INRIX

COVID-19 Effect on Collisions on Interstates and Highways in the US

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The INRIX Riskiest Roads study analyzes and ranks the effect the global pandemic had on automobile and truck collisions on America's busiest Interstates and highways.

Vision Zero policies and action plans have been implemented across the country in small, medium and large cities as well as many states. Their aim is to reduce traffic-related deaths to zero, regardless of mode of transport, usually by 2030. Ending fatalities, as well as serious injuries, is a primary goal that shares responsibility among, public agencies, private enterprise, non-profits, and the public. To help assist in this cause, INRIX has released, and will continue to release, incident data and reporting as it relates to collisions, as we commit our team to safer roadways.

KEY FINDINGS:

- Vehicle-miles traveled (VMT) dropped but vehicle speeds increased between April and July, playing a significant factor in the increase in the fatality rate on our nation's roadways.
- While early federal statistics indicate a 31% increase in the Q2 fatality rate, collisions decreased significantly.
- As VMT hit its lowest point and recovered nationwide, collisions fell more than 50% in seven metropolitan areas, and 21 of 25 metros saw at least 25% fewer collisions.
- Increases in collisions between August and October outpaced the growth in travel, resulting in a higher collision rate.
- 14 of 25 metro areas had greater percentage decreases in collisions on arterial streets than on Interstates and freeways/expressways

METRO AREA	TOP COLLISION CORRIDOR	APR-OCT COLLISIONS YOY	METRO RANK
Atlanta, GA	GA-401	-25%	17
Baltimore, MD	I-95	-18%	22
Boston, MA	I-95	-33%	6
Charlotte, NC	I-77	-28%	15
Chicago, IL	I-90	-5%	25
Dallas, TX	I-35E	-32%	8
Denver, CO	I-25	-29%	11
Detroit, MI	I-94	-35%	4
Houston, TX	I-45	-20%	20
Los Angeles, CA	I-10	-21%	19
Miami, FL	I-95	-8%	24
Minneapolis, MN	I-94	-32%	7
New York City, NY	I-95	-38%	1
Orlando, FL	I-4	-24%	18
Philadelphia, PA	I-95	-28%	14
Phoenix, AZ	I-17	-36%	2
Portland, OR	I-5	-28%	13
Sacramento, CA	US-50	-30%	9
San Antonio, TX	I-410	-33%	5
San Diego, CA	I-5	-29%	10
San Francisco, CA	US-101	-28%	12
Seattle, WA	I-5	-35%	3
St. Louis, MO	I-70	-16%	23
Tampa, FL	I-275	-19%	21
Washington DC	I-66	-26%	16

METHODOLOGY

Using historical collision and lane closure information available on over five million miles of road worldwide, INRIX XD Incidents platform includes data from a broad source of inputs, including commercial and public feeds, agency personnel, social networks, community-input data, traffic flow, closure duration and INRIX-curated incidents. The data is then validated, aggregated, and gauged for severity and impact.

For this study, INRIX analyzed road conditions on National Interstates, freeways and expressways, and arterials in the Top 25 Metropolitan Areas in the United States to determine:

- The top collision corridors and hotspot locations under "normal," pre-COVID conditions, and the change in collisions during COVID;
- The impact of pandemic-related VMT reductions on speed and collisions nationwide, by metropolitan area;
- Riskiest roads and the COVID-19 effect on collisions; and
- Collisions during VMT reductions by road type (e.g. Freeways vs. Arterials).

Definitions

Collision
A traffic incident impacting a roadway that is unplanned.

Collision rate
Rate of collisions per million miles traveled.

Corridor Risk Score
The average risk score of a corridor's segments within a metro area.

Functional Road Classification (FRC)
A classification for road types:
1=Interstates
2=Highways and freeways
3=Major Arterials

Risk Score
A rating given to a road segment based on collisions, traffic volume and segment length. Road segments are rated 1 to 5, low to high.

Riskiest Roads
Roads with high average risk scores.

This study does not, however, assess fault for any type of traffic incident. Collision frequency and severity are influenced by various factors, including travel speeds, weather, driver behavior, road design, speed limits and free flow speeds, lighting and signage, pavement markings, objects in roadway, etc. No part of this study should be construed as assigning fault or blame or used in any type of legal or insurance proceedings or lawsuits.

INRIX Top Collision Corridors and Riskiest Hotspot Locations

INRIX recently released its analysis on three years of collision data in the top 25 Metropolitan Statistical Areas (MSA) in the US to determine the location and severity of the most collision-heavy roads over the last three years. The INRIX Riskiest Roads report provides information on the top 250 roads across 70 metropolitan areas.

