


I-45 North Houston Highway Improvement Project

HOW SAFETY AND CONGESTION WILL BE IMPROVED

Texas Department of Transportation

What are the goals of the NHHIP regarding safety and congestion?

The Texas Department of Transportation (TxDOT) designed the North Houston Highway Improvement Project (NHHIP) so that it increases safety for drivers, cyclists and pedestrians by improving freeway and local street mobility. The top priority is reducing vehicle crashes and traffic congestion while minimizing impacts to adjacent neighborhoods and businesses.

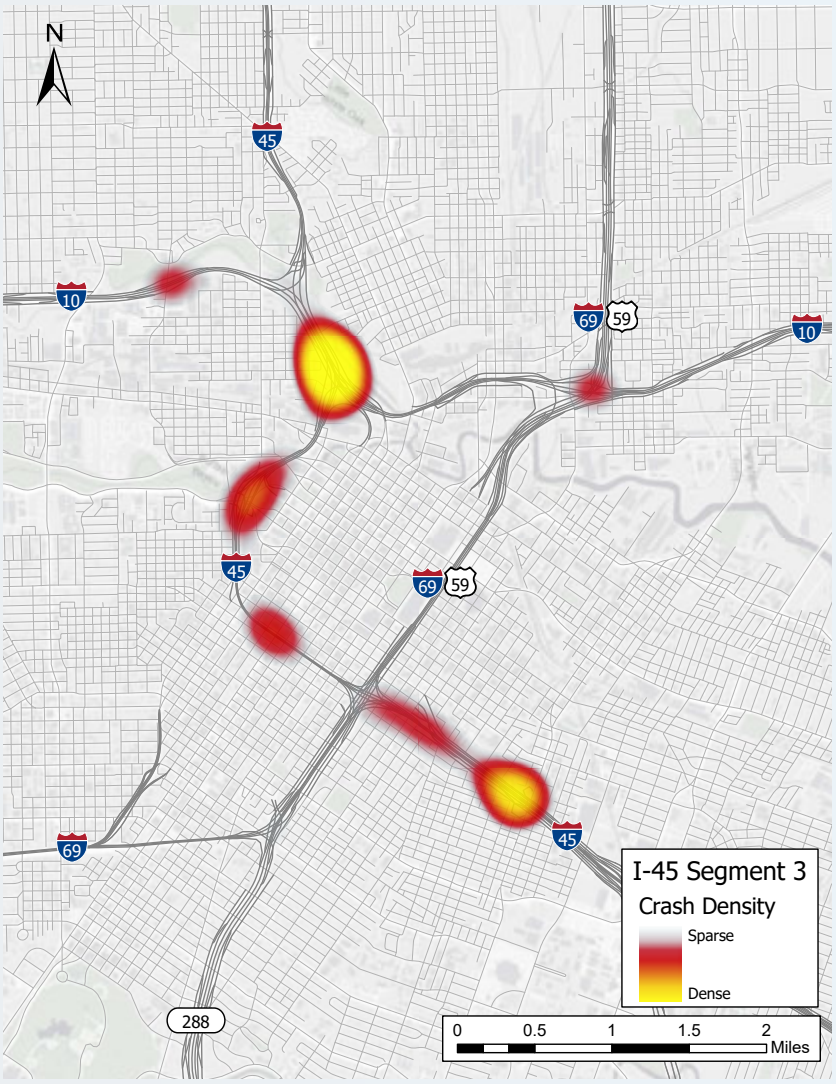
The NHHIP includes over 23 miles of freeway including the Downtown loop system in the heart of Harris County. Many of these roadways have significant operational and safety needs and do not meet current Federal Highway Administration (FHWA) or TxDOT design standards.

The main goal regarding safety and congestion for the NHHIP is to improve the existing conditions to the maximum extent possible using measures of effectiveness (MOEs) to quantify these improvements. The MOEs regarding safety and congestion are:

- Reduction in crash frequency
- Reduction in crash severity
- Reduction in travel time
- Average speed improvement

To achieve these goals requires improving the existing system as compared to the “no build alternative” option. The “no build alternative” option was evaluated and considered and each of the proposed alternatives was compared to this option throughout the extent of the Alternatives Analysis.[1] The Preferred Alternative that came out of the Alternatives Analysis not only greatly reduces the frequency and severity of crashes but also provides the maximum level of mobility improvements.

1 See *FEIS Alternatives Analysis*



Crash density in NHHIP project area.
TxDOT Crash Records Information System (CRIS), 2019

Bridges will be raised to meet national height standards.

How have these goals been met?

Over the years, there have been temporary fixes to the system to improve safety, but the area still has crash rates higher than average interstate crash rates in Texas. In fact, in 2019, the finance and consumer research firm ValuePenguin studied federal road safety and found I-45 to be the second most dangerous road in America.[2]

The NHHIP will bring I-45's outdated infrastructure up to current design standards along with reducing critical safety conflicts by reducing the instances of weaving distances to exits of less than 1,500 feet, eliminating crowded merging locations in short spaces, eliminating or fixing left-hand exits and entrances, and raising low bridge clearances. By fixing these safety conflicts, the NHHIP will reduce the crash frequency and severity for each freeway within the project limits. All freeways show an anticipated reduction in crash rates by at least 20% with a 28% reduction in fatal and injury crashes.

Segment 2 (I-10 to I-610) of the NHHIP is a crash hot spot with a high level of merging locations, left-hand exits, and substandard lane and shoulder widths. In 2018 alone, there were 234 crashes on I-45 between I-10 and I- 610 (Segment 2) with 79 of those fatal or injury crashes. Our analysis shows the proposed configuration will reduce the total crashes between 31% and 59% in Segments 2 and 3.[3]

I-45 between I-10 and Scott Street (Segment 3) is another crash hot spot. There were 783 crashes on I-45 between I-10 and Scott Street (Segment 3) in 2018 alone. The proposed project will reduce the crashes in this segment by 30% which means 235 fewer crashes every year.

Between 2015 and 2018, there were 66 incidents within the area of Segments 2 and 3 of the project when a bridge was hit by a truck passing underneath, and four bridge strikes in Segment 1 during the same period. This project will bring all bridge clearances up to the latest standards, with the goal of reducing bridge hits to zero. These events often trigger the entire freeway closing down to clear crashes and inspect the structural integrity of the bridge, which can cause standstill congestion for several hours.

2 *"The 50 Most Dangerous Roads in America"* by Bailey Peterson, October 30, 2019
https://www.valuepenguin.com/most-dangerous-roads-america

3 *Federal Highway Administration (FHWA)NHHIP Segments 2 and 3 Interstate Access Justification Report (IAJR),* August 2020.

Improving safety and reducing crash frequency will contribute to travel time reliability. In addition, the proposed MaX lanes provide 24/7 dedicated right -of-way for the management of traffic. This added capacity will be managed by either type of vehicle, capacity, and/or ingress/egress points. This increased capacity means more users can access the system which has a subsequent benefit of a reduction in congestion on the local street network as well.

For example, in the afternoon, it is expected to take about 87 minutes to go from north of I-610 into Downtown. With the addition of bi-directional MaX lanes, this would take 17 minutes using a bus or carpooling. In the morning, it is expected to take 34 minutes to go from Downtown to north of I-610. With these improvements, a bus or carpool would take 12 minutes using the bi-directional MaX lanes, a 65% reduction in travel time.

Examples of Travel Time Reduction with NHHIP

Start-End Locations	Travel time in opening year if no NHHIP	Travel time with NHHIP	Reduction in travel time with NHHIP	Cumulative time savings (hours/year)[4]
Airline/Crosstimbers to Convention Center (morning)	77 minutes	19 minutes	75%	251
Near Northside to Midtown (morning)	103 minutes	16 minutes	84%	377
Third Ward to I-610 (afternoon)	75 minutes	18 minutes	76%	247
Memorial Park to EaDo (afternoon)	64 minutes	17 minutes	73%	294
Fifth Ward to Downtown (afternoon)	36 minutes	14 minutes	61%	95

Average speeds will also increase as a result of the NHHIP in certain spot locations.

- On I-45 northbound approaching US 59/I-69 over Scott Street, congestion in the morning is expected to slow to 6 mph in the future without the NHHIP. The proposed improvements would increase the speed to 41 mph.
- On US 59/I-69 southbound next to Downtown, speeds will consistently drop to 10 mph during the morning and afternoon weekdays in the future without the NHHIP, as they often do today. This location will operate at 53 mph with the proposed depressed section of Downtown in the NHHIP.
- On I-10 at the I-45 interchange, speeds are expected to be as low as 20 mph in the future without the NHHIP. With the proposed improvements, speeds are expected to be 50 mph.
- In the morning, I-610 WB approaching I-45 is expected to drop to 12 mph in the future without the NHHIP. This project shows improvement at this location to 54 mph.
- SH 288 slows to a crawl approaching I-45 in the morning and afternoon, which will continue in the future with speeds below 10 mph without the NHHIP. The changes to the SH 288 and I-45 areas of the project bring those speeds up to 47 mph.

4 Assumptions: use route 260 days a year

According to the FHWA, travel time reliability should be considered a key performance measure for multiple reasons. Shippers and freight carriers require predictable travel times to remain competitive. Personal and business travelers value reliability because it allows them to make better use of their own time. Lack of reliability means that businesses may lose money and disrupt delivery and manufacturing processes, or travelers can be late for work, miss appointments, or incur extra childcare fees.

The NHHIP started over 15 years ago as a major regional study partnership between the the Federal Transit Administration, FHWA, Houston-Galveston Area Council (H-GAC), TxDOT, and Metropolitan Transit Authority of Harris County (METRO). The study was named the North-Hardy Corridor Planning Study. Many alternatives to improve safety and congestion along the I-45/ Hardy Toll Road corridor between Greenspoint and Downtown Houston were analyzed and vetted with stakeholders and the public. This study was completed in 2005 and recommended that two separate transit oriented components move forward for further development: 1) light rail and 2) converting the existing one-way, reversible High Occupancy Vehicle Lane to four two-way managed lanes.

While METRO moved forward with light rail development, which resulted in the METRORail Red Line being implemented, TxDOT continued to study improvement alternatives for the managed lanes through a detailed traffic study. Six years later in 2011, TxDOT advanced the managed lane portion as the NHHIP. Since 2011, the alternatives have been analyzed using the H-GAC developed population growth projections and conformity traffic model that is the basis of all recommended projects in the region. The NHHIP recommendations complement the METRORail component through managed lanes, renamed to MaX Lanes to highlight this complement. This was used by METRO as part of their 2019 Bond Referendum to add Bus Rapid Transit to these lanes.

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TxDOT Houston District
7600 Washington Avenue
Houston, TX 77007

To learn more about the NHHIP, scan the QR code and watch the Changes for the Better video.

For more information about the project please visit: www.ih45northandmore.com
Also, find out more about TxDOT at www.txdot.gov, or contact us by email at: HOU-PIOWebmail@txdot.gov and follow us on Facebook, Twitter and/or Instagram @TxDOTHouston.