

# 100 Most Congested Roadways in Texas

## 2020 Summary

In response to increased roadway congestion throughout the state, in 2009 the Texas Legislature mandated that the Texas Department of Transportation (TxDOT) annually produce a ranked list of the most congested roadways in the state. This list measures congestion by the number of extra hours of travel time (also called ‘delay’) experienced by travelers on each section of road analyzed. Because of the significant delay values in the most congested corridors, and the length of time needed to create solutions to major mobility challenges, the roads in the top of the list change little from year to year.

The 2020 top 10 list using data from 2019 are shown in Exhibit 1. **These data were collected before the COVID-19 pandemic affected congestion levels in early 2020.**

**Exhibit 1: 2020 Top 10 Most Congested Roads in Texas**

2020	County	Road Segment	From	To	2019
1	Travis	IH 35	US 290 N / SS 69	Ben White Blvd / SH 71	2
2	Harris	W Loop Fwy / IH 610	Katy Fwy / IH 10 / US 90	Southwest Fwy / IH 69 / US 59	1
3	Harris	Southwest Fwy / IH 69 / US 59	W Loop Fwy / IH 610	South Fwy / SH 288	3
4	Dallas	Woodall Rodgers Fwy / SS 366	US 75	N Beckley Ave	5
5	Harris	Eastex Fwy / IH 69 / US 59	SH 288	IH 10	4
6	Harris	N Loop W Fwy / IH 610	North Fwy / IH 45	Katy Fwy / IH 10 / US 90	11
7	Harris	Gulf Fwy / IH 45	IH 10 / US 90	S Loop E Fwy / IH 610	6
8	Dallas	Stemmons Fwy / IH 35E / US 77	John W Carpenter / SH 183	Tom Landry Fwy / IH 30	8
9	Dallas	US 75	LBJ / IH 635	Woodall Rodgers Fwy / SS 366	7
10	Harris	IH 10 / US 90	North Fwy / IH 45	Eastex Fwy / US 59	13

Two of these road sections are new to the top 10 list:

- N Loop W Fwy / IH 610 in Houston - #6 this year, #11 last year
- IH 10 / US 90 in Houston - #10 this year, #13 last year

Full results and multi-year rank comparisons of more than 1,800 road segments can be found in the full spreadsheet at <https://mobility.tamu.edu/texas-most-congested-roadways/>.

And while congestion is often a by-product of desirable economic growth, for individuals attempting to navigate a congested roadway it simply feels like “a problem.” TxDOT is actively seeking solutions to many of these problem sections and the Texas Transportation Commission accelerated those solutions for several road segments through the Texas Clear Lanes program, a 2015 initiative announced by Governor Abbott to provide relief at major chokepoints across the state. Many of the Texas Clear Lanes projects are on, or adjacent to, some of the most congested sections in the top 100 list.

## INTRODUCTION

Everything is interconnected – that’s the complicated reality behind the Texas 100 Most Congested Roadways list. And everyone feels it. Economic prosperity is connected to congestion, congested freeways are frequently connected to congested streets. Also, many elements create change, a fact that is also reflected in the 2020 report (2019 calendar year data). There are many transportation variables and urban economic factors that influence congestion levels, so it is difficult to explain all the causes for roadway segments moving up or down the congestion list. This report describes how a few of the most common factors affect roadway, corridor and regional congestion.

What has not changed since its beginning in 2009 is the goal of this effort: to use traffic volume and speed data to arrive at a measure of traffic congestion and the frustration that travelers and shippers feel. The primary measure (delay per mile) quantifies how much more time it takes the vehicles traveling on a congested road than it does for those same vehicles to travel that same mile of road during uncongested conditions. This year’s report presents some of the findings from the most recent study, as well as describes some of the changes in technology and data collection that have affected the project methodology over time.