Table 1 provides a snapshot of the top collision corridors, the effect of COVID-19 on corridor collisions and hotspots in each of the 25 MSAs. The global list and rankings can be found on inrix.com/most-dangerous-roads.

TABLE 1 Top Collision Corridors, COVID-19's Effect, and Top Hotspots

METRO AREA	TOP COLLISION CORRIDOR	APR-OCT COLLISIONS YOY	RISKIEST HOTSPOT
Atlanta	GA-401	-12%	I-20 Ralph David Abernathy Fwy at I-85/I-75
Baltimore	I-95	-9%	MD-43 White Marsh Blvd at I-95 JFK Memorial Hwy
Boston	I-95	-28%	I-495 Blue Star Memorial Hwy at I-93 Northern Expy
Charlotte	I-77	-15%	I-77 at NC-460 Gold Hill Rd
Chicago	I-90	3%	IL-19 Irving Park Rd at Barrington Rd
Dallas	I-35E	-35%	I-635 Lyndon B Johnson Fwy at Hillcrest Rd
Denver	I-25	-27%	I-25 at 84th Ave
Detroit	I-94	-8%	I-75 at I-696
Houston	I-45	-12%	I-69 Southwest Fwy at I-610
Los Angeles	I-10	-26%	Long Beach Blvd at I-105 Century Fwy
Miami	I-95	-18%	I-95 at Ives Dairy Rd
Minneapolis	I-94	-4%	MN-65 at I-94 / I-35
New York City	I-95	-41%	Lower Level I-95 George Washington Bridge (NY Side)
Orlando	I-4	-24%	I-4 at FI-436
Philadelphia	I-95	-30%	I-76 Schuykill Expy at I-476 Veterans Memorial Hwy
Phoenix	I-17	-33%	I-17 through Osborn Gardens
Portland	I-5	-23%	I-84 Banfield Expy at Sandy Blvd
Sacramento	US-50	-22%	CA-99 Golden State Hwy at Sutterville Rd
San Antonio	I-410	-28%	I-37 at I-35 PanAm Expy
San Diego	I-5	-37%	I-15 Escondido Fwy at Friars Rd
San Francisco	US-101	-22%	I-80 at Treasure Island Rd
Seattle	I-5	-43%	I-5 at Mercer St
St. Louis	I-70	-7%	I-270 at I-44
Tampa	I-275	-26%	I-75 at I-4
Washington DC	I-66	-16%	VA-28 Sully Rd at I-66

Collisions vary considerably based on the type and function of roadway. For example, collisions reported on Interstate 90 in Chicago increased 3% over last year, despite a large downturn in VMT in the region. Seattle, on the other hand, registered 43% fewer collisions on Interstate 5, the top spot in the Puget Sound Region.

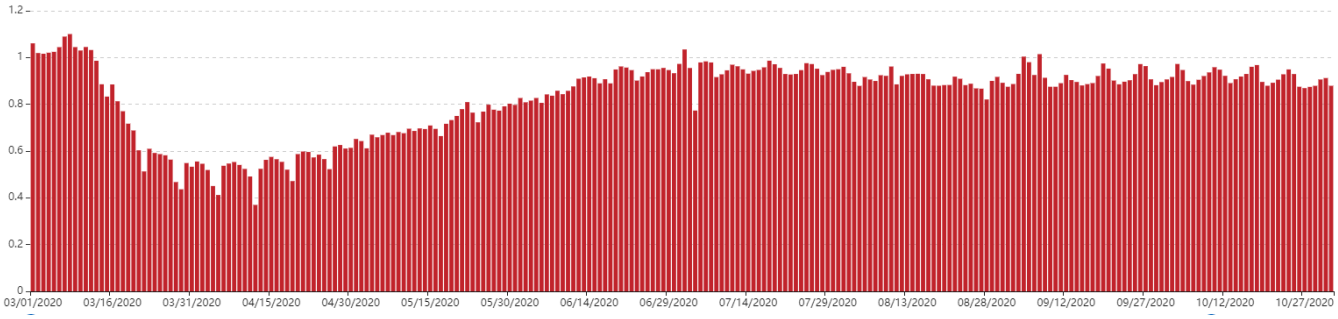
While oftentimes occurring on the most collision-heavy corridors, the collision hotspots may occur outside of the top corridor. For instance, San Francisco's top collision corridor is U.S. Route 101, yet the top hotspot was located on I-80.

However, COVID-19 has fundamentally changed the way people travel. To better understand the true impacts, this report analyzes the relationship between VMT, speeds and roadway collisions on America's Interstates, highways, and arterial streets.

VMT Plummets During COVID-19, Travel Speeds Increase

Nationwide, VMT decreased significantly with the onset of COVID-19 as seen in Figure 1. By early April, VMT in the United States dropped 46% from pre-COVID levels, taking 11 weeks to rebound but many major metro areas have yet to fully recover. Since then, travel across the country has remained flat, with minor weekly variation. Out of the top 100 US metropolitan areas, just 45 have met their pre-COVID level of VMT.

FIGURE 1 Normalized Weekly VMT; United States



Relationship between VMT, Travel Speeds and Collisions

Lower VMT levels typically coincide with a reduction in recurring traffic congestion (traffic delay not caused by collisions or events) and higher vehicle speeds. Higher travel speeds increase the risk of a crash involving injury.

Table 2 reveals the VMT drop and associated speed increases during the most congested hour of the day. For example, miles traveled in Greater Atlanta was 27% below "normal" volumes during the April to July period. As a result, speeds on major highways and freeways in the area increased 31% above normal during the 5:00pm rush hour, the most congested hour of the day. In the following months, VMT around Atlanta increased to 15% below "normal," resulting in lower average speeds than the previous period (31% to 21% above normal).

Between April and July, Philadelphia and San Francisco saw travel speeds on Interstates and highways increase more than 60%, while Boston and San Francisco saw the largest increases in speeds since August, with both experiencing 45% faster speeds than normal.

TABLE 2 VMT, Travel Speeds and Collisions for the Top 25 Metropolitan Areas

METRO AREA	APRIL-JULY ADJ. VMT	APRIL-JULY SPEED INCREASE	APRIL-JULY COLLISIONS VS 2019	AUG-OCT ADJ. VMT	AUG-OCT SPEED INCREASE	AUG-OCT COLLISIONS VS 2019
Atlanta	-27%	31%	-35%	-15%	21%	-11%
Baltimore	-38%	51%	-30%	-23%	38%	-2%
Boston	-35%	56%	-43%	-16%	45%	-19%
Charlotte	-26%	28%	-39%	-13%	18%	-14%
Chicago	-31%	29%	-11%	-18%	16%	4%
Dallas	-30%	27%	-47%	-19%	18%	-13%
Denver	-22%	30%	-44%	-7%	19%	-9%
Detroit	-37%	33%	-58%	-19%	26%	-4%
Houston	-32%	40%	-27%	-23%	26%	-11%
Los Angeles	-39%	55%	-40%	-29%	32%	5%
Miami	-48%	30%	-20%	-38%	18%	9%
Minneapolis	-26%	33%	-50%	-12%	22%	-9%
New York	-41%	41%	-57%	-21%	22%	-12%
Orlando	-47%	25%	-36%	-32%	15%	-8%
Philadelphia	-37%	64%	-39%	-19%	33%	-13%
Phoenix	-36%	13%	-51%	-25%	8%	-15%
Portland	-31%	41%	-50%	-20%	22%	1%
Sacramento	-31%	21%	-42%	-21%	16%	-13%
San Antonio	-33%	26%	-45%	-22%	13%	-18%
San Diego	-39%	45%	-49%	-24%	36%	-3%
San Francisco	-47%	63%	-50%	-38%	45%	2%
Seattle	-32%	36%	-53%	-21%	22%	-10%
St. Louis	-26%	20%	-24%	-13%	11%	-5%
Tampa	-37%	25%	-21%	-26%	16%	-16%
Washington DC	-41%	39%	-42%	-27%	27%	-5%

During the first four months of COVID-19 restrictions, collisions decreased across all major metropolitan areas, though with significant variation. For example, collisions were cut more than half in seven metro areas, and more than a quarter in 21 of 25 metros – with reductions ranging from 11% in Chicago to 58% in St. Louis. In relation to miles driven, collisions decreased more than VMT in 18 of 25 metros.

However, collisions since August are tracking closer to their 2019 level. During the three-month period, Boston had the largest reduction with 19% fewer collisions. Just two metros, Boston and Charlotte, had larger drops in collisions per VMT.

Table 3 provides a 30,000-foot view of the top 25 metros. During the April to July period, median metro area collisions retracted more than VMT. This indicates the collision rate, or collisions per VMT, decreased during the first four full months of COVID-19 shutdowns and restrictions.

