



GOVERNMENT OF BERMUDA  
Ministry of Public Works

**Department of Works and Engineering  
Highways Section**

**Department of Planning Consultee Return Sheet**

TO: Director of Planning  
FROM: Tina Beer-Searle, Principal Highways Engineer, P.Eng.  
DATE: 5/11/2023  
ADDRESS: Fairmount Southampton  
PROJECT: SCO0001-23 TIS from Brunel Feb 2023

**1. Assessment**

**Objective**

- a. The TIS objective of type of units does not match the EIS amount and type of units. There should be a distinction between a tourism unit and a residential one.
- b. The proposed 2025 full development conditions do not match the EIS conditions of full development in 20 years.

**Methodology**

- a. Supplemental Masterplan from March 31, 2023 should have been used.

**Operational Analysis Methodology**

- a. Using the HCM manual that is designed for usage in United States the software needs to be adjusted to Bermuda roadway conditions. BDA is unique in that our roadways are utilized by pedal bikes, motor cycles, buses, commercial traffic and passenger cars. Unlike the US, we do not have designated bus or cycle lanes and all traffic end up on the same lane dramatically reducing the speed of traffic. In the past electric pedal bikes were non existing on BDA roads, now they have a significant presents in our roadways even during rush hour that slows down traffic.
- b. The HCM manuals speeds are based on miles per hour and BDA speed limit of 35km/hr is an equivalent to 22 miles/hr. The HCM manual does not provide sufficient data in its charts for such a low speed.
- c. Consideration should be given to classify BDA roadways as Urban Streets versus the Two-Way Highway due to large roadway developments within a one-mile stretch such as grocery stores, churches, schools, and gas station along Middle Road. These all contribute to the level of queues accumulating along a road stretch.
- d. BDA roads do not offer the opportunity to use a less travelled route. Middle Road and South Road are considered mayor travelled routes but not in comparison to the US where traffic has an uninterrupted flow on its highways. In the contrast in BDA traffic is constantly being interrupted due to the bus stops, vehicles letting other vehicles enter the main route from estates roads and other tributary routes, since only two main routes in this area to get to Hamilton, etc.

**Intersection Descriptions**

- a. Middle Road intersection at site access should include the merging of lanes from Lighthouse Road.



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**Table 1 2025 No-Build Traffic Operation**

The recommendation of the LOS A seems idealistic based on above listed items in d. LOS B or C should be considered. See table below.

Vehicles coming from the hotel will have a delay time in AM to enter main travelled routes such as South Road and Middle Road since there are no traffic lights mitigating traffic and their entry into the lane depends upon the discretion of the main route traveler or a break in traffic flow.

**Two-Lane Highways**

Two-lane highways differ greