



EXECUTIVE SUMMARY

Community Workshop: Health Impact Assessment of the North Houston Highway Improvement Project

Air Alliance Houston has been funded by the Urban Institute and the Robert Wood Johnson Foundation under the [500 Cities Data Challenge](#) to conduct a Health Impact Assessment (HIA) of the proposed I-45 highway expansion project known as the North Houston Highway Improvement Project (NHHIP).

HIA is an objective methodology designed to establish the ways in which a proposed policy or project could benefit and/or harm community health.

Air Alliance Houston is concerned about the health effects of the freeway on the roughly [80,000 Houston-area children](#) attending schools within traffic-related air pollution (TRAP) zones. Children living or attending school near highly trafficked freeways like I-45 are at greater risk of damage to their developing brains, lungs, hearts, and circulatory systems. Furthermore, a number of traffic-related air pollutants – such as diesel particulate matter, benzene, 1,3 butadiene, and formaldehyde – are known to cause cancer.

Table 1 outlines the project goals, the health effects under consideration, and the impact categories included in the assessment.

The NHHIP project offers an opportunity to integrate protective and health-promoting design features that will reduce school children’s exposure to the freeway and help protect community health.

Workshop Goals

The workshop was designed to educate participants about the health effects of freeways; familiarize them with the process of conducting an HIA; and, give them an opportunity for input on the focus of the assessment and associated recommendations.

Stakeholder Feedback

The workshop solicited feedback from stakeholders in two ways.

HIA Goals	
1.	Quantify the project's potential positive and negative health effects for inclusion in the final environmental impact statement.
2.	Serve as a model project to integrate HIAs into future mobility projects in the metro-Houston area.
3.	Raise public awareness of the public health implications of freeways.
Health Effects	
Focusing on schools located within 150 m (500 ft) of the NHHIP project, the HIA is using a combination of existing data sets, data gathering, literature review, and stakeholder input to assess the potential positive and negative health effects associated with:	
1.	the proposed freeway expansion; and,
2.	proposed mitigation strategies.
Impact Categories	
Air quality	Noise
Mobility	Visual impacts
Low income communities	Urban heat island
Economic development	Flooding
Parks and green space	

Table 1. HIA Overview: Goals, Health Effects under Consideration, Impact Categories.

The learning objective for the project team was to better understand the environmental impacts, health effects, and locations along the NHHIP corridor that are most important to stakeholders.

First, attendees were invited to share the positive and negative changes they anticipate resulting from the NHHIP project, the groups of people they anticipate being most affected, and where along the expansion the changes are most likely to occur. (See p. iv.)

Participants were then divided into groups and asked to discuss the impact of the project on a school that is adjacent to I-45 through the lens of one of three environmental impact areas: air quality, mobility, or flooding. (See pp. iv-v.)

STAKEHOLDER FEEDBACK: POSITIVE & NEGATIVE CHANGES

The first opportunity for feedback asked stakeholders to share a list of the changes they anticipate the NHHIP expansion will bring to their community: both positive and negative.

Significantly, the following changes were included in either or both the positive and negative columns of most stakeholder responses:

- Congestion, idling, commute time.
- Impact on connectivity.
- Impact on traffic-related air pollution.
- Impact on flooding.
- Impact on economic development.

The following groups were identified by a majority of stakeholders as the people who will be most impacted by the project (positively and/or negatively):

- Residents, businesses, and institutions near the highway.
- Low income communities and communities of color.
- Commuters into downtown.
- Children, particularly during outdoor playtime at school.

These results suggest that further research should be conducted to understand the underlying levels of vulnerability among neighborhoods adjacent to the freeway as well as which opportunities for modifying the current design would benefit the groups that are at highest risk of negative health and economic outcomes associated with the project.

SCENARIO EXERCISE: IMPACT OF NHHIP ON SCHOOLS

After identifying the positive and negative changes they anticipate occurring over the length of the NHHIP project, stakeholders divided into three groups to consider how those impacts might affect a specific school within the context of one of three environmental impact categories: air quality (Figure 1), mobility (Figure 2), or flooding (Figure 3).



Figure 1. Air Quality Exposure: Average Daily Traffic Density within 150m of NHHIP. Data Source: TX Department of Transportation, 2016.

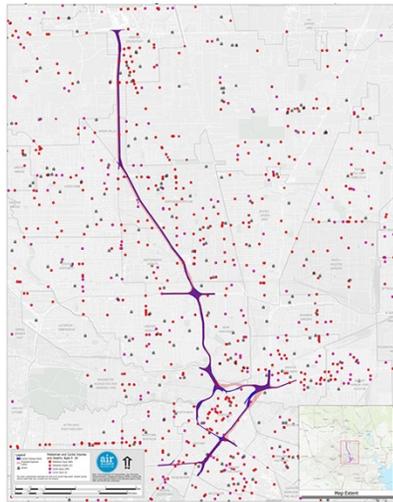


Figure 2. Mobility Exposure: Injuries and Deaths of School-Age Children Near NHHIP. Data Source: TX Department of Transportation CRIS, 2018.

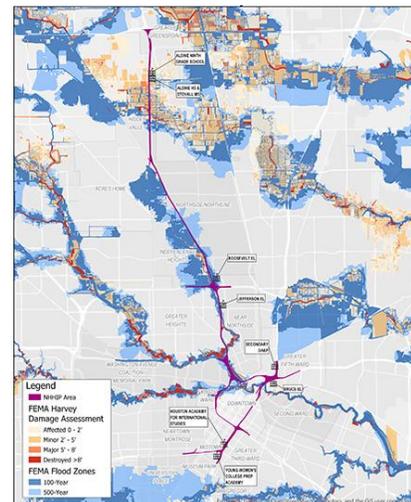


Figure 3. Flooding Exposure: FEMA Floodplains & Harvey Damage Assessment. Data Source: U.S. FEMA, 2018.

After reviewing maps showing a school adjacent to the NHHIP expansion and relevant environmental exposures, example demographics, and their answers to the positive and negative change activity, each group was asked to develop a list of: members of the community depicted on

the map; existing assets and hazards; new assets and hazards that will be caused by the NHHIP project; and, strategies to bolster assets and protect the community from potential hazards. Table 2 summarizes the results from all three environmental categories.

Air Quality	Mobility	Flooding
<i>Who is the community?</i>		
<ul style="list-style-type: none"> • Neighborhood children: high rate of Hispanic, special needs, asthma, no car. • Students: walking to school, outdoor activities. 	<ul style="list-style-type: none"> • Neighborhood children: high rate of Hispanic, asthma. • Anyone living or working near the freeway. • Transit riders, pedestrians, cyclists. • Teachers, school staff. 	<ul style="list-style-type: none"> • Neighborhood children: high rate of Hispanic, low income, asthma, no car. • Teachers, school staff. • Flooding may impact commuting patterns near the school, particularly use of the nearby bayou greenway.
<i>What are the school location's assets?</i>		
<ul style="list-style-type: none"> • Only school in neighborhood. • Two nearby churches. 	<ul style="list-style-type: none"> • Access roads. • Detention pond in NHHIP design. 	<ul style="list-style-type: none"> • Schools are often used for community events and meetings. • Neighborhood SPARK park may be the only recreational opportunity in the neighborhood.
<i>What problems does the NHHIP project raise?</i>		
<ul style="list-style-type: none"> • No bussing within 2 miles of school, increasing likelihood of exposure to traffic-related air quality by walking/cycling over or under the freeway. • No buffer between school and freeway. Boxed in by other roads. • Limited tree canopy. 	<ul style="list-style-type: none"> • Lack of connectivity over or under the freeway where it intersects Little White Oak Bayou. • School is not connected to nearby green space on the other side of freeway. 	<ul style="list-style-type: none"> • Concern that current street flooding will worsen with the widened freeway. • Poor water quality in the bayou (which floods). • Park desert. Food desert. Economic, social, retail amenities on other side of freeway.
<i>What protective strategies would you recommend?</i>		
<ul style="list-style-type: none"> • Install air quality monitors. • Construction mitigation activities: no diesel-fired equipment, control dust, control noise. • Bus students to different school during construction. • No idling policy. • Reduce carpool line: carpooling, ride share, safe routes to school, add nearby bus stop. • Implement operational guidelines based on daily air quality. • Fund interventions such as air filters, vegetative barriers. • Depress highway. 	<ul style="list-style-type: none"> • Install air quality monitors. • Partnerships with clinics and school nurses to increase access to health care services. • Fund interventions such as air filters, vegetative barriers. • Educate parent/schools regarding the risks associated with walking/cycling to school under current conditions and ways to make it safer. • Crossing guards. 	<ul style="list-style-type: none"> • Hydrological assessment of the NHHIP design's effect on flooding. • Improve storm infrastructure, elevate flood prone areas. • Fund construction for elevated pedestrian bridges across the freeway.

Table 2. Stakeholder Feedback on the Impact of the NHHIP Project on an Example School and Potential Protective Strategies under Three Impact Categories: Air Quality, Mobility, Flooding. Each group was asked to develop a list of: members of the community depicted on the map; existing assets and hazards; new assets and hazards that will be caused by the NHHIP project; and, strategies to bolster assets and protect the community from potential hazards.



POLICY OPPORTUNITIES

The HIA policy advisory committee met immediately after the stakeholder workshop to discuss the major themes identified during the morning session.

Complexity & Interconnectivity

The group shared a general sense that health had not been a direct focus of conversations about the NHHIP project prior to the HIA workshop, although health-related topics such as quality of life and increasing access to multiple modes of transportation have influenced design decisions both within TX DOT and among its partners. Focusing on the potential health effects associated with three environmental impacts – air quality, mobility, and flooding – brought to light the complexity of the project and the interconnectedness of the potential social, environmental, economic, and health outcomes flowing out of it.

A Range of Perspectives

The policy advisory group acknowledged and reflected the wide spectrum of opinions about the NHHIP project that were expressed by stakeholders at the workshop. Approaches ranged from strong opposition to the project to strong support for it. Citing lessons learned from the [I-10 West expansion in Katy](#) a decade ago, some stakeholders are concerned that increasing capacity on I-45 will attract more motorists (a concept called “induced demand”), leading to increased environmental exposures such as air pollution without fixing the congestion problem in the long run. Stakeholders on the other end of the spectrum see the NHHIP project as an opportunity to improve the central business district: increasing connectivity with surrounding neighborhoods, increasing green space downtown, and building out a more comprehensive walking and cycling infrastructure in that part of the city.

Disparity Between the Current Approach to Segments 1-2 v. Segment 3

Segment 3 has been funded, is scheduled to break ground in 2020, and is the subject of active conversations with the City of Houston regarding design improvements. Many stakeholders at the workshop expressed a desire to work with TX DoT and its partners to refine the design of Segments 1 & 2 so that, in addition to enhancing the efficiency of the regional road network, NHHIP improves quality of life in neighborhoods adjacent to the northern stretches of the expansion.

Funding Opportunities

Three funding pools were identified as possibilities to replicate the design work and regulatory negotiations in the central business district: city/county funding (including the school district), public/private partnerships (including healthcare), and philanthropy. The TX DoT budget and H-GAC funds may also come into play.

NEXT STEPS

The community workshop marked the end of the project’s scoping phase. The team will use the results of the workshop and the policy advisory committee meeting to inform the assessment and prioritize recommendations.