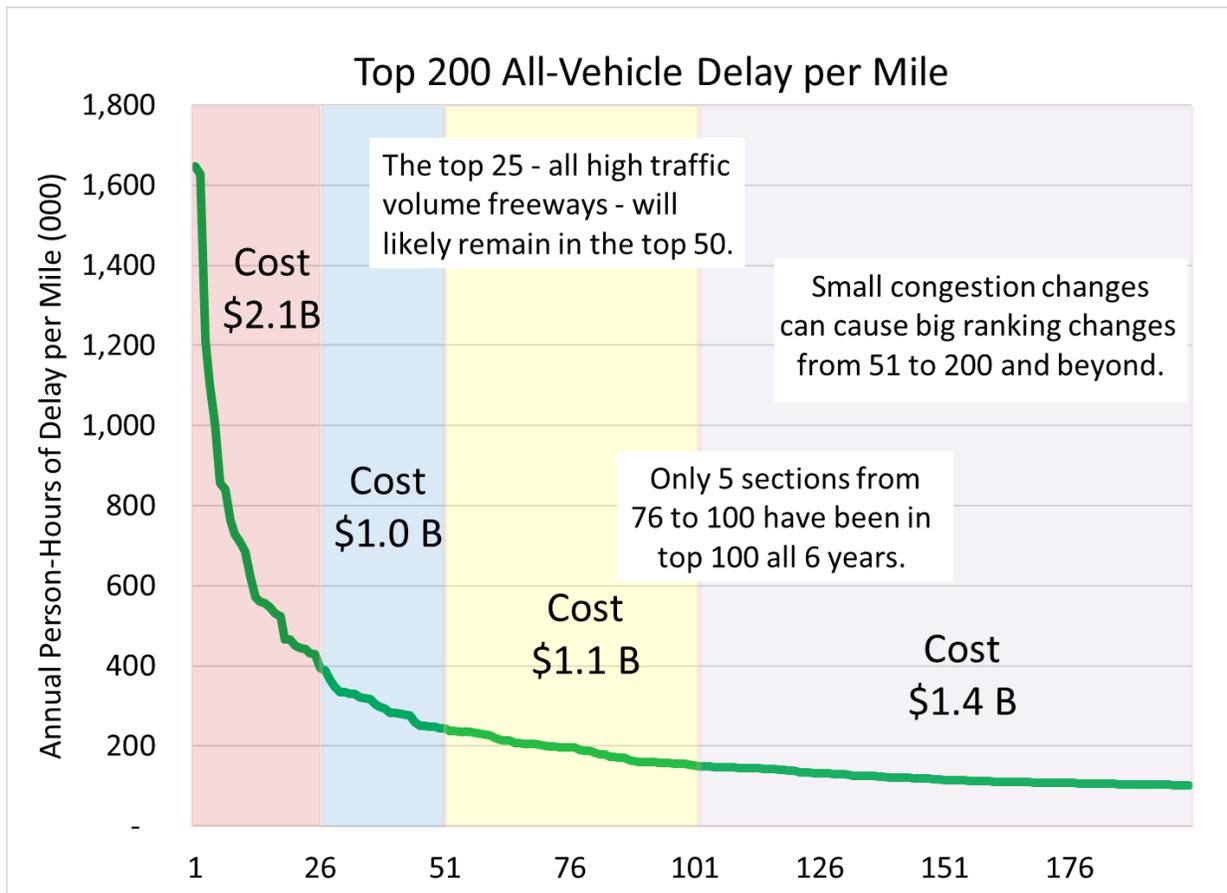
**As noted earlier, these data are from the period before the COVID-19 pandemic; the 2021 list with 2020 data may look very different.**

## WHAT’S ON THE LIST

Congestion is widespread, but its relevance can be subjective – what is considered “very congested” in small cities might be considered “acceptable” in larger cities. In an effort to demonstrate these contextual differences, this study tracks roughly 1,800 road sections across the state, in urban and suburban areas, including at least 18 sections and 60 miles in each of the 25 Texas metro areas (see urban regions map on the TTI website <https://mobility.tamu.edu/texas-most-congested-roadways/> ). The resulting database is useful in tracking statewide congestion, and can be used to help prioritize projects that address congestion problems in each metro area. Rural Texas congestion is not tracked in this effort.

Exhibit 2 displays the extra travel time per mile of roadway for the top 200 segments on the list. Congestion is not only unevenly distributed across the Texas 100 list, it also declines sharply from the top few roadways. The travel delay per mile begins to flatten at about the 50<sup>th</sup> ranked section. After the top 100 roadways, congestion changes much less for the remaining sections. The congestion cost (based on wasted time and fuel) is shown for four groupings of the Top 200. The congestion cost for the Top 25 is equal to the Top 26 to 100.

**Exhibit 2: Annual Delay Hours per Road Mile - 200 Most Congested Roads in Texas**



The most congested roads on the list are in the four largest metro areas of the state: Austin, Dallas/Fort Worth, Houston, and San Antonio:

- The 52 most congested roadways are in these four regions, and 86 of the top 88.
- 95 of the top 100 congested sections are in these four regions
- 174 of the top 200 are in the four largest metro regions

The most congested list has been relatively stable. This is partly because the Texas Clear Lanes effort is relatively new, and the projects have not yet opened. It is also a result of math; as Exhibit 2 shows, the delay values are more than twice as high for the 25<sup>th</sup> section than for the 100<sup>th</sup> section. Of this year's Top 25, since the 2016 report:

- Almost all (21) have been top 25 for 4 of the last 5 years; and
- Zero were ever outside the top 100.

Of this year's 26 to 50:

- Almost all have been in the top 100 (5 spent at least 1 year each outside the top 100 in the last 5 years).

Of this year's 51 to 75:

- The majority have been in the top 100 (10 spent at least 1 year each outside top 100 in the last 5 years).

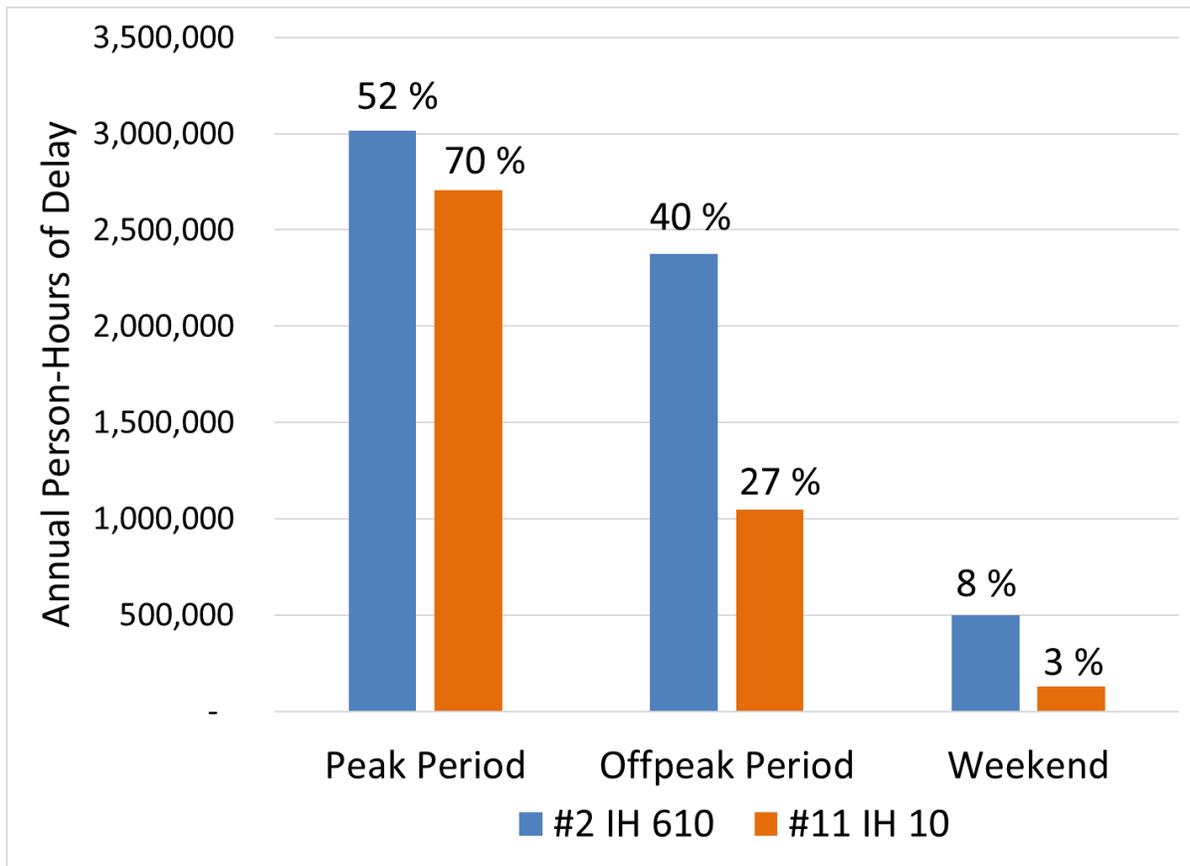
Of this year's 76 to 100:

- There is less consistency, and 18 spent at least 1 year outside the top 100 in the last 5 years.

The Top 25 are, generally, the roads where congestion is most intense and continues for long periods throughout the day. Highest on the list are urban segments where congestion also occurs outside the peak travel periods. For example, Exhibit 3 shows a comparison of two sections of the Top 20 in Houston. The second highest ranking segment for 2020, IH-610 West Loop (from the Katy Freeway to the Southwest Freeway) has about 49 percent of its delay outside of the traditional peak periods (6:00 to 9:00am and 4:00 to 7:00pm). This shows that congestion is not just a “rush hour” phenomenon. In contrast, the segment ranked at position #11 for 2020 (IH-10 Katy Freeway between IH-610 West Loop and IH-45 North Freeway) suffers much less off-peak period delay (only 30 percent of its delay is outside of the peak periods). And most of the top 20 sections have much more delay outside the traditional peak periods than those sections further down the list.

Congestion is not a uniquely urban or downtown problem, or even one related only to the congestion conditions on the roadway section itself. Some urban road segments jump up the list because nearby construction or maintenance projects cause traffic to divert onto the usually uncongested section. This same diverted traffic will again seek the least congested roadway once construction projects are completed.

### Exhibit 3. Comparison of Segment #2 and Segment #11 for Off-Peak Period Congestion



### WHAT ARE THE INFLUENCING FACTORS THAT PUT ROADS ON THE LIST?

#### Economic Prosperity

The most enduring trend since 2009 has been growth – in population, jobs, travel demands, traffic volume – everything except road and transit capacity necessary to accommodate the growth. Traffic congestion may be an inevitable result of economic growth, but the congestion growth rate is not seen as reasonable.

#### Land Use

Land use changes along or near a corridor can have a dramatic impact on the corridor. In urban areas that are developing densely, thousands of trips may be added to a corridor very quickly when people move into newly available housing units or take advantage of new offices, retail stores or restaurants. For example, recent high-density development along Westheimer Road in Houston between SH-6 and IH-610 is one reason that this segment of road is ranked at #49 on the list. That kind of land use change can send a roadway to a higher position on the list in a short period of time.

## Construction

Construction on a road – or on a nearby road – can be the reason for congestion changes. Big construction projects often cause congestion on the road where the project is being built. In smaller cities, even short-term and smaller projects like pavement overlays, re-striping, traffic signal work at a single intersection or turn lane additions can affect annual congestion statistics.

Projects on nearby or connecting roads can also cause congestion on a road where there would otherwise be none. When the road under construction becomes congested, backed-up traffic shifts to connecting roads and they become congested as well. For example, recent construction on Austin’s Loop 1/MoPac Freeway created congestion on other nearby roadways (Cesar Chavez, Bee Caves, and South Lamar) when traffic along Loop 1 was slowed due to construction.

## Congestion Outside the Peak Period

Congestion outside the normal peak traffic periods is another frequent condition that moves a road up on the congested list. These roads “where it’s always rush hour” not only see regular congestion, but also see more intense problems from traffic crashes and stalled vehicles. This is the case with IH-35 through Central Austin, or IH-610 West in Houston.

Off-peak period delay can also be significant on arterials, or high-capacity urban thoroughfares, whose traffic signals are timed to serve all travel directions at smaller cross street intersections, rather than prioritizing the major street peak direction, causing delay on the bigger arterial streets. During rush hour, however, the arterials are prioritized and their delay time is lessened.

## Weather

Even an exceptionally bad weather year can cause a road segment to appear in the congestion data. Heavy rains can slow traffic, regular flooding can block it, and high winds can deposit debris on the roads or down signs that obstruct traffic until removed or repaired. Extreme weather, especially high heat followed by excessive rains, can accelerate roadway damage, creating large cracks that worsen with the weight of traffic. That kind of damage can slow traffic, and the effort to repair the problem can also obstruct a road and cause congestion.

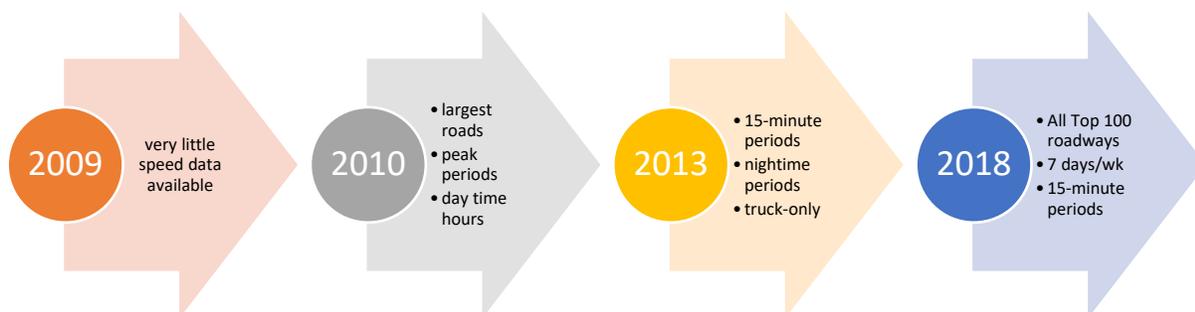
## HOW HAS THE METHODOLOGY CHANGED OVER THE YEARS?

Eleven years producing this list of congested roads have seen changes to road usage levels in Texas. There have also been changes to speed data availability since the first year of this report, both for the time periods and the number of roadways on which it was captured. In 2009, the study’s first year, there was very little directly collected speed data so speeds were estimated using traffic volume and the number of roadway lanes. Since 2010, however, speed data have continued to improve in both temporal and spatial coverage. In that year, the speed data was

hourly and for only the state’s largest roadways, generally during higher traffic periods, and during most daytime hours. However, by year four of the report, speeds were available for 15-minute periods, including many overnight periods. As of the 2017 reporting period, speed data were available for over 95 percent of the 15-minute periods for all seven days of the week on all the Texas 100 roadway sections.

In addition, companies who once collected only truck or fleet data now collect passenger vehicle data from anonymized sources like cell phones and in-car devices. As of the 2019 report, connected vehicles became a large portion of the probe vehicles reporting roadway performance information to data collection companies. The result is that the reporting has become more accurate both in terms of the timeframes and vehicle types they measure. Exhibit 4 shows these changes to speed data availability through time.

#### Exhibit 4: Timeline Showing Changes to Speed Data Availability



## Conclusion

The 100 Most Congested Roadways report provides a birds-eye view of congestion in Texas in 2019 – **before the effects of the COVID-19 pandemic**. It is designed to show where delay hours are occurring, in order of severity. It also shows how the type of traffic (commuters or trucks) is affected by congestion, the differences between peak and off-peak period congestion levels, and more. What this report does not show is what is causing the congestion on a given roadway, nor does it identify solutions. However, the report’s discussion on congestion describes a variety of reasons why it occurs and gives analysts some insight into what strategies might be effective. This report also provides a brief description of the project methodology and the factors that influence congestion.

# 100 Most Congested Roadways for Trucks in Texas

## 2020 Summary

In response to increased roadway congestion throughout the state, in 2009 the Texas Legislature mandated that the Texas Department of Transportation annually produce a ranked list of the most congested roadways in the state. This list measures congestion by the number of extra hours of travel time (also called ‘delay’) experienced by travelers on each section of road analyzed. Because of the significant delay values in the most congested corridors, and the slow nature of solution implementation to address a congested roadway, the overall list changes little from year to year.

In 2014, the “Texas 100” analysis began to show delay specific to trucks. The same road sections that were monitored for overall congestion were also monitored for truck congestion. Exhibit 5 shows the top 10 locations in Texas for truck congestion. Eight of these road sections are also in the top 10 for overall congestion. IH-35 in Austin has the top spot on both lists as the corridor has significant congestion all day long with a large amount of truck traffic in the vehicle mix.

As with the overall congestion list, **these data were collected in 2019 before the COVID-19 pandemic affected congestion levels in early 2020.**

### Exhibit 5: 2020 Top 10 Most Congested Roads for Trucks in Texas

2020	County	Road Segment	From	To	2019
1	Travis	IH 35	US 290 N / SS 69	Ben White Blvd / SH 71	1
2	Harris	Eastex Fwy / IH 69 / US 59	SH 288	IH 10	2
3	Harris	W Loop Fwy / IH 610	Katy Fwy / IH 10 / US 90	Southwest Fwy/IH 69/US 59	4
4	Harris	IH 10 / US 90	North Fwy / IH 45	Eastex Fwy / IH 69 / US 59	7
5	Harris	Gulf Fwy / IH 45	IH 10 / US 90	S Loop E Fwy / IH 610	5
6	Harris	N Loop W Fwy / IH 610	North Fwy / IH 45	Katy Fwy / IH 10 / US 90	11
7	Dallas	Stemmons Fwy / IH 35E / US 77	John W. Carpenter Fwy/SH 183	Tom Landry Fwy / IH 30	9
8	Tarrant	North Fwy / IH 35W / US 287	SH 183	IH 30	12
9	Webb	Bob Bullock Loop / SL 20	US – Mexico Border	IH 35 / US 83	3
10	Harris	Southwest Fwy / IH 69 / US 59	W Loop Fwy / IH 610	South Fwy / SH 288	10

Two of these road sections are new to the top 10 list:

- North Loop Fwy West / IH 610 in Houston - #6 this year, #11 last year
- North Fwy / IH 35W / US 287 in Fort Worth - #8 this year, #12 last year

Full results and multi-year comparisons of more than 1,800 road segments can be found in the full spreadsheet at <https://mobility.tamu.edu/texas-most-congested-roadways/>.

The “All-Vehicle Congestion” and “Truck Congestion” rankings in the most congested list can be very different because trucks are a small part of some very congested commuter freeway corridors (e.g., Austin’s MoPac Freeway, Dallas’ Woodall Rodgers Freeway, San Antonio’s McAllister Freeway). Truck congestion is a significant part of most Laredo corridors, and many urban Interstate corridors. Roadways that generally carry freight traffic through smaller regions such as Bryan-College Station, Midland-Odessa, Tyler and Waco are also ranked much higher on the truck list than the all-vehicle list. Since 2016, the truck list has been stable in the upper half of the top 100. For the bottom half of the top 100, however, the truck list has not been as stable as the “all vehicle” list.

Of this year’s Top 25 congested sections for trucks:

- The majority (15) have been in the top 25 for 4 of last 5 years; and
- Only 4 were ever outside the top 100 for at least 1 year during these 5 years.

Of this year’s 26 to 50 congested sections for trucks:

- Most have been in the top 100 (only 8 spent at least 1 year of the last 5 outside the top 100).

Of this year’s 51 to 75 congested sections for trucks:

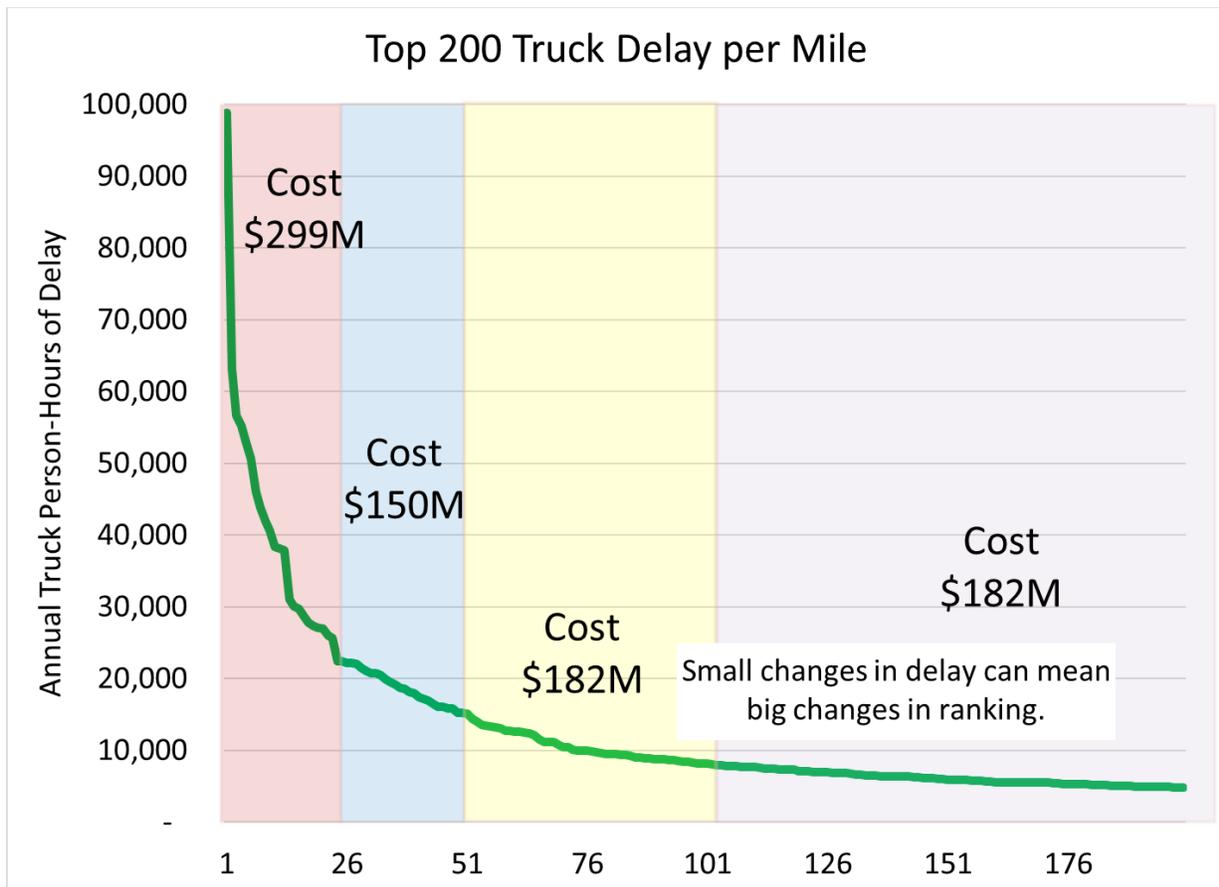
- There is less consistency and 16 spent at least 1 year of the last 5 outside the top 100.

Of this year’s 76 to 100 congested sections for trucks:

- There is less consistency and 19 spent at least 1 year of the last 5 outside the top 100.

Exhibit 6 displays the extra travel time per mile of roadway for the top 200 segments on the Truck Top 200 list. Congestion is not only unevenly distributed across the truck list, it also declines sharply after the top few roadways. The travel delay per mile begins to flatten at about the 50<sup>th</sup> ranked section. After the top 100 roadways, congestion changes much less for the remaining sections. The congestion cost (based on wasted time and fuel) is shown for four groupings of the Top 200. The congestion cost for the Top 25 is slightly less than the next 75 sections combined which follows the same trend as the all-vehicle Top 200 congested list.

**Exhibit 6: Annual Truck Delay Hours per Road Mile - 200 Most Congested Roads in Texas**



TxDOT relies on the Texas 100 Most Congested Roadway Sections to routinely monitor truck bottleneck locations, and it informs several TxDOT planning and programming activities. Truck bottleneck locations are reflected in the National Freight Strategic Plan based on TxDOT’s two-year required truck freight bottleneck performance reporting to the Federal Highway Administration (FHWA). The “Texas 100” yearly bottleneck information is also used to prioritize bottlenecks in project selection and Transportation System Management and Operations (TSMO) operational activities.

# Methodology and Definitions

## ANNUAL HOURS OF DELAY

The annual measure of delay is the starting point for calculating the congestion measures shown in Exhibit 8 below. To arrive at this measure, the data must be acquired for four data elements:

- Actual travel speed
- Free-flow travel speed
- Vehicle volume (passenger vehicles and trucks)
- Vehicle occupancy (persons per vehicle) to “convert” vehicle-hours of delay to person-hours of delay

TTI uses the traffic volume and traffic speed data for each section of road to create the large dataset that contains each of the Texas 100 reporting sections. For example, on each roadway section, the travel speed and traffic volumes are gathered for each 15-minute time period of the average week. This means that data is gathered for 672 (24 hours per day x 4 periods per hour x 7 days per week) discrete periods of each week for each segment for the year. This speed data is compared with free-flow speeds to compute the difference between a congested period and a free-flowing time period. By factoring in vehicle occupancy, the person-hours of delay time for each roadway can be calculated. For details about the methodology used, including any changes made since the prior year, see *100 Texas Congested – 2020 Method (Final)*.

## Exhibit 8. Measures Definitions

<b>DELAY</b>	
Annual Delay	The sum of the extra travel time in the peak period, off-peak period, and weekend.
Annual Delay Per Mile	Annual hours of delay divided by segment length so that comparable values are obtained. The primary performance measure upon which rankings are produced.
Peak Period Delay	The hours of delay that occur during the 6:00am-9:00am and 4:00-7:00pm weekday peak periods.
Off-Peak Period Delay	The hours of delay that occur on weekdays outside of the peak period.
Weekend Delay	The hours of delay that occur on weekends.
Texas Congestion Index	Score indicating the relationship between the peak-period, average travel time and the free-flow travel time. The score is arrived at by dividing the congested travel time by the free-flow travel time. For example, for a segment where a free-flow trip takes 30 minutes, and a trip during peak periods takes 36 minutes, the TCI would be 1.20 (36 / 30).
Planning Time Index	A travel time reliability measure indicating the amount of time that should be planned to arrive on-time for 19 trips out of 20. A value of 2.50 means that for a 30-minute trip in light traffic, 75 minutes (2.50 x 30) should be planned.
Commuter Stress Index	Score indicating the relationship between the peak period, average travel time for the morning and evening peak travel direction and the free-flow travel time for the peak direction of travel only.
<b>VOLUME, SPEED &amp; FUNCTIONAL CLASS</b>	
Peak-Period Average Speed	The average speed during the 6:00am-9:00am and 4:00-7:00pm timeframe.
Average Uncongested Speed	The average operating speeds during light-traffic conditions, typically during overnight hours.
Functional Class	Coding system for road segments for purposes of analysis. 1=interstates and freeways, 3=major and minor arterial streets.
<b>TRUCKS</b>	
Annual Truck Delay	The portion of annual delay from trucks.
Annual Truck Delay Per Mile	Annual hours of truck delay divided by the segment length
Peak Period Truck Delay	The hours of truck delay that occur during the 6:00am-9:00am and 4:00-7:00pm timeframe on weekdays.
Off-Peak Period Truck Delay	The hours of truck delay that occur in non-peak periods on weekdays.
Weekend Truck Delay	The hours of truck delay that occur on weekends.
Annual Truck Congestion Cost	The portion of annual congestion cost from trucks.
Peak Period Average Truck Speed	The average truck speed during the 6:00am-9:00am and 4:00-7:00pm timeframe.
Average Uncongested Truck Speed	The average truck operating speeds during light traffic conditions, typically during overnight hours.
<b>CONGESTION COST, EXCESS FUEL &amp; ADDITIONAL EMISSIONS DUE TO CONGESTION</b>	
Annual Congestion Cost	The cost of wasted time and fuel associated with congestion.
Excess Fuel Consumed	Additional gallons of fuel consumed due to congestion.
Excess Truck Fuel Consumed	The portion of excess fuel consumed by trucks due to congestion.
Additional CO2 Produced	Pounds of additional carbon dioxide produced because of congestion.
Additional Truck CO2 Produced	Pounds of additional carbon dioxide produced by trucks because of congestion.