ave Jurupa St	5.1	102	101	2.43	302	1.30	319
New York	I-95 NB (Cross Bronx/Bruckner Expys)	I-80/NJ Tpke Pelham Pkwy/Exit 8	11.5	101	104	3.31	148	1.81	126
Charleston	I-26 WB	Dorchester Rd W Aviation Ave	4.3	101	104	3.17	170	1.55	245
Boston	Southeast Expy/I-93 SB	I-90 Freeport St/Exit 13	3.7	101	104	3.07	190	1.72	165
Pittsburgh	Penn Lincoln Pkwy/I-376 WB	US-22 Bus/Exit 10 Squirrel Hill Tnl	5.3	100	107	4.18	42	2.37	23
Atlanta	I-285 EB	Riverside Dr/Exit 24 I-85/Exit 33	9.1	100	107	3.97	66	1.97	78

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
New York	Garden State Pkwy NB	I-78/Mill Rd/Exit 142 I-280/Exit 145	3.8	100	107	3.52	112	1.83	119
Seattle	I-5 NB	WA-527/Exit 189 Marine View Dr/Exit 195	5.6	100	107	3.48	118	1.70	179
Dallas-Fort Worth	US-75 NB	Exchange Pkwy/Exit 36 Eldorado Pkwy/Exit 39	4.4	100	107	3.14	177	1.58	235
Harrisburg	I-83 NB	3rd St/Exit 42 Union Deposit Rd/Exit 48	6.7	99	112	3.01	205	1.52	261
Chicago	I-90/I-94 EB (Kennedy/Dan Ryan Expys)	I-294/Tri State Tollway Ruble St/Exit 52B	15.9	98	113	4.35	28	2.72	7
New York	Grand Central Pkwy EB	I-278 I-295/NY-25/Exit 21	10.6	98	113	3.71	85	1.87	107
New York	NJ-17	Paramus Rd/Saddle River Rd Passaic St	5.5	98	113	3.61	97	1.79	137
Los Angeles	Pomona Fwy/CA-60 WB	Fairway Dr Peck Rd	10.4	98	113	3.47	120	1.69	189
Hartford	I-84 WB	US-5/Main St Flatbush Ave/Exit 45	5.5	98	113	3.34	138	1.66	204
Providence	I-95 NB	US-1/Elmwood Ave/Exit 17 US-6/RI-10/Exit 22	4.0	98	113	3.08	188	1.55	245
Boston	Pilgrims Hwy/MA-3 NB	MA-228/Hingham St/Exit 14 Union St/Exit 17	6.6	98	113	2.99	208	1.46	285
Seattle	I-5 NB	72nd St/74th St/Exit 129 I-705/WA-7/Exit 133	4.2	98	113	2.78	249	1.52	261
New York	Van Wyck Expy/I-678 SB	Horace Harding Expy/Exit 12A Linden Blvd/Exit 3	6.2	97	121	5.20	7	2.81	4
Detroit	Edsel Ford Fwy/I-94 EB	Grand Blvd/Exit 213 Chene St/Exit 217	4.0	97	121	3.77	79	1.83	119
San Francisco	Eastshore Fwy/I-80 WB/I-580 EB	Cutting Blvd Bay Bridge Toll Plz	8.5	97	121	3.57	103	1.94	89
Boston	I-95/MA-128 SB	US-3/Middlesex Tpke/Exit 32 MA-9/Worcester St/Exit 20	13.1	97	121	2.90	226	1.58	235
San Francisco	Nimitz Fwy/I-880 SB	I-238/Washington Ave CA-92/Jackson St	4.3	96	125	3.45	123	1.81	126
Riverside	Escondido Fwy/I-15 NB	CA-79/Old Town Front St CA-79/Winchester Rd	3.2	95	126	2.66	270	1.36	310

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Houston	US-59 NB (Southwest/Eastex Fwys)	Buffalo Speedway I-45	4.8	94	127	4.36	27	2.29	30
Tampa	I-275 SB	Floribaska Ave/28th Ave/Exit 28 US-92/Dale Mabry Hwy/Exit 23	4.2	94	127	3.50	116	1.88	103
Los Angeles	Century Fwy/I-105 EB	Nash St I-605	17.6	94	127	3.42	125	1.80	130
Minneapolis-St. Paul	Crosstown Hwy/MN-62 EB	US-169/US-212 Cr-32/Penn Ave	4.6	94	127	3.27	156	1.69	189
Providence	I-95 SB	US-1/George St/Exit 27 RI-7/RI-146/Charles St/Exit 23	3.2	94	127	3.17	170	1.70	179
Los Angeles	I-5 SB	Alton Pkwy El Toro Rd	3.4	94	127	3.14	177	1.67	198
Dallas-Fort Worth	I-35E SB	Ave D/Exit 466B Mayhill Rd/Exit 462	4.4	94	127	2.81	241	1.54	252
Houston	I-45 NB	Clearwood Dr/Edgebrook St Broadway St/Park Place Blvd/Exit 39	3.8	93	134	3.36	134	1.90	96
Chicago	Tri State Tollway/I-294 SB	IL-58/Golf Rd Ohare Oasis	7.6	93	134	3.14	177	1.84	114
Cincinnati	I-75 NB	I-275/Exit 185 KY-1072/Kyles Ln/Exit 189	3.5	93	134	2.97	214	1.53	257
Houston	W Loop Fwy/I-610 NB	Braeswood Blvd/S Post Oak Rd/Exit 4 Woodway Dr/Exit 10	5.8	92	137	4.01	61	2.09	51
Orlando	I-4 EB	Floridas Turnpike/Exit 31 FL-423/Lee Rd/Exit 46	9.8	92	137	3.40	127	1.74	154
Sacramento	I-80 EB	El Camino Ave Northgate Blvd	3.6	92	137	3.20	169	1.72	165
Baltimore	Baltimore Beltway Outer Loop/I-695 WB	US-1/Exit 32 MD-139/Charles St/Exit 25	7.5	92	137	3.07	190	1.71	175
Atlanta	GA-400/US-19 SB	GA-120/Old Milton Pkwy/Exit 10 GA-140/Holcomb Bridge Rd/Exit 7	4.7	91	141	3.54	107	1.79	137
Dallas-Fort Worth	Stemmons Fwy/I-35E SB	Empire Central Dr/Exit 434A I-30/Exit 428	6.7	91	141	3.01	205	1.91	95
Los Angeles	I-710 SB	Floral Dr Atlantic Blvd/Bandini Blvd	3.7	90	143	4.19	40	2.10	50
New York	Southern State Pkwy WB	New Hwy/Exit 34 Brookside Ave/Exit 21	10.8	90	143	2.86	231	1.51	266

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
New York	Belt/Shore/Laurelton Pkwy EB	I-678/Van Wyck Expy/Exit 20 Merrick Blvd/Exit 24	3.6	90	143	2.47	301	2.16	43
Minneapolis-St. Paul	I-494 EB	US-212/Prairie Center Dr/Exit 1 Cr-32/Penn Ave/Exit 6	5.7	89	146	3.95	68	2.16	43
Portland	I-5 NB	Corbett Ave/Exit 298 N Tomahawk Island Dr/Exit 308	10.1	89	146	3.78	78	2.23	34
Washington, DC	Capital Beltway SB	MD-650/New Hampshire Ave/Exit 28 MD-201/Kenilworth Ave/Exit 23	4.8	89	146	2.99	208	1.55	245
Bridgeport	Merritt Pkwy/CT-15 NB	CT-58/Black Rock Tpke/Exit 44 CT-25/Exit 49	5.6	89	146	2.79	246	1.47	280
Cincinnati	I-75 NB	I-74/US-52/US-27/Exit 4 OH-4/Paddock Rd/Exit 9	5.0	88	150	3.51	114	1.84	114
Seattle	I-5 NB	Center Dr/Exit 118 Berkeley St/Exit 122	4.6	87	151	3.33	140	1.74	154
Sacramento	I-80 WB	Horseshoe Bar Rd Douglas Blvd	6.8	87	151	2.56	286	1.39	306
Tampa	I-275 NB	Howard Franklin Brg Lois Ave/Exit 22	3.4	87	151	2.49	298	1.83	119
Los Angeles	Orange Fwy/CA-57 NB	I-5/CA-22/Chapman Ave (Orange) CA-60/Pomona Fwy	14.7	86	154	3.50	116	1.88	103
Seattle	WA-167 SB	277th St 8th St	7.3	86	154	3.36	134	1.72	165
Bridgeport	Connecticut Turnpike/I-95 NB	Field Point Rd Mill Plain Rd/Exit 21	22.2	86	154	3.27	156	1.70	179
Los Angeles	I-5 NB (Santa Ana/Golden St Fwys)	CA-39/Beach Blvd Riverside Dr	22.5	86	154	3.07	190	1.92	92
Bridgeport	Merritt Pkwy/CT-15 SB	Main St/Exit 48 CT-33/Exit 41	9.9	86	154	2.84	235	1.42	297
Riverside	Ontario Fwy/I-15 SB	4th St CA-60	4.4	86	154	2.54	289	1.34	314
New York	NJ-4	Teaneck Rd Forest Ave	3.3	85	160	3.06	195	1.65	210
San Jose	CA-17 SB	Camden Ave/San Tomas Expy CA-9	3.2	85	160	1.83	324	1.24	322
Austin	I-35 NB	Shelby Ln/St Elmo Rd/Exit 230 Martin Luther King Blvd/19th St/Exit 235	4.7	84	162	4.06	56	2.63	9

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Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Washington, DC	MD 295/ Baltimore Washington Pkwy NB	MD-450 Powder Mill Rd	7.7	84	162	3.32	143	1.85	110
Boston	I-95/MA-128 NB	MA-2/Exit 29 MA-28/Main St/Exit 38	11.1	84	162	3.29	151	1.73	163
Minneapolis-St. Paul	I-394 EB	Xenia Ave/Park Place Blvd/Exit 5 US-12/Exit 8B	3.3	84	162	3.12	185	1.76	150
Vallejo-Fairfield CA	I-80 EB	Suisun Valley Rd N Texas St	7.4	84	162	2.02	319	1.17	323
Minneapolis-St. Paul	I-694 EB	Cr-44/Silver Lake Rd/Exit 39 Lexington Ave/Exit 43	3.6	83	167	3.35	137	1.81	126
Las Vegas	I-15 NB	Tropicana Ave/Exit 37 Sahara Ave/Exit 40	3.2	83	167	3.13	183	1.69	189
Dallas-Fort Worth	US-75 NB	Ross Ave/Exit 286 Mockingbird Ln/Exit 3	3.6	83	167	3.04	201	1.66	204
Raleigh	I-40 EB	Airport Blvd/Exit 284 NC-54/Exit 290	6.9	83	167	2.93	222	1.57	241
San Jose	Sinclair Fwy/I-280 NB	CA-87/Guadalupe Pkwy I-880/CA-17	3.7	83	167	2.84	235	1.47	280
Seattle	I-90 WB	Bellevue Way/Exit 9 Mercer Way/Exit 6	3.3	83	167	2.73	256	1.72	165
Bridgeport	I-84 EB	Mill Plain Rd/Old Ridgebury Rd/Exit 2 CT-37/Exit 6	4.3	83	167	2.61	276	1.38	308
Chicago	Stevenson Expy/I-55 SB	State St/Exit 293C Pulaski Rd/Exit 287	5.7	82	174	4.27	32	2.42	20
Santa Cruz	Cabrillo Hwy/CA-1 SB	CA-17 Park Ave	4.8	82	174	4.14	46	2.26	31
Los Angeles	San Diego Fwy/I-405 NB	I-105/Imperial Hwy Getty Center Dr	13.1	82	174	3.97	66	2.65	8
New Orleans	I-10 WB	Causeway Blvd/Exit 228 End Blvd/Florida Blvd	5.0	82	174	3.63	95	2.00	70
Austin	Loop 1/Mopac Expy SB	US-183/Research Blvd Barton Skwy	9.1	82	174	3.46	121	2.03	67
Dallas-Fort Worth	LBJ Fwy/I-635 EB	Valley View Ln/Exit 30 Kingsley Rd/Exit 13	16.7	82	174	3.11	186	1.70	179
San Diego	San Diego Fwy/I-5 NB	I-805 (North) Manchester Ave	7.6	82	174	2.91	225	1.63	216

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Seattle	I-5 SB	320th St/Exit 143 I-705/WA-7/Exit 133	11.1	82	174	2.89	228	1.58	235
Minneapolis-St. Paul	I-494 WB	34th Ave/Exit 1 Cr-32/Penn Ave/Exit 6	4.1	81	182	3.73	82	2.18	39
Los Angeles	Santa Monica Fwy/I-10 WB	I-5/Golden State Fwy National Blvd	12.6	81	182	3.59	99	2.21	36
Los Angeles	CA-134 EB	Bob Hope Dr I-5/Golden Hwy	3.1	81	182	3.38	130	1.84	114
Miami	Palmetto Expy/SR 826 NB	56th St/Miller Dr US-27/Okeechobee Rd	10.5	81	182	3.14	177	1.73	163
Seattle	I-405 NB	61st Ave 44th St/Exit 7	7.0	81	182	3.14	177	1.68	195
Minneapolis-St. Paul	I-35W NB	Cleveland Ave/Exit 24 I-694/Exit 27	3.9	81	182	2.89	228	1.49	273
Los Angeles	I-5 NB	Brand Blvd CA-14	5.8	81	182	2.64	274	1.46	285
Miami	Dolphin Expy/SR 836 EB	107th Ave FL-959/Red Rd	5.0	80	189	3.48	118	1.96	80
Los Angeles	US-101 SB (Ventura/Hollywood Fwys)	Ventura Blvd/Shoup Ave Vignes St/Exit 2B	26.7	80	189	3.32	143	1.85	110
Los Angeles	US-101 NB (Santa Ana/Hollywood Fwys)	I-5/CA-60 Haskell Ave	21.5	80	189	3.26	160	1.85	110
Denver	I-25 SB	58th Ave/Exit 215 CO-2/Colorado Blvd/Exit 204	10.9	80	189	3.05	198	1.71	175
Miami	Palmetto Expy/SR 826 SB	FL-823/57th Ave/Red Rd W 68th St/Gratigny Dr	4.6	80	189	2.85	234	1.53	257
Houston	I-45 SB	Tidwell Rd Cavalcade St/Exit 50	3.4	80	189	2.81	241	1.54	252
Portland	I-205 NB	Division St/Exit 19 US-30 Bus/Columbia Blvd/Exit 23	4.1	80	189	2.81	241	1.50	270
Washington, DC	Custis Mem Pkwy/I-66 EB	VA-234/Pr Wm Pkwy/Exit 44 N. Patrick Henry Dr	24.4	80	189	2.80	245	1.52	261
Los Angeles	CA-57 SB	Brea Canyon Rd Oranewood Ave	11.7	80	189	2.61	276	1.42	297
New York	I-278 WB	New York Ave Slosson Ave/Exit 12	3.2	79	198	3.95	68	2.24	33

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

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Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Los Angeles	CA-110 SB (Pasadena/Harbor Fwys)	Avenue 60 Olympic Blvd/9th St	6.6	79	198	3.70	86	2.38	21
Los Angeles	Santa Ana Fwy/I-5 NB	Sand Canyon Ave 17th St	8.4	79	198	3.25	163	1.87	107
Santa Rosa CA	US-101 NB	Railroad Ave Commerce Blvd/Wilfred Ave	4.2	79	198	2.95	219	1.67	198
Portland	I-205 SB	Airport Way/Exit 24 Washington St/Stark St/Exit 20	4.0	79	198	2.58	284	1.43	295
Statesville- Mooresville NC	I-77 SB	NC-150/Exit 36 Iredell/Mecklenburg Co Line	8.8	79	198	1.85	323	1.34	314
Oxnard CA	Ventura Fwy/US-101 NB	Camarillo Springs Rd Las Posas Rd	5.2	78	204	2.21	314	1.44	289
Dallas-Fort Worth	Loop 820/I-820 WB	TX-26/Grapevine Hwy US-377/Denton Hwy/Exit 19	3.1	77	205	4.07	53	2.43	18
Seattle	I-405 SB	WA-520/Ne 14th St/Exit 14 Se Coal Creek Pkwy/Exit 10	4.5	77	205	3.99	64	2.18	39
New York	Long Island Expy/I-495 WB	Glen Cove Rd/Exit 39 Woodhaven Blvd	14.9	77	205	3.32	143	2.02	68
New Haven	I-95 SB	CT-100/High St/Exit 52 Ella T Grasso Blvd/Exit 45	4.7	77	205	2.59	280	1.63	216
San Diego	San Diego Fwy/I-5 SB	Harbor Dr Birmingham Dr	14.8	77	205	2.39	308	1.36	310
Boston	I-93 NB	Storrow Dr/Exit 26B Montvale Ave/Exit 36	8.9	77	205	2.19	315	1.72	165
Los Angeles	San Gabriel River Fwy/I-605 SB	Beverly Blvd Florence Ave	4.8	76	211	3.64	91	2.34	26
Austin	Loop 1/Mopac Expy NB	US-290/TX-71 FM-2222/Northland Dr	9.8	76	211	3.15	176	1.78	143
Boston	Southeast Expy/I-93 SB	Granite Ave/Exit 11 MA-3/Exit 7	3.8	75	213	3.34	138	1.80	130
Chicago	I-94 WB	W Lawrence Ave Touhy Ave/Exit 39	3.9	75	213	2.79	246	1.61	227
Los Angeles	San Diego Fwy/I-405 NB	MacArthur Blvd Brookhurst St	7.8	74	215	3.59	99	2.06	59
Los Angeles	San Bernadino Fwy/I-10 EB	City Terrace Dr/Herbert Ave Baldwin Park Blvd	12.8	74	215	3.54	107	2.18	39

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Los Angeles	Foothill Fwy/I-210 EB	Lincoln Ave CA-39/Azusa Ave	17.2	74	215	3.17	170	1.84	114
Baltimore	Baltimore Beltway Inner Loop/I-695 NB	US-1/Southwestern Blvd/Exit 12 Security Blvd/Exit 17	5.3	74	215	3.08	188	1.76	150
Houston	I-45 NB (Gulf/North Fwys)	Dumble St Gulf Bank Rd/Exit 57	13.6	74	215	2.99	208	1.66	204
Milwaukee	North-South Fwy/I-43 SB/I-94 WB	WI-59/6th St/Exit 311 Howard Ave/Exit 314	3.5	74	215	2.71	261	1.54	252
San Francisco	I-80 EB (James Lick Fwy/Bay Brdg)	US-101 Treasure Island Rd	3.6	73	221	4.18	42	2.47	14
Atlanta	I-20 EB	GA-155/Candler Rd/Exit 65 Wesley Chapel Rd/Exit 68	3.0	73	221	3.05	198	1.79	137
Atlanta	I-285 WB	Ashford Dunwoody Rd/Exit 29 I-75/Exit 20	8.1	73	221	2.83	238	1.57	241
Riverside	Corona Fwy/I-15 SB	Hidden Valley Pkwy El Cerrito Rd	5.0	73	221	2.54	289	1.47	280
Bridgeport	Connecticut Turnpike/I-95 SB	Bronson Rd/Exit 20 US-1/Post Rd/Exit 13	10.8	73	221	2.54	289	1.39	306
Los Angeles	I-405 NB	Ventura Blvd Rinaldi St	9.5	73	221	2.53	293	1.44	289
San Francisco	California Delta Hwy/CA-4 WB	Hillcrest Ave Sommerville Rd	3.0	72	227	4.22	36	2.38	21
San Francisco	Grove Shafter Fwy/CA-24 EB	I-580/I-980 Caldecott Tunnel	4.1	72	227	3.45	123	2.06	59
Pittsburgh	Penn Lincoln Pkwy/I-376 EB	2nd Ave/1st Ave/Exit 1 William Penn Hwy/Exit 10A	8.1	72	227	3.36	134	2.06	59
Minneapolis-St. Paul	I-694 WB	I-35E/I-694/Exit 46 MN-51/Exit 42	3.9	72	227	3.13	183	1.81	126
Boston	Newburyport Tpke/US-1 SB	MA-129/Salem St Essex St	4.1	72	227	2.59	280	1.44	289
San Antonio	I-35 NB	Judson Rd/Exit 170 Evans Rd/Exit 174	3.8	72	227	2.43	302	1.41	301
Los Angeles	I-110 SB	W Vernon Ave 51st St	2.5	71	233	3.75	81	2.04	64
San Jose	Bayshore Fwy/US-101 SB	Fair Oaks Ave De La Cruz Blvd	4.2	71	233	3.53	109	2.08	52

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Nashville	I-440 EB	TN-1/End Ave/Exit 1 US-31 Alt/US-41 Alt/Nolensville Pike/Exit6	4.8	71	233	3.40	127	2.00	70
Houston	W Loop Fwy/I-610 SB	US-290/18th St Evergreen St/Exit 5	6.9	71	233	3.32	143	2.04	64
Atlanta	I-75 NB	Mount Paran Rd/Exit 256 Barrett Pkwy/Exit 269	12.8	71	233	3.03	203	1.74	154
Dallas-Fort Worth	Loop 12 SB	I-35E Union Bower Rd	4.1	71	233	2.94	220	1.61	227
Kansas City	I-70 EB	18th St/Exit 4 I-435/Exit 8	4.2	71	233	2.86	231	1.63	216
San Francisco	I-880 NB	CA-84/Decoto Rd Tennyson Rd	5.3	71	233	2.79	246	1.70	179
St. Louis	I-270 SB	Ladue Rd/Exit 13 Dougherty Ferry Rd/Exit 8	5.1	71	233	2.67	269	1.50	270
Minneapolis-St. Paul	I-35E SB	US-10 Pennsylvania Ave/Exit 108	4.8	71	233	2.65	273	1.55	245
Milwaukee	I-94 EB	Moorland Rd/Exit 301B WI-181/84th St/Exit 306	4.4	71	233	2.59	280	1.52	261
Bridgeport	Connecticut Turnpike/I-95 SB	Stratford Ave/Exit 28 Round Hill Rd/Exit 22	4.9	70	244	3.16	173	1.70	179
Washington, DC	Custis Mem Pkwy/I-66 WB	US-29/Lee Hwy/Exit 73 VA-123/Exit 60	14.8	70	244	2.99	208	1.72	165
Los Angeles	Harbor Fwy/I-110 NB	111th Pl I-110/I-10/Santa Monica Fwy	6.5	70	244	2.97	214	2.51	11
Los Angeles	CA-55 SB	Katella Ave McFadden Ave	6.0	70	244	2.89	228	1.61	227
Philadelphia	Delaware Expy/I-95 SB	Academy Rd/Exit 32 Girard Ave/Exit 23	8.3	70	244	2.75	253	1.95	85
New York	Northern State Pkwy WB	Willis Ave/Exit 28 Lakeville Rd/Exit 25	3.4	70	244	2.72	260	1.58	235
San Diego	I-805 SB	I-5 La Jolla Village Dr/Miramar Rd	2.9	69	250	3.38	130	2.00	70
Los Angeles	I-605 NB	Beverly Blvd Valley Blvd	5.0	69	250	3.33	140	1.86	109
Dallas-Fort Worth	TX-183 EB	I-820 Bedford Rd	4.0	69	250	3.01	205	1.80	130

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Minneapolis-St. Paul	I-35W SB	Washington Ave/Exit 17C Diamond Lake Rd/Exit 12B	7.7	69	250	2.84	235	1.74	154
Cincinnati	I-71 NB	Dana Ave/Exit 5 Red Bank Rd/Exit 9	3.8	69	250	2.68	267	1.53	257
Los Angeles	US-101 SB	Liberty Canyon Rd Parkway Calabasas	4.4	69	250	2.55	288	1.46	285
Los Angeles	I-5 SB (Santa Ana/Golden St Fwys)	East Cesar Chavez Ave Valley View Ave	17.5	68	256	3.31	148	2.12	47
Milwaukee	I-94 WB	I-43/I-794 General Mitchell Blvd/Exit 308	2.9	68	256	3.29	151	2.04	64
Los Angeles	CA-91 EB (Gardena/Artesia Fwys)	I-110 (East) Cherry Ave	6.7	68	256	3.26	160	1.89	98
San Antonio	I-410 EB	Starcrest Dr/Exit 25 Interchange Pkwy/Exit 26	1.1	68	256	3.06	195	1.74	154
New York	Long Island Expy EB	Sagtikos State Pkwy NY-111/Exit 56	3.2	68	256	3.03	203	1.72	165
Dallas-Fort Worth	I-35E NB	Harry Hines Blvd/Exit 435 Valley View Ln/Exit 441	5.8	68	256	2.82	239	1.65	210
San Francisco	I-880 NB	98th Ave 23rd Ave	4.2	68	256	2.42	305	1.42	297
Houston	Northwest Fwy/ US-290 WB	Mangum Rd N Eldridge Pkwy	11.0	67	263	3.07	190	1.76	150
San Francisco	US-101 SB	CA-84/Woodside Rd University Ave	4.4	67	263	2.70	263	1.62	224
New York	Long Island Expy/I-495 EB	Maurice Ave/Exit 18 Mineola Ave/Willis Ave/Exit 37	16.0	66	265	3.57	103	2.30	29
Los Angeles	I-405 NB	Avalon Blvd Inglewood Ave	7.3	66	265	2.78	249	1.63	216
Los Angeles	CA-2 SB	CA-134/Holly Dr Fletcher Dr	3.1	66	265	2.71	261	1.52	261
New York	I-80 WB	US-202/Exit 42 Cr-513/Exit 37	4.7	66	265	2.52	295	1.61	227
Los Angeles	Santa Monica Fwy/I-10 EB	CA-1/Lincoln Blvd/Exit 1B Alameda St	14.9	65	269	3.60	98	2.31	28
Miami	Dolphin Expy/SR 836 WB	I-95 FL-959/Red Rd	5.5	65	269	3.56	105	2.21	36

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Los Angeles	Costa Mesa Fwy/CA-55 NB	CA-73 4th St/Irvine Blvd	6.5	65	269	3.28	153	1.95	85
Chicago	I-94 WB	115th St/Exit 66B US-20/US-12/95th St/Exit 62	3.8	65	269	2.73	256	1.54	252
Los Angeles	I-405 SB	Valley View St Warner Ave	6.6	65	269	2.59	280	1.51	266
Portland	Beaverton Tigard Fwy NB	I-5/Exit 7 Hall Blvd/Exit 4A	4.2	65	269	2.33	309	1.41	301
Minneapolis-St. Paul	I-94 WB	Cretin Ave/Vandalia St/Exit 237 I-35W/11th St/Exit 233	4.1	64	275	3.25	163	2.07	56
Milwaukee	Zoo Fwy/US-45 SB	WI-190/Capitol Dr/Exit 44 I-94/Exit 38	3.8	64	275	3.25	163	1.97	78
Los Angeles	Pomona Fwy/CA-60 EB	Whittier Blvd Brea Canyon Rd	21.7	64	275	3.14	177	1.82	123
Los Angeles	I-210 WB	I-605 Baldwin Ave	5.5	64	275	2.69	264	1.60	232
Washington, DC	John Hanson Hwy/US-50 WB	Garden City Dr/Exit 6 Columbia Park Rd	3.0	64	275	2.68	267	1.58	235
Seattle	I-405 NB	8th St/Se 12th St/Exit 12 Juanita Woodinville Way/Exit 22	10.0	64	275	2.58	284	1.51	266
San Jose	Bayshore Fwy/US-101 NB	CA-237 San Antonio Rd	4.7	63	281	3.21	168	1.96	80
Seattle	I-405 SB	WA-527/26th Ave/Exit 26 WA-908/85th St/Exit 18	8.7	62	282	2.50	297	1.44	289
San Jose	Nimitz Fwy/I-880 SB	CA-237/W Calaveras Blvd 1st St	4.6	61	283	2.97	214	1.80	130
Phoenix	I-10 EB (Papago/Maricopa Fwys)	Buckeye Rd/Exit 149 Broadway Rd/52nd St/Exit 153B	6.1	61	283	2.82	239	1.74	154
Minneapolis-St. Paul	US-169 NB	Cr-3/Excelsior Blvd MN-55	4.0	60	285	2.93	222	1.77	147
Denver	I-25 NB	Evans Ave/Exit 203 84th Ave/Exit 219	15.1	60	285	2.73	256	1.66	204
Los Angeles	I-10 WB	Citrus St Baldwin Park Blvd	5.2	60	285	2.69	264	1.66	204
San Francisco	Eastshore Fwy/I-80 EB/I-580 WB	Cypress St University Ave	3.3	59	288	3.37	133	2.07	56

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
San Francisco	I-80 WB	Hillcrest Rd US-101	3.5	59	288	2.86	231	1.79	137
Los Angeles	I-405 SB	CA-55/Costa Mesa Fwy Jeffrey Rd/University Dr	4.5	59	288	2.60	279	1.63	216
Houston	US-59 SB	Greenbriar Dr I-610 (Houston) (South)	3.0	59	288	2.53	293	1.55	245
Portland	I-84 EB	I-5 I-205/Exit 8	6.0	58	292	2.28	312	1.56	243
Sacramento	Capital City Fwy/I-80 Bus EB	US-50/CA-99 Fulton Ave	7.3	57	293	2.78	249	1.72	165
San Diego	CA-78 EB	Rancho Santa Fe Rd Mission Rd	4.2	56	294	3.10	187	1.98	77
San Francisco	US-101 NB	Whipple Ave Marine Pkwy/Ralston Ave	3.1	56	294	2.75	253	1.74	154
Houston	South Fwy NB	McHard Rd Orem Dr	3.3	56	294	2.73	256	1.63	216
Houston	Northwest Fwy EB	Telge Rd West Rd	4.5	56	294	2.54	289	1.53	257
Chicago	I-94 EB	75th St 87th St/Exit 61B	3.4	56	294	2.51	296	1.71	175
San Francisco	I-680 NB	Stone Valley Rd N Main St	5.3	56	294	2.49	298	1.61	227
Houston	Gulf Fwy/I-45 SB	Dumble St I-610/Exit 40	3.6	55	300	3.07	190	2.00	70
Atlanta	I-85 NB	Chamblee Tucker Rd/Exit 94 GA-140/Jimmy Carter Blvd/Exit 99	4.7	55	300	2.63	275	1.63	216
Charlotte	I-485 EB	NC-49/Tryon St/Exit 1 NC-51/Exit 64	5.3	54	302	3.28	153	2.13	46
Phoenix	Papago Fwy/I-10 WB	AZ-51/AZ-202/Exit 147 35th Ave/Exit 141	6.2	54	302	2.76	252	1.74	154
Austin	I-35 NB	E Fm-1626/Crown Colony Dr William Cannon Dr/Exit 228	3.7	54	302	2.41	307	1.48	277
Los Angeles	San Diego Fwy/I-405 SB	Nordhoff St Mulholland Dr	8.1	53	305	2.97	214	2.06	59
New York	NJ-17	I-80 Garden State Pkwy	4.7	53	305	2.48	300	1.60	232

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Los Angeles	Harbor Fwy/CA-110 NB	I-10/Santa Monica Fwy Stadium Way/Exit 24C	3.1	52	307	4.89	10	3.20	2
San Jose	Bayshore Fwy/US-101 SB	Alum Rock Ave/Santa Clara St Tully Rd	3.7	52	307	3.05	198	1.82	123
Houston	South Fwy/TX-288 SB	Southmore Blvd Airport Blvd	5.7	52	307	2.75	253	1.69	189
San Jose	W Valley Fwy/CA-85 SB	Central Expy Fremont Ave	3.0	50	310	2.69	264	1.74	154
Los Angeles	I-10 WB	Valley Blvd Atlantic Blvd	6.4	50	310	2.56	286	1.62	224
Dallas-Fort Worth	TX-360 SB	Post N Paddock St Division St	3.0	49	312	3.53	109	2.51	11
Seattle	I-5 NB	45th St/Exit 169 236th St/Exit 177	8.8	49	312	2.33	309	1.50	270
Washington, DC	Shirley Hwy/I-395 SB	Quaker Ln/Exit 6 VA-236/Duke St/Exit 3	3.6	48	314	2.61	276	1.71	175
Atlanta	I-85 SB	GA-120/Duluth Hwy/Exit 107 Steve Reynolds Blvd/Exit 103	3.7	48	314	2.25	313	1.72	165
Houston	I-45 SB	Sam Houston Tollway/Exit 32 FM-2351/Exit 29	3.7	48	314	1.93	321	1.88	103
Los Angeles	I-5 SB	CA-73 CA-1/Camino De Vis	5.8	47	317	1.52	326	1.08	327
Los Angeles	Century Fwy/I-105 WB	Bellflower Blvd Crenshaw Blvd	12.5	46	318	2.42	305	1.59	234
Boston	Broadway	MA-99 MA-129/Salem St	4.5	46	318	2.17	316	1.48	277
Miami	FL Tpke Ext/FL-821 NB	FL-874/Exit 17 US-41/8th St/Sw 25th Ter/Exit 25	11.9	45	320	2.30	311	1.49	273

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-1. Reliably Unreliable (All 328 Corridors), continued

Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 Weekday Peak-period Travel Time Reliability					
				Buffer Index (%)	Rank	Planning Time Index	Rank	Travel Time Index	Rank
Los Angeles	I-5 NB	Penrose St Osborne St	3.3	44	321	2.43	302	1.90	96
Charleston	I-26 EB	US-78/University Blvd Dorchester Rd	10.5	43	322	1.86	322	1.17	323
Sacramento	I-80 WB	I-5/CA-99 Capitol Ave/Enterprise Blvd	5.0	42	323	1.54	325	1.09	325
San Jose	Sinclair Fwy/I-680 SB	CA-237/Calaveras Blvd Berryessa Rd	3.5	40	324	2.04	318	1.40	304
San Jose	W Valley Fwy/CA-85 NB	I-280 CA-82/El Camino Real	3.8	39	325	2.00	320	1.34	314
New York	Garden State Pkwy NB	Cr-539/Exit 58 Forked River Rest Area	17.5	37	326	1.43	327	1.04	328
Sacramento	S Sacramento Fwy/CA-99 SB	12th Ave Mack Rd/Bruceville Rd	5.4	24	327	2.11	317	1.70	179
Allentown PA-NJ	US-22 WB	15th St PA-145/Macarthur Rd	3.4	18	328	1.30	328	1.09	325

Buffer Index—measure of trip reliability that expresses the amount of extra “buffer” time needed to be on time for 95 percent of trips. A BI of 150 percent means that for a trip that takes 30 minutes on average, 45 extra minutes should be planned (30 minutes x 150% = 45 minutes). **Planning Time Index**—represents the total travel time that should be planned for a trip. It differs from the BI in that it includes typical delay as well as unexpected delay. A PTI of 2.50 means that for a 30-minute trip in light traffic, 75 minutes should be planned (30 minutes x 2.50 = 75 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. **Note:** Please do not place too much emphasis on small differences in rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-2. Congestion Leaders (All 328 Corridors)

Urban Area	Corridor	Corridor Endpoints From To	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	Harbor Fwy/CA-110 NB	I-10/Santa Monica Fwy Stadium Way/Exit 24C	3.1	1,440	1	2,170	28	95,020	27
Los Angeles	Harbor Fwy/I-110 NB	111th Pl I-110/I-10/Santa Monica Fwy	6.5	1,126	2	3,665	13	158,173	14
Los Angeles	San Diego Fwy/I-405 NB	I-105/Imperial Hwy Getty Center Dr	13.1	965	3	6,057	2	269,925	2
New York	Van Wyck Expy/I-678 NB	Belt Pkwy/Exit 1 Main St/Exit 8	3.1	690	4	1,086	68	46,928	69
Los Angeles	San Gabriel River Fwy/I-605 SB	Beverly Blvd Florence Ave	4.8	681	5	1,644	43	70,454	43
Los Angeles	Santa Monica Fwy/I-10 EB	CA-1/Lincoln Blvd/Exit 1B Alameda St	14.9	640	6	4,664	8	203,998	8
Los Angeles	Santa Monica Fwy/I-10 WB	I-5/Golden State Fwy National Blvd	12.6	633	7	3,831	11	169,842	11
San Francisco	I-80 EB (James Lick Fwy/Bay Brdg)	US-101 Treasure Island Rd	3.6	600	8	1,005	76	43,711	79
San Francisco	Grove Shafter Fwy/CA-24 WB	Saint Stephens Dr Caldecott Tunnel	3.5	600	8	934	84	43,359	82
Los Angeles	I-110 SB	W Vernon Ave 51st St	2.5	582	10	670	124	30,929	114
New York	I-278 EB (Gowanus Expy/Brooklyn Queens)	92nd St/Exit 17 Apollo St/Meeker Ave/Exit 34	11.6	581	11	3,618	15	149,860	15
Los Angeles	Riverside Fwy/CA-91 EB	CA-55/Costa Mesa Fwy Mckinley St	20.7	576	12	5,698	3	260,647	3
New York	I-278 WB (Brooklyn Queens/Gowanus Expy)	NY-25A/Northern Blvd/Exit 41 NY-27/Prospect Expy/Exit 24	10.2	550	13	2,966	19	124,355	20
Austin	I-35 SB	US-183/Exit 239-240 Woodland Ave	6.7	546	14	1,698	38	77,880	37
San Francisco	Eastshore Fwy/I-80 EB/I-580 WB	Cypress St University Ave	3.3	538	15	847	91	36,568	98
Austin	I-35 NB	Shelby Ln/St Elmo Rd/Exit 230 Martin Luther King Blvd/19th St/Exit 235	4.7	536	16	1,243	58	54,236	61
Los Angeles	CA-110 SB (Pasadena/Harbor Fwys)	Avenue 60 Olympic Blvd/9th St	6.6	526	17	1,679	40	73,700	41
Los Angeles	I-5 SB (Santa Ana/Golden St Fwys)	East Cesar Chavez Ave Valley View Ave	17.5	523	18	4,541	9	196,333	9

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length.

Wasted Fuel—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.

Congestion Cost—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel).

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Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
New York	Van Wyck Expy/I-678 SB	Horace Harding Expy/Exit 12A Linden Blvd/Exit 3	6.2	520	19	1,625	44	70,308	44
San Francisco	Eastshore Fwy/I-80 WB/I-580 EB	Cutting Blvd Bay Bridge Toll Plz	8.5	515	20	2,122	29	90,264	29
Los Angeles	US-101 NB (Santa Ana/Hollywood Fwys)	I-5/CA-60 Haskell Ave	21.5	503	21	5,386	6	232,387	6
Los Angeles	San Diego Fwy/I-405 NB	Macarthur Blvd Brookhurst St	7.8	497	22	1,777	37	81,506	35
Los Angeles	I-5 NB (Santa Ana/Golden St Fwys)	CA-39/Beach Blvd Riverside Dr	22.5	487	23	5,442	5	235,356	5
Los Angeles	San Bernadino Fwy/I-10 EB	City Terrace Dr/Herbert Ave Baldwin Park Blvd	12.8	487	23	3,041	18	132,990	17
Los Angeles	US-101 SB (Ventura/Hollywood Fwys)	Ventura Blvd/Shoup Ave Vignes St/Exit 2B	26.7	485	25	6,262	1	277,782	1
Houston	I-10 EB	T C Jester Blvd/Exit 765 McKee St/San Jacinto St	4.4	475	26	951	81	43,270	83
Boston	Southeast Expy/I-93 NB	MA-28/Randolph Ave/Exit 5 Columbia Rd/Exit 15	10.4	470	27	2,442	22	105,165	22
Washington, DC	Capital Beltway/I-495 Outer Loop	US-1/Baltimore Ave/Exit 25 MD-97/Georgia Ave/Exit 31	6.3	465	28	1,360	55	61,030	54
Houston	N Loop W Fwy/I-610 EB	US-290 Yale St	4.0	460	29	885	89	39,255	90
Los Angeles	San Diego Fwy/I-405 SB	Nordhoff St Mulholland Dr	8.1	458	30	1,793	36	79,085	36
Houston	US-59 NB (Southwest/Eastex Fwys)	Buffalo Speedway I-45	4.8	453	31	1,025	74	45,426	72
New York	Major Deegan Expy/I-87 NB	I-278/Bruckner Expy I-95/Cross Bronx Expy/Exit 7	4.1	452	32	975	80	41,142	86
Seattle	I-5 SB	WA-523/145th St/Exit 175 Union St/Exit 165	8.9	441	33	1,930	32	84,806	33
Pittsburgh	Penn Lincoln Pkwy/I-376 EB	Lydia St/Exit 2 US-19 TK RT/PA-51/Exit 5	3.4	433	34	728	107	33,336	108
Miami	Dolphin Expy/SR 836 EB	107th Ave FL-959/Red Rd	5.0	431	35	1,105	67	45,316	73
New York	Long Island Expy/I-495 EB	Maurice Ave/Exit 18 Mineola Ave/Willis Ave/Exit 37	16.0	426	36	3,506	16	149,511	16

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length.

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Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
New York	I-95 SB (NE Thwy, Bruckner/Cross Bronx Expys)	Conner St/Exit 13 Hudson Ter	22.7	425	37	4,907	7	213,006	7
Los Angeles	I-605 NB	Beverly Blvd Valley Blvd	5.0	423	38	1,038	71	44,997	74
Chicago	Stevenson Expy/I-55 SB	State St/Exit 293C Pulaski Rd/Exit 287	5.7	414	39	1,249	56	55,001	59
New York	Goethals Brg EB/I-278 EB	Meeker Ave/Forest Ave/Exit 4 Bradley Ave/Exit 11	3.3	414	39	716	111	30,094	124
Seattle	I-5 NB	Albro Pl/Swift Ave/Exit 161 James St/Exit 164	4.1	398	41	836	96	35,495	102
Los Angeles	Santa Ana Fwy/I-5 NB	Sand Canyon Ave 17th St	8.4	397	42	1,595	45	71,034	42
Philadelphia	Schuylkill Expy/I-76 WB	Oregon Ave/Passyunk Ave/Exit 347 Belmont Ave/Exit 338	9.5	391	43	1,961	31	83,569	34
Los Angeles	I-5 NB	Penrose St Osborne St	3.3	388	44	641	131	27,533	137
Dallas-Fort Worth	TX-360 SB	Post N Paddock St Division St	3.0	385	45	557	156	23,967	158
New York	I-278 WB	New York Ave Slosson Ave/Exit 12	3.2	378	46	622	137	26,235	142
Houston	W Loop Fwy/I-610 SB	US-290/18th St Evergreen St/Exit 5	6.9	375	47	1,225	60	54,336	60
New York	Major Deegan Expy SB	Van Cortlandt Park/Exit 11 I-95/Cross Bronx Expy/Exit 7	3.5	375	47	707	114	29,288	129
Chicago	Eisenhower Expy/I-290 WB	S Ashland Ave/Exit 28B 9th Ave/Exit 19B	8.8	368	49	1,847	35	77,727	38
New York	I-95 NB (Cross Bronx/Bruckner Expys)	I-80/NJ Tpke Pelham Pkwy/Exit 8	11.5	365	50	2,229	25	93,448	28
Dallas-Fort Worth	Loop 820/I-820 WB	TX-26/Grapevine Hwy US-377/Denton Hwy/Exit 19	3.1	364	51	569	152	24,587	153
Los Angeles	Foothill Fwy/I-210 EB	Lincoln Ave CA-39/Azusa Ave	17.2	363	52	3,073	17	132,885	18
Miami	Palmetto Expy/SR 826 SB	74th St 25th St	3.2	362	53	526	164	23,317	162
Houston	I-45 NB (Gulf/North Fwys)	Dumble St Gulf Bank Rd/Exit 57	13.6	361	54	2,302	23	104,654	23

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Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	I-710 SB	Floral Dr Atlantic Blvd/Bandini Blvd	3.7	359	55	649	130	27,869	135
Houston	W Loop Fwy/I-610 NB	Braeswood Blvd/S Post Oak Rd/Exit 4 Woodway Dr/Exit 10	5.8	357	56	946	83	43,412	81
Los Angeles	Pomona Fwy/CA-60 EB	Whittier Blvd Brea Canyon Rd	21.7	357	56	3,828	12	165,020	12
Houston	Gulf Fwy/I-45 SB	Dumble St I-610/Exit 40	3.6	355	58	591	145	26,134	145
Dallas-Fort Worth	Stemmons Fwy/I-35E SB	Empire Central Dr/Exit 434A I-30/Exit 428	6.7	354	59	1,163	62	50,255	64
Los Angeles	Costa Mesa Fwy/CA-55 NB	CA-73 4th St/Irvine Blvd	6.5	351	60	1,025	74	47,964	67
New York	Long Island Expy/I-495 WB	Glen Cove Rd/Exit 39 Woodhaven Blvd	14.9	351	60	2,633	21	115,117	21
Los Angeles	I-5 SB	Alton Pkwy El Toro Rd	3.4	346	62	542	159	25,004	151
New York	Belt/Shore/Laurelton Pkwy EB	I-678/Van Wyck Expy/Exit 20 Merrick Blvd/Exit 24	3.6	346	62	627	135	27,041	139
Chicago	Eisenhower Expy/I-290 EB	IL-72/Higgins Rd/Exit 1 Austin Blvd/Exit 23A	21.5	345	64	3,953	10	174,780	10
Miami	Dolphin Expy/SR 836 WB	I-95 FL-959/Red Rd	5.5	342	65	911	88	38,161	92
San Francisco	Nimitz Fwy/I-880 SB	I-238/Washington Ave CA-92/Jackson St	4.3	342	65	674	121	29,968	125
Seattle	I-405 SB	WA-520/Ne 14th St/Exit 14 SE Coal Creek Pkwy/Exit 10	4.5	342	65	774	103	33,127	109
New York	Laurelton/Belt/Shore Pkwy WB	Francis Lewis Blvd/Exit 24 Nassau Expy/Exit 19	4.9	335	68	846	92	36,004	99
Washington, DC	I-95 SB	I-395 Russell Rd/Exit 148	23.9	333	69	3,637	14	164,962	13
Chicago	I-90/I-94 EB (Kennedy/Dan Ryan Expys)	I-294/Tri State Tollway Ruble St/Exit 52B	15.9	330	70	2,876	20	124,436	19
San Francisco	I-80 WB	Hillcrest Rd US-101	3.5	329	71	559	154	23,833	159
Houston	I-45 NB	Clearwood Dr/Edgebrook St Broadway St/Park Place Blvd/Exit39	3.8	323	72	545	157	25,207	150

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Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	Orange Fwy/CA-57 NB	I-5/CA-22/Chapman Ave (Orange) CA-60/Pomona Fwy	14.7	321	73	2,260	24	100,145	25
Houston	I-45 SB	Tidwell Rd Cavalcade St/Exit 50	3.4	318	74	484	174	23,078	164
Los Angeles	I-10 WB	Citrus St Baldwin Park Blvd	5.2	317	75	786	101	35,294	103
Atlanta	I-285 EB	Riverside Dr/Exit 24 I-85/Exit 33	9.10	307	76	1,420	48	64,012	49
Houston	I-45 SB	Sam Houston Tollway/Exit 32 FM-2351/Exit 29	3.7	306	77	502	168	23,533	160
San Francisco	Grove Shafter Fwy/CA-24 EB	I-580/I-980 Caldecott Tunnel	4.1	305	78	601	141	25,648	148
New York	Grand Central Pkwy EB	I-278 I-295/NY-25/Exit 21	10.6	300	79	1,654	42	70,149	45
Washington, DC	Capital Beltway/I-495 Inner Loop	I-95/I-395/Exit 57 MD-650/New Hampshire Ave/Exit28	41.4	300	79	5,625	4	257,175	4
Los Angeles	I-710 NB	Alondra Blvd Imperial Hwy	3.0	299	81	437	186	19,195	189
Riverside	Riverside Fwy/CA-91 WB	McKinley St Auto Center Dr/Serfas Club Dr	5.6	299	81	837	95	38,149	93
Minneapolis-St. Paul	I-94 WB	Cretin Ave/Vandalia St/Exit 237 I-35W/11th St/Exit 233	4.1	298	83	576	150	24,302	155
Minneapolis-St. Paul	I-494 WB	34th Ave/Exit 1 Cr-32/Penn Ave/Exit 6	4.1	297	84	571	151	24,438	154
Dallas-Fort Worth	Thornton Fwy/I-30 WB	Saint Francis Ave/Exit 52 Griffin St	7.2	294	85	1,027	72	44,426	78
San Jose	Bayshore Fwy/US-101 SB	Alum Rock Ave/Santa Clara St Tully Rd	3.7	291	86	513	166	21,716	175
Los Angeles	CA-91 EB (Gardena/Artesia Fwys)	I-110 (East) Cherry Ave	6.7	288	87	947	82	41,016	87
San Francisco	I-580 EB	Eden Canyon Rd El Charro Rd/Fallon Rd	9.6	288	87	1,232	59	55,924	57
San Jose	Bayshore Fwy/US-101 SB	Fair Oaks Ave De La Cruz Blvd	4.2	287	89	558	155	24,079	157
Boston	Southeast Expy/I-93 SB	Granite Ave/Exit 11 MA-3/Exit 7	3.8	283	90	528	163	23,193	163

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Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	Pomona Fwy/CA-60 WB	Fairway Dr Peck Rd	10.4	281	91	1,374	53	62,000	51
New York	Southern State Pkwy EB	Franklin Ave/Exit 16 Wantagh Ave/Exit 28	10.3	279	92	1,384	52	62,819	50
Houston	Eastex Fwy/US-59 SB	Quitman St/Liberty Rd TX-288	4.1	278	93	531	162	23,441	161
Philadelphia	Delaware Expy/I-95 SB	Academy Rd/Exit 32 Girard Ave/Exit 23	8.3	278	93	1,129	65	49,912	65
Tampa	I-275 SB	Floribruska Ave/28th Ave/Exit 28 US-92/Dale Mabry Hwy/Exit 23	4.2	278	93	562	153	24,682	152
Portland	I-5 NB	Corbett Ave/Exit 298 N Tomahawk Island Dr/Exit 308	10.1	275	96	1,39.6	51	59,113	55
Los Angeles	I-10 WB	Valley Blvd Atlantic Blvd	6.4	274	97	839	94	37,490	95
Los Angeles	I-405 NB	Avalon Blvd Inglewood Ave	7.3	274	97	859	90	42,017	85
New York	FDR Dr NB	I-495/Tunnel Exit St/Queens Midtown Tunnl 116th St/Exit 16	4.0	274	97	593	143	24,161	156
Las Vegas	I-15 NB	Tropicana Ave/Exit 37 Sahara Ave/Exit 40	3.2	273	100	427	190	18,787	194
Los Angeles	Century Fwy/I-105 EB	Nash St I-605	17.6	272	101	2,208	26	102,055	24
Dallas-Fort Worth	Loop 820/I-820 EB	Mark Iv Pkwy/Exit 16 Rufe Snow Dr/Exit 20	5.2	270	102	711	113	30,693	117
Minneapolis-St. Paul	I-494 EB	US-212/Prairie Center Dr/Exit 1 Cr-32/Penn Ave/Exit 6	5.7	270	102	672	123	30,503	120
New York	Belt Pkwy EB	Knapp St Pennsylvania Ave/Exit 14	7.5	269	104	1,039	70	44,527	77
New York	Bronx Whitestone Brg NB/Whitestone Expy NB	Linden Pl/Exit 14 Toll Plaza	3.4	268	105	504	167	20,416	183
New York	Garden State Pkwy NB	I-78/Mill Rd/Exit 142 I-280/Exit 145	3.8	266	106	470	177	22,157	171
Denver	I-25 SB	58th Ave/Exit 215 CO-2/Colorado Blvd/Exit 204	10.9	265	107	1,402	50	61,549	52
Chicago	I-290 WB	I-88/Exit 15A IL-83/Exit 10A	6.0	264	108	845	93	37,497	94

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Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	I-210 WB	I-605 Baldwin Ave	5.5	264	108	689	116	30,873	115
Boston	Southeast Expy/I-93 SB	I-90 Freeport St/Exit 13	3.7	263	110	485	173	20,641	178
Atlanta	I-75 NB	Mount Paran Rd/Exit 256 Barrett Pkwy/Exit 269	12.8	262	111	1,683	39	76,923	39
Pittsburgh	Penn Lincoln Pkwy/I-376 WB	US-22 Bus/Exit 10 Squirrel Hill Tuml	5.3	260	112	724	108	31,422	113
Miami	Palmetto Expy/SR 826 NB	56th St/Miller Dr US-27/Okeechobee Rd	10.5	259	113	1,245	57	55,742	58
Dallas-Fort Worth	TX-183 EB	I-820 Bedford Rd	4.0	258	114	462	179	21,818	173
Dallas-Fort Worth	I-635 WB	US-75/Exit 19 Josey Ln/Exit 26	8.3	258	114	923	86	44,566	76
Los Angeles	CA-134 EB	Bob Hope Dr I-5/Golden Hwy	3.1	258	114	384	208	16,734	213
Los Angeles	I-5 SB	Buena Vista St Mission Rd	12.6	254	117	1,488	46	68,161	46
Phoenix	Papago Fwy/I-10 WB	AZ-51/AZ-202/Exit 147 35th Ave/Exit 141	6.2	253	118	784	102	33,970	107
Chicago	Stevenson Expy/I-55 NB	US-20/US-45/US-12/Exit 279A Pulaski Rd/Exit 287	8.9	252	119	1,172	61	52,206	62
Orlando	I-4 EB	Floridas Turnpike/Exit 31 FL-423/Lee Rd/Exit 46	9.8	252	119	1,149	63	51,759	63
Phoenix	I-10 EB (Papago/Maricopa Fwys)	Buckeye Rd/Exit 149 Broadway Rd/52nd St/Exit153B	6.1	252	119	759	105	33,067	110
Dallas-Fort Worth	LBJ Fwy/I-635 EB	Valley View Ln/Exit 30 Kingsley Rd/Exit 13	16.7	251	122	1,919	33	88,647	30
Houston	US-59 SB	Greenbriar Dr I-610 (Houston) (South)	3.0	248	123	329	225	15,476	222
New Haven	I-95 NB	Marsh Hill Rd/Exit 41 Ella T Grasso Blvd/Exit 45	4.0	248	123	488	172	21,720	174
Portland	US-26 EB	OR-217/Exit 69 Canyon Rd/Exit 73	4.2	244	125	543	158	22,394	169
San Francisco	I-880 NB	CA-84/Decoto Rd Tennyson Rd	5.3	241	126	580	149	26,147	143

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				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Chicago	I-90/I-94 WB (Dan Ryan/Kennedy Expys)	Pershing Rd/Exit 55B Sayre Ave/Exit 81B	15.4	240	127	2,054	30	88,085	31
New York	NJ-17	Paramus Rd/Saddle River Rd Passaic St	5.5	239	128	636	134	26,939	140
San Francisco	California Delta Hwy/CA-4 EB	Bailey Rd Somerville Rd	5.8	238	129	659	128	29,239	130
San Jose	Bayshore Fwy/US-101 NB	CA-237 San Antonio Rd	4.7	238	129	496	171	22,171	170
Seattle	I-5 NB	72nd St/74th St/Exit 129 I-705/WA-7/Exit 133	4.2	236	131	477	176	21,310	176
Denver	I-25 NB	Evans Ave/Exit 203 84th Ave/Exit 219	15.1	235	132	1,679	40	75,464	40
San Francisco	US-101 NB	Whipple Ave Marine Pkwy/Ralston Ave	3.1	233	133	306	237	14,456	229
San Francisco	California Delta Hwy/CA-4 WB	Hillcrest Ave Somerville Rd	3.0	232	134	329	225	14,793	226
Baton Rouge	I-12 EB	Essen Ln O'Neal Ln	5.8	231	135	789	99	35,987	100
Boston	I-93 SB	I-95/MA-128/Exit 37 US-1/Exit 27	9.8	230	136	1,106	66	48,371	66
Dallas-Fort Worth	I-30 EB	Hampton Rd/Exit 42 Barry Ave/Exit 48	6.9	229	137	793	98	34,165	106
San Diego	San Diego Fwy/I-5 NB	I-805 (North) Manchester Ave	7.6	229	137	684	118	34,806	105
San Diego	I-805 SB	I-5 La Jolla Village Dr/Miramar Rd	2.9	229	137	304	240	13,491	244
New York	Harlem River Dr NB	Willis Avenue Brg/Exit 18 I-95/Amsterdam Ave/Exit 23	3.2	225	140	355	217	15,570	221
Philadelphia	Schuylkill Expy/I-76 EB	I-276 South St/Exit 346	18.9	225	140	2,189	27	95,520	26
Baltimore	Baltimore Beltway Inner Loop/I-695 NB	US-1/Southwestern Blvd/Exit 12 Security Blvd/Exit 17	5.3	223	142	592	144	26,083	146
Los Angeles	CA-55 SB	Katella Ave McFadden Ave	6.0	223	142	582	148	28,041	133
Los Angeles	I-405 SB	Valley View St Warner Ave	6.6	223	142	595	142	30,783	116

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				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Los Angeles	I-405 SB	CA-55/Costa Mesa Fwy Jeffrey Rd/University Dr	4.5	223	142	419	196	21,040	177
Dallas-Fort Worth	US-75 NB	Ross Ave/Exit 286 Mockingbird Ln/Exit 3	3.6	218	146	363	215	16,353	215
Los Angeles	Century Fwy/I-105 WB	Bellflower Blvd Crenshaw Blvd	12.5	215	147	1,143	64	56,633	56
Cincinnati	I-75 SB	I-74/US-52/US-27/Exit 4 W 7th St/Exit 1	3.4	214	148	343	221	15,739	220
Atlanta	I-75/I-85 NB	GA-166 US-78/US-278/US-29/Exit 249	7.6	213	149	808	97	37,126	96
Atlanta	I-85 NB	Chamblee Tucker Rd/Exit 94 GA-140/Jimmy Carter Blvd/Exit 99	4.7	213	149	502	168	23,007	165
Baltimore	Baltimore Beltway Outer Loop/I-695 SB	MD-140/Reisterstown Rd/Exit 20 US-40/Exit 15	7.1	211	151	674	121	32,677	111
Milwaukee	Zoo Fwy/US-45 SB	WI-190/Capitol Dr/Exit 44 I-94/Exit 38	3.8	211	151	394	206	16,792	212
San Diego	CA-78 EB	Rancho Santa Fe Rd Mission Rd	4.2	211	151	406	200	17,966	201
Washington, DC	Custis Mem Pkwy/I-66 WB	US-29/Lee Hwy/Exit 73 VA-123/Exit 60	14.8	211	151	1,463	47	65,408	47
New York	Garden State Pkwy SB	Watchung Ave/Exit 151 Walnut St/Exit 147	4.5	208	155	454	180	20,287	184
San Jose	Nimitz Fwy/I-880 SB	CA-237/W Calaveras Blvd 1st St	4.6	207	156	447	183	19,151	190
Atlanta	I-20 EB	GA-155/Candler Rd/Exit 65 Wesley Chapel Rd/Exit 68	3.0	206	157	312	233	14,267	233
Detroit	Edsel Ford Fwy/I-94 EB	Grand Blvd/Exit 213 Chene St/Exit 217	4.0	204	158	397	204	17,187	208
Norfolk	Hampton Roads Beltway/I-64 EB	Rip Rap Rd/Exit 265 Hampton Roads Brg Tunn (Hampton)	3.1	204	158	310	234	13,230	246
Milwaukee	I-94 WB	I-43/I-794 General Mitchell Blvd/Exit 308	2.9	202	160	294	245	12,133	266
Dallas-Fort Worth	North Fwy/I-35W NB	Rosedale St/Exit 49B Western Center Blvd/Exit 58	9.5	200	161	913	87	39,923	89
Santa Cruz	Cabrillo Hwy/CA-1 SB	CA-17 Park Ave	4.8	200	161	420	194	18,526	195

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length.