However, collisions quickly rebounded close to pre-COVID levels between August and October. Growth in collisions (57%), during this period outpaced the growth in miles traveled (22%), resulting in a higher collision rate during the latter three-month period.

While it is too early to determine the cause of the sharp reversal of collision trends, the high volatility warrants further investigation.

TABLE 3 Median Changes in VMT, Speeds and Collisions among Top 25 Metro Areas

	MEDIAN VMT CHANGE	MEDIAN SPEED CHANGE	MEDIAN COLLISION CHANGE
April - July	-35%	+33%	-42%
August - October	-21%	+22%	-9%

VMT and Collision Severity / Fatalities

Traffic collisions tend to correlate with the amount people travel. In general, fewer cars on the road leads to reduced collisions, though the severity of these collisions tends to increase. Though this study does not attempt to analyze the severity of collisions, preliminary statistics reveal trends that would indicate an increase in the fatality rate, and therefore, severity.

According to the National Highway Traffic Safety Administration (NHTSA), estimated traffic fatalities decreased in the first half of 2020 compared to the same period in 2019.[1] Between April and June, when COVID-19 emerged and government travel restrictions went into place, NHTSA estimates that traffic fatalities decreased 3.3%. While the absolute number of fatalities decreased, due to the large drop in VMT, the fatality rate increased to 1.42 fatalities per 100 million miles of VMT, up from 1.08 during the same quarter last year – a striking 31% increase.

Additionally, the National Safety Council (NSC) estimates that January through August 2020 saw 4% more motor vehicle fatalities than last year, with fatalities rising in 33 out of 50 states and Washington DC.[2] While the data is an initial look and subject to adjustments, both NHTSA and NSC fatality data paint an unpleasant picture of what is happening on U.S. roadways despite a large drop in VMT.

The injury and fatality statistics also do not yet signify the type of collision and the mode(s) of travel involved and need more vetting to gain a fuller safety picture. For example, if fatalities are increasing on city streets, but decreasing on highways, the severe injury/fatality rate may fall overall, yet be increasing for cyclists and pedestrians, requiring different safety solutions.

1 “Early Estimate of Motor Vehicle Traffic Fatalities for the First Half (Jan-Jun) of 2020,” at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813004

2 “Preliminary Monthly Estimates, Monthly Preliminary Motor-Vehicle Fatality Estimates – August 2020”at https://injuryfacts.nsc.org/motor-vehicle/overview/preliminary-monthly-estimates/

Collisions During COVID-19 Downturn Vary by Roadway

COVID-19 has affected roadway safety differently throughout the United States. INRIX aggregated collision data at the road level in each of the top 25 metropolitan areas. Table 4 provides the collision change between April and October 2020 on the top 3 riskiest roadways in each metro area, scored by risk on a 1 to 5 scale (low to high).

In general, the riskiest corridors saw less of a collision reduction during the COVID-19 downturn than their less-risky counterparts. It total, 60% of the riskiest corridors in metro areas had a smaller decrease than their respective metro area, while 40% of corridors saw a larger drop in collisions.

The "riskiest" roads are not necessarily the ones with the most collisions. After adjusting for volume and length, these corridors pose the most risk for travelers.

TABLE 4 COVID-19's Effect on Collisions Along Riskiest Corridors:

Atlanta		CE	Baltimore		CE	Boston		CE	Charlotte		CE	Chicago		CE
GA-407	3.7	-26%	I-695	2.8	-11%	I-93	2.8	-26%	NC-27	4.3	-22%	CR-A50	3.8	1%
I-85	3.5	-26%	I-895	2.6	-31%	I-95	2.6	-28%	BILLY GRAHAM	3.8	-24%	W LAWRENCE	3.0	-5%
GA-403	2.9	-22%	I-95	2.3	-9%	US-1	2.5	-13%	I-277	3.6	-49%	I-290	2.6	-2%
Dallas		**CE**	**Denver**		**CE**	**Detroit**		**CE**	**Houston**		**CE**	**Los Angeles**		**CE**
N STEMMONS	4.0	0%	I-225	3.4	-43%	M-39	3.1	-22%	I-610	3.4	-21%	CA-79	4.7	-29%
TX-366	3.6	-53%	CO-88	3.1	-25%	I-475	3.0	-44%	TX-288	3.4	20%	CA-110	4.5	-9%
US-175	3.3	-10%	US-6	2.9	6%	I-696	3.0	-17%	US-59	3.3	-13%	PKY-ROUTE	4.1	-5%
Miami		**CE**	**Minneapolis**		**CE**	**New York**		**CE**	**Orlando**		**CE**	**Philadelphia**		**CE**
SR-112-TOLL	3.5	0%	I-35W	3.2	-31%	FDR DR N	4.4	-24%	SR-530	3.4	-14%	VALLEY FORGE	4.0	-55%
PALMETTO EXF	3.5	39%	MN-100	3.2	-49%	I-678	3.8	-29%	SR-423	3.2	13%	US-30	3.2	-43%
SR-90	3.3	-19%	MN-62	3.1	-49%	TILLARY ST	3.5	-14%	CR-423	3.2	-43%	RT-42	3.0	-36%
Phoenix		**CE**	**Portland**		**CE**	**Sacramento**		**CE**	**San Antonio**		**CE**	**San Diego**		**CE**
I-17	3.0	-33%	I-84	3.0	-20%	I-80-BR	3.9	-35%	US-87	3.0	-30%	CA-78	4.0	-19%
I-10	2.8	-35%	I-5	2.8	-23%	CA-99	3.7	-23%	US-90	2.9	-31%	I-805	3.6	-37%
AZ-101-LOOP	2.8	-32%	US-26	2.5	2%	CA-193	3.5	-7%	US-281	2.9	-33%	I-5	3.5	-37%
San Francisco		**CE**	**Seattle**		**CE**	**St. Louis**		**CE**	**Tampa**		**CE**	**Washington DC**		**CE**
CA-242	4.5	-26%	I-405	3.2	-42%	I-270	2.8	-38%	SR-688	3.1	-43%	MD-144	5.0	-60%
I-880	4.1	-26%	I-5	3.1	-43%	I-64	2.8	-23%	SR-55	3.0	-10%	I-66	3.5	-16%
I-580-BYP	4.0	-14%	WA-167	3.1	-37%	I-170	2.6	-18%	I-275	2.9	-26%	US-1-ALT	3.4	-33%

To get a better understanding of how collisions were spread across a metro area, INRIX also looked at collision data by type of road, noting that speed can play a larger role on the severity of collisions on arterial and city streets, since cyclists and pedestrians may be involved. In the latest statistics provided by NHTSA, while motor vehicle and passenger fatalities dropped in 2018, cyclists and pedestrian fatality rates increased, emphasizing the need to pay close attention to city streets and other modes of travel besides the automobile.

