



I-45 North Houston Highway Improvement Project

AIR QUALITY IS IMPROVING



Is TxDOT Considering Air Quality Impacts of the NHHIP?

Absolutely. The Texas Department of Transportation (TxDOT) conducted two air quality studies – a carbon monoxide (CO) traffic air quality analysis and a mobile source air toxics (MSAT) analysis. In the first study, CO concentrations through the year 2040 were projected to remain below existing national standards, along any segment of the proposed project. The CO modeling indicated that in 2035 (the estimated year of completion of the project), even the worst-case CO concentrations are projected to be well below the applicable National Ambient Air Quality Standards (NAAQS) for CO. See CO Traffic Air Quality (CO TAQA) Tech Report for NHHIP for more details. The NAAQS are set by the Environmental Protection Agency (EPA) at levels which protect public health, including the health of vulnerable populations.

The second study was a MSAT analysis that evaluated nine compounds identified by the Environmental Protection Agency (EPA) as cancer-risk drivers. Study results indicated that MSAT are projected to decrease by 72% from 2018 through 2040. Both air quality studies conducted by TxDOT assumed a substantial increase in vehicle miles travelled (VMT) between the present and 2040, and both are consistent with and supported by the trends in Houston air quality as discussed below.

impression that air quality is getting worse. Or, one might assume air quality worsens when population and vehicle traffic increases. However, data shows that air quality has actually improved over time. To further address public concerns, TxDOT supplemented the 2 air quality studies with additional information on Houston air quality data, trends and projections. From 2000 to 2017, air emissions were reduced in Houston despite more people, traffic, and industry coming into the area (see Houston Trends Table). In addition, the number of days Houston exceeded the ozone standard has dropped from 59 in 2000, to 21 in 2010 and to 14 in 2018.¹

Over the last decade EPA required a nationwide network of near road monitors for three NAAQS – NO₂, CO, and PM 2.5. Since these monitors are sited near heavily trafficked roadways, they were located to represent worst-case scenarios for roadway emissions. All U.S. near road monitors demonstrate attainment for NO₂ and CO. Only a few near-road monitors in the nation show potential exceedances for PM_{2.5}; none were in Texas. The Houston and Texas near-road monitors continue to show concentrations below the applicable NAAQS. See the CO TAQA Technical Report appendix for additional information on near road monitor data.

Air Quality is Improving – Criteria Pollutants

The EPA sets the NAAQS for the criteria certain pollutants [ozone, CO, particulate matter (PM₁₀ and PM_{2.5}), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead] and states must try to “attain” these standards. The greater Houston area attains all federal air standards except for ozone. Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties are nonattainment for the 2008 ozone standard (75 ppb). In July 2018, EPA designated Liberty and Waller Counties attainment for the new lower 2015 ozone standard (70 ppb) and the other 6 counties as nonattainment.

When EPA makes air quality standards more stringent, more areas typically get designated as not attaining the standard. This may give the false

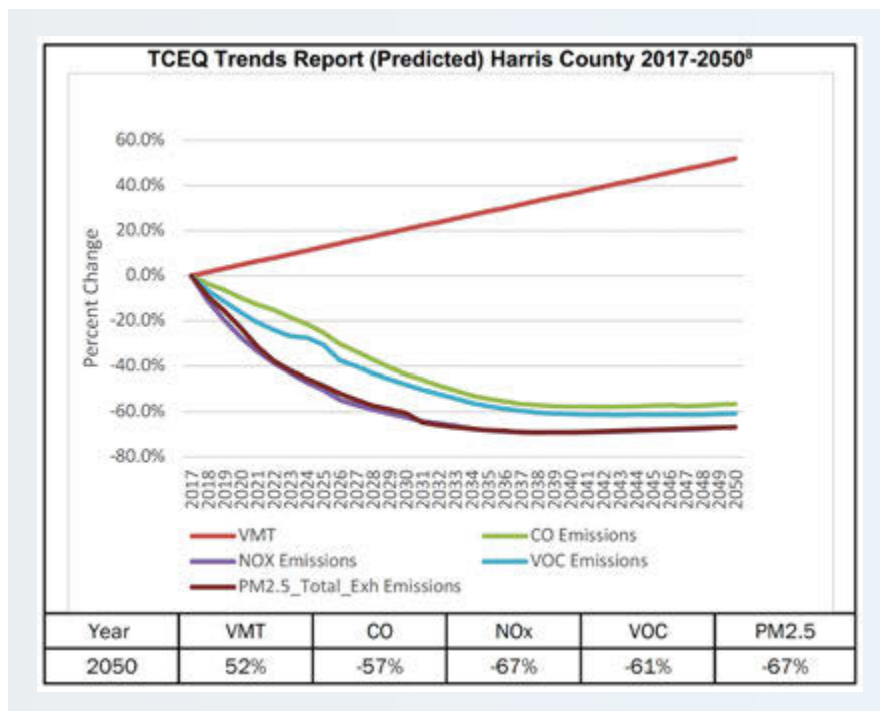
¹ EPA Monitor Values Report for Houston, accessed on October 3, 2019, at: <https://www.epa.gov/outdoor-air-quality-data/monitor-values-report>

From 2000 to 2017, the Houston Trends table below shows decreases in ozone, NO₂, CO and PM_{2.5} levels, while population and VMT increased.

Item	Population (million) ²	Daily VMT (million) ³	1-hour CO (pm) ⁴	Annual Mean NO ₂ (ppb) ⁵	Annual Mean PM _{2.5} µg/m ⁶	8-hour Ozone (ppb) ⁷
2000 - 2017	2.49 - 4.94	91.9 - 133.0	5.7 - 2.1	20.8 - 14.47	14.3 - 10.4	117 - 79
Percentage Change from 2000 to 2017	98%	45%	-63%	-30%	-27%	-32%

Because the area did not meet the federal ozone standard, transportation projects and plans such as the North Houston Highway Improvement Project (NHHIP) must comply with the State Implementation Plan (SIP) for air quality. In addition, regions with populations over 50,000 are required by federal statute to have a regional planning organization to manage a program on how the region will conform to federal air standards. For the Houston region, that organization is the Houston-Galveston Area Council (H-GAC). The Federal Highway Administration (FHWA) determined on August 2, 2019 that H-GAC's 2045 Regional Transportation Plan was in conformance with the SIP. This determination of conformance by FHWA is required before TxDOT can make an environmental decision.

The Texas Commission on Environmental Quality (TCEQ) Trends Report projects on-road mobile source emissions per each Texas county through 2050. All eight Houston-area counties project a downward trend in mobile source emissions from 2017 to 2050 despite increasing traffic. Harris County trends are provided in the table below as an example of projected on-road mobile source emission reductions through 2050. Market changes with electric or other alternative fueled vehicles are not part of this projection, but they are expected to result in even greater emission reductions than what is in the table. For further details on Houston's air quality, see the CO TAQA Technical Report for the NHHIP.



² Population is from FHWA Highway Statistics Series, 2000 and 2017 "Urban Data" for Houston-The Woodlands-Sugarland Census Bureau core-based statistical area at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm>

³ Daily VMT is from FHWA Highway Statistics Series, 2000 and 2017 "Urban Data" file HM-71 for Houston-The Woodlands-Sugarland Census Bureau core-based statistical area at <https://www.fhwa.dot.gov/policyinformation/statistics.cfm>. 2017 is the most recent data available as of October 3, 2019.

⁴ 2000 - 2017 monitor value reports for Houston for PM2.5, NO₂, CO, and Ozone at <https://www.epa.gov/outdoor-air-quality-data/monitor-values-report>

⁵⁻⁷ Ibid.

⁸ TCEQ Trends Report, full title: "The On Road, Mobile Source Trend Emissions Inventories for All 254 Counties in Texas for 1999 - 2050" at: https://www.tceq.texas.gov/assets/public/implementation/air/am/contracts/reports/mob/5821111226FY1514-20150807-tti-MOVES2014_Onroad_EI_Trends_1990_2050.pdf

Air Quality Is Improving - Air Toxics

Air toxics levels have declined in Houston. Air toxics monitoring in Houston from 2014 through 2016 demonstrated benzene was below long-term health risk thresholds.⁹ Even with projected increases in vehicle travel, mobile source air toxics emissions are on the decline in Houston. For the NHHIP, TxDOT analysis projected total mobile source air toxics emissions to decrease by 72 percent from 2018 to 2040, even though NHHIP VMT is projected to rise by 58%. The MSAT are projected to decrease even as VMT increases due to increasingly stringent fuel standards and improvements in vehicle technology. For more detailed information, see the Mobile Source Air Toxics Emissions Technical Report for the NHHIP.

TCEQ monitors hazardous air toxics across the state of Texas. In 2016, TCEQ issued a memo titled “Health Effects Review of 2016 Ambient Air Network Monitoring Data in Region 12, Houston.” The results of the analysis indicate the monitored emissions do not appear to result in any short-term or long-term adverse health effects.¹⁰ TCEQ has a program to address any areas of air toxic concerns called the Air Pollutant Watch List (APWL). There are currently no APWL sites in Harris County.

To address children’s health, EPA performed a study “Assessing Outdoor Air Near Schools” between 2009-2012.¹¹ Initially, EPA considered 62 priority schools throughout the U.S. to conduct ambient air toxics monitoring and 14 of these schools were close to major roads. EPA chose schools based on their modeling that predicted air toxics would exceed health risk thresholds. One of the schools, Young Scholars Academy, is near NHHIP and EPA chose it for the study because of its proximity to major roadways. EPA monitored benzene and 1,3-butadiene and determined that concentration estimates were “not as high as was suggested by the modeling information.”¹² Based on the low monitored values, EPA decided further air toxics monitoring at the school was not needed. For the 14 schools near major roads, mobile source related air toxics monitoring results were below health risk thresholds. The monitoring results were again less than EPA modeling predicted, so EPA did not extend further mobile source related monitoring for the 14 schools abutting major roadways.

Proposed NHHIP Improvements

NHHIP provides options to reduce single occupant vehicle driving — four Managed Express Lanes for use by transit vehicles, buses, car pools, and future autonomous vehicles, as well as improved pedestrian and bicyclist facilities. This is another way in which the project may contribute to reduced congestion and improved air quality. See Bicycle and Pedestrian Position Paper for more details on these facilities that encourage non-motorized travel.

During construction of the project, there may be a temporary increase in dust near the project site. Residents who open their windows for ventilation or cooling their home could experience the intrusion of dust into their home. TxDOT shall provide funding for weatherization and energy efficiency to qualifying community members.

Since questions and concerns arose regarding air quality related to the project, especially during construction, TxDOT will fund ambient air monitoring for a minimum of 5-years near the right-of-way at one location each in Segment 3 and Segment 2 during construction.¹³ At the end of 5 years, TxDOT will assess if further air monitoring will be conducted and if an air monitor is needed for Segment 1. Monitoring will include NO₂, CO, PM_{2.5}, and priority MSAT except PM2.5 will be used as a surrogate for diesel particulate. TxDOT is in discussion with HISD for potentially locating the monitors at schools abutting or within 200 feet of the corridor. Monitoring results will be provided on a publicly accessible website with an option for members of the public to receive monitor data notifications. Monitoring results will be compared to health-based NAAQS limits and EPA air toxics health risk thresholds. TxDOT is consulting with TCEQ and EPA on the development of this program, including risk controls, if needed.

⁹ Houston toxicology analyses, TCEQ, <https://www.tceq.texas.gov/toxicology/regmemo>

¹⁰ Health Effects Review of 2016 Ambient Air Network Monitoring Data in Region 12, Houston, <https://www.tceq.texas.gov/assets/public/implementation/tox/monitoring/evaluation/2016/reg12.pdf>

¹¹ Assessing Outdoor Air Near Schools, EPA, <https://www3.epa.gov/air/sat/index.html>

¹² <https://www3.epa.gov/air/sat/YoungSchol.html>

¹³ The monitoring equipment, operation and analysis will be consistent with EPA federal regulatory monitor criteria; although they will not be EPA and TCEQ approved regulatory monitors, nor part of the TCEQ annual air monitoring plan.

Need More Information?

NHHIP Website: <http://www.ih45northandmore.com/>. See CO TAQA and Mobile Source Air Toxics (MSAT) Technical Reports.

TCEQ Websites

- Houston monitor data toxicology analysis, visit: <https://www.tceq.texas.gov/toxicology/regmemo>
- Air quality forecasts, visit: <https://service.govdelivery.com/accounts/TXTCEQ/subscriber/new>
- Ozone specialized reports, visit: https://www.tceq.texas.gov/cgi-bin/compliance/monops/8hr_4highest.pl
- Air quality success data, visit: <https://www.tceq.texas.gov/airquality/airsuccess>

EPA Websites

- Air monitor data, visit: <https://www.epa.gov/outdoor-air-quality-data/monitor-values-report>
- EPA Air Quality Trends: <https://gispub.epa.gov/air/trendsreport/2018/#resources>
- EPA is required to review the NAAQS at 5-year year schedule following a process that allows for the public and scientific community to submit relevant information for inclusion in their NAAQS assessment
See: <https://www.epa.gov/criteria-air-pollutants/process-reviewing-national-ambient-air-quality-standards>
- The EPA Integrated Risk Information System (IRIS) characterizes the health hazards of chemicals found in the environment, including MSAT. The process for developing the IRIS assessments allow for the for the public and scientific community to submit relevant information. See: <https://www.epa.gov/iris/basic-information-about-integrated-risk-information-system>

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- Visit: <https://drivecleantexas.org>

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



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