

TRANSPORT REVIEW

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SUBJECT	:	Grand Cayman Island - East-West Arterial Road Extension

1. Introduction

My name is Kevin Kay. I am a Divisional Director with Ardent Consulting Engineers (ACE) based in their London and Edinburgh offices. I have a Bachelor of Science in Geography and a Masters of Science in Sustainable Environment Management, both from the University of Plymouth in the United Kingdom. I am a Chartered Transport Planning Professional (CTPP) and a Fellow of the Chartered Institution of Highways and Transportation (FCIHT).

The views expressed are my own and are not intended to confer wider sanction by the organisation.

2. Overview

Context

The Cayman Islands is an island group and overseas territory of the United Kingdom in the Caribbean Sea comprising the islands of Grand Cayman, Little Cayman and Cayman Brac. The island of Grand Cayman is 22 miles long and 8 miles wide, as shown in Figure 1.

Figure 1. Grand Cayman Geography



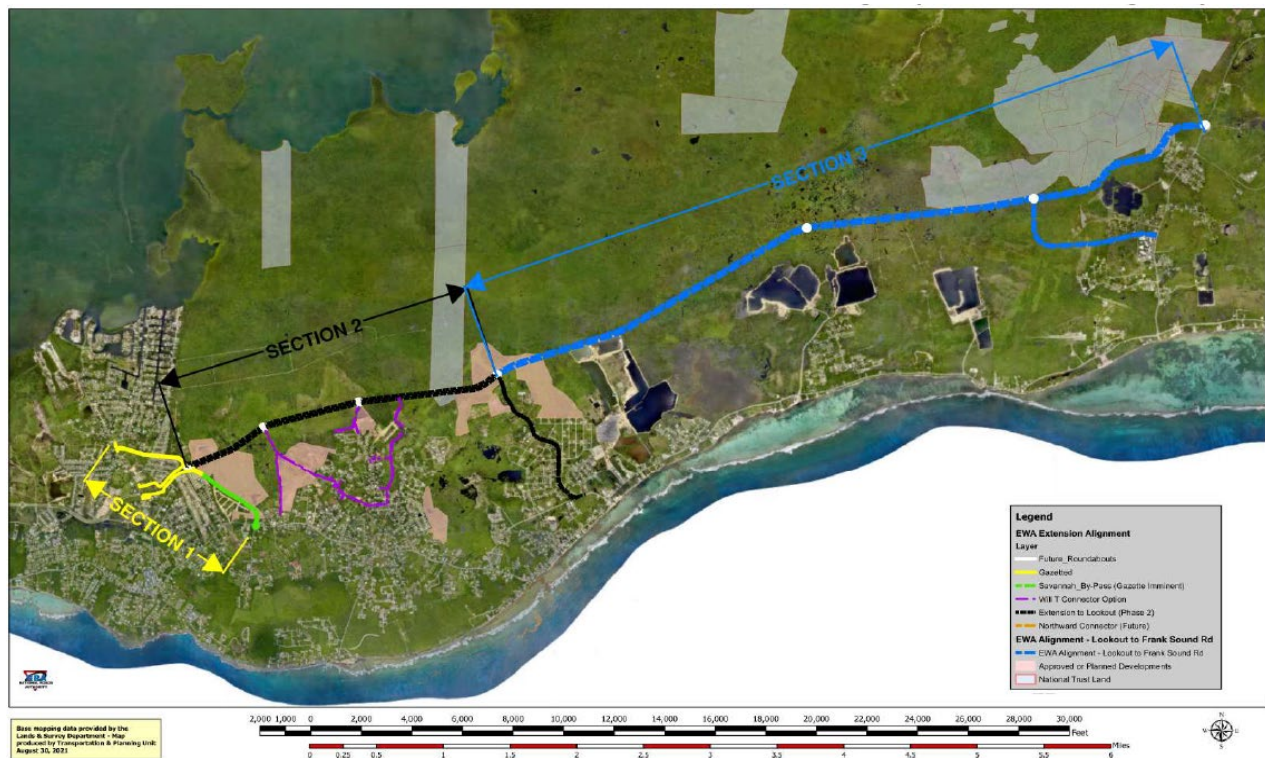
The network of roads and highways has a total length of 785 km¹. For each of the country's 68,136 inhabitants this puts the Cayman Islands in 47th place in the global ranking in terms of road network density, as of 2021.

The Road Scheme

The East-West Arterial Road Extension (the 'project' or 'EWA Extension') is a road-based scheme covering some 13km (or 8 miles) between Hirst Road, to the west, and Frank Sound Road to the east, with various 'spurs' extending southwards to meet existing roads.

The indicative alignment for the EWA Extension is shown in Figure 2 below.

Figure 2. East-West Arterial Road Extension Alignment



According to the published **EIA Scoping Report² (2023)**, the study area for the scheme encompasses the proposed route's footprint, which is represented by a 10-mile-long (16 km), 160-ft-wide (49 m) multi-lane highway and associated roundabouts.

The proposed configuration of the road comprises three lanes in each direction, central medians and cycle tracks, as shown in Figure 3 below. This is therefore a significant scheme, akin to a high-standard inter-urban road or motorway.

¹ <https://www.worlddata.info/america/cayman-islands/transport.php>.

² Terms of Reference Environmental Impact Assessment for the East-West Arterial Extension (30 January 2023)

Figure 3. Proposed Cross-Section of East-West Arterial Road Extension

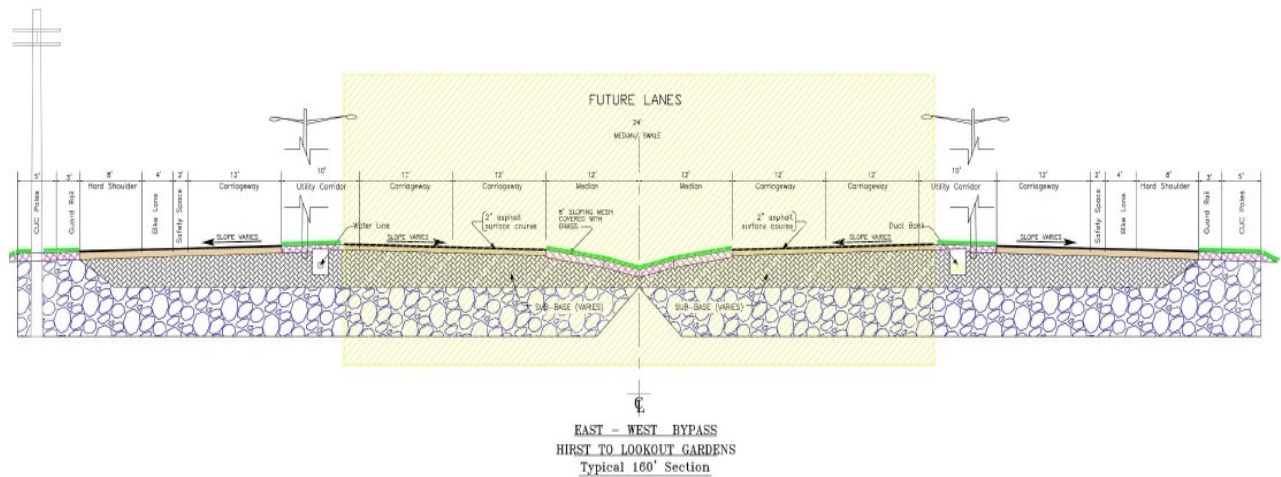


Figure 4: Original EWA Extension typical section proposed between Hurst Road and Lookout Gardens

Source: EIA Terms of Reference EIA for the East-West Arterial Extension (30 January 2023)

Proposer

The National Roads Authority (NRA) is the proposer for the project. It was created on 1st July 2004 by the National Roads Authority Law (2004). In accordance with its terms of reference, the organisation:

"... aims to enhance transport development in the Cayman Islands by building and maintaining a safe and efficient network of roads, in partnership with a Board of Directors, the Ministry, Cabinet, and the private sector, having regard to national and economic growth strategies."

There does not appear to be a co-ordinated body or single Ministry that seeks to reconcile the transport mobility of the islands with spatial planning objectives. Rather, in the case of the project, the NRA seeks to respond to the identified traffic demands arising from the economic growth agenda.

The Rationale

The project has been discussed since 2004 (then called 'Central Highway') when Hurricane Ivan caused damage to existing coastal roads. This meteorological event caused some areas of Bodden Town and Lower Bay / East End to be temporarily cut-off.

This led to plans being drawn up to address the issues experienced, as well having an eye on climate change resilience, in light of the vulnerability of existing infrastructure and communities to coastal storm events as well as to secure improved emergency vehicle access.

So the plans have been drawn for this project in part because of the resilience that a more central highway corridor would provide, as an alternative to the existing southern coastal road.

It is understood that the project may also offer opportunities for new land-uses and new developments to be zoned by expanding the scope of accessible areas across the island, with the additional implications this would have in terms of additional traffic generation and other environmental effects.

With the prospect of growth being more constrained in western areas of the island, there are likely to be greater development pressures in eastern districts in the future, including but not limited to meeting the needs of the following:

- Health City Cayman Islands;
- Ironwood Resort;
- Arnold Palmer Golf Course;
- Morritt’s Reef Resorts expansion;
- Additional residential development zoning in Bodden Town.

In this respect, the NRA has been asked to meet the directives of the Government in looking ahead and accommodating the needs of the Development Plan for Grand Cayman.

