



## MEMORANDUM

**TO:** Mayor and City Council

**THROUGH:** Michael Rogers, Assistant City Manager *MR*

**FROM:** Richard Mendoza, P.E., Director, Transportation and Public Works *RMM*

**DATE:** April 7, 2025

**SUBJECT:** **Additional Information Regarding Air Quality at Caps**

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The purpose of this memorandum is to provide responses to questions posed at the Climate, Water, Environment, and Parks Committee (CWEP) meeting on February 26, 2025, regarding the quality of experience on highway caps, particularly as related to air quality. The information included in this memorandum provides a summary of existing and ongoing analyses regarding air quality and other microclimate factors potentially influencing how people may experience potential caps over I-35.

### **TxDOT Environmental Impact Study**

The TxDOT I-35 Capital Express Central Project Environmental Impact Study (EIS)<sup>1</sup> identifies the purpose and need for the roadway project, evaluates the potential environmental consequences of multiple alternatives for the project, and identifies Modified Build Alternative 3 as the preferred alternative. As part of the EIS, TxDOT evaluated air quality impacts for the baseline “No Build” and for their “Build” scenarios. The EIS evaluated the impacts of the TxDOT roadway project without consideration for caps over the highway.

As part of the air quality assessment<sup>2</sup> for the Capital Express Central Project, a carbon monoxide (CO) traffic air quality analysis (CO TAQA) was completed to assess whether the proposed project would adversely affect local air quality by contributing to CO levels that exceed the 1-hour or 8-hour CO National Ambient Air Quality Standards (NAAQS). The analysis results for each alternative indicate that CO concentrations would not be expected to exceed the national standard at any time along any segment of the project, even assuming worst-case conditions.

TxDOT also conducted a Quantitative Mobile Source Air Toxics Analysis for the Capital Express Central Project. That analysis suggests that although there is incomplete or unavailable information to evaluate project-specific Mobile Source Air Toxics 4 (MSAT) health impacts, regardless of the build alternative

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<sup>1</sup> [CapEx Central Final ROD and FEIS 2023-08-14](#)

<sup>2</sup> [APPROVED-FEIS-ROD Appendix-P-Air-Quality 2023-08-14](#)

chosen, emissions would likely be lower than present levels in the design year as a result of EPA regulations for vehicle engines and fuels. The Final Environmental Impact Study (FEIS) suggests that a decrease in MSAT emissions can be expected for both Build and No Build alternatives in 2050, compared to the existing year of 2023.

In 2023, City Council approved [Resolution 20231214-061](#) to fund approximately \$15M to TxDOT to pursue 30% design and environmental clearance of potential City-funded caps and stitches over I-35. Because the caps pose minimal impacts on environmental concerns within the highway, TxDOT will be pursuing a categorical exclusion determination from the Federal Highway Administration. Categorical exclusions are a category of actions that do not individually or cumulatively have a significant effect on the human environment. Therefore, neither an environmental assessment nor an environmental impact statement is required.

In addition, TxDOT is analyzing air quality inside the tunnels and at tunnel exhaust ports as a part of the environmental review and planning for the deck caps based on engineering standards found in the American National Standards Institute/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 217-2020. These standards address the design, construction, testing, commissioning, operation, and maintenance requirements of the ventilation system, which would be appropriately sized and continuously monitored to ensure air quality for tunnel occupants and the surrounding environment is within acceptable limits.

### **Peer City Research**

Understanding that many in the Austin community have additional questions regarding air quality conditions at potential highway caps, staff researched peer cities with existing highway caps (including Seattle, Boston, and Denver) to determine if any localized air quality analyses have been conducted at existing caps around the country. Of particular interest is the potential degree to which highway caps may impact prevailing air quality conditions along a highway.

Of these and other peer cities, staff only found an existing air quality study for the I-70 cap in Denver<sup>3</sup>, as referenced at the CWEP meeting. The key findings from that study are as follows:

- Denver, Colorado's Cap is over I-70, currently named as the "Central-70 Cover Park":
  - Amenities include a playground, splash pad, soccer field, and amphitheater;
  - Opened in 2022;
  - \$125M Park; and
  - Less than 800 feet, therefore does not require mechanical tunnel ventilation systems
- Air Quality studies (2023) were conducted by Colorado Public Radio News and University of Colorado Boulder to run a series of air monitors on the deck park:
  - The studies measured ultrafine particles associated with traffic emissions and particulate matter (PM) 2.5 at the park and within the adjacent neighborhood;
  - Traffic emissions reach the edges of the highway cap, but pollution levels in the center were no higher than the locations in the surrounding neighborhoods;

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<sup>3</sup> Brasch, S. (2023, October 30). *Colorado built a park over I-70 to contain pollution. is the air safe to breathe?*. Colorado Public Radio. <https://www.cpr.org/2023/10/30/colorado-built-a-park-over-i-70-to-contain-pollution-is-the-air-safe-to-breathe/>

- Pollution was more elevated at the edges of the park compared to the surrounding neighborhoods. Air quality levels recorded in this research was not shared, so it is uncertain if these levels at the edges exceeded air quality standards; and
- The park's center had lower level of pollution than at the edges of the park.
- Another air monitor on a nearby neighborhood school, set up in 2017, monitored particulate pollution linked to the I-70 construction dust:
  - There were some spikes linked to construction dust, but those spikes did not measure levels above federal air quality standards for a range of pollutants;
  - These monitors found that between 2017 and 2023, average particulate levels are now higher than before the I-70 viaduct was torn down;
  - However, average levels of nitrogen dioxide, a pollutant closely associated with traffic pollution, has declined.

### **I-35 Cap and Stitch Microclimate Study**

Because the TxDOT environmental study for caps will not model the impacts the caps will have on future air flows and potential pollutant dispersions, staff developed a consultant scope-of-work in 2024 to evaluate localized conditions related to air quality, heat, and noise on the caps. The modelling is intended to identify potential impacts to cap users' comfort and health and to propose suggested mitigation measures as amenity design guidelines. The results of the study will be integrated into the future design phase for cap amenities, particularly regarding vegetation placement and edge conditions.

This Microclimate Study is funded by the City's \$1.12M Reconnecting Communities Pilot Planning Grant. Because this [Infrastructure Investment and Jobs Act](#) (IIJA)-funded grant program is subject to review under Executive Order Unleashing American Energy<sup>4</sup>, staff have voluntarily paused work pending the 90-day review period to ensure the City is able to compensate the consultant for future work.

Prior to pausing work, the microclimate study made progress on its first iteration of modeling at the 11<sup>th</sup>-12<sup>th</sup> Street cap, with additional modelling at other caps to follow. The findings summarized below are preliminary and have been shared with stakeholders for review and comment, including the TxDOT Environmental team. These preliminary findings have not yet been shared publicly. Staff anticipate recommencing the project in May 2025, after the 90-day federal review, with the intention of sharing this information publicly upon stakeholder review and verification.

**Preliminary findings for the 11<sup>th</sup>-12<sup>th</sup> Street Cap show that the depression and concrete retaining walls that the TxDOT project is providing may significantly lessen negative air quality impacts and improve noise comfort on top of potential caps. Additionally, there may be opportunities to strategically design on-cap amenities to direct air flows and place vegetation (trees) to further mitigate potential extreme heat concerns, as well as buildings to absorb noise volumes.**

The attached graphics illustrate scenarios with decks only (no build) and decks that provide enhanced amenities (build scenario) for the potential 11<sup>th</sup>-12<sup>th</sup> Street Cap, forecasting particular matter levels with a diameter of 2.5 micrometers or less, noise levels, and Mean Radiant Temperature (MRT) on the deck cap. The following preliminary findings for the 11<sup>th</sup>-12<sup>th</sup> Street Cap continue to be a work in progress:

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<sup>4</sup> [Unleashing American Energy – The White House](#)

- **Air Quality:**
  - On cap PM2.5 (particulate matter with a diameter of 2.5 micrometers or less) levels are well below thresholds of 16 and 45 micrograms/meters<sup>3</sup> which pose moderate and significant threat to occupants' health
  - The model shows most pollutants pool within the highway canyon and minimal amounts move over the 20+ feet walls of the sunken highway
  
- **Noise Level:**
  - On cap noise levels with basic amenities (grass and trees only) are projected to be up to 79dB. On cap noise levels assuming full on cap amenities (enhanced amenities, including buildings) are as low as 53dB. Enhanced amenities such as vegetation and buildings can serve as noise blocks.
  - For reference, noise levels at 75dB (equivalent to the sound of landscaping equipment from inside the house) can exceed human comfort levels.
  - Existing noise level in the area around the potential 11<sup>th</sup> – 12<sup>th</sup> Street Cap were measured at 75dBA during consultants site visit in October 2024.
  
- **Heat/Median Radiant Temperature (MRT):**
  - The locations and orientation of buildings, vegetation, and shaded areas in the build scenario (enhanced amenities) may be strategically designed to result in median radiant temperatures between 5 and 30 degrees cooler than no build scenario (decks only).
  - MRT measures the average temperature of all surfaces, and coupled with air temperature and wind flow, it provides an indication of thermal comfort because it accounts for radiant heat exchange between the human body and its surroundings.

Staff look forward to continuing this microclimate study by extending the air quality, noise, and heat analyses to other potential caps. This continued work will help ensure that amenities are strategically designed to provide a high-quality, comfortable on-cap experience for users.

If you have any questions, please contact Brianna Frey, Strategic Projects Director, Transportation and Public Works [brianna.frey@austintexas.gov](mailto:brianna.frey@austintexas.gov).

cc: T.C. Broadnax, City Manager  
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 Brianna Frey, Strategic Projects Director, Transportation and Public Works

# ATTACHMENT. 11<sup>TH</sup> – 12<sup>TH</sup> STREET CAP NO BUILD AND BUILD MODEL RESULTS

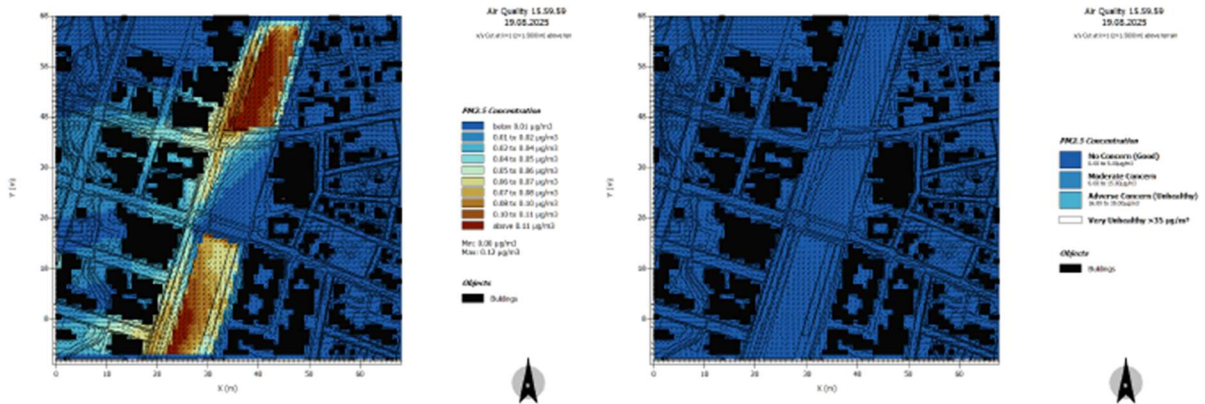
The following graphics illustrate scenarios with decks only (no build) and decks that provide enhanced amenities (build scenario) for the potential 11<sup>th</sup>-12<sup>th</sup> Street Cap, forecasting Particulate Matter (PM) 2.5 levels.

## Task 2.5 Air Quality PM 2.5

No Build

Forecast Date: August 19<sup>th</sup> Time: 4 PM Height Above Ground Plane: 5 feet [1.5 meters]

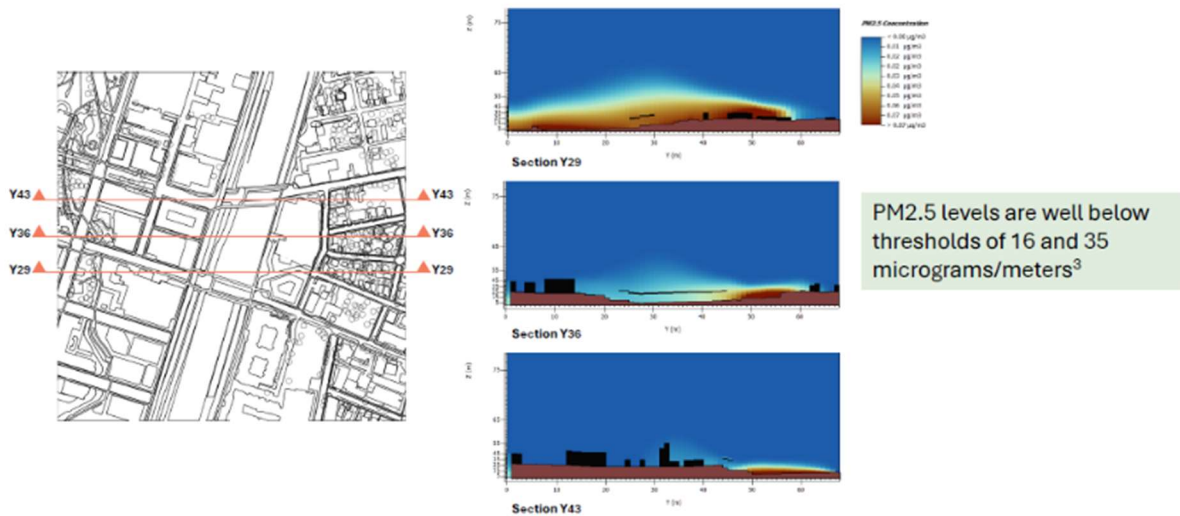
Particulate Matter is fine particles that can penetrate deep into the lungs and bloodstream thereby increasing the risk of respiratory and cardiovascular diseases.



## Task 2.5 Air Quality PM 2.5 Sections

No Build

Forecast Date: August 19<sup>th</sup> Time: 4 PM Height Above Ground Plane: 5 feet [1.5 meters]

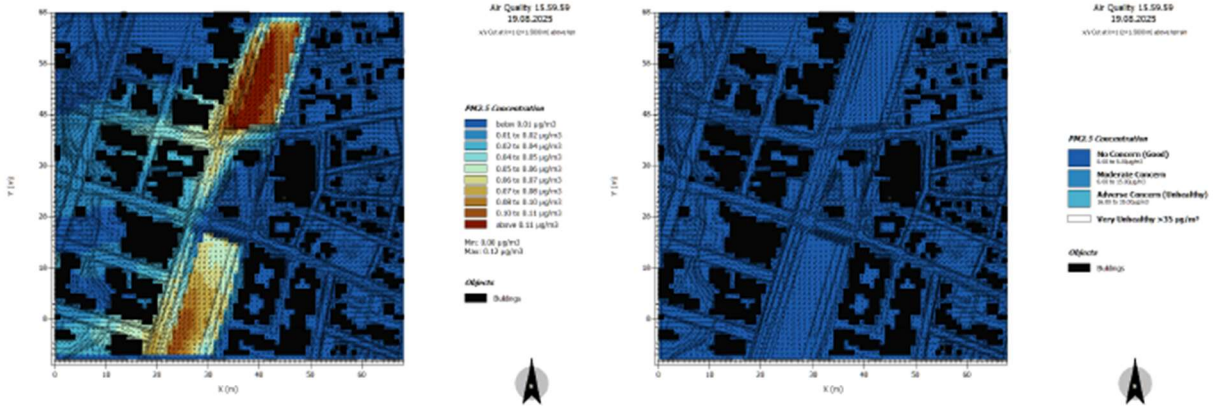


# Task 2.5 Air Quality PM 2.5

Build

Forecast Date: August 19<sup>th</sup> Time: 4 PM Height Above Ground Plane: 5 feet [1.5 meters]

Particulate Matter is fine particles that can penetrate deep into the lungs and bloodstream thereby increasing the risk of respiratory and cardiovascular diseases.



The following graphic illustrate decks only (no build) and decks that provide enhanced amenities (build scenario) for the potential 11<sup>th</sup>-12<sup>th</sup> Street Cap, forecasting Mean Radiant Temperature (MRT) on the deck cap.

# Task 2.5 No Build and Build MRT