Wasted Fuel—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.

Congestion Cost—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel).

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Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Baltimore	Baltimore Beltway Inner Loop/I-695 EB	MD-140/Reisterstown Rd/Exit 20 MD-542/Loch Raven Blvd/Exit 29	10.2	199	163	976	79	45,506	71
Seattle	I-5 SB	320th St/Exit 143 I-705/WA-7/Exit 133	11.1	199	163	1,058	69	47,150	68
Houston	Northwest Fwy/ US-290 WB	Mangum Rd N Eldridge Pkwy	11.0	197	165	978	78	44,833	75
Washington, DC	Shirley Hwy/I-395 SB	Quaker Ln/Exit 6 VA-236/Duke St/Exit 3	3.6	197	165	317	231	14,333	231
Boston	I-95/MA-128 NB	MA-2/Exit 29 MA-28/Main St/Exit 38	11.1	195	167	1,027	72	46,457	70
Norfolk	Hampton Roads Beltway/I-64 WB	VA-168/Tidewater Dr/Exit 277 Hampton Roads Brg Tunl(Norfolk)	6.4	195	167	587	147	25,823	147
Minneapolis-St. Paul	I-35W SB	Washington Ave/Exit 17C Diamond Lake Rd/Exit 12B	7.7	193	169	705	115	29,597	127
New York	Cross Island Pkwy NB	Grand Central Pkwy/Exit 29 I-295/Throgs Neck Brg/Exit 33	4.7	192	170	438	185	19,843	186
Providence	I-95 SB	US-1/George St/Exit 27 RI-7/RI-146/Charles St/Exit 23	3.2	191	171	287	248	12,266	262
Cincinnati	I-75 NB	I-74/US-52/US-27/Exit 4 OH-4/Paddock Rd/Exit 9	5.0	190	172	480	175	20,426	182
Orlando	I-4 WB	FL-423/Lee Rd/Exit 46 FL-408/Exit 36	5.7	190	172	497	170	22,645	167
Washington, DC	I-95 NB	Dale Blvd/Smoketown Rd/Eb Exit 156 VA-123/Exit 160	4.8	190	172	379	210	19,070	191
Chicago	Stevenson Expy/I-55 SB	IL-43/Harlem Ave/Exit 283 County Line Rd/Exit 276A	7.3	189	175	718	110	31,721	112
Hartford	I-84 EB	S Main St/Exit 41 I-91/Exit 51-52	6.7	189	175	614	139	26,683	141
New York	Grand Central Pkwy WB	Little Neck Pkwy/Exit 24 Homelawn St/Exit 17/Exit 18	4.6	187	177	422	191	18,883	193
Austin	Loop 1/Mopac Expy SB	US-183/Research Blvd Barton Skwy	9.1	186	178	787	100	35,733	101
New York	Cross Island Pkwy SB	14th Ave/Exit 35 NY-25/Exit 27	7.5	186	178	686	117	30,440	122
San Francisco	I-880 NB	98th Ave 23rd Ave	4.2	186	178	339	222	16,073	217

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Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
New Orleans	Pontchartrain Expy WB	Whitney Ave Oretha C Haley Blvd	3.6	185	181	364	214	15,438	223
Boston	I-93 NB	Storrow Dr/Exit 26B Montvale Ave/Exit 36	8.9	184	182	773	104	34,841	104
San Francisco	US-101 SB	CA-84/Woodside Rd University Ave	4.4	184	182	339	222	16,139	216
Washington, DC	MD 295/ Baltimore Washington Pkwy NB	MD-450 Powder Mill Rd	7.7	184	182	678	120	30,485	121
New York	NJ-17	I-80 Garden State Pkwy	4.7	183	185	421	193	17,806	205
Baltimore	Baltimore Beltway Outer Loop/I-695 WB	US-1/Exit 32 MD-139/Charles St/Exit 25	7.5	182	186	661	127	30,543	119
Tampa	I-275 NB	Howard Franklin Brg Lois Ave/Exit 22	3.4	182	186	283	249	12,891	249
New Haven	I-95 SB	CT-100/High St/Exit 52 Ella T Grasso Blvd/Exit 45	4.7	181	188	422	191	18,426	197
New Orleans	I-10 WB	Causeway Blvd/Exit 228 End Blvd/Florida Blvd	5.0	181	188	463	178	20,524	181
Sacramento	Capital City Fwy/I-80 Bus EB	US-50/CA-99 Fulton Ave	7.3	181	188	627	135	28,006	134
Washington, DC	Capital Beltway SB	MD-650/New Hampshire Ave/Exit 28 MD-201/Kenilworth Ave/Exit 23	4.8	179	191	348	219	17,824	204
Charlotte	I-485 EB	NC-49/Tryon St/Exit 1 NC-51/Exit 64	5.3	178	192	451	181	20,543	180
New York	NJ-4	Teaneck Rd Forest Ave	3.3	178	192	304	240	12,811	252
Minneapolis-St. Paul	I-394 EB	Xenia Ave/Park Place Blvd/Exit 5 US-12/Exit 8B	3.3	176	194	269	260	11,679	270
Atlanta	I-85 SB	GA-13/Exit 86 (East) I-75/Exit 85	2.5	175	195	225	279	10,286	280
Bridgeport	Connecticut Turnpike/I-95 NB	Field Point Rd Mill Plain Rd/Exit 21	22.2	174	196	1,879	34	85,821	32
New York	Henry Hudson Pkwy NB	W 72nd St I-95/Riverside Dr/Exit 14-15	6.2	173	197	539	160	22,484	168
Providence	I-95 NB	US-1/Elmwood Ave/Exit 17 US-6/RI-10/Exit 22	4.0	173	197	331	224	14,014	235

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Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
San Francisco	I-680 NB	Stone Valley Rd N Main St	5.3	173	197	404	201	18,436	196
Dallas-Fort Worth	North Fwy/I-35W SB	Golden Triangle Blvd/Exit 64 TX-121/Exit 52	11.8	172	200	990	77	43,602	80
Dallas-Fort Worth	I-35E NB	Harry Hines Blvd/Exit 435 Valley View Ln/Exit 441	5.8	171	201	432	187	19,871	185
New York	Northern State Pkwy WB	Willis Ave/Exit 28 Lakeville Rd/Exit 25	3.4	170	202	260	264	12,551	255
Seattle	WA-520 WB	148th Ave 84th Ave	4.2	170	202	346	220	15,132	224
New Orleans	I-10 EB	Loyola Dr Veterans Memorial Blvd	3.5	169	204	292	247	13,382	245
Pittsburgh	Penn Lincoln Pkwy/I-376 EB	2nd Ave/1st Ave/Exit 1 William Penn Hwy/Exit 10A	8.1	169	204	682	119	30,684	118
New York	Long Island Expy EB	Sagtikos State Pkwy NY-111/Exit 56	3.2	168	206	252	269	11,728	269
Los Angeles	I-5 NB	Brand Blvd CA-14	5.8	166	207	430	188	20,620	179
San Jose	Sinclair Fwy/I-280 NB	CA-87/Guadalupe Pkwy I-880/CA-17	3.7	166	207	238	274	12,152	265
Cincinnati	I-75 SB	OH-126/Exit 14 Ronald Reagan Cross County Hwy/Exit10	3.9	164	209	325	228	13,979	236
Seattle	I-5 NB	WA-527/Exit 189 Marine View Dr/Exit 195	5.6	164	209	440	184	19,521	188
Atlanta	I-285 WB	Ashford Dunwoody Rd/Exit 29 I-75/Exit 20	8.1	161	211	638	132	29,800	126
Los Angeles	CA-57 SB	Brea Canyon Rd Orangewood Ave	11.7	160	212	752	106	39,075	91
Nashville	I-440 EB	TN-1/End Ave/Exit 1 US-31 Alt/US-41 Alt/Nolensville Pike/Exit6	4.8	160	212	414	197	17,674	206
New York	Southern State Pkwy WB	New Hwy/Exit 34 Brookside Ave/Exit 21	10.8	159	214	712	112	37,001	97
Boston	I-495 NB	MA-110/Chelmsford St/Exit 34 Woburn St/Exit 37	3.0	158	215	203	290	10,140	284
Cincinnati	I-75 NB	I-275/Exit 185 KY-1072/Kyles Ln/Exit 189	3.5	158	215	279	252	12,295	261

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Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Dallas-Fort Worth	I-35E NB	Hundley Dr/Exit 457B Post Oak Dr/Exit 461	3.8	154	217	258	265	11,974	267
Seattle	I-405 NB	61st Ave 44th St/Exit 7	7.0	154	217	521	165	22,823	166
Boston	I-95/MA-128 SB	US-3/Middlesex Tpke/Exit 32 MA-9/Worcester St/Exit 20	13.1	153	219	932	85	42,850	84
Riverside	Corona Fwy/I-15 SB	Hidden Valley Pkwy El Cerrito Rd	5.0	151	220	400	203	17,123	210
Seattle	I-90 WB	Bellevue Way/Exit 9 Mercer Way/Exit 6	3.3	150	221	240	271	10,427	278
New York	Belt Pkwy WB	Ocean Pkwy Bay 8th St/Exit 4	3.5	149	222	248	270	11,448	272
Seattle	I-5 NB	45th St/Exit 169 236th St/Exit 177	8.8	149	222	618	138	27,848	136
Hartford	I-84 WB	US-5/Main St Flatbush Ave/Exit 45	5.5	148	224	396	205	16,818	211
Portland	I-84 EB	I-5 I-205/Exit 8	6.0	148	224	450	182	18,944	192
San Francisco	I-680 NB	Scott Creek Rd Andrade Rd/Mission Rd	9.5	148	224	657	129	28,534	132
Chicago	Tri State Tollway/I-294 SB	IL-58/Golf Rd Ohare Oasis	7.6	147	227	609	140	25,621	149
Los Angeles	I-405 NB	Ventura Blvd Rinaldi St	9.5	147	227	638	132	29,550	128
Los Angeles	US-101 SB	Liberty Canyon Rd Parkway Calabasas	4.4	147	227	298	243	13,833	240
Santa Barbara	US-101 SB	Mission St San Ysidro Rd	5.9	147	227	414	197	18,211	199
Bridgeport	Connecticut Turnpike/I-95 SB	Stratford Ave/Exit 28 Round Hill Rd/Exit 22	4.9	145	231	350	218	15,805	219
Riverside	Ontario Fwy/I-15 SB	4th St CA-60	4.4	143	232	269	260	13,116	247
Seattle	I-405 NB	8th St/Se 12th St/Exit 12 Juanita Woodinville Way/Exit 22	10.0	142	233	662	126	30,159	123
Seattle	I-5 NB	Center Dr/Exit 118 Berkeley St/Exit 122	4.6	142	233	310	234	13,910	237

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Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
New York	I-287 NB	Randolphville Rd/Exit 7 Easton Ave/Exit 10	3.4	138	235	215	285	10,335	279
New York	I-80 WB	US-202/Exit 42 Cr-513/Exit 37	4.7	138	235	298	243	13,900	238
Washington, DC	Shirley Hwy/I-395 NB	I-95/I-495 Southwest Fwy	21.6	137	237	1,374	53	61,381	53
Portland	I-205 NB	Division St/Exit 19 US-30 Bus/Columbia Blvd/Exit 23	4.1	136	238	271	257	11,896	268
Sacramento	I-80 EB	El Camino Ave Northgate Blvd	3.6	136	238	237	275	10,151	282
San Diego	San Diego Fwy/I-5 SB	Harbor Dr Birmingham Dr	14.8	136	238	724	108	40,350	88
Santa Rosa CA	US-101 NB	Railroad Ave Commerce Blvd/Wilfred Ave	4.2	136	238	274	255	12,249	263
Houston	South Fwy/TX-288 SB	Southmore Blvd Airport Blvd	5.7	135	242	361	216	15,896	218
Riverside	Riverside Fwy/CA-91 EB	Van Buren Blvd Central Ave (East)	4.2	135	242	271	257	12,815	251
Atlanta	GA-400/US-19 SB	GA-120/Old Milton Pkwy/Exit 10 GA-140/Holcomb Bridge Rd/Exit 7	4.7	134	244	313	232	14,365	230
Riverside	Ontario Fwy/I-15 NB	Limonite Ave Jurupa St	5.1	134	244	306	237	14,754	227
Miami	Palmetto Expy/SR 826 SB	FL-823/57th Ave/Red Rd W 68th St/Gratigny Dr	4.6	133	246	254	267	12,396	258
Austin	Loop 1/Mopac Expy NB	US-290/TX-71 Fm-2222/Northland Dr	9.8	132	247	588	146	27,383	138
Charleston	I-26 WB	Dorchester Rd W Aviation Ave	4.3	132	247	270	259	12,485	256
Minneapolis-St. Paul	I-35E SB	US-10 Pennsylvania Ave/Exit 108	4.8	132	247	265	263	12,585	254
Baton Rouge	I-10 EB	LA-415/Exit 151 Dalrymple Dr/Exit 156	4.7	131	250	373	212	16,615	214
Bridgeport	Connecticut Turnpike/I-95 SB	Brookside Dr US-1/Exit 5	4.3	130	251	253	268	12,356	259
Philadelphia	Delaware Expy/I-95 NB	I-495/DE-92/Naamans Rd/Exit 11 US-322/Exit2/Exit3	3.2	130	251	188	295	8,995	295