Current Status

Beyond its terminal point at Hirst Road in Savannah, an initial phase (Section 1) of the project is progressing (as shown in Figures 4 and 5)

Figure 4. East-West Arterial Extension (Section 1 - Hirst Road to Woodlands Drive)



Source: National Roads Authority

Figure 5. Construction of E-W Arterial Extension (Section 1)

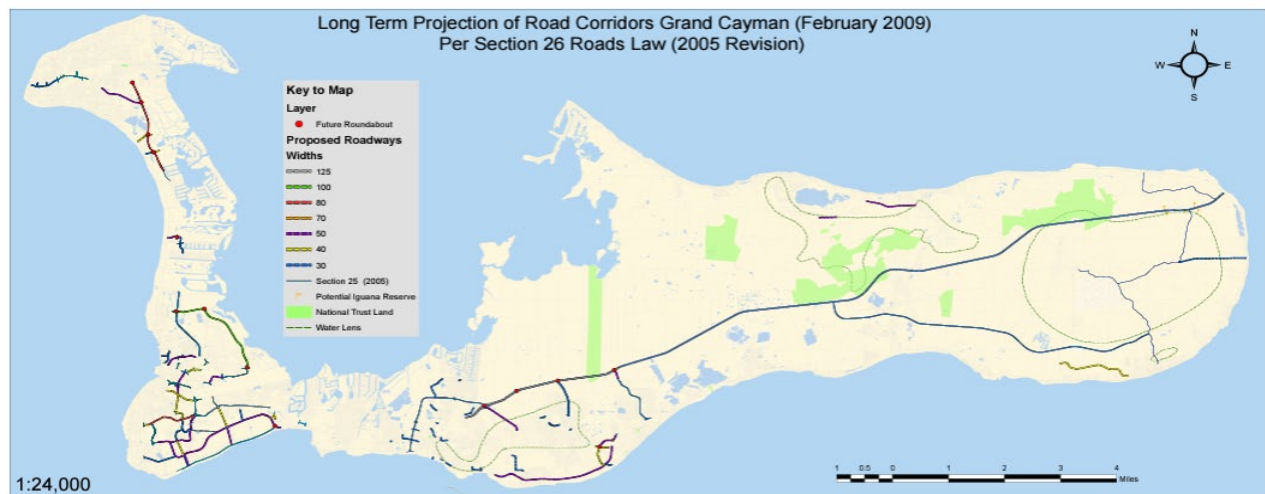


3. Background

Regulations

In 2005, a 'Section 25 Gazette'³ under the Road Law (now Roads Act) was passed, which allows the Government to develop a long-range plan, including making an amendment under the Development Plan for this a 'central' road corridor. Figure 6 shows the proposed Section 26 gazette that was endorsed by the NRA Board of Directors in February 2009 and was forwarded to the Ministry of Works.

Figure 6. Section 286 Long-term Roads Plan⁴



³ <https://www.caymanroads.com/documents/Approved-Gazetted-Section25-E-W-Arterial-and-Collector-Corridors---24by36-20200313012530.pdf>

⁴ <https://www.caymanroads.com/documents/Section-26---2009---SH---Mar-20200313012629.pdf>

The above is intended to guide the long-term road development aspirations for Grand Cayman Island.

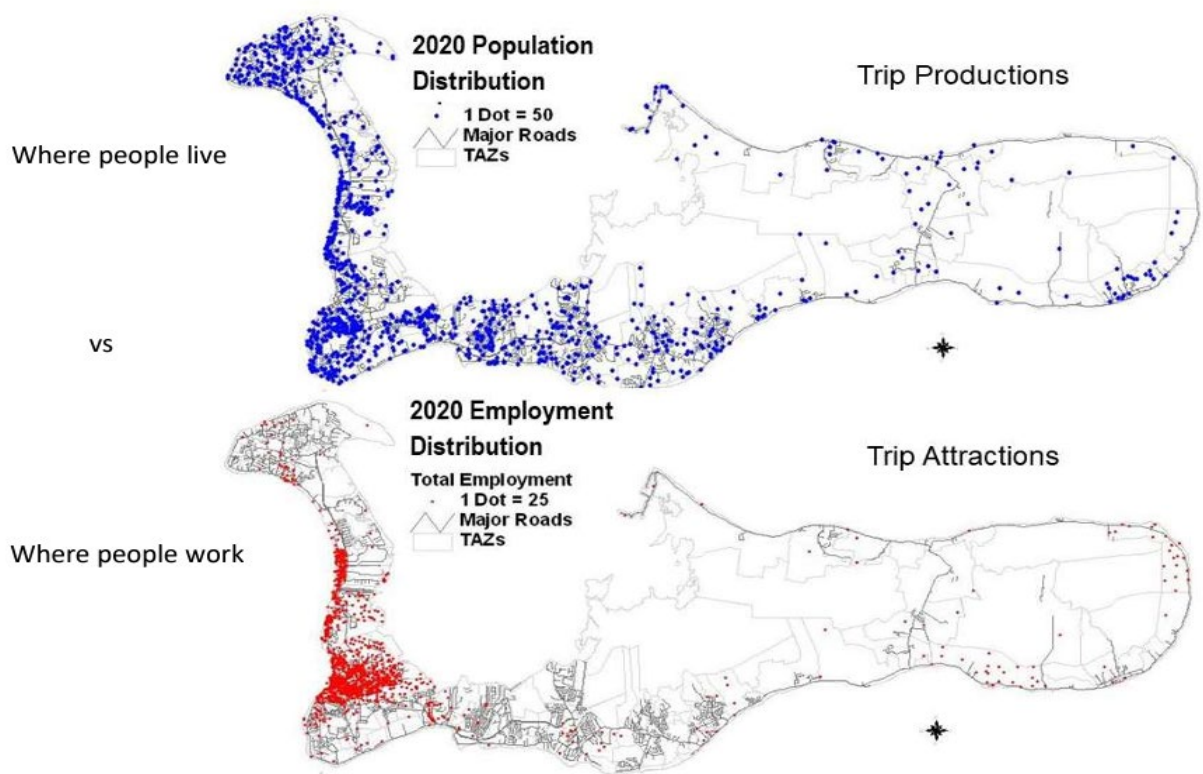
In 2021, ten elected independents came together to form a new Government. Using the acronym PACT ('People-driven, Accountable, Competent and Transparent'), the Government stated that it intended to proceed with the EWA Extension on Grand Cayman in order to help reduce traffic problems to and from the Eastern Districts.

Travel Demand

Grand Cayman's population is spread out across the island, while employment tends to be concentrated to the west around George Town. A geographical distribution is shown in Figure 7 below.

This means that patterns of traffic are subject to a 'funnelling' effect with a large number of westbound movements being experienced during the morning peak and eastbound in the evening peak, but largely dissipating as one moves further eastwards.

Figure 7. Distribution of Population and Employment on Grand Cayman



Source: NRA

It could be argued from the above patterns that there is less justification for new road infrastructure serving the eastern neighbourhoods of the island, owing to the lower residential density. This is compared to recognised 'pinch points' further west where there is a greater need to manage conflicting streams of traffic.

The existing single carriageway road links in Eastern Districts meet the expected demand for car travel, although improvements to junction capacity cannot be excluded in helping to smooth out issues in certain locations.

Existing Infrastructure

The extent of the road network matches observable residential and employment patterns/densities, with a concentration of the 'higher order' primary roads and dual carriageways increasing towards George Town. From a hierarchical point of view, the various residential areas feed traffic to the primary highway network from a number of secondary roads, which themselves are served by tertiary streets.

In these more heavily trafficked areas, the primary roads include the Esterley Tibbetts Highway, Bobby Thomson Way, Linford Pierson Highway which connect with the existing EWA. Together these all form a main 'spine' serving approximately one third of the island. This is shown in Figure 8.

Figure 8. Primary Road Network and Projects

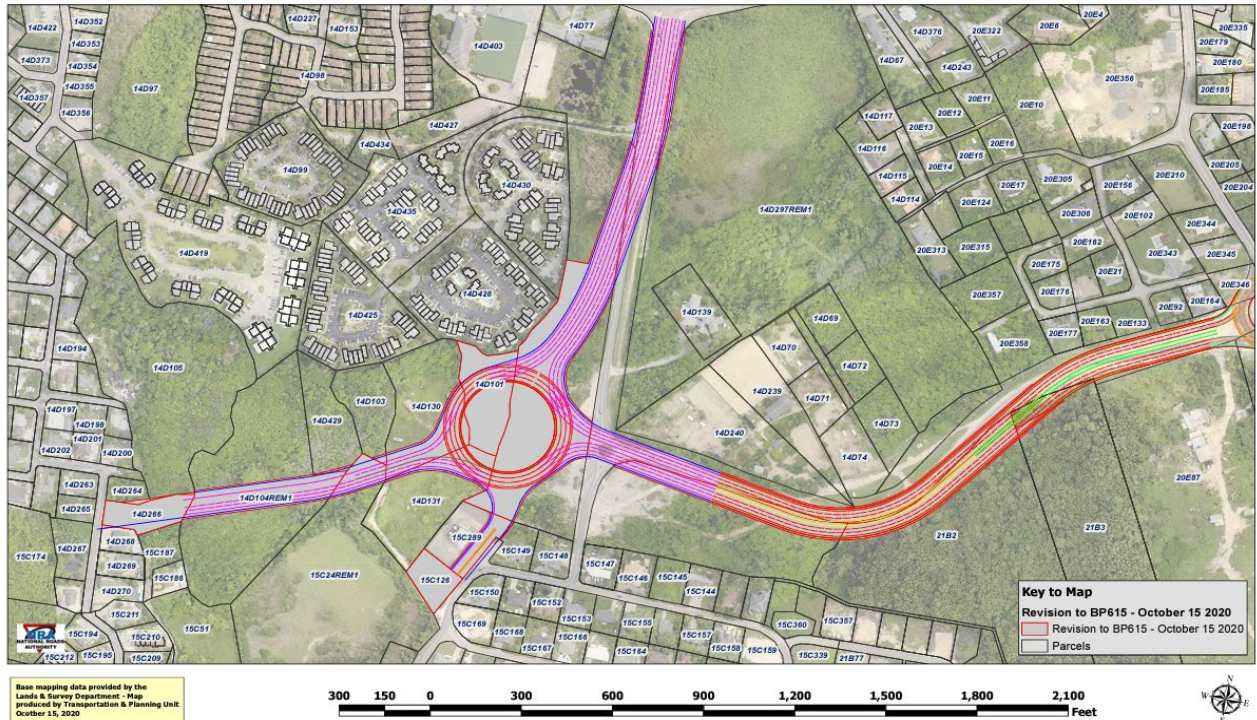


Given that these areas are those subject to the greatest demand by traffic, they have consequently been the subject of recent highway infrastructure improvements. These have included the following⁵:

- Widening of Linford Pierson Highway (to three lanes). See Figure 9.
- Widening of Shamrock Road (between Grand Harbour and Crewe Road. See Figure 10.
- The CUC roundabout improvement project (King's Sports Centre)
- The Airport Connection Road (ACR)
- Godfrey - Nixon Boulevard Extension

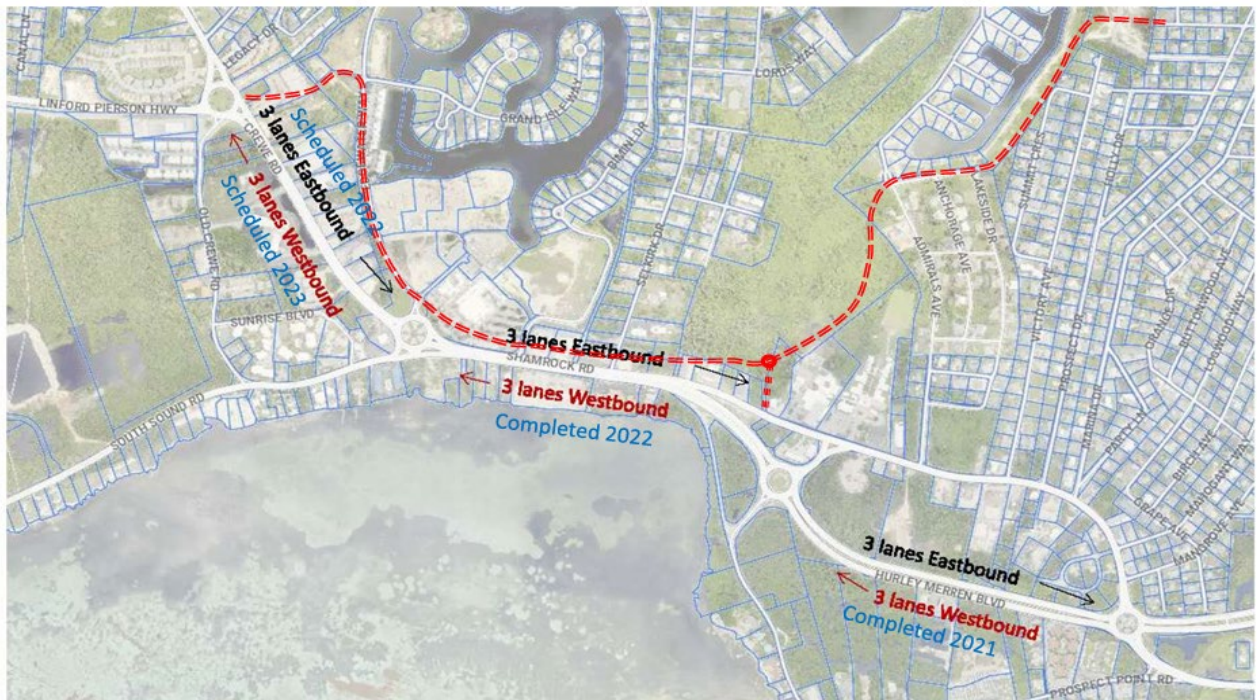
⁵ <https://www.caymancompass.com/2020/02/17/road-projects-focus-on-quick-wins/>

Figure 9. Proposed Linford Pierson / BTW Highway Works (under construction)



Source: NRA⁶

Figure 10. Crewe Road, Shamrock & Hurley Merren Boulevard Widening Works



Source: NRA⁷

⁶ <https://www.caymanroads.com/upload/files/3/622b6baecbb65.pdf>

⁷ <https://www.caymanroads.com/documents/HURLEY-MERREN-BLVD-6-lane-EXPANSION-20220405133932.pdf>

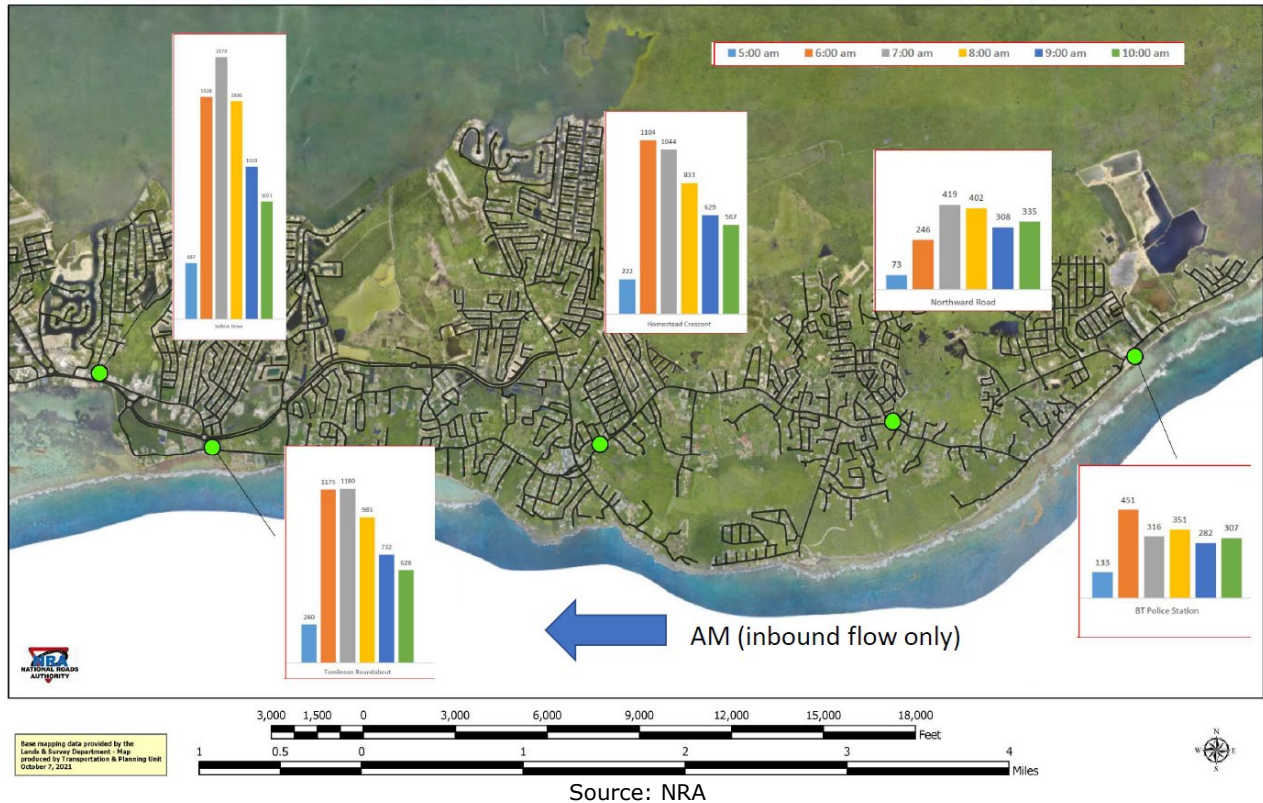
Widening of the existing East-West Arterial Road has also taken place on Hurley Merren Boulevard (3-lanes) and further sections are planned to be upgraded further east.

4. Existing Conditions

Traffic Data

Existing traffic flow information from the NRA is presented below in Figure 11, covering the AM peak period (05:00-10:00).

Figure 11. Traffic Flow (AM Peak – Westbound)



The traffic data suggests that the existing primary road east of Savannah accommodates a maximum westbound traffic flow of c.1,000 vehicles per hour (vph) on Shamrock Road (at Homestead Crescent). This decreases by half (c.400-500) further east at Northward Road, with a further reduction to c. 300-400 at Bodden Town Road.

On the face of it, the recorded traffic volumes should be within the link capacity of the road network to accommodate, as the directional limit of single carriageway road (7.3m) would be between 1,300-1,500vph depending on the degree of frontage access.

The levels of traffic recorded on the eastern sections would not seem to justify the creation of the EWA Extension, based on current traffic flows.

Even if one was to account for the anticipated level of growth in the eastern districts, and the consequential increase in traffic that would occur as a result, it is difficult to see how the NRA could justify any infrastructure beyond the Hirst Road / Shamrock Road connector (see Figure 19). While Section 2 (Hirst Road to Lookout Gardens) may be seen as an opportunity to release further land for development, it would not appear to be justifiable based on highway capacity alone. The case for Section 3 is even more doubtful on traffic grounds alone.

It is noted, however, that journey time reliability is an important consideration for the NRA, with the following plots shown in Figure 12 and 13 being used to show the variability in the accessibility levels from the North Shore areas.

Figure 12. AM Peak Westbound Journey Times

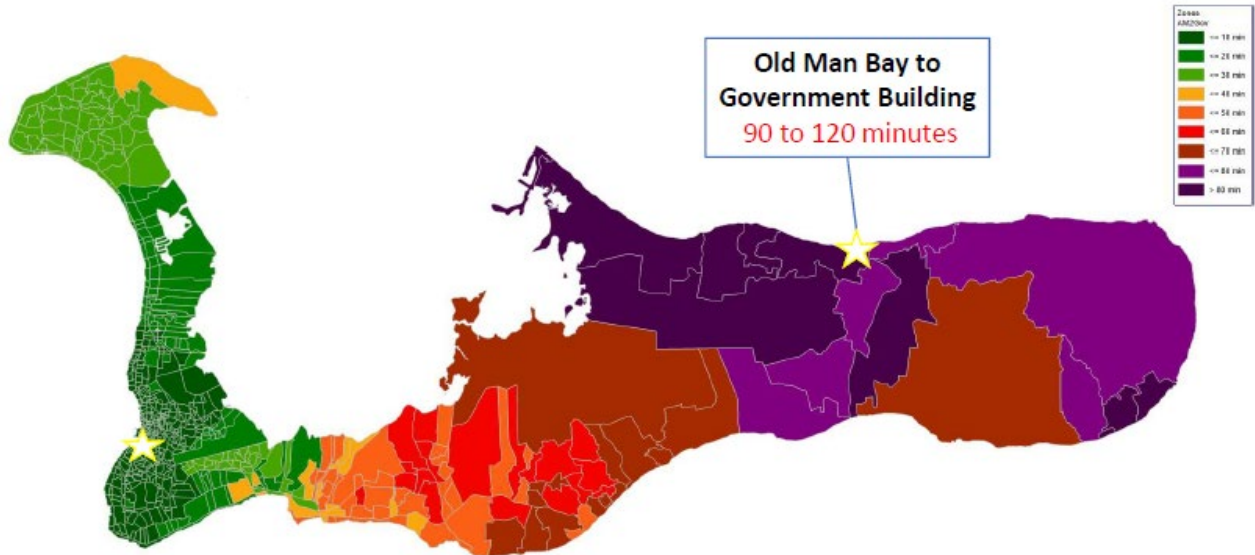
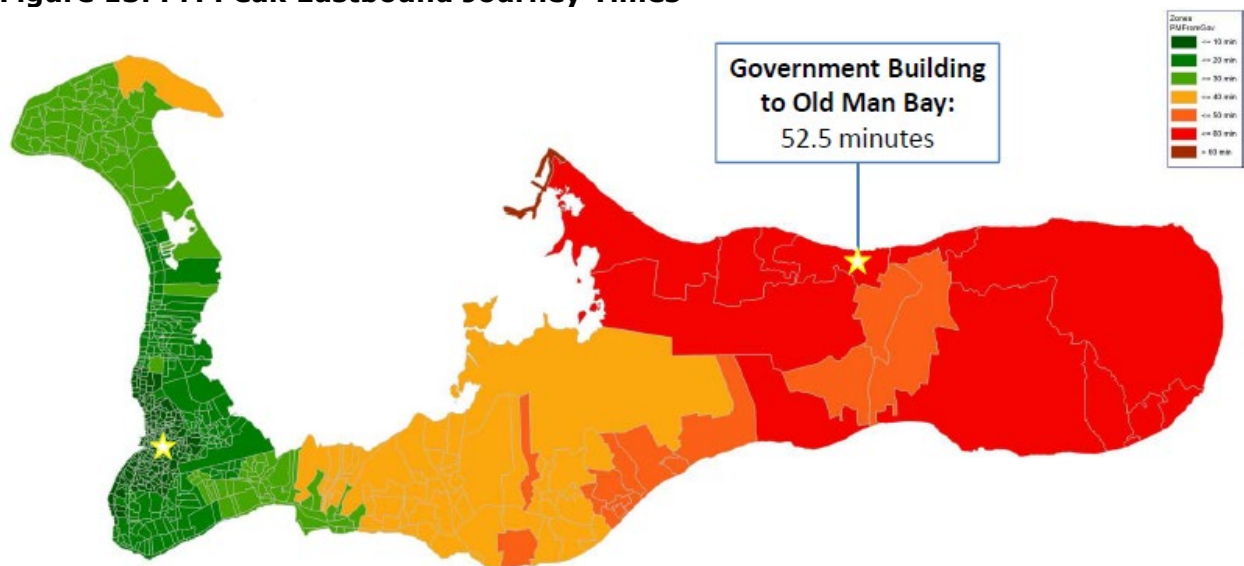


Figure 13. PM Peak Eastbound Journey Times



The following journey times are presented for the following 'intervention' scenarios:

- Status Quo.
- Bobby Thompson Way widening (4 lanes).
- East-West Arterial (to Lookout Gardens) only.
- East-West Arterial + Bobby Thompson Way widening.
- East-West Arterial + Bobby Thompson Way widening + Shamrock Road West widening 6 lanes.

The review of the journey time benefits for the different scenarios are presented in Table 1.

Table 1. Journey Time Benefit from different scenarios

AM PEAK HR (6:30 am to 8:30 am) OLD MAN BAY to GOVT Admin Building				
Status Quo (i.e. marginal improvements)	BTW (4 lanes) Widening only	E-W Arterial (to Lookout Gdns) only	EWA + BTW combined	EWA + BTW + SHAMROCK (6lanes)
90 mins to 120 mins 13 mph avg spd	~75 mins 15 mph avg spd	~75 mins 15 mph avg spd	~62 mins 18 mph avg spd	45-50 mins 28 mph avg spd

PM PEAK HR (4:30 pm to 6:30 pm) Govt Admin Building to Old Man Bay				
Status Quo (i.e. marginal improvements)	BTW (4 lanes) Widening only	E-W Arterial (to Lookout Gdns) only	EWA + BTW combined	EWA + BTW + SHAMROCK (6lanes)
50 to 60 mins 19 - 23 mph avg spd	~57 mins 20 mph avg spd	~54 mins 21 mph avg spd	~50 mins 23 mph avg spd	~45 mins 25 mph avg spd

Source: NRA⁸

The above data suggests that much of the journey time benefits reported for the EWA Extension, when taken in isolation, are similar to those that would be achieved through the widening of Bobby Thompsom Way, i.e. from 90 to 75 minutes in the AM peak and from up to 60 minutes to 57/54 minutes in the PM peak.

In combination, both schemes would achieve further journey time savings in the AM peak but with more marginal benefits in the PM peak.

Overall, what the above data suggests is that the effect of infrastructure improvements taking place on existing highway corridors (i.e. Bobby Thompson Way and Shamrock Road) would be far greater than those which could be achieved by the EWA Extension.

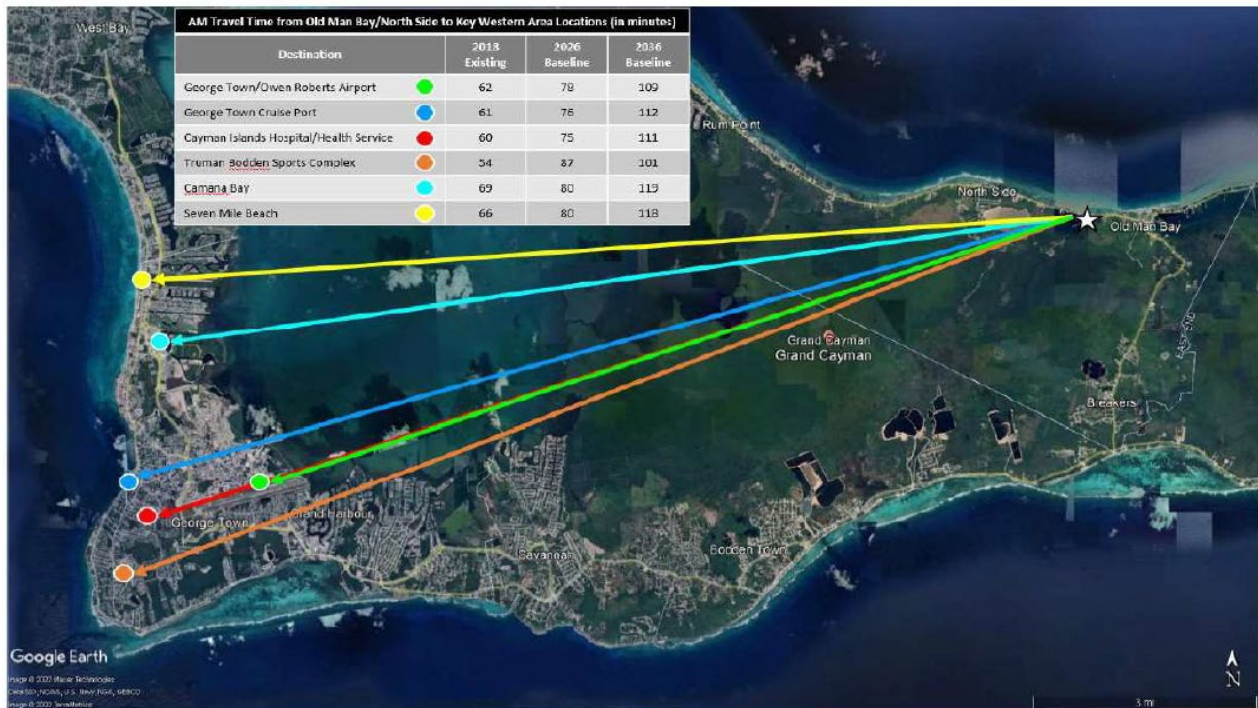
It would therefore seem beneficial to prioritise those infrastructure projects that rely on the existing roads, rather than through the creation of new roads, with the environmental implications that this would entail.

