Appendix E, Attachment L – High-Level Summary Report of the EWA EIA Study Findings for the Selection of a Preferred Alternative

Environmental Statement
East-West Arterial Extension:
Section 2 (Woodland Drive – Lookout Road)
Section 3 (Lookout Road – Frank Sound Road)

Whitman, Requardt & Associates, LLP
Engineers · Architects · Environmental Planners Est. 1915

MEMORANDUM

Date: May 28, 2024

From: Whitman, Requardt & Associates, LLP (WRA)

Subject: High-Level Summary Report of the EWA EIA Study Findings for the Selection of a Preferred Alternative

Work Order Number: 35184.003

Contract Number: PPC-2022-NRA-007-RFP

Project: Phase 2 of EWA Extension EIA

BACKGROUND

The National Roads Authority (NRA) is the Government entity responsible for planning, design, construction, and maintenance of public roads on the island of Grand Cayman.

In 2022, the NRA acquired the services of Whitman, Requardt & Associates, LLP (WRA) to perform an Environmental Impact Assessment (EIA) for the East-West Arterial (EWA) Extension, Sections 2 and 3. To support these efforts, the firms of Remington & Vernick Engineers (RVE) and Baird & Associates were also separately contracted to conduct specialized Pre-Project Hydraulic and Hydrologic (H&H) analysis.

The Environmental Assessment Board (EAB), a subcommittee of the National Conservation Council (NCC), in accordance with Section 3(13) of the National Conservation Act of 2013, is overseeing the preparation and implementation of the EIA.

The EWA Extension comprises three sections.

- Section 1 extends between Hirst Road and Woodland Drive and is currently under construction.
- Section 2 would connect Woodland Drive to Lookout Road (also includes Will T Connector).
- Section 3 would connect Lookout Road to Frank Sound Road.

In May 2005, the proposed EWA Extension corridor from Woodland Drive in Bodden Town, to Frank Sound Road in North Side was initially planned and gazetted by the NRA in the Cayman Islands Gazette, Extraordinary Supplement, Number 13/2005, in accordance with Section 25 of the Roads Law (2000 Revision), now Section 26 under the Roads Law (2005 Revision).

A Draft Terms of Reference (ToR) for the EWA Extension, dated January 30, 2023, was developed to provide a defined protocol for assessing the potential impacts of the proposed EWA Extension. The Draft ToR was made available for public comment and then the Final ToR was prepared and approved on April 4, 2023.

EIA STUDY SCOPE

The scope of the EIA is defined in the “Final Terms of Reference (ToR)” dated April 4, 2023. This comprehensive document defines study protocols for each of the following considerations:

- Route Alignment and Assessment of Alternatives
- Socio-economic Considerations
- Hydrology and Drainage (including climate resiliency)
- Geo-Environmental
- Terrestrial Ecology
- Cultural and Natural Heritage Sites
- Greenhouse Gas Emissions
- Noise and Vibration

The overall scope of the environmental studies included the following key tasks:

- Definition of baseline site and environmental design conditions.
- Development and assessment of alternative project alignments.
- Identification and assessment of anticipated environmental impacts and socio-economic impacts related to project development.
- Identification and assessment of possible mitigation considerations to reduce negative impact.
- Preparation of an Environmental Statement (ES) summarizing the results of the EIA, including technical appendices for each EIA consideration listed above, as well as an Environmental Management Plan (EMP) for the project.

STUDY AREA

The EWA Extension study area encompasses Section 2, from Woodland Drive to Lookout Road; and Section 3, from Lookout Road to Frank Sound Road within Bodden Town and North Side districts, northwards to North Sound and south to the coastline**.**

This area includes the corridor initially gazetted in 2005 for the EWA Extension.

The study area was established to allow for the identification of a range of roadway and multimodal alternatives. In addition to the immediate project study area, a broader, island-based perspective was also incorporated for specific evaluations (e.g., traffic and socio-economics).

NEEDS and OBJECTIVES

Currently, a single coastal road, Bodden Town Road, provides access between the eastern and western sides of Grand Cayman.

Made up of one lane in each direction, Bodden Town Road is vulnerable to traffic congestion, especially during peak travel hours when people from the eastern side of the island are trying to access employment, education, and other services on the western side.

As a result of road closures due to accidents or construction as well as extreme weather events, Bodden Town Road becomes compromised and inaccessible, stranding North Side and East End residents from accessing goods and services mainly located on the west side of Grand Cayman.

The objectives, referred to as Critical Success Factors (CSF)s, of the EWA project are to:

- Create an alternative travel route to the existing two-lane Bodden Town Road.
- Improve resiliency of the existing roadway travel route between North Side/East End and George Town/West Bay.
- Support current and future traffic demand.
- Improve travel time between North Side/East End and George Town/West Bay.
- Reduce tourism travel time between North Side/East End and George Town.
- Improve safe vehicular travel by reducing roadway conflict points.
- Provide opportunity for enhanced and safe pedestrian and bicycle travel.
- Accommodate utility expansion (electricity, fiber, water, central sewerage system). *
- Provide opportunity to safely accommodate and expand public transportation. *

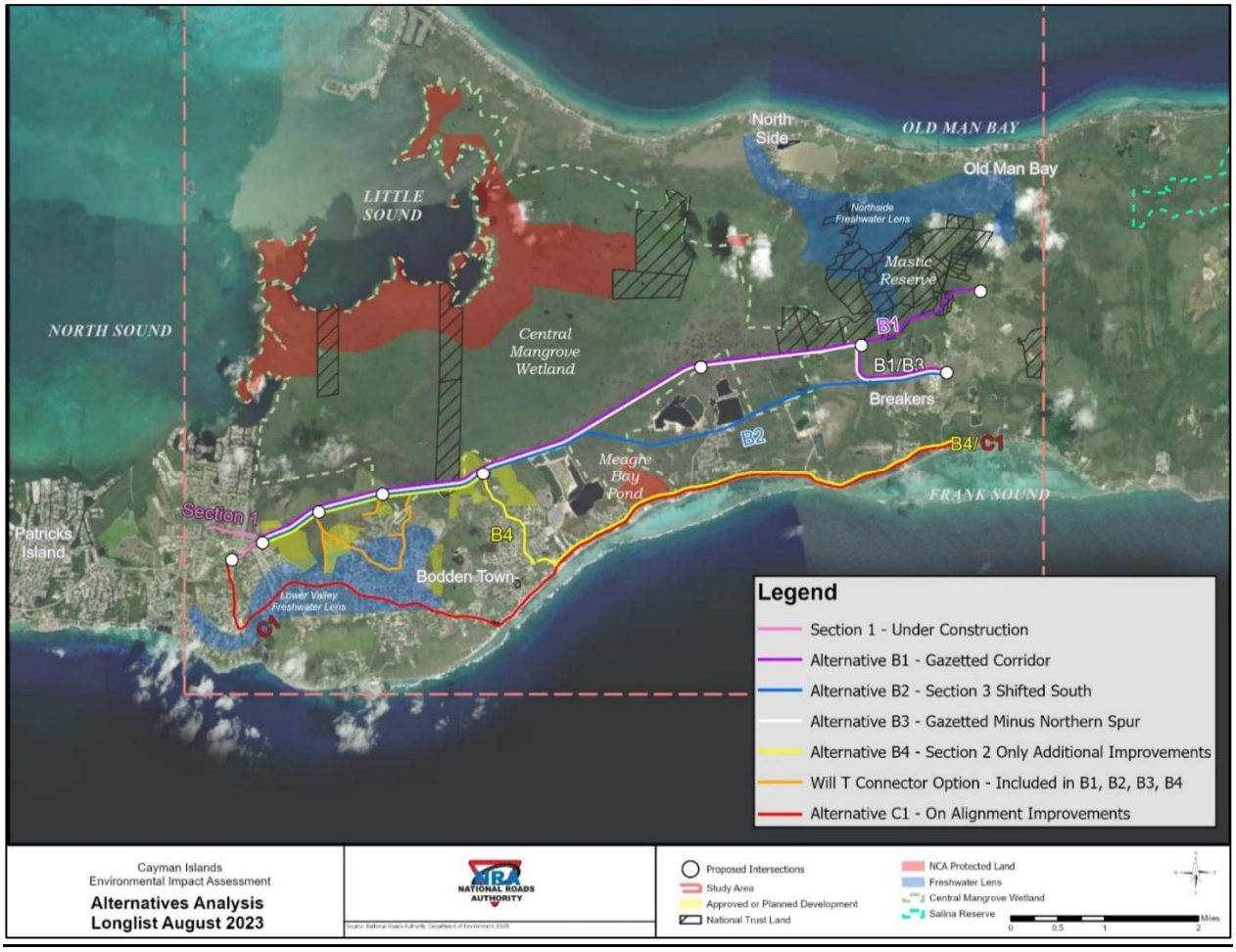
* *These criteria are to provide opportunities to accommodate these features. It is outside of ambit of the NRA to provide public transportation or utilities.*

ALTERNATIVES PROCESS

The following five-step process was employed for developing the alternatives solutions evaluation.

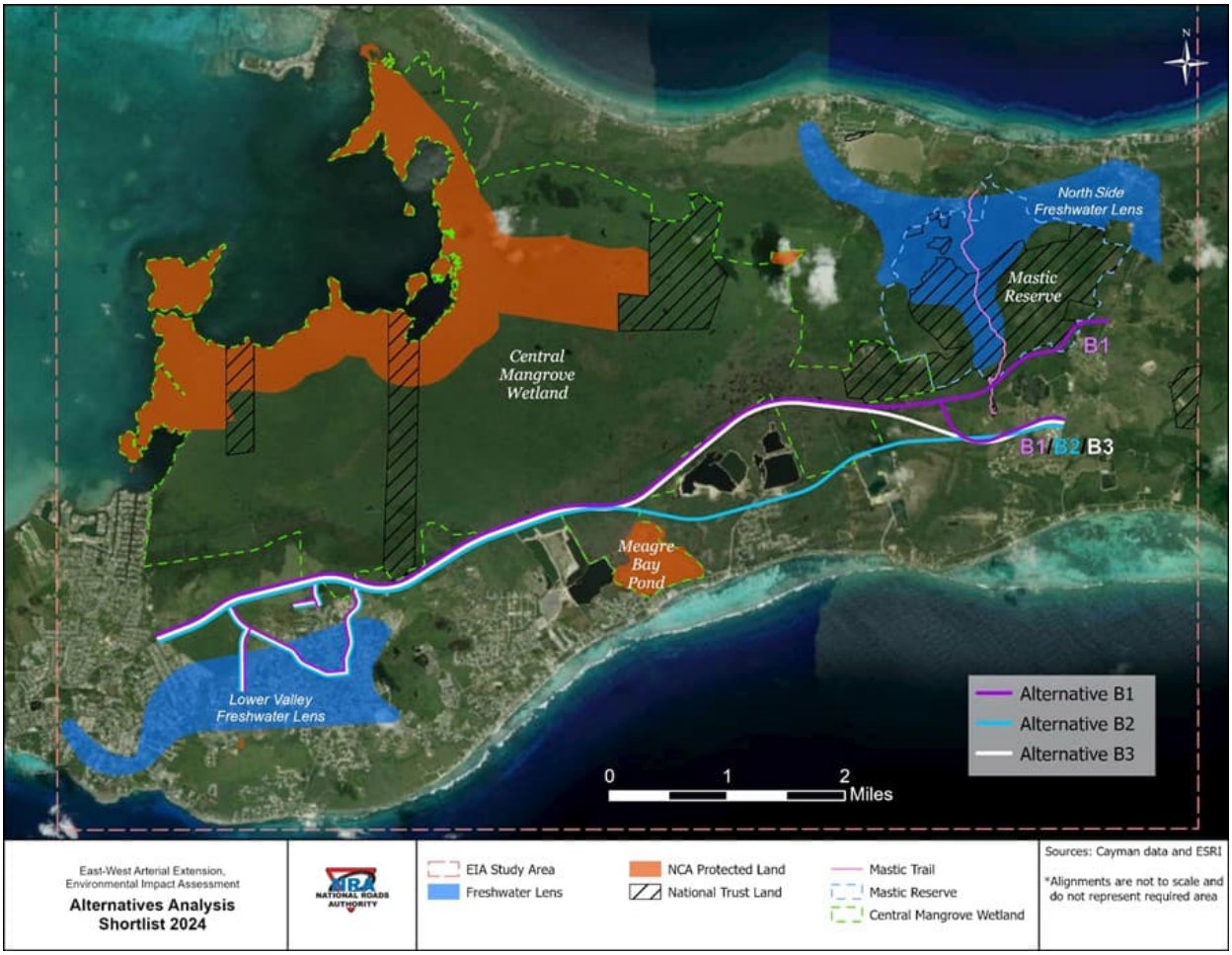
- Identify the constraints and dependencies, as well as the CSFs (complete).
- Identify Longlist of Alternatives (complete).
- Evaluate Longlist of Alternatives to select a Shortlist of Alternatives for further analysis (complete).
- Analyze the Shortlist of Alternatives (complete).
- Select and refine a Preferred Alternative (underway).

The Longlist of Alternatives that were developed included a No-Build Scenario and five Build Alternatives (B1, B2, B3, B4, and C1).



As a result of the Longlist Alternatives Evaluation, the No-Build Scenario and four Build Alternatives (B1, B2, B3, and B4) were advanced for further studies as a Shortlist of Alternatives. All four Build alternatives share the same common section beginning at the western terminus, near Woodland Drive, and continuing east to near Lookout Road; they also share the same common improvements to the local roadway network referred to as the Will T Connector. As part of Shortlist Alternatives Evaluation, Alternative B1, which utilizes the general location of the corridor initially gazetted in 2005, was slightly shifted to avoid and minimize impacts to identified features and to best meet design criteria guidelines.

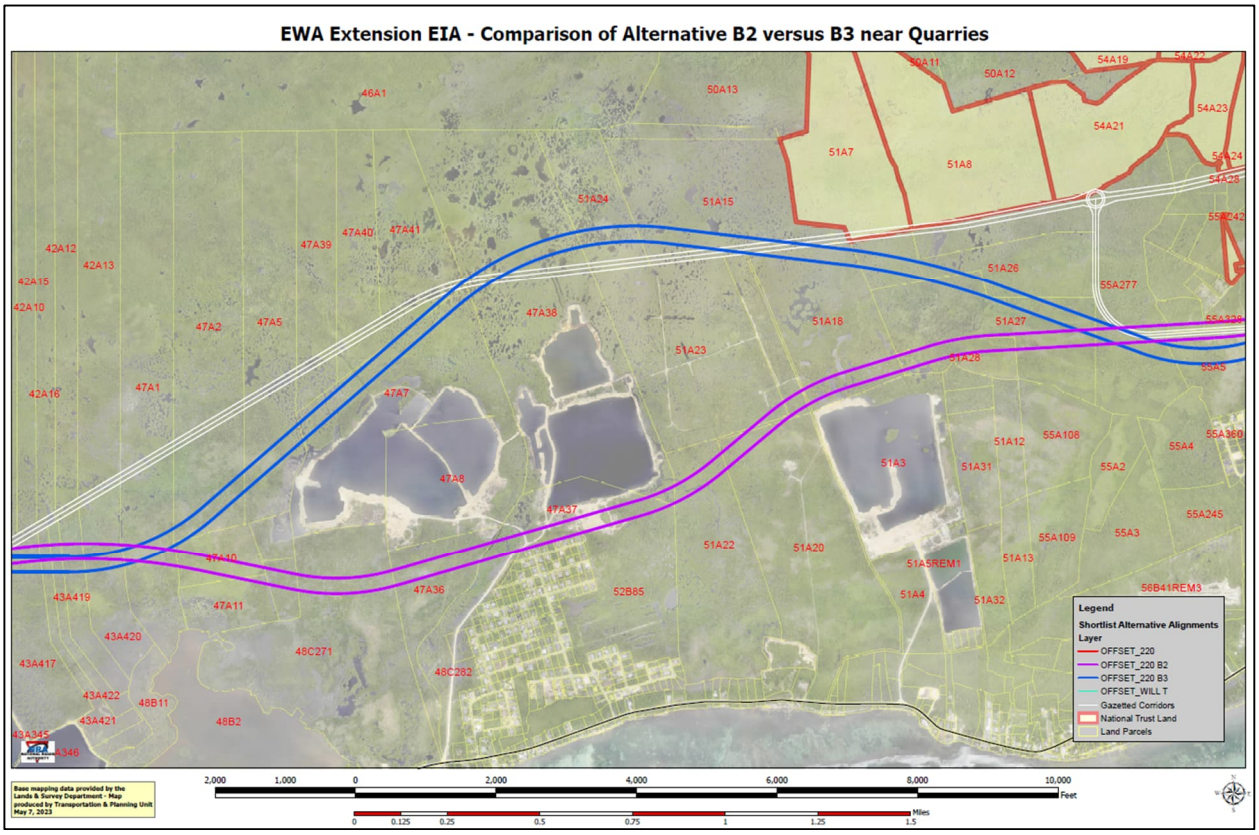
Also, during the Shortlist Alternatives Evaluation, the NRA and EAB concurred with the elimination of Alternative B4 from further evaluation due to its infeasibility to meet the resiliency criteria without significant social impacts and engineering constraints as well as its inability to provide a complete alternate east-west travel route in the event of road closures or emergencies.



As a result of the Shortlist Alternatives Evaluation and through collective discussions held with the NRA; the EAB; the Ministry of Planning, Agriculture, Housing, Infrastructure, Transport & Development; and the Ministry of Sustainability and Climate Resiliency, Alternative B1 was eliminated from the Preferred Alternative selection. The two remaining shortlisted alternatives, Alternatives B2 and B3, have been identified for consideration as the Preferred Alternative.

Alternatives B2 and B3 are the same through Section 2 from Woodland Drive to Lookout Road, and they both include the Will T Connector improvements. They are also very similar in location on the eastern end of the project area where they connect to Frank Sound Road. All entities involved in the Preferred Alternative selection discussions agreed upon these common/similar sections, which comprises approximately 63% of the proposed mainline EWA corridor and approximately 73% when including the Will T Connector proposed corridor.

The difference between Alternatives B2 and B3 occurs in the middle of Section 3, around Meagre Bay Pond and Midland Acres, where Alternative B2 travels south of the quarries and adjacent to the Midland Acres while Alternative B3 travels north of the quarries. Concurrence of the alternative within this area was not reached by the entities involved in the Preferred Alternative selection discussions; therefore, a Preferred Alternative has not yet been selected for further refinement/evaluation to complete the EIA process.



HIGH-LEVEL SUMMARY OF SHORTLIST EVALUATION FOR ALTERNATIVES B2 & B3

The following is a high-level summary of the overall evaluations for the entire proposed corridor alignments of Alternatives B2 and B3 (Sections 2 and 3) in relation to the CSFs, engineering constraints, social impacts, natural environmental impacts, and project costs.

From a CSFs and Engineering Constraints perspective, Alternatives B2 and B3 are comparable to one another. Both Alternatives B2 and B3 are expected to provide improved resiliency and opportunities for multimodal accessibility with separated/dedicated facilities for transit, pedestrians, bicycles, and other micromobility modes of travel. The proposed corridor width (220 feet; 67 m) also provides the space needed to accommodate additional features including lighting, utilities, and a solar panel canopy that will not only provide electricity generation but also shade for the sidewalk and micromobility facilities. Although both Alternatives B2 and B3 have been designed to accommodate these features, it is outside the ambit of the NRA to provide the solar array, utilities, and public transportation. Overall, both Alternatives B2 and B3 are expected to have similar adverse effects on the amount of property affected to improve roadway to achieve sound geometric design conditions as well as areas required for construction staging and for construction activities.

From a Traffic-specific CSF evaluation perspective, and as noted above, Alternatives B2 and B3 are comparable to one another and projected to provide the same outcomes for the following established CSF considerations:

- Large Beneficial effects on creating an alternative travel route to the existing two-lane Bodden Town Road.
- Large Beneficial effects on improving resiliency of existing roadway between North Side/East End and George Town/West Bay.
- Large Beneficial effects on supporting current and future traffic demand through district-to-district and employment access.
- Large Beneficial effects on improving study area travel times and Slight Beneficial effects on improving key destination travel times between North Side/East End and George Town.
- Slight Beneficial effects on reducing tourist travel times between North Side/East End and George Town.
- Large Beneficial effects on improving safe vehicular travel by reducing roadway conflict points.

- Large Beneficial effects on providing opportunity for enhanced and safe pedestrian and bicycle travel.

From a Social – Socio-economics Impacts perspective, Alternatives B2 and B3 are comparable to one another due to the anticipated similar yet significantly improved accessibility, severance, journey quality, and option value opportunities.

From a Natural Environment Impacts perspective, Alternatives B2 and B3 are expected to result in similar impacts to natural environment resources, such as:

- Geo-Environmental – Moderate Adverse effects on the Lower Valley Freshwater Lens and Slight Adverse effects on the North Side Freshwater Lens
- Terrestrial Ecology – Neutral effects on the Coastal Habitat, Pygmy Blue Butterfly, Tea Banker
- Cultural and Natural Heritage – Neutral effects on the Mastic Reserve, Mastic Trail, Meagre Bay Pond, Cemeteries
- Hydrology and Drainage – Moderate Adverse effects on the Central Mangrove Wetland (CMW), Mastic Reserve, and Developed Areas; Slight Adverse effects on Meagre Bay Pond and the Freshwater lenses; Neutral effects on the existing drainage infrastructure

For the Cost-Benefit analysis, both Alternatives B2 and B3 are expected to result in a Benefit-Cost ratio of 1.3, where a Benefit-Cost ratio above 1.0 represents the anticipated benefits being greater than the anticipated costs.

The following table displays the high-level differences between the entire proposed corridor alignments of Alternatives B2 and B3 (Sections 2 and 3) in relation to engineering features, project costs, social – noise impacts, natural environment impacts, and project present value benefits and costs. Further detailed information for each consideration is available and can be viewed in the individual discipline technical reports and/or the Shortlist Evaluation Document that have been developed for this EWA EIA project.

CONSIDERATIONS	ALTERNATIVE B2	ALTERNATIVE B3
ENGINEERING EVALUATION		
Mainline Length (excludes Will T Connector)	7.6 miles (12.2 km)	7.9 miles (12.7 km)
Bridges	16	15
ESTIMATED COSTS		
Construction and Maintenance Costs – USD (CI $)	$810,080,339 ($680,467,485)	$813,862,405 ($683,644,420)
Right of Way Costs (Property Only) – USD (CI $)	$21,509,800 ($18,068,232)	$20,158,564 ($16,933,193)
Total Costs – USD (CI $)	$831,590,139 ($698,535,717)	$834,020,969 ($700,577,613)
NOISE		
2026 Impacts	Overall decrease (benefit)	Overall decrease (benefit)
2074 Impacts	Overall increase (disbenefit) 163 noise receptors at or above the SOAEL	Overall increase (disbenefit) 160 noise receptors at or above the SOAEL
Monetized Disbenefit (2026-2074) Net Present Value USD (CI $)	-$11,323,154 (-$9,511,449)	- $12,141,363 (-$10,198,745)
GEO-ENVIRONMENTAL		
Brackish Groundwater	Neutral (132 acres; 53 ha)	Neutral (135 acres; 55 ha)
Peat Removal	Large Adverse (2.1 miles; 3.4 km thru CMW) (223,811 Cu yd; 171,116 m^3)	Large Adverse (2.8 miles; 4.5 km thru CMW) (454,153 Cu yd; 347,225 m^3)

CONSIDERATIONS	ALTERNATIVE B2	ALTERNATIVE B3
TERRESTRIAL ECOLOGY		
Man modified	Moderate Adverse 108.6 acre (43.9 ha)	Moderate Adverse 89.5 acre (36.2 ha)
Upland Habitats	Slight Adverse 1.8 acre (0.7 ha)	Slight Adverse 2.5 acre (1.0 ha)
Wetland Habitats (includes both parrot and non-parrot wetland habitat)	Large Adverse 128.2 acre (51.9 ha)	Large Adverse 151.1 acre (61.1 ha)
Parrot Habitat	Large Adverse 91.4 acre (37.0 ha)	Large Adverse 80.1 acre (32.4 ha)
Amenity Value Loss – 2017 USD (CI $)	-$7,545,000 ($6,337,800)	-$8,345,000 ($7,009,800)
Carbon Sequestration Loss (tCO2e/yr)	300.7	354.6
CULTURAL AND NATURAL HERITAGE		
Central Mangrove Wetland (8,655 acres total)	Slight Adverse 57 acres (23 ha)	Slight Adverse 76 acres (31 ha)
Overall Acres of Resources Impacts	57 acres (23 ha)	76 acres (31 ha)
GREEN HOUSE GASES (GHG)		
GHG One -Time Emissions 2024-2026 (Ton CO_2e)	74,216	108,662
GHG Annual Operational Traffic Emissions 2026-2074 (Ton CO_2e)	102,119	100,870
Overall GHG Monetized Benefit – USD (CI $)	$81,110,000 ($68,132,400)	$85,582,000 ($71,888,880)
COST BENEFIT ANALYSIS		
Present Value of Benefits	$666,285,000 USD	$657,558,000 USD
Present Value of Costs	$496,154,000 USD	$494,841,000 USD

NEXT STEPS TO COMPLETE EIA PROCESS

- Selection of a Preferred Alternative.
- Once the Preferred Alternative is selected, further design refinements and impacts analyses will be completed for this alternative and incorporated into the Draft Environmental Statement (ES). The Draft ES will then be made available for Public Comment once complete; public consultation meetings will also be conducted during this period.
- Following the Public Comment period, the Final ES will be completed along with an Environmental Management Plan, which will outline the potential mitigation measures to be considered for unavoidable impacts.