FIGURE 2 Year Over Year Reductions in Collisions, on Major Arterials

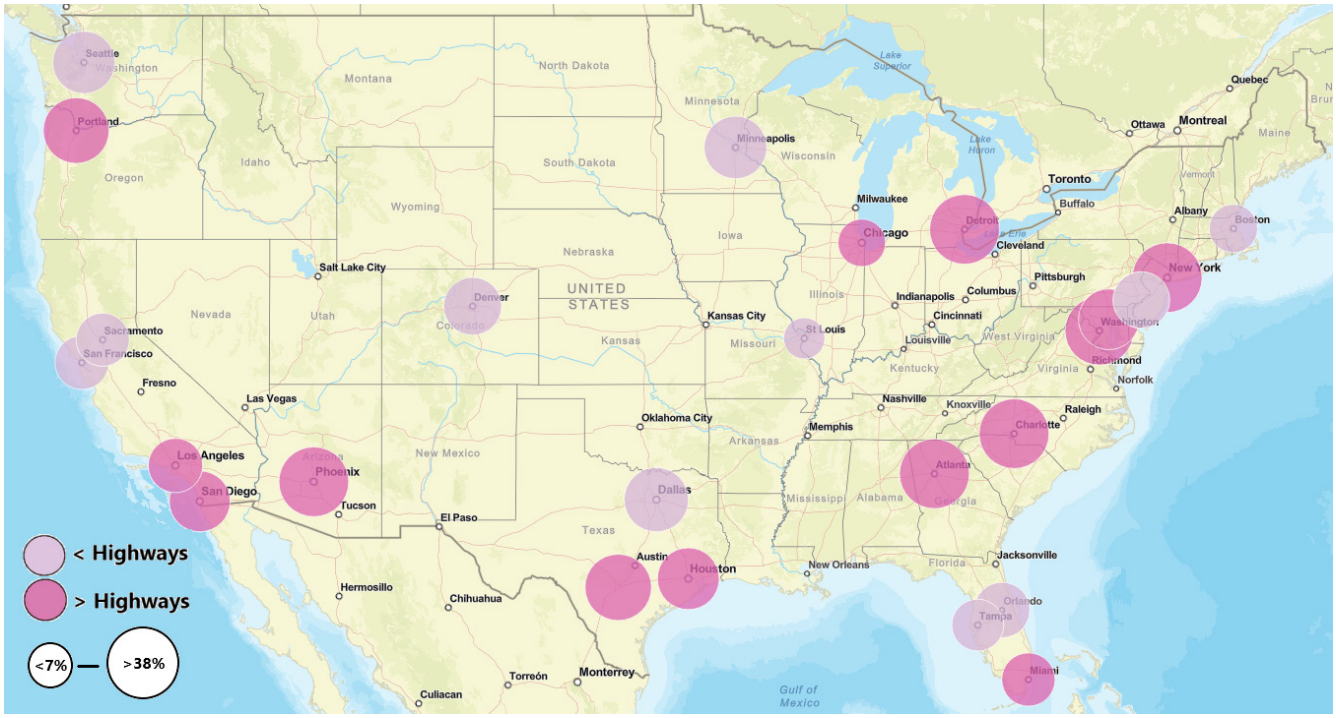


Figure 2 reveals the decrease in collisions on major arterials between April and October versus last year. It also shows which metro areas had a larger decrease in collisions on major arterials compared to both Interstates and freeways/expressways. In all, 14 of 25 metros saw a larger percentage decrease on arterials. This is significant, as major arterials are often travel corridors for cyclists, pedestrians and other users of non-motorized modes, who's safety is heavily affected by increases in travel speeds.

The widest disparity in collisions exists in the Boston area, where collisions on Interstates dropped 38% over the seven-month period but dropped just 8% on arterial streets. Charlotte saw the largest decrease in collisions on arterials, with a 45% drop in reported collisions on FRC3+ roads.

CONCLUSION

COVID-19 has had a large effect in several transportation-related areas, accelerating certain trends, curtailing others, and creating new challenges. For example, working from home had outpaced transit two years ago as a commute mode nationwide, yet the pandemic forced many employers to close offices and allow even more remote workers.

Long before the pandemic, many city departments of transportation implemented “slow,” “safe,” “healthy” streets, yet when COVID-19 hit the United States, cities like New York, Oakland, and Seattle implemented a record number of these programs to promote social distancing while car traffic was down.

Yet the recent spikes in fatality rates in Q2, and in collisions in Q3, further add to a volatile time in transportation. Between April and July, fatality rates skyrocketed to levels last seen in 2006, while crash rates decreased. Yet in the following three months, VMT growth was surpassed by collisions, reversing the early “trend” seen at the onset of the pandemic. It is understandable that with increases in speeds (and therefore, reduced congestion) in urban areas collisions may decrease per mile traveled, but with an increase in speeds, fatalities may increase per mile traveled – all else being equal.

However, as this study focused on major metropolitan areas, it is not encapsulating more rural areas, which may be experiencing higher than normal fatalities for the nation. It is simply too early to tell based on current data available.

National VMT will likely continue grow, albeit, at a much slower rate than seen during the summer, and travelers should expect higher than “normal” peak and off-peak travel speeds for the near future. As such, and going into winter months, safety needs to be top of mind to public officials, drivers, and freight movers. Unfortunately, public budgets are coming under a microscope due to economic conditions associated with COVID-19, putting pressure on departments of transportation to deliver safety improvements and services in a heavily-constrained environment.

ABOUT INRIX RESEARCH

Launched in 2016, INRIX Research uses INRIX proprietary big data, analytics and industry expertise to understand the movement of people and goods around the world.

We achieve this by leveraging billions of anonymous data points every day from a diverse set of sources on all roads in countries of coverage. Our data provides a rich and fertile picture of mobility that enables INRIX Research to produce valuable and actionable insights for policy makers, transport professionals, automakers, and drivers.

INRIX Research has a team in Europe and North America, and is comprised of economists, transportation policy specialists and data scientists with backgrounds in academia, think tanks and commercial research and development groups. We have decades of experience in applying rigorous, cutting-edge methodologies to answer salient, real-world problems.

In addition to our research outputs, INRIX research reports and data are a free and valuable resource for journalists, researchers and policymakers. We are able to assist with data, analysis and expert commentary on all aspects of urban mobility and smart cities. Spokespeople are available globally for interviews.

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