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Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Baltimore	John Hanson Hwy/US-50/US-301 EB	I-97/Exit 21 MD-70/Rowe Blvd/Exit 24	3.4	129	253	215	285	9,927	285
Washington, DC	Custis Mem Pkwy/I-66 EB	VA-234/Pr Wm Pkwy/Exit 44 N. Patrick Henry Dr	24.4	129	253	1,413	49	64,800	48
Oxnard CA	Ventura Fwy/US-101 NB	Camarillo Springs Rd Las Posas Rd	5.2	128	255	320	229	14,503	228
Dallas-Fort Worth	Loop 12 SB	I-35E Union Bower Rd	4.1	127	256	209	287	10,146	283
Minneapolis-St. Paul	I-694 EB	Cr-44/Silver Lake Rd/Exit 39 Lexington Ave/Exit 43	3.6	127	256	197	293	9,097	291
Cincinnati	I-71 NB	Dana Ave/Exit 5 Red Bank Rd/Exit 9	3.8	126	258	240	271	10,573	276
St. Louis	I-270 SB	Ladue Rd/Exit 13 Dougherty Ferry Rd/Exit 8	5.1	124	259	294	245	13,642	243
San Jose	W Valley Fwy/CA-85 SB	Central Expy Fremont Ave	3.0	123	260	152	307	7,289	305
Dallas-Fort Worth	US-75 NB	Exchange Pkwy/Exit 36 Eldorado Pkwy/Exit 39	4.4	121	261	226	278	11,042	273
San Antonio	I-410 EB	Starcrest Dr/Exit 25 Interchange Pkwy/Exit 26	1.1	121	261	63	327	2,682	327
Minneapolis-St. Paul	US-169 NB	Cr-3/Excelsior Blvd MN-55	4.0	118	263	222	281	9,466	290
Sacramento	I-80 WB	Horseshoe Bar Rd Douglas Blvd	6.8	117	264	383	209	17,174	209
Baton Rouge	I-10 WB	Siegen Ln/Exit 163 Perkins Rd/Exit 157	6.4	116	265	420	194	19,783	187
Raleigh	I-40 EB	Airport Blvd/Exit 284 NC-54/Exit 290	6.9	116	265	371	213	17,992	200
Minneapolis-St. Paul	I-694 WB	I-35E/I-694/Exit 46 MN-51/Exit 42	3.9	115	267	198	292	8,870	296
Chicago	Edens Expy/I-94 EB	Tower Rd/Exit 31 I-90/Kennedy Expy	11.0	114	268	668	125	29,155	131
Los Angeles	CA-2 SB	CA-134/Holly Dr Fletcher Dr	3.1	114	268	161	304	7,349	304
Seattle	WA-167 SB	277th St 8th St	7.3	114	268	408	199	17,830	203

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				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Atlanta	GA-400 SB	Toll Plaza I-85/Exit 87	4.1	112	271	220	282	10,737	274
Bridgeport	Connecticut Turnpike/I-95 SB	Bronson Rd/Exit 20 US-1/Post Rd/Exit 13	10.8	109	272	534	161	26,140	144
Milwaukee	I-94 EB	Moorland Rd/Exit 301B WI-181/84th St/Exit 306	4.4	108	273	220	282	9,884	286
New Haven	I-84 WB	I-691 (Cheshire) (West) Austin Rd/Exit 25A	3.4	108	273	170	301	7,772	300
Boston	I-95/MA-128 NB	Neponset St/Exit 11 MA-1A/Exit 15	6.0	107	275	310	234	13,860	239
Portland	I-205 SB	Airport Way/Exit 24 Washington St/Stark St/Exit 20	4.0	107	275	208	288	9,042	293
Minneapolis-St. Paul	Crosstown Hwy/MN-62 EB	US-169/US-212 Cr-32/Penn Ave	4.6	105	277	225	279	9,541	289
San Jose	Sinclair Fwy/I-680 SB	CA-237/Calaveras Blvd Berryessa Rd	3.5	105	277	148	309	7,155	307
Seattle	I-5 SB	84th St/Hosmer St/Exit 128 41st Division Dr/Exit 120	7.9	105	277	379	210	17,639	207
Los Angeles	I-5 SB	CA-73 CA-1/Camino De Vis	5.8	104	280	275	253	12,936	248
Boston	Broadway	MA-99 MA-129/Salem St	4.5	103	281	231	276	9,571	288
Kansas City	I-70 EB	18th St/Exit 4 I-435/Exit 8	4.2	103	281	207	289	9,024	294
Sacramento	S Sacramento Fwy/CA-99 SB	12th Ave Mack Rd/Bruceville Rd	5.4	103	281	272	256	11,614	271
New York	Pulaski Skwy NB	I-95/Exp US-1 Tonnele Ave	3.3	101	284	170	301	7,148	308
Milwaukee	North-South Fwy/I-43 SB/I-94 WB	WI-59/6th St/Exit 311 Howard Ave/Exit 314	3.5	100	285	172	300	7,415	303
San Antonio	I-35 NB	Judson Rd/Exit 170 Evans Rd/Exit 174	3.8	100	285	147	310	7,606	301
Seattle	I-405 SB	WA-527/26th Ave/Exit 26 WA-908/85th St/Exit 18	8.7	100	285	404	201	18,318	198
Atlanta	I-85 SB	GA-120/Duluth Hwy/Exit 107 Steve Reynolds Blvd/Exit 103	3.7	95	288	175	297	7,913	298

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				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Louisville	I-64 WB	Cannons Ln/Exit 10 I-71/Exit 6	4.4	92	289	203	290	9,093	292
Miami	FL Tpke Ext/FL-821 NB	FL-874/Exit 17 US-41/8th St/Sw 25th Ter/Exit 25	11.9	92	289	430	188	21,979	172
Atlanta	I-75 SB	Mount Zion Pkwy/Exit 231 Hudson Bridge Rd/Exit 224	6.7	90	291	275	253	13,798	241
Boston	Pilgrims Hwy/MA-3 NB	MA-228/Hingham St/Exit 14 Union St/Exit 17	6.6	87	292	256	266	12,355	260
Chicago	I-55 NB	IL-53/Exit 267 IL-83/Kingery Hwy/Exit 274	8.9	87	292	389	207	17,863	202
Dallas-Fort Worth	I-35E SB	Ave D/Exit 466B Mayhill Rd/Exit 462	4.4	87	292	174	299	7,861	299
Minneapolis-St. Paul	I-35W NB	Cleveland Ave/Exit 24 I-694/Exit 27	3.9	87	292	136	312	6,657	311
Harrisburg	I-83 NB	3rd St/Exit 42 Union Deposit Rd/Exit 48	6.7	86	296	305	239	13,703	242
Riverside	Ontario Fwy/I-15 NB	I-210/Exit 115 Glen Helen Pkwy	6.2	86	296	281	250	12,440	257
Dayton	I-75 NB	Dixie Hwy/Central Ave/Exit 47 Keowee St/Exit 55	7.2	83	298	329	225	14,291	232
Houston	South Fwy NB	Mchard Rd Orem Dr	3.3	83	298	121	315	5,576	315
New York	I-287 WB	I-87/I-287 (Irvington) NY-303/Exit 12	7.9	82	300	318	230	14,138	234
Austin	I-35 NB	E Fm-1626/Crown Colony Dr William Cannon Dr/Exit 228	3.7	81	301	142	311	6,398	313
Boston	Newburyport Tpke/US-1 SB	MA-129/Salem St Essex St	4.1	81	301	168	303	6,992	309
Houston	Northwest Fwy EB	Telge Rd West Rd	4.5	79	303	154	306	7,289	305
Charlotte	I-85 NB	University City Blvd Speedway Blvd/Exit 49	6.2	78	304	219	284	10,708	275
Portland	I-5 SB	OR-99W/Barbur Blvd/Exit 294 Elligsen Rd/Exit 286	7.7	77	305	281	250	12,589	253
Portland	Beaverton Tigard Fwy NB	I-5/Exit 7 Hall Blvd/Exit 4A	4.2	77	305	157	305	6,877	310

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length.

Wasted Fuel—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.

Congestion Cost—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel).

Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Washington, DC	I-270 NB	Middlebrook Rd/Exit 13 MD-109/Exit 22	8.5	73	307	269	260	12,851	250
Washington, DC	John Hanson Hwy/US-50 WB	Garden City Dr/Exit 6 Columbia Park Rd	3.0	72	308	98	323	4,479	324
Riverside	Escondido Fwy/I-15 NB	CA-79/Old Town Front St CA-79/Winchester Rd	3.2	71	309	114	319	5,144	320
Vallejo-Fairfield CA	I-80 EB	Suisun Valley Rd N Texas St	7.4	70	310	229	277	10,524	277
Birmingham	I-65 SB	US-31/Montgomery Hwy/Exit 252 Jefferson/Shelby County Line	3.5	66	311	108	320	5,365	318
New York	Hutchinson River Pkwy NB	Cross County Pkwy/Exit 15 Mamaroneck Rd/Exit 22	4.5	62	312	123	314	6,013	314
Bridgeport	Merritt Pkwy/CT-15 NB	CT-58/Black Rock Tpke/Exit 44 CT-25/Exit 49	5.6	61	313	152	307	7,533	302
Chicago	I-94 EB	75th St 87th St/Exit 61B	3.4	61	313	107	321	4,716	322
San Jose	CA-17 SB	Camden Ave/San Tomas Expy CA-9	3.2	61	313	82	326	4,011	326
Bridgeport	I-84 EB	Mill Plain Rd/Old Ridgebury Rd/Exit 2 CT-37/Exit 6	4.3	60	316	120	316	5,423	317
San Jose	W Valley Fwy/CA-85 NB	I-280 CA-82/El Camino Real	3.8	60	316	88	325	4,526	323
Chicago	I-94 WB	W Lawrence Ave Touhy Ave/Exit 39	3.9	59	318	117	317	5,235	319
Bridgeport	Merritt Pkwy/CT-15 NB	Den Rd/Exit 33 CT-57/Exit 42	12.8	53	319	304	240	15,079	225
Charleston	I-26 EB	US-78/University Blvd Dorchester Rd	10.5	52	320	240	271	12,230	264
Chicago	I-94 WB	115Th St/Exit 66B US-20/US-12/95th St/Exit 62	3.8	46	321	94	324	4,022	325
Sacramento	I-80 WB	I-5/CA-99 Capitol Ave/Enterprise Blvd	5.0	46	321	103	322	4,970	321
Bridgeport	Merritt Pkwy/CT-15 SB	Main St/Exit 48 CT-33/Exit 41	9.9	45	323	191	294	9,809	287
Statesville- Mooresville NC	I-77 SB	NC-150/Exit 36 Iredell/Mecklenburg Co Line	8.8	44	324	176	296	8,528	297

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length.

Wasted Fuel—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.

Congestion Cost—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel).

Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Table A-2. Congestion Leaders (All 328 Corridors), continued

Urban Area	Corridor	Limits (From/To)	Corridor Length (miles)	2010 All-day Everyday Congestion					
				Delay Per Mile		Wasted Fuel		Congestion Cost	
				Person-hrs (x 1000)	Rank	Gallons (x 1000)	Rank	(x \$1000)	Rank
Boston	I-93 NB	MA-213/Exit 48 Pelham Rd/Exit 2	7.3	41	325	127	313	6,450	312
Washington, DC	I-70 WB	MD-144/Exit 59 US-15/US-340/Exit 52	6.8	32	326	116	318	5,430	316
New York	Garden State Pkwy NB	Cr-539/Exit 58 Forked River Rest Area	17.5	26	327	175	297	10,178	281
Allentown PA-NJ	US-22 WB	15th St PA-145/Macarthur Rd	3.4	13	328	15	328	1,018	328

Delay Per Mile—Extra travel time during the year due to congestion, divided by the corridor length.

Wasted Fuel—Increased fuel consumption due to travel in congested conditions rather than free-flow conditions.

Congestion Cost—Value of travel time delay (estimated at \$16 per hour for person travel and \$88 per hour for truck time) and excess fuel consumption (estimated using state average cost per gallon of gasoline and diesel).

Note: Please do not place too much emphasis on small differences in the rankings. There may be little difference between (for example) 5th and 10th. The actual measure values should also be examined.

Appendix B

Detailed Methodology

Appendix B provides the details of the methodology for the *2011 Congested Corridors Report (CCR)*.

A short roadway segment (less than 1 mile) with congestion for more than 10 hours in a week was the beginning of a congested corridor. (“Congestion” was having a speed less than half of the free-flow speed). Each adjacent, upstream segment of roadway that was congested for four hours per week was included in the corridor. Four hours was chosen as the threshold after reviewing the data which showed that many upstream segments had some congestion nearly every weekday. Since it typically did not constitute every day of the week, choosing four hours allows one day per week to have a different queuing pattern. Researchers combined traffic volume information from the states with the speed data to compute the performance measures.

After the corridor limits were established, the following steps were used to calculate the congestion performance measures for each corridor.

1. Obtain HPMS traffic volume data by road section
2. Match the HPMS road network sections with the traffic speed dataset road sections for each corridor
3. Estimate traffic volumes for each hour time interval from the daily volume data
4. Calculate average travel speed and total delay for each hour interval
5. Establish free-flow (i.e., low volume) travel speed
6. Calculate congestion performance measures

Step 1. Identify Traffic Volume Data

The HPMS dataset from FHWA provided the source for traffic volume data, although the geographic designations in the HPMS dataset are not identical to the private sector speed data. The daily traffic volume data must be divided into the same time interval as the traffic speed data (hour intervals). While there are some detailed traffic counts on major roads, the most widespread and consistent traffic counts available are average daily traffic (ADT) counts. The hourly traffic volumes for each section, therefore, were estimated from these ADT counts using typical time-of-day traffic volume profiles developed from continuous count locations or other data sources. Step 3 shows the average hourly volume profiles used in the measure calculations.

Volume estimates for each day of the week (to match the speed database) were created from the average volume data using the factors in Exhibit B-1. Automated traffic recorders from around the country were reviewed and the factors in Exhibit B-1 are a “best-fit” average for both freeways and major streets. Creating an hourly volume to be used with the traffic speed values, then, is a process of multiplying the annual average by the daily factor and by the hourly factor.

Exhibit B-1. Volume Adjustment Factors

Day of Week	Adjustment Factor (to convert average annual volume into day of week volume)
Monday to Thursday	+5%
Friday	+10%
Saturday	-10%
Sunday	-20%

Step 2. Combine the Road Networks for Traffic Volume and Speed Data

The second step was to combine the road networks for the traffic volume and speed data sources, such that an estimate of traffic speed and traffic volume was available for each corridor. The combination (also known as conflation) of the traffic volume and traffic speed networks was accomplished using Geographic Information Systems (GIS) tools. The INRIX speed network was chosen as the base network; an ADT count from the HPMS network was applied to each segment of roadway in the speed network. The traffic count and speed data for each roadway segment were then combined into areawide performance measures.

Step 3. Estimate Traffic Volumes for Shorter Time Intervals

The third step was to estimate traffic volumes for one-hour time intervals for each day of the week.

Typical time-of-day traffic distribution profiles are needed to estimate hourly traffic flows from average daily traffic volumes. Previous analytical efforts^{1,2} have developed typical traffic profiles at the hourly level (the roadway traffic and inventory databases are used for a variety of traffic and economic studies). These traffic distribution profiles were developed for the following different scenarios (resulting in 16 unique profiles):

- Functional class: freeway and non-freeway
- Day type: weekday and weekend
- Traffic congestion level: percentage reduction in speed from free-flow (varies for freeways and streets)
- Directionality: peak traffic in the morning (AM), peak traffic in the evening (PM), approximately equal traffic in each peak

The 16 traffic distribution profiles shown in Exhibits B-2 through B-6 are considered to be very comprehensive, as they were developed based upon 713 continuous traffic monitoring locations in urban areas of 37 states.

¹ *Roadway Usage Patterns: Urban Case Studies*. Prepared for Volpe National Transportation Systems Center and Federal Highway Administration, July 22, 1994.

