

Appendix F

GREENHOUSE GAS TECHNICAL MEMORANDUM

KINGS BEACH WESTERN APPROACH PROJECT



Technical Memorandum

March 9, 2020

To: Project: Kings Beach Western Approach Project

Attn:

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CC: File No.: MEMO_KINGS BEACH GHG.DOCX

Subject: Operational GHG Emissions Analysis

Introduction

This memorandum has been to summarize the results of operational emissions modeling for greenhouse gas (GHG) emissions associated with the proposed Kings Beach Western Approach Project (Project). Operational GHG emission were estimated for two design alternatives: Alternative 3 (Roundabout) and Alternative 4 (Signalization)

Alternatives Analyzed

The project design alternatives are described in detail in the Kings Beach Western Approach Traffic Operations Analysis Report (TOAR) and Intersection Control Evaluation (ICE), dated January 2020. As provided in the TOAR/ICE, the design alternatives are as follows:

Alternative 3 (Roundabout)

This alternative features the construction of a hybrid four-legged modern roundabout shifted slightly west of the existing intersection and will incorporate Brassie Avenue as a leg of the intersection. The roundabout also will include the road diet east and west of the intersection. The current full access driveway connected as the south leg of SR 28/SR 267 will be converted to a right in/right out only. See Attachment 1 for the Roundabout Alternative design.

Alternative 4 (Signalization)

This alternative includes modifications to the existing lane geometrics to accommodate the road diet, additional buffered bicycle lanes and modifications to existing signal at SR 28/SR 267 to



accommodate modified lane geometries and move the signal poles out of the existing sidewalks. See Attachment 2 for the Signalization Alternative design.

Under both alternatives, a road diet would be implemented between East Agatam Avenue and Secline Street.

Emissions Modeling Methodology

Traffic operations under both design alternatives was analyzed using SIDRA 7.0 Trip for years 2018 (Existing Conditions) and 2045 (Cumulative Conditions). The traffic operations methodology, analysis conditions, and Alternative design parameters are described in detail in the TOAR/ICE. SIDRA calculates fuel consumption and greenhouse gas generation using a detailed set of parameters including vehicle class mix, drive modes (acceleration, deceleration, idling and cruise cycles), vehicle movements in each traffic lane, as well as road grade and relevant speeds (cruise, initial, final). Light and heavy vehicles are treated separately with different parameter for mass, acceleration and deceleration characteristics. The SIDRA model output for Alternative 3 (Roundabout) and Alternative 4 (Signalization) are provided as Attachment 3 and Attachment 4 to this memo, respectively.

Emissions Output

The operational emissions output for Alternative 3 (Roundabout) and Alternative 4 (Signalization) are summarized in Table 1 below. The operational GHG emissions associated with Alternative 3 (Roundabout) would be substantially lower than emissions associated with Alternative (Signalization), primarily due to a reduction in vehicle idling. As provided in the TOAR/ICE, the following delay conditions for the worst lane movement are anticipated under Summer Friday PM peak hour conditions for year 2045: Alternative 3 (Roundabout) 12.6 seconds delay; Alternative 4 (Signalization) 38.7 seconds delay.

Table 1 - Project Construction-generated Air Pollutant Emissions (Annual)

Alternative	Operational Emissions (metric tons CO2 per year)	
	Year 2018	Year2045
Alternative 3 - Roundabout	152	176
Alternative 4 - Signalization	289	432
<i>Percent Reduction Using Roundabout</i>	<i>47%</i>	<i>59%</i>