

Project-Level Greenhouse Gas (GHG) Analyses



Analysis estimated lifecycle energy and GHG emissions from construction, operation, and maintenance of transportation facilities for project alternatives. GHG analyzed include: • carbon dioxide (CO₂) • methane (CH₄) • nitrous oxide (N₂O)

Analysis Results and Limitations that Effect Estimates

- The analysis indicated that the preferred alternative would produce more GHG from construction, operation, and maintenance of the facility than Alternative 2, but the greenhouse gas emissions estimated for the two build alternatives are not substantially different.
- Travel demand modeling does not forecast mode shift to transit and active transportation.

Strategies for GHG Emissions Reduction

- Travel demand management - Mode Shift
 - Build Alternative 2
 - Bus Rapid Transit (40.3 miles*), Shared-use Paths (17.7 miles)
 - Modified Build Alternative 3
 - Bus Rapid Transit (36.7 miles*), Shared-use Paths (19.3 miles)
 - No Build - No Bus Rapid Transit or Shared-use Paths
- All of the alternatives in future years would potentially be lower due to future technology improvements (fleet electrification), and future vehicle emission standards.

Construction, maintenance, and operations activities are broken into 5 categories:



Estimated emissions for the following types of facilities:



Images from FHWA Infrastructure Carbon Estimator (ICE) – May 2021

*Length of Bus Rapid Transit based on managed lanes miles in both directions

Potential Impacts on I-35 from Climate Change



Risk Assessment for Changing Climate

Predicted Climate Change Impacts on the Proposed Project

- All risks predicted to be low to medium with resiliency strategies; no high or extreme risks
- Medium risk for extreme precipitation event-flooding due to managed lanes, mainlanes, and SUP depressed in some sections, may result in notifications, temporary closures, or detours
- Concrete more resilient to climate changes than asphalt and requires less maintenance

TxDOT Climate Resiliency Strategies

Design

- Utilization of concrete on roadways and shared-use path
- TxDOT Stormwater Management and Design
- Hydraulics Transportation and Infrastructure

Aesthetics (on-going public input)

- Aesthetics may include shade structures and vegetation along with the SUP

Maintenance

- Periodic maintenance assessments

Emergency Management and Response

- Traffic Management
- TxDOT statewide inclement weather and road condition notification system
- Communication strategies
- Advance Preparation
- Infrastructure Assessments after major events

	Managed Lanes, Mainlanes, and Frontage Roads	Bridges and Overpasses Structures	Pedestrian and Bicycle Shared Use Paths
Increased Temperature Drier soils, expansion, and cracking of materials	High	High	High
High Temperature Extremes Vehicle Durability	High	High	High
Photochemical Smog, decreased visibility	High	High	High
Network power failure due to excess demands	High	High	High
Health effects	High	High	High
Low Temperature Extremes Accumulation of winter precipitation	High	High	High
Extreme Precipitation Events Flooding	Medium	High	Medium
Expansion and cracking of materials, water sheeting on project surface	High	High	High
Increased CO₂ Durability of Structures	High	High	High
Wildfire Fire and Heat Damage	High	High	High

Project Component