It is also the case that all of the journey time information is presented for an Origin-Destination (O-D) involving 'Old Man Bay' to destinations in George Town (see Figure 14). In reality, this will only apply to a much smaller proportion of the overall traffic on the island.

Focusing on the longest trips is therefore likely to 'skew' the apparent benefits of the EWA Extension when in fact the majority of drivers will be making shorter trips and not using the sections in question (most particularly Section 3).

⁸ <https://www.caymanroads.com/upload/files/4/62509727cb477.pdf>

Figure 14. Journey Times to Key Destinations from Old Man Bay Under Different Scenarios.



Source: NRA

A more appropriate comparison would be to consider journey times from Bodden Town, which is forecast to experience greater levels of future (already zoned) growth, and thus traffic.

For 'intermediate' origins/destinations such as these, car journeys would likely benefit disproportionately from the accessibility that would be provided by the Shamrock Road connector (Figure 19) and, to a lesser extent Section 2 of the EWA Extension, which could provide some relief to the existing corridor.

Other highway improvements could be implemented to provide further East-West connectivity through corridors that are parallel to Shamrock Road, but without resorting to the level of infrastructure proposed through the EWA Extension. One example would be to progress with the construction of Gazetted route BP40 (see below), which would increase the number of East-West routes between Bodden Town and Shamrock Road (at the Countryside Shopping Village). This would provide some additional capacity while serving areas zoned for development.

What is clear, however, is that the lower levels of traffic experienced on roads between Bodden Town, Frank Sound and North Side are less likely to lead to vehicular delays, as the traffic recorded will not trigger the link capacity thresholds on the relevant roads. As such, the same comparative journey time benefit, and therefore the business case, will be much weaker for Section 3 of the project.

Even then, it has been proving that the pinch-points are not in Bodden Town itself but further west where traffic from multiple locations converge. It has already been shown by the NRA that these issues are being addressed by existing infrastructure improvement proposals.

The case for the EWA Extension is therefore unfounded on the grounds of providing vehicular traffic benefits alone.

Public Transport

There are eleven bus routes operating across Grand Cayman with 125 designated bus shelters and bus stops dotted across the island. Figure 15 shows the extent of the network.

All routes run to and from the bus depot in central George Town, where there is a Public Transport Inspector on duty from 7am-7pm Monday-Friday to supervise all bus operations. Limited services are provided on a Sunday. Most buses comprise a 'mini-bus' type of operation, carrying between 14-29 passengers. These are run by private operators rather than the public sector.

Because of the private nature of the operation, it is understood that there have been anecdotal reports and complaints that buses will go to Bodden Town and Frank Sound (from George Town) on a regular basis but will often turn around and drive back to town rather than complete their route around to North Side and East End, especially if their bus is empty.

There has also been much speculation that congestion issues associated with the volume of traffic on Grand Cayman could encourage the Government to implement peak-time bus services using more conventional buses.

Figure 15. Public Transport (Bus) Network



1 WB **WB1 - Yellow - Every 4 Minutes**
Seven Mile Beach, Governor's Residence, Cayman Turtle Centre, Hell

2 WB **WB2 - Dark Green - Every 6 Minutes**
Seven Mile Beach, Governor's Residence, Cayman Turtle Centre, Hell

3 **3 - Purple - Every 15 Minutes**
Airport, George Town, West Bay

4A **4A/4B - Bright Blue - Every 30 Minutes**
Government Hospital, Field of Dreams

4B Sports Complex, University College of the Cayman Islands

7A **7A - Red - Every 15 Minutes**
Bodden Town Public Beach, Gun Square, Blow Holes, Wreck of the Ten Sails, Colliers Beach, Botanic Park

7B **7B - Light Green - Every 15 Minutes**
Smith Cove, Mind's Eye, Pedro St. James Castle, Bodden Town Public Beach, Gun Square, Wreck of the Ten Sails, Colliers Beach, Botanic Park

8A **8A - Orange - Every 15 Minutes**
Bodden Town Public Beach, Gun Square, Botanic Park, Cayman Kai

8B **8B - Light Green - Every 15 Minutes**
Smith Cove, Mind's Eye, Pedro St. James Castle, Bodden Town Public Beach, Gun Square, Botanic Park, Cayman Kai

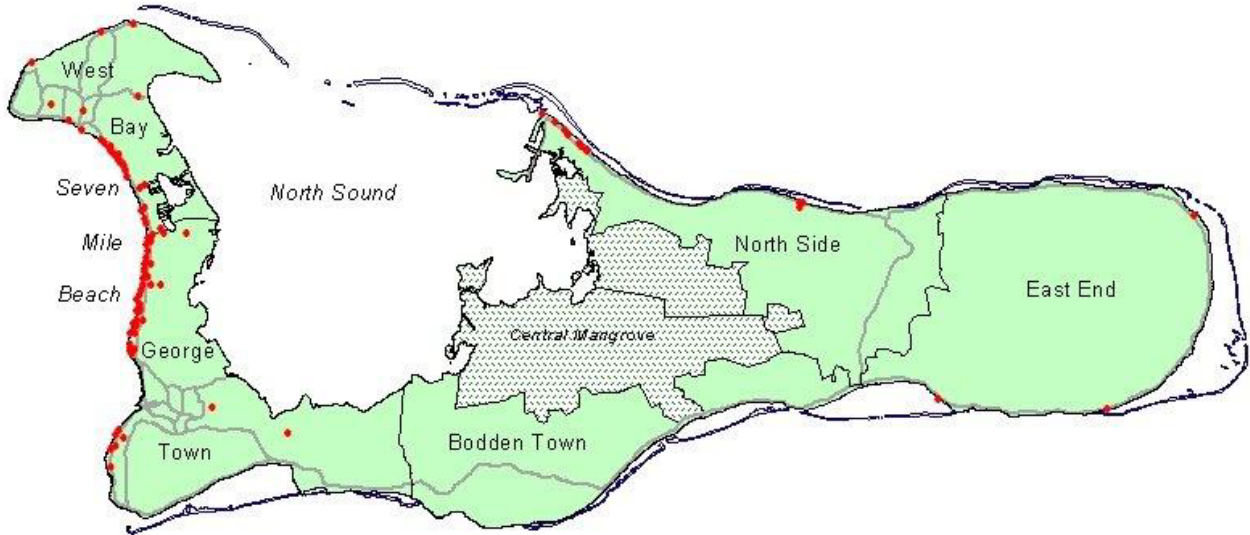
9A **9A - Dark Blue - Every 15 Minutes**
Queen Elizabeth II Botanic Park, Colliers Beach, Wreck of the Ten Sails, Blowholes

9B **9B - Light Green - Every 15 Minutes**
Smith Cove, Mind's Eye, Bodden Town Public Beach, Gun Square, Botanic Park, Wreck of the Ten Sails, Colliers Beach, Blowholes

5. Transport-related Environmental Considerations

As shown indicatively below in Figure 16 and 17, the project would cross environmental sensitive areas, including areas covered by the Central Mangrove.

Figure 16. Extent of Mangrove Areas



Source: The Application of a Spatial Decision Support System to Tourism-Based Land Management in Small Island States (2000)

Figure 17. Extent of the Central Mangrove (with Longer-Term Road Plan)



Source: Department of Environment

The method of construction for the road would need to respond appropriately to the hydrology of the Mangrove areas in order to ensure its hydrology is not affected.

This goes as much for the tidal movement of waters as it does in terms of the means of treatment for the road drainage, including what methods would be adopted for intermediate treatment through appropriate means of attenuation (and petrol interceptors).

At this stage, little has been presented relating to the proposed design for the project to reach a judgement on the conformity of the design and how sensitive it has been to the geography and ecology along the proposed alignment. More sensitive environmental solutions may also have an increased cost, which then needs to feed back into the Benefits/Cost ratios for the scheme.

A study⁹ in 2018 highlighted the risk that the Government's economic growth priorities may be contributing to further habitat loss in Grand Cayman. It states that:

"The demand for real estate by international investors initially attracted by the island's financial services, along with that of the professionals employed to provide these services, has been one of the key drivers of mangrove wetland clearance. Interview results suggest the hypothesis that these dynamics have persisted due to the alignment of political forces that has emerged in their defense: a state structurally-dependent on development fees for revenues and dependent for political support on landowners and the development and real estate industries."

While the above statement strays into the political sphere, it would appear to be the case that the rationale for the EWA Extension is partly driven by a need to improve the accessibility to land for development, more than it would be about meeting some marginal journey time savings from populations located furthest away from the (employment) poles of attraction.

The resilience point, including improving access for emergency vehicles, could potentially be met through other means (e.g. BP40, see below).

6. Alternative Interventions

Approach to the Assessment

In determining the benefits arising from the project, any comprehensive assessment cannot be done in isolation from considering other measures that could be implemented to achieve similar aims. This is because:

- Most business cases should rely on a sequential assessment of the following:
 - The Strategic Case
 - Is there a robust case for change?
 - What is the outcome that this scheme is trying to achieve?
 - Is the proposed scheme the best way of achieving the outcome?
 - The Socio-Economic Case
 - What are the benefits to users and the environment?

⁹ Environmental destruction in the new economy: Offshore finance and mangrove forest clearance in Grand Cayman' Geoforum, Volume 97, December 2018, Pages 155-168

- The Commercial Case
 - What are the full costs of the scheme? Is the Benefit Cost Ratio (BCR) positive?
 - Is the project viable, both in terms of capital construction and maintenance (i.e. whole life cycle)?
- The Financial Case
 - Where are the funds going to come from (e.g. capital investment, private toll)?
- The Management Case
 - Are the institutional frameworks compliant with the on-going operation of the project.
- The EIA process usually requires an assessment to be conducted of what the 'reasonable alternatives' would be to the project.

In both cases, the assessment of the project should look to present the variety of options that exist to deal with the identified issue(s), to determine if the choice of scheme is the optimal way to address the problems that are being experienced.

Such an assessment should also prove that the BCR of the project are positive and that it confers sufficient value-for-money to justify its implementation.

At this stage, it is not known if the design of the road will have progressed to an extent where detailed construction costs can be established to inform that value-based assessment.

One particular aspect would be to outline if the total costs of the project, including all associated construction and environmental mitigation, has been detailed.

Environmental Impact Assessment

The [EIA Scoping Reportⁱⁱ \(2023\)](#) considers Section 2 and Section 3 together, however, the impact/benefit equation for the two sections will be very different. East of Bodden Town, the traffic levels make it difficult to justify the EWA Extension, in part or in whole.

The robustness of the EIA will also depend on specifying a set of realistic 'reasonable alternatives'. In this respect, at present the document covers the following:

- Scenario 1a-1x: This is limited to consideration of 'alternative alignments' of essentially the same roadway scheme. The inference is that those different alignments (and methods of construction, including option from 'bridged' sections to address the flooding concerns) would be considered in determining the best road option to take forward.
- Scenario 2: A 'no build' option which will be a means of demonstrating how worse existing conditions would be without the scheme. This seems to be considered as a mere counterpoint to skew the balance of benefits for Scenario 1.
- Scenario 3: Improvements to Bodden Town Rd, but with the pre-judged conclusion that such an option would have implications for a need to acquire property resulting in residential/commercial relocations.

While the EIA study intends to consider alternatives, these seek to pre-judge the merits of the EWA Extension scheme, with a focus of the assessment being on different alignments. The assessment ought to:

- Consider EWA Section 2 and Section 3 separately and in combination. This is because the merits of one may be very different in technical (and environmental) terms than the other.
- Consider different configurations of the two sections involving single carriageways and dual-carriageway options. This is because the underlying data does not support a requirement for consistency in terms of the level of infrastructure required along the route of the EWA Extension.

Other interventions could also have formed part of a more holistic approach to the assessment of the congestion problems experienced on the island, against the objective of securing longer-term sustainable growth across the island, from a 'menu' comprising the following:

Alternative Road-Based Schemes

New or Improved Highway Corridors

The **EIA Scoping Reportⁱⁱ (2023)** itself identified the following alternatives:

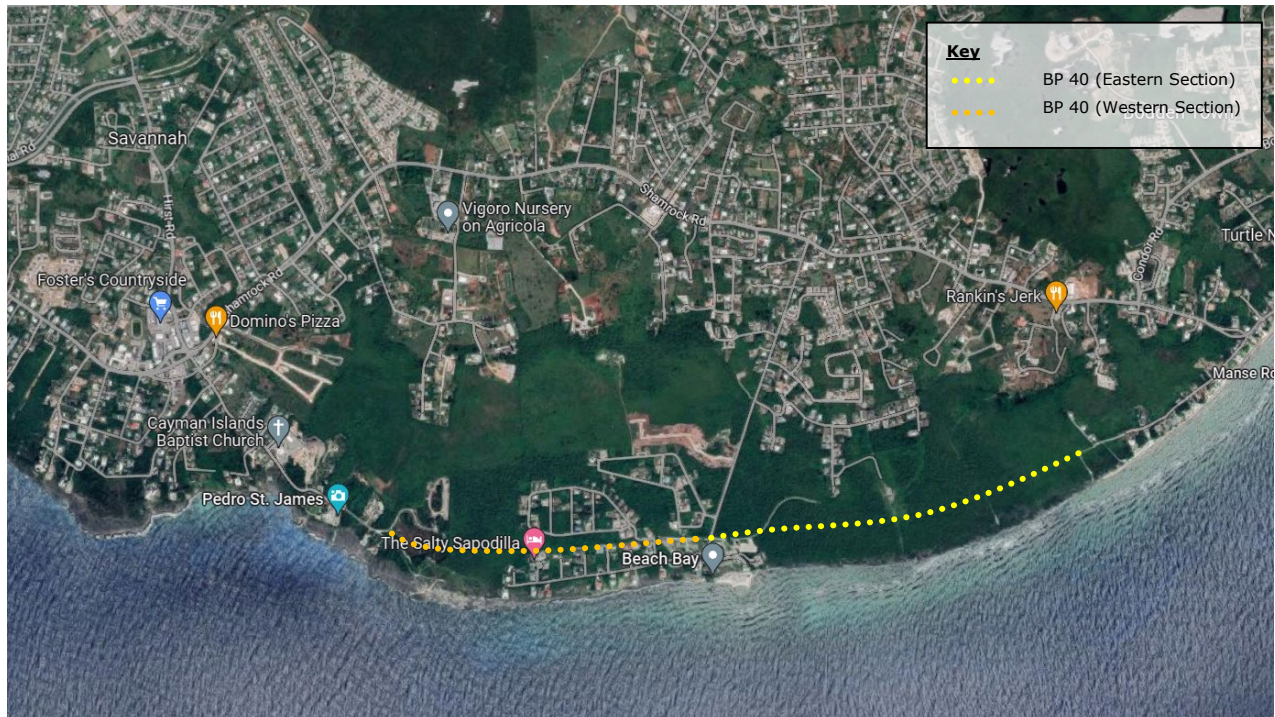
- **Gazetted Corridor option:** This would include improvements to existing road corridors, mainly around the elevation of roadways in places to facilitate proper drainage and reduce the risk of causing flooding.
- **Bodden Town Rd improvements:** This would provide alternative routes for emergency vehicle passage when the road is compromised; dedicated lanes for transit and safe pedestrian/bicycle use. Adding or widening lanes may create a need to acquire property resulting in residential/commercial relocations.

As one of the objectives of the East-West Arterial Extension is to provide additional highway capacity to meet East-West demand, other improvements could be made to increase the number of other East-West road corridors.

The coastal road referred to as BP40, for example, was gazetted in 1979 but was never constructed. As shown in Figure 18, the alignment would stretch from Manse Road to Pedro Castle, with an intermediate connection with Beach Bay Road.

It is understood that the construction of the section from Manse Road to Beach Bay Road is being advanced through an agreement between the Government and the developer of a new 'The Residences at Mandarin Oriental' accommodation scheme.

Figure 18. Gazetted Road Alignment BP40 (Indicative)



Some observations on this route are that:

- It would provide additional resilience for emergency vehicles, as this would offer an alternative to Shamrock Road.
- Its alignment is more in keeping with the patterns of land zoned for future development.
- It would facilitate greater connectivity with existing residential, employment and tourism areas around Bodden Town, leading to a greater potential for 'local living'.
- It would provide additional connectivity for potential public transport services.

The nature of the underlying geology (i.e. coastal bluff) means that:

- Lower costs of construction as it requires comparatively less excavation and fill.
- The land also sits much higher above sea level compared to lower levels of areas situated in other wetland areas (where parts of the East-West Arterial Extension would be sited)

The topography of the BP40 route therefore offers greater resilience to storm surges/overtopping events, which was one of the justifications advanced for the EWA Extension.

In this respect, it is interesting to note that Page 48 of the EIA Scoping Report states that:

"No generally accepted, delineated floodplain mapping exists for the Cayman Islands; however, the proposed EWA Extension corridor, like much of Grand Cayman, is low-lying and likely vulnerable to tidal flooding and hurricane/tropical storm-associated flooding, both of which can create numerous potential hazards."

The alignment for the BP40 route could therefore achieve similar resilience benefits in a much shorter time frame than the East-West Arterial Extension and with less consequent impacts.

Other 'Pinch Point' Locations

As outlined above, there are a number of highway infrastructure schemes which have been proposed or are under construction.

Understandably, these schemes are located towards the western part of the island, where the higher traffic levels are experienced.

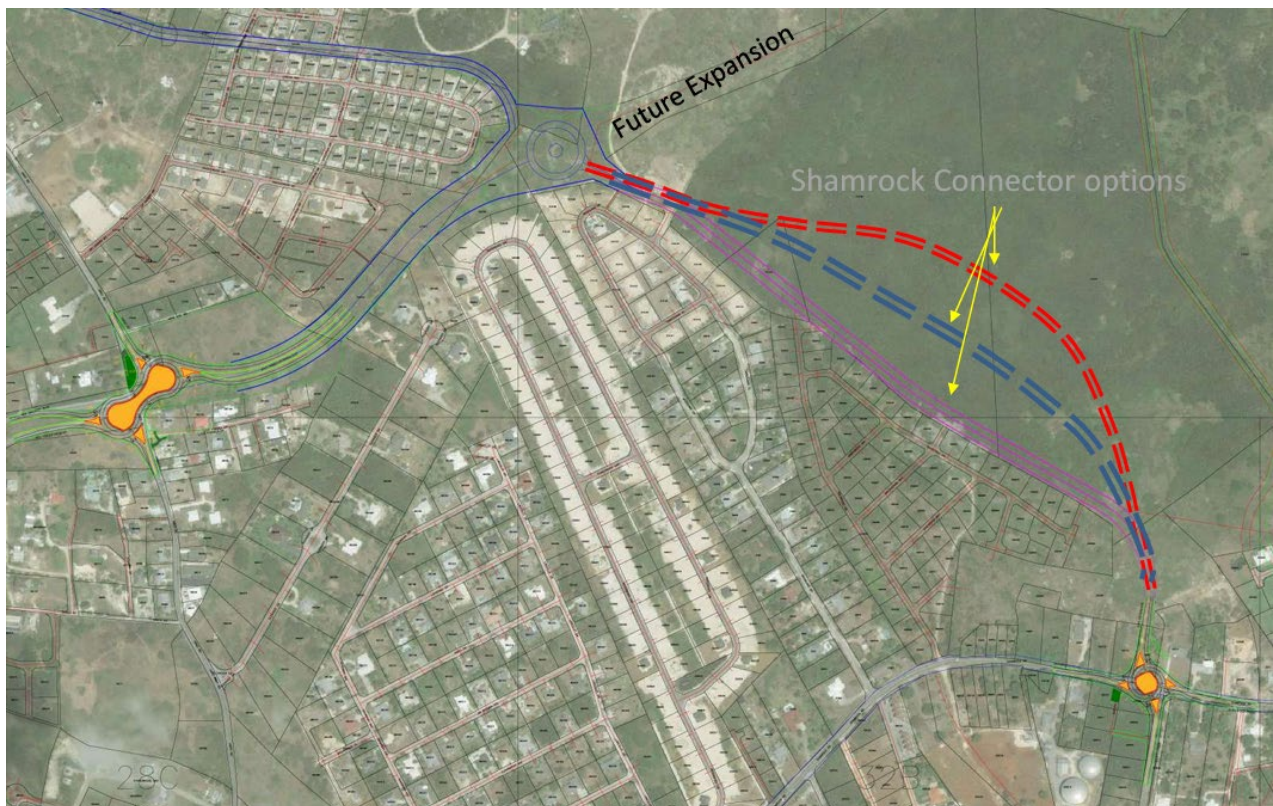
In the context that some of these schemes have not yet been fully completed, nor established a new degree of equilibrium in terms of network operations, it is too early to establish the journey time savings benefits that they will offer.

It is also the case that these schemes are likely to have a greater effect overall, because they will cater for the needs of a greater number of users than the EWA Extension project would, especially Section 3.

As such, there may be highway schemes that could achieve improvements to network operations in other locations where greater journey time benefits could be achieved.

The Woodlands-Shamrock Road scheme (shown in 'in green' in Figure 19) would deliver an important link in itself to the existing EWA, providing some relief for traffic on Shamrock Road.

Figure 19. Snapshot of E-W Arterial Extension (Section 1)



Source: NRA^{vii}

The potential could also exist to create a bus gate on Shamrock Road, so that most vehicular traffic (except for intermediate local access) would be diverted to the existing EWA. This is discussed further below.

Bus Services

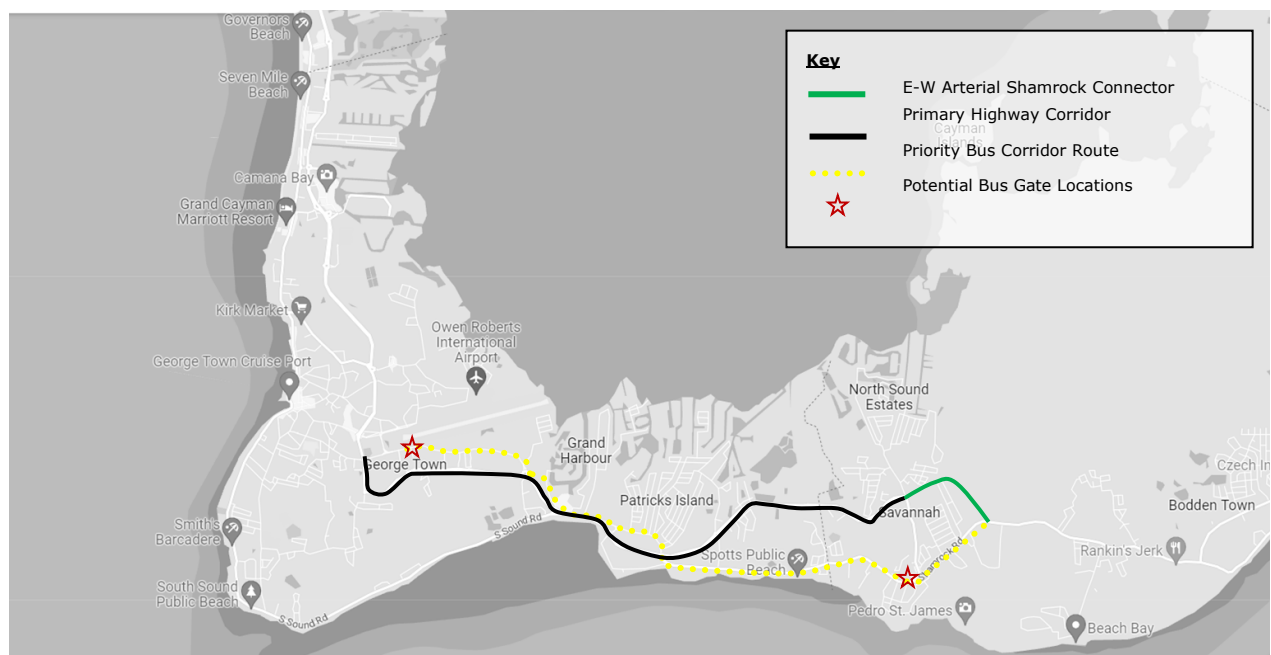
Bus services are largely a private sector affair and, while that is not necessarily a bad thing, there is scope for the Government to take a more active role in the provision of bus services in order to encourage greater modal shift.

While the main focus of infrastructure improvements has been on carriageway lane widening, bus priority measures could be included at key 'pinch points' or junctions to reduce bus journey times (comparative to the car) or improve reliability.

Short sections of bus lanes on the approach to roundabouts or signal optimisation at controlled junctions could be considered as part of future plans.

The Shamrock Road Connector to the EWA (Section 1) at Hirst Road could provide some traffic relief for Shamrock Road while allowing an element of priority to be provided for buses and cyclists. This could be further facilitated by carefully placed bus gates, as shown for example in Figure 20.

Figure 20. Potential Public Transport / Cycle Priority Corridor



The bus gate would balance the priority for traffic to use the existing EWA, while providing a more sustainable modes focused corridor for travel East-West to/from George Town.

Buses are able to make use of existing roads, with strategically positioned bus gates that would remove elements of through-traffic. This would provide semi-priority corridors and more reliable journey times (while maintaining vehicular access to existing properties).

The reduced traffic on re-allocated secondary routes would be conducive to an increase in cycling.

Cycling

The idea of a National Cycle Network for Grand Cayman could have a degree of traction locally. The topography and favourable weather on the island would generally be favourable for cycling.

In urban areas, this could be a substitute for short-distance car trips which would in turn provide some capacity relief.

A comprehensive plan would have the benefits of linking together what can appear to be a disparate and dis-jointed network of cycle infrastructure together and promote a more consistent messaging around the benefits of cycling.

Water-Based Transport

Many of the issues highlighted by the NRA are the journey time issues experienced by longer-distance car travel from communities on the North Side and Eastern District. Given the travel times and the unique geography of Grand Cayman, options could be looked at for introducing water-based transport options across North Sound (e.g. Water Cay – Camana Bay) with onward public transport connections to George Town.

Demand Management

Focusing on alternative demand management measures should also be looked at in greater detail, in managing down rather than simply accommodating the traffic impacts of future growth.

Car Parking

For example, people's decision to use the private car for some journeys will be dependent on the availability and price paid for car parking at their destination(s).

A review of car parking charging within George Town would offer a means of determining the travel choice sensitivities, as this would influence the volumes or frequency of vehicular trips.

At the other end of the spectrum, some towns and local authorities in other parts of the world have implemented Workplace Parking Levies for businesses, in areas where the stock of public car parking is otherwise lower overall.

The benefits of such demand management measures can include:

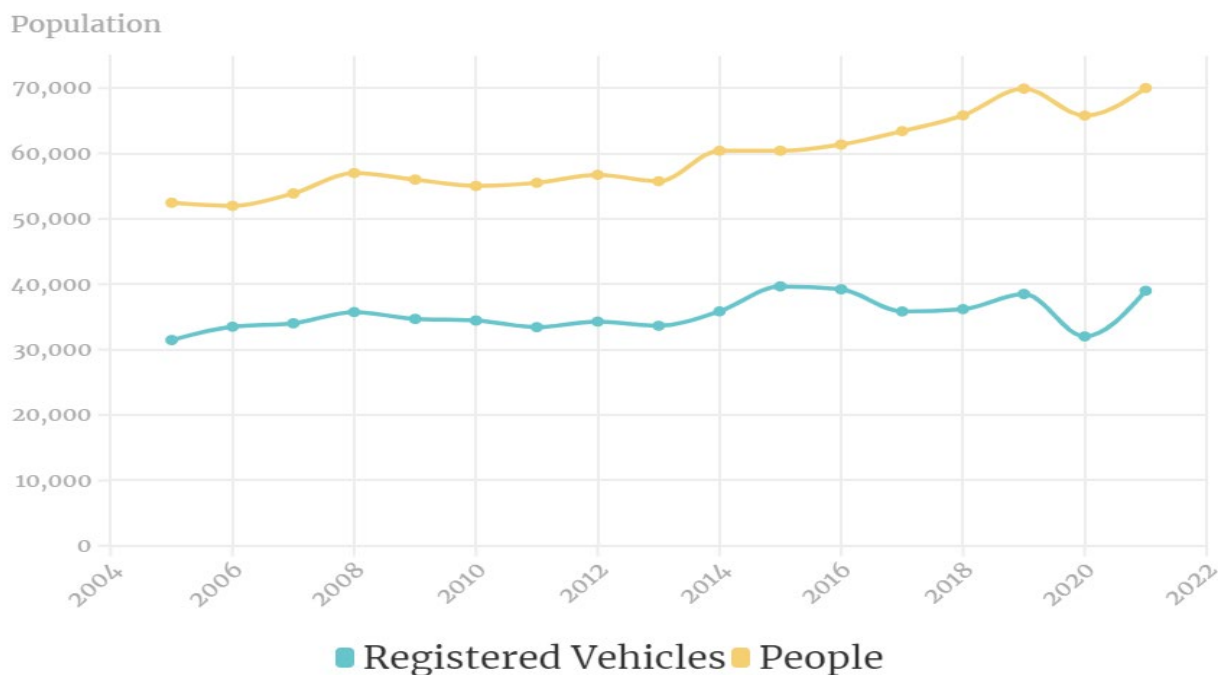
- A reduction in vehicle miles, which would comply with sustainable development principles, by tackling the climate crisis.
- The opportunity for additional revenue generation created could offer a means of funding better public transport services (or other forms of sustainable travel) across Grand Cayman Island, which in turn would act as a further incentive for modal shift.

Vehicle Taxation

From Census information published in July 2022, it is estimated that 79.9% of households own a motor vehicle, with an average of 1.7 per household^{ix}.

There is also evidence that car ownership rates have increased faster than population growth, which creates additional pressures on the road network.

Figure 21: Population and Vehicle Ownership



Source: Economic and Statistics Office (ESO)¹⁰

Some form of differentiation in the taxation regime for households with higher multiple vehicle ownership (e.g. >2 cars) could be employed to ensure the majority of Caymanians continue to have access to a primary vehicle, but without encouraging a family’s reliance on excessive ownership.

Road Pricing

While perhaps a more locally controversial suggestion, many cities have considered different methods of road pricing, including time-limited congestion charging or toll roads, to ensure a better spread of traffic within the peak hours or geographically-based restrictions, supported by investment in public transport infrastructure (e.g. Park and Ride).

Active Travel

The substitution of short-distance car trips for walking and cycling journeys could be delivered with greater investment in local pedestrian and cycling infrastructure.

Such measures would be best suited to built-up areas, such as in and around George Town, where the potential for short journeys exist. This would reduce the impact of background traffic, releasing traffic capacity for use by longer-distance car users.

The School Run

The latest 2021 Census data, shown in Table 2 below, indicated that around 67% of all persons attending school do so by private car. Conversely, the number of students using walking and cycling is low.

¹⁰ The Future of the Rush Hour: The Story in Data, Cayman Compass (June 2022)

Table 2. Persons Attending School by Type of School and Main Means of Transportation to School (20210

	Total	Day Care / Nursery / Preschool	Primary School	Middle / High / Secondary School	Vocational Institution	Community College	University / College	Special Education	Other	DK/NS
Total	14,664	1,647	4,519	4,287	151	369	3,211	130	289	61
Private Vehicle	9,937	1,575	3,774	2,590	65	271	1,521	60	74	9
School Bus	2,060	11	553	1,343	13	23	52	58	6	-
Public Bus	221	3	16	45	1	15	135	4	1	-
Walking	333	19	59	66	3	3	179	-	3	-
Bicycle	27	-	5	10	1	-	11	-	-	-
Taxi	16	-	-	-	-	1	15	-	-	-
Motorcycle/Moped	5	-	-	-	-	1	4	-	-	-
Boating	6	-	2	-	-	-	1	1	1	1
None	1,821	21	65	187	64	47	1,227	6	195	8
DK/NS	238	17	45	47	3	8	66	1	8	43

Source: Economics and Statistics Office Government of the Cayman Islands¹¹

School travel planning or the creation of a 'Safer Routes to School' programme, supported by low-impact improvements to infrastructure in key places could encourage more students to use sustainable modes, thereby reducing the dependence and (particularly in the morning).

Another alternative would be to undertake a study into the potential introduction of free or discounted bus travel to all students.

7. Conclusions

The preliminary conclusions which can be drawn from this high-level review are as follows:

- Spatial planning in Grand Cayman is characterised by the concentration of employment (and to a lesser extent retail) in western areas of the island.
- This creates a 'funnelling' effect whereby there are high levels of traffic at peak times; westbound in the morning and eastbound in the evening.
- The pressures caused by traffic has led the National Roads Authority (NRA) to propose and construct a number of significant road infrastructure projects, including:
 - The widening of Linford Pierson Way, Crewe Road / Shamrock Road and existing sections of the East-West Arterial Road.
 - A slight extension to the E-W Arterial Road is being constructed from Hirst Road to Woodlands, with a future extension eastwards to Shamrock Road.
- Increased development and zoning for development in the eastern regions are likely to put some additional pressures on traffic.
- The proposal for the East-West Arterial Road Extension is for a 49m corridor (160ft) comprising three lanes in each direction, central medians and cycle tracks. It represents a significant level of infrastructure investment which is incongruous with the natural character of the surrounding area.

- The traffic flows (present or future) would not justify this level of infrastructure, from the existing or forecasted 'with future growth' projections.
- The analysis completed by the NRA suggests that:
 - The greatest journey times benefits arising from the proposed E-W Arterial Extension will be felt from origins/destinations beyond Frank Sound. However, these will affect relatively fewer people.
 - Other infrastructure schemes could deliver equal or greater journey time benefits as the E-W Arterial extension project, particularly as they would apply to a greater number of road users.
- The analysis of available traffic data suggests that, further east, the volumes of vehicular movements are of an order (i.e. 300-400vph each way) which the existing capacity of a single carriageway (c.1300-1500vph) would be capable of easily accommodating.
- There would appear on the face of it to be little highway link capacity justification for a further continuation of the EWA eastwards under current spatial planning conditions. The immediate rationale for the Section 3 of the E-W Arterial Road are particularly difficult to justify on highway capacity or journey times alone.
- For users with 'intermediate' origins/destinations such as Bodden Town, some journey times benefits could arise from the Shamrock Road Connector (See Figure 19) to Hirst Road, as this has the potential to provide some relief to existing areas along Shamrock Road.
- However, there will be some significant variability in the benefits arising from EWA Extension Section 2 and 3 by account of the number of users for whom these routes would be a logical choice for travel.
- It is also the case that other forms of intervention could be implemented by the Government to 'manage down' the impact of traffic through modal shift, with investment in alternative modes of transport such as public transport, active travel infrastructure and other demand management measures (e.g. parking charges, differential taxation, road pricing).
- It is also possible to add to the density of East-West routes by relying on existing gazetted road corridors such as the BP40 route, whereby:
 - It would provide additional resilience for emergency vehicles, as an alternative to Shamrock Road but also because of the advantage of topography and geology.
 - Its alignment is more in keeping with the patterns of land already zoned for future development, rather than relying on new 'releases' and the impacts thereof on fauna and flora.
 - It would facilitate greater connectivity with existing residential, employment and tourism areas around Bodden Town, leading to a greater potential for 'local living'.
- This is against a backdrop of a Strategic Case for the project, which should realistically have presented the variety of options available that deal with the identified issue(s). This is similar to an EIA process that requires an assessment of all 'reasonable alternatives'.

- While the [EIA Scoping Reportⁱⁱ \(2023\)](#) intends to consider alternatives, these seek to pre-judge the merits of the EWA Extension scheme, with a focus of the assessment being on different alignments. In truth, the assessment ought to:
 - Consider Section 2 and Section 3 parts of the EWA project alignments separately and in combination. This is because the merits of one may be very different in technical (and environmental) terms than the other.
 - Consider different configuration of the two sections involving single carriageways and dual-carriageway options. This is because the underlying data does not support a requirement for consistency in terms of the level of infrastructure required along the route of the EWA Extension.
- Other interventions could also have formed part of a more holistic approach to the assessment of the congestion problems experienced on the island, against the objective of securing longer-term sustainable growth across the island.
- Ultimately, even if the assessment criteria were revised, the assessment should also prove that the Benefit Cost Ratio of the project are positive and that it confers sufficient value-for-money to justify its implementation. That would not be limited to the construction and maintenance costs for the scheme but also any mitigation measures that would be required to mitigate any of the environmental impacts, particularly on the Central Mangrove area.