² *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.

TTI's 2011 Congested Corridors Report Powered by INRIX Traffic Data—Methodology B-3

Exhibit B-2. Weekday Traffic Distribution Profile for No to Low Congestion

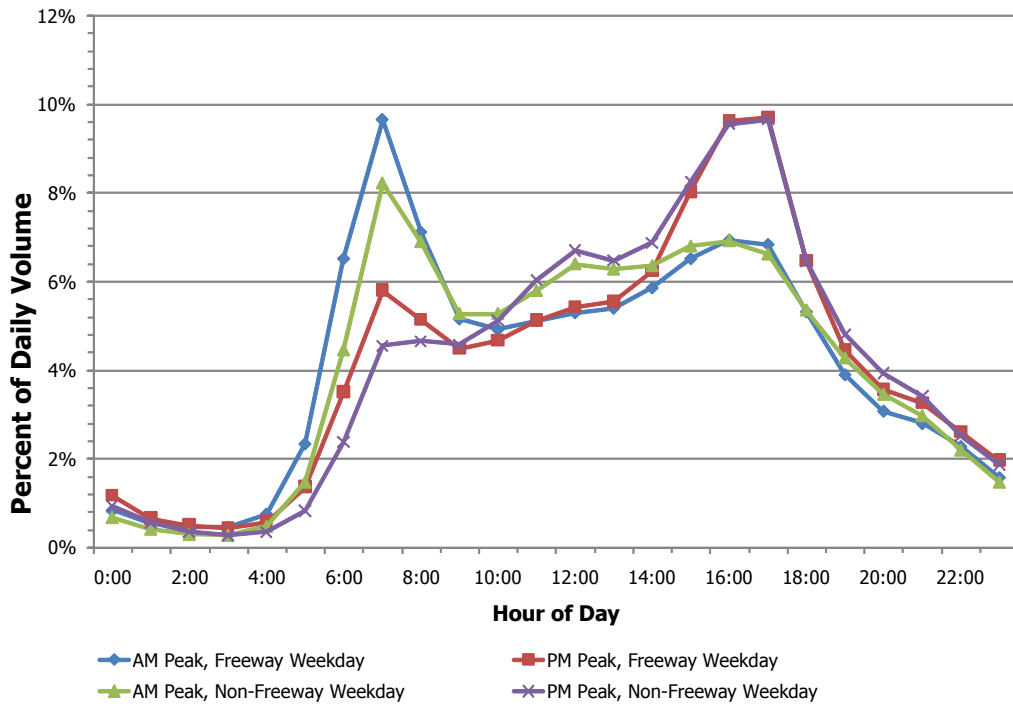


Exhibit B-3. Weekday Traffic Distribution Profile for Moderate Congestion

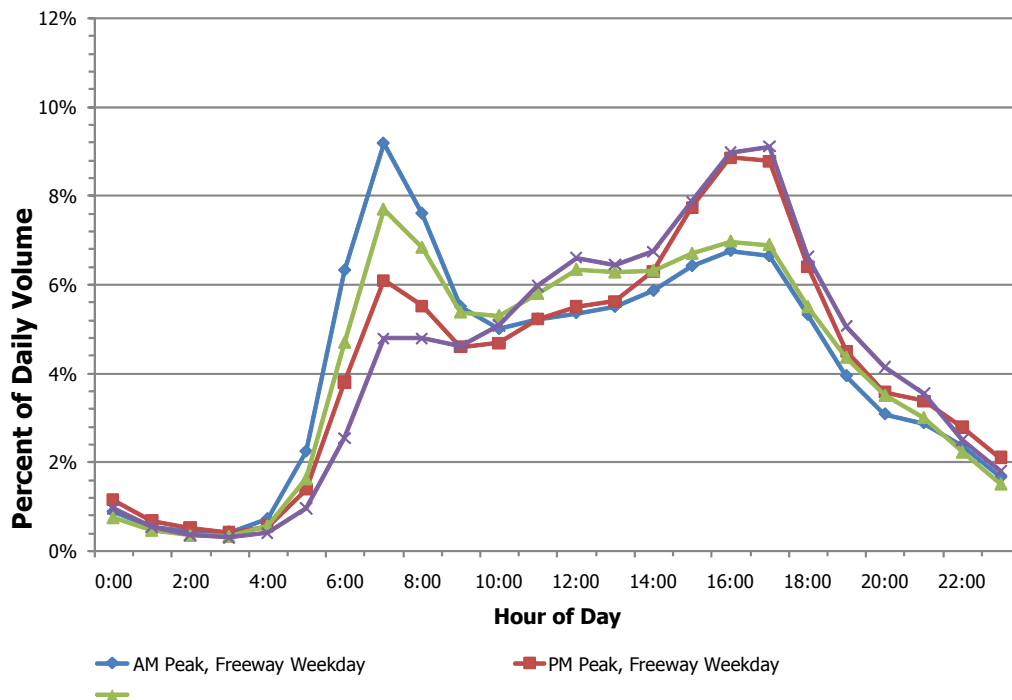


Exhibit B-4. Weekday Traffic Distribution Profile for Severe Congestion

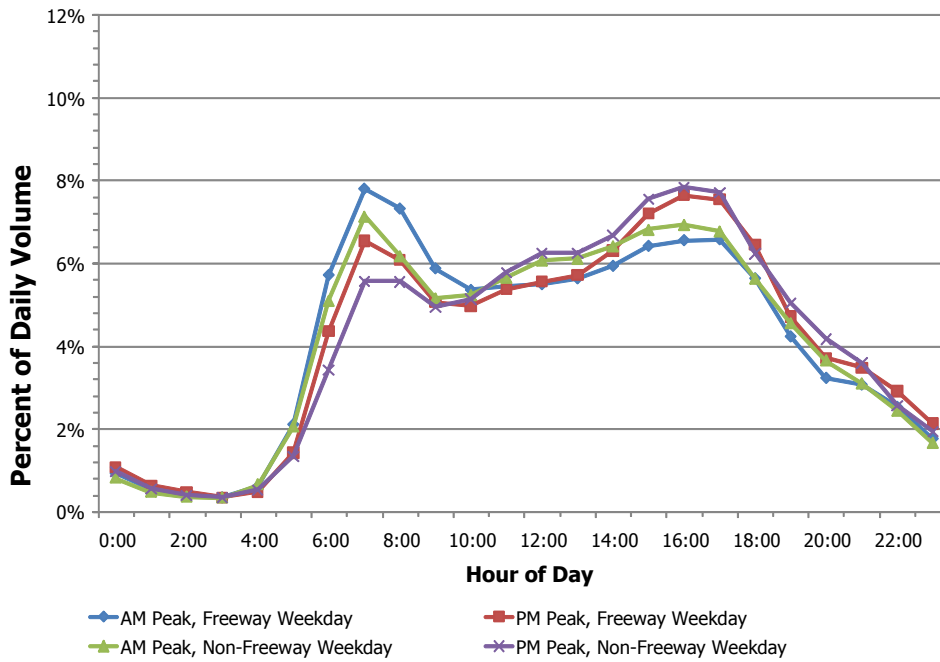


Exhibit B-5. Weekend Traffic Distribution Profile

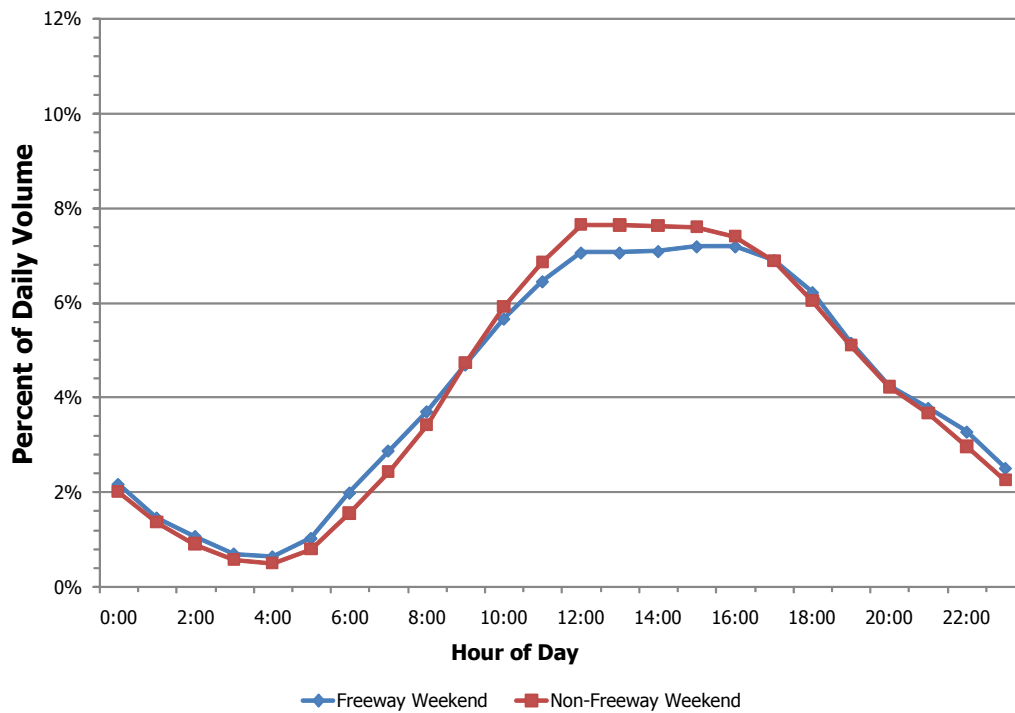
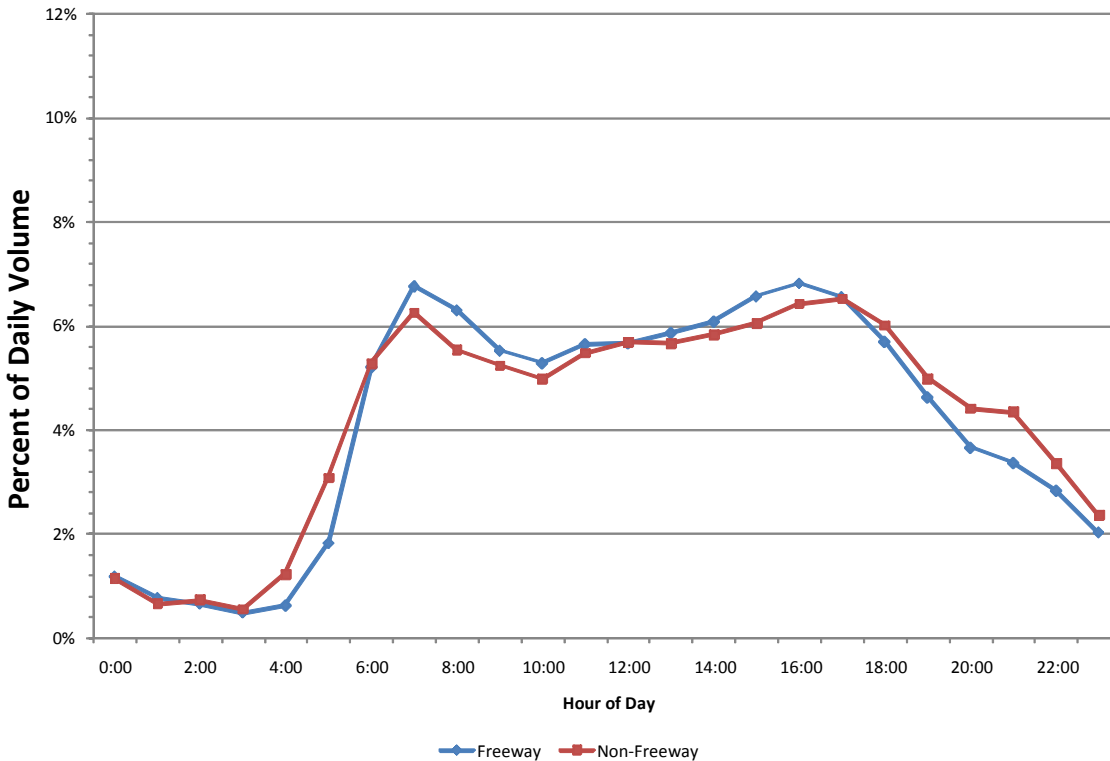


Exhibit A-6. Weekday Traffic Distribution Profile for Severe Congestion and Similar Speeds in Each Peak Period



The next step in the traffic flow assignment process is to determine which of the 16 traffic distribution profiles should be assigned to each Traffic Message Channel (TMC) path (the “geography” used by the private sector data providers), such that the hourly traffic flows can be calculated from traffic count data supplied by HPMS. The assignment should be as follows:
Functional class: assign based on HPMS functional road class

- Freeway – access-controlled highways
 - Non-freeway – all other major roads and streets (not used in the 2011 CCR)
- Day type: assign volume profile based on each day
 - Weekday (Monday through Friday)
 - Weekend (Saturday and Sunday)
- Traffic congestion level: assign based on the peak period speed reduction percentage calculated from the private sector speed data. The peak period speed reduction is calculated as follows:
 - 1) Calculate a simple average peak period speed (add up all the morning and evening peak period speeds and divide the total by the 8 periods in the eight peak hours) for each TMC path using speed data from 6 a.m. to 10 a.m. (morning peak period) and 3 p.m. to 7 p.m. (evening peak period).
 - 2) Calculate a free-flow speed during the light traffic hours (e.g., 10 p.m. to 5 a.m.) to be used as the baseline for congestion calculations. Since INRIX provides a free-flow speed in its archived average speed set, this speed was used in the calculations.

3) Calculate the peak period speed reduction by dividing the average combined peak period speed by the free-flow speed.

$$\text{Speed Reduction Factor} = \frac{\text{Average Peak Period Speed}}{\text{Free-Flow Speed (10 p. m. to 5 a. m.)}} \quad (\text{Eq. B-1})$$

For Freeways:

- speed reduction factor ranging from 90% to 100% (no to low congestion)
- speed reduction factor ranging from 75% to 90% (moderate congestion)
- speed reduction factor less than 75% (severe congestion)

For Non-Freeways:

- speed reduction factor ranging from 80% to 100% (no to low congestion)
- speed reduction factor ranging from 65% to 80% (moderate congestion)
- speed reduction factor less than 65% (severe congestion)
- Directionality: Assign this factor based on peak period speed differentials in the private sector speed dataset. The peak period speed differential is calculated as follows:
 - 1) Calculate the average morning peak period speed (6 a.m. to 10 a.m.) and the average evening peak period speed (3 p.m. to 7 p.m.)
 - 2) Assign the peak period volume curve based on the speed differential. The lowest speed determines the peak direction. Any section where the difference in the morning and evening peak period speeds is 6 mph or less will be assigned the even volume distribution.

Step 4. Calculate Travel and Time

The hourly speed and volume data was combined to calculate the total travel time for each one hour time period. The one hour volume for each segment was multiplied by the corresponding travel time to get a quantity of vehicle-hours; these were summed across the entire corridor.

Step 5. Establish Free-Flow Travel Speed and Time

The calculation of congestion measures required establishing a congestion threshold, such that delay was accumulated for any time period once the speeds are lower than the congestion threshold. There has been considerable debate about the appropriate congestion thresholds, but for the purpose of the CCR methodology, the data was used to identify the speed at low volume conditions (for example, 10 p.m. to 5 a.m.). This speed is relatively high, but varies according to the roadway design characteristics. An upper limit of 65 mph was placed on the freeway free-flow speed to maintain a reasonable estimate of delay.

Step 6. Calculate Congestion Performance Measures

The mobility performance measures were calculated using the equations shown in the next section of this methodology once the one-hour dataset of actual speeds, free-flow travel speeds and traffic volumes was prepared.

Calculation of the Congestion Measures

This section summarizes the methodology utilized to calculate many of the statistics shown in the *Congested Corridors Report* and is divided into three main sections containing information on the constant values, variables and calculation steps of the main performance measures of the mobility database.

1. **National Constants**
2. **Urban Area Constants and Inventory Values**
3. **Variable and Performance Measure Calculation Descriptions**
 - 1) Travel Speed
 - 2) Travel Delay
 - 3) Annual Person Delay
 - 4) Annual Peak Period Travel Time
 - 5) Travel Time Index
 - 6) Wasted Fuel
 - 7) Total Congestion Cost
 - 8) Buffer Index
 - 9) Planning Time Index

Generally, the sections are listed in the order that they will be needed to complete all calculations.

National Constants

The congestion calculations utilize the values in Exhibit B-7 as national constants—values used along all corridors to estimate the effect of congestion.

Exhibit B-7. National Congestion Constants for 2011 Congested Corridors Report

Constant	Value
Vehicle Occupancy	1.25 persons per vehicle
Average Cost of Time (\$2010)*	\$16.30 per person hour ¹
Commercial Vehicle Operating Cost (\$2010)	\$88.12 per vehicle hour ^{1, 2}
Working Days (5x50)	250 days
Total Travel Days (7x52)	364 days

¹ Adjusted annually using the Consumer Price Index.

² Adjusted periodically using industry cost and logistics data.

*Source: (Reference 9,10)

Vehicle Occupancy

The average number of persons in each vehicle during peak period travel is 1.25.

Working Days and Weeks

With the addition of the INRIX speed data in the 2011 CCR, the calculations are based on a full year of data that includes all days of the week rather than just the working days. The delay from each day of the week is multiplied by 50 work weeks to annualize the delay. The weekend days are multiplied by 57 to help account for the lighter traffic days on holidays. Total delay for the year is based on 364 total travel days in the year.

Average Cost of Time

The 2010 value of person time used in the report is \$16.30 per hour based on the value of time, rather than the average or prevailing wage rate (9).

Commercial Vehicle Operating Cost

Truck travel time and operating costs (excluding diesel costs) are valued at \$88.12 per hour (10).

Corridor Variables

In addition to the national constants, four urbanized area or state specific values were identified and used in the congestion cost estimate calculations.

Daily Vehicle-Miles of Travel

The daily vehicle-miles of travel (DVMT) is the average daily traffic (ADT) of a section of roadway multiplied by the length (in miles) of that section of roadway. This allows the daily volume of all urban facilities to be presented in terms that can be utilized in cost calculations. DVMT was estimated for the freeways corridors located in each urbanized study area. These estimates originate from the HPMS database and other local transportation data sources.

Fuel Costs

Statewide average fuel cost estimates were obtained from daily fuel price data published by the American Automobile Association (AAA) (11). Values for gasoline and diesel are reported separately.

Truck Percentage

The percentage of passenger cars and trucks for each corridor was estimated from the Highway Performance Monitoring System dataset (7). The values are used to estimate congestion costs and are not used to adjust the roadway capacity.

Variable and Performance Measure Calculation Descriptions

The major calculation products are described in this section. In some cases the process requires the use of variables described elsewhere in this methodology.

Travel Speed

The peak period average travel speeds were obtained from INRIX. Researchers also obtained free-flow travel speeds from INRIX to calculate the delay-based measures in the report.

Travel Delay

Most of the basic performance measures presented in the *Congested Corridors Report* are developed in the process of calculating travel delay—the amount of extra time spent traveling due to congestion. The travel delay calculations have been greatly simplified with the addition of the INRIX speed data. This speed data reflects the effects of both recurring delay (or usual) and incident delay (crashes, vehicle breakdowns, etc.). The delay calculations are performed at the individual roadway section level and for each hour of the week. Depending on the application, the delay can be aggregated into summaries such as weekday peak period, weekend, weekday off-peak period, etc.

$$\text{Daily Vehicle-Hours of Delay} = \frac{\text{Daily Vehicle-Miles of Travel}}{\text{Speed}} - \frac{\text{Daily Vehicle-Miles of Travel}}{\text{Free-Flow Speed}} \quad (\text{Eq. B-2})$$

Annual Person Delay

This calculation is performed to expand the daily vehicle-hours of delay estimates for the freeways to a yearly estimate in each study area. To calculate the annual person-hours of delay, multiply each day-of-the-week delay estimate by the average vehicle occupancy (1.25 persons per vehicle) and by 52 working weeks per year (Equation B-3).

$$\begin{array}{l} \text{Annual} \\ \text{Persons-Hours} \\ \text{of Delay} \end{array} = \begin{array}{l} \text{Daily Vehicle-Hours} \\ \text{of Delay on} \\ \text{Freeways} \end{array} \times \begin{array}{l} \text{Annual Conversion} \\ \text{Factor} \end{array} \times \begin{array}{l} 1.25 \text{ Persons} \\ \text{per Vehicle} \end{array} \quad (\text{Eq. B-3})$$

The Annual Person-Hours of Delay (Equation B-3) was divided by the congested corridor length to obtain the delay per mile values used for the rankings in the *2011 Congested Corridors Report*.

Annual Peak Period Major Road Travel Time

Total travel time can be used as both a performance measure and as a component in other calculations. The *2011 Congested Corridor Report* used travel time as a component; future reports will incorporate other information and expand on the use of total travel time as a performance measure.

Total travel time is the sum of travel delay and free-flow travel time. Both of the quantities are only calculated for the freeways. Free-flow travel time is the amount of time needed to travel the roadway section length at the free-flow speeds (provided by INRIX for each roadway section) (Equation B-4).

$$\begin{array}{l} \text{Annual Free-Flow} \\ \text{Travel Time} \\ \text{(Vehicle-Hours)} \end{array} = \frac{1}{\begin{array}{l} \text{Free-Flow} \\ \text{Travel Speed} \end{array}} \times \begin{array}{l} \text{Daily} \\ \text{Vehicle-Miles} \\ \text{of Travel} \end{array} \times \begin{array}{l} \text{Annual} \\ \text{Conversion} \\ \text{Factor} \end{array} \quad (\text{Eq. B-4})$$

$$\begin{array}{l} \text{Annual} \\ \text{Travel Time} \end{array} = \begin{array}{l} \text{Freeway} \\ \text{Delay} \\ \text{Eq. B-3} \end{array} + \begin{array}{l} \text{Freeway} \\ \text{Free-Flow} \\ \text{Travel Time} \\ \text{Eq. B-4} \end{array} \quad (\text{Eq. B-5})$$

Travel Time Index

The Travel Time Index (TTI) compares peak period travel time to free-flow travel time. The Travel Time Index includes both recurring and incident conditions and is, therefore, an estimate of the conditions faced by urban travelers. Equation B-6 illustrates the ratio used to calculate the TTI. The ratio has units of time divided by time and the Index, therefore, has no units. This “unitless” feature allows the Index to be used to compare trips of different lengths to estimate the travel time in excess of that experienced in free-flow conditions.

The free-flow travel time for each functional class is subtracted from the average travel time to estimate delay. The Travel Time Index is calculated by comparing total travel time to the free-flow travel time (Equations B-6 and B-7). The corridor Travel Time Index is calculated by weighting the individual section indices by the vehicle-miles of travel in each section (See Equation B-20).

$$\text{Travel Time Index} = \frac{\text{Peak Travel Time}}{\text{Free-Flow Travel Time}} \quad (\text{Eq. B-6})$$

$$\text{Travel Time Index} = \frac{\text{Delay Time} + \text{Free-Flow Travel Time}}{\text{Free-Flow Travel Time}} \quad (\text{Eq. B-7})$$

Wasted Fuel

The average fuel economy calculation is used to estimate the difference in fuel consumption of the vehicles operating in congested and uncongested conditions. Equations B-8 and B-9 are the regression equations resulting from fuel efficiency data from EPA/FHWA's MOVES model (12).

$$\text{Passenger Car Fuel Economy} = -0.0066 \times (\text{speed})^2 + 0.823 \times (\text{speed}) + 6.1577 \quad (\text{Eq. B-8})$$

$$\text{Truck Fuel Economy} = 1.4898 \times \ln \text{ speed} - 0.2554 \quad (\text{Eq. B-9})$$

The CCR calculates the wasted fuel due to vehicles moving at speeds slower than free-flow throughout the day. Equation B-10 calculates the fuel wasted in delay conditions from Equation B-3, the average hourly speed, and the average fuel economy associated with the hourly speed (Equation B-8 and B-9).

$$\text{Annual Fuel Wasted} = \frac{\text{Travel Time}}{\text{Eq. B-4}} \times \frac{\text{Average Hourly Speed}}{\text{Eq. B-2}} \div \frac{\text{Average Fuel Economy}}{\text{Eq. B-8,9}} \times \frac{\text{Annual Conversion Factor}}{\text{Eq. B-10}} \quad (\text{Eq. B-10})$$

Equation B-11 incorporates the same factors to calculate fuel that would be consumed in free-flow conditions. The fuel that is deemed “wasted due to congestion” is the difference between the amount consumed at peak speeds and free-flow speeds (Equation B-10).

$$\frac{\text{Annual Fuel Consumed in Free-Flow Conditions}}{\text{Eq. B-11}} = \frac{\text{Travel Time}}{\text{Eq. B-4}} \times \frac{\text{Free-Flow Speed from INRIX Data}}{\text{Eq. B-2}} \div \frac{\text{Average Fuel Economy for Free-Flow Speeds}}{\text{Eq. B-8,9}} \times \frac{\text{Annual Conversion Factor}}{\text{Eq. B-11}} \quad (\text{Eq. B-11})$$

$$\text{Annual Fuel Wasted in Congestion} = \frac{\text{Annual Fuel Consumed in Congestion}}{\text{Eq. B-12}} - \frac{\text{Annual Fuel That Would be Consumed in Free-flow Conditions}}{\text{Eq. B-12}} \quad (\text{Eq. B-12})$$

Total Congestion Cost

Two cost components are associated with congestion: delay cost and fuel cost. These values are directly related to the travel speed calculations. The following sections and Equations B-14 through B-16 show how to calculate the cost of delay and fuel effects of congestion.

Passenger Vehicle Delay Cost. The delay cost is an estimate of the value of lost time in passenger vehicles in congestion. Equation B-13 shows how to calculate the passenger vehicle delay costs that result from lost time.

$$\text{Annual Psgr-Veh Delay Cost} = \frac{\text{Daily Psgr Vehicle Hours of Delay (Eq. B-3)}}{\text{Value of Person Time (\$/hour)}} \times \frac{\text{Vehicle Occupancy (pers vehicle)}}{\text{Annual Conversion Factor}} \quad (\text{Eq. B-13})$$

Passenger Vehicle Fuel Cost. Fuel cost due to congestion is calculated for passenger vehicles in Equation B-14. This is done by associating the wasted fuel, the percentage of the vehicle mix that is passenger, and the fuel costs.

$$\text{Annual Fuel Cost} = \frac{\text{Daily Fuel Wasted (Eq. B-12)}}{\text{Percent of Passenger Vehicles}} \times \frac{\text{Gasoline Cost}}{\text{Annual Conversion Factor}} \quad (\text{Eq. B-14})$$

Truck or Commercial Vehicle Delay Cost. The delay cost is an estimate of the value of lost time in commercial vehicles and the increased operating costs of commercial vehicles in congestion. Equation B-15 shows how to calculate the passenger vehicle delay costs that result from lost time.

$$\text{Annual Comm-Veh Delay Cost} = \frac{\text{Daily Comm Vehicle Hours of Delay (Eq. B-3)}}{\text{Value of Comm Vehicle Time (\$/hour)}} \times \frac{\text{Annual Conversion Factor}}{\text{Factor}} \quad (\text{Eq. B-15})$$

Truck or Commercial Vehicle Fuel Cost. Fuel cost due to congestion is calculated for commercial vehicles in Equation B-16. This is done by associating the wasted fuel, the percentage of the vehicle mix that is commercial, and the fuel costs.

$$\text{Annual Fuel Cost} = \frac{\text{Daily Fuel Wasted (Eq. B-12)}}{\text{Percent of Commercial Vehicles}} \times \frac{\text{Diesel Cost}}{\text{Annual Conversion Factor}} \quad (\text{Eq. B-16})$$

Total Congestion Cost. Equation B-17 combines the cost due to travel delay and wasted fuel to determine the annual cost due to congestion resulting from incident and recurring delay.

$$\text{Annual Cost Due to Congestion} = \text{Annual Passenger Vehicle Delay Cost + Annual Passenger Fuel Cost + Annual Comm Veh Delay Cost + Annual Comm Veh Fuel Cost} \quad (\text{Eq. B-17})$$

Eq. B-13 Eq. B-14 Eq. B-15 (Eq B-16)

Buffer Index. Equation B-18 shows the computation performed to compute the buffer index reliability measure.

$$\text{Buffer Index (\%)} = 100\% \times \frac{\frac{\text{95th Percentile Travel Time (minutes)} - \text{Average Travel Time (minutes)}}{\text{Average Travel Time (minutes)}}}{\text{Average Travel Time (minutes)}} \quad (\text{Eq. B-18})$$

Planning Time Index. Equation B-19 shows the computation performed to compute the planning time index reliability measure.

$$\text{Planning Time Index} = \frac{\text{95th Percent Travel Time (minutes)}}{\text{Free – flow Travel Time (minutes)}} \quad (\text{Eq. B-19})$$

Volume weighting of Indices. Separate travel time indices, buffer indices, and planning time indices were calculated for each segment within a corridor. These indices were weighted together by vehicle-miles of travel from each segment to generate a corridor travel time index, buffer index, and planning time index. Equation B-20 shows how a particular corridor index would be calculated.

$$\text{Corridor Index} = \frac{\text{Index}_{\text{Segment 1}} \times \text{VMT}_{\text{Segment 1}} + \text{Index}_{\text{Segment 2}} \times \text{VMT}_{\text{Segment 2}} + \dots \text{Index}_{\text{Segment n}} \times \text{VMT}_{\text{Segment n}}}{\text{VMT}_{\text{Segment 1}} + \text{VMT}_{\text{Segment 2}} + \dots \text{VMT}_{\text{Segment n}}} \quad (\text{Eq. B-20})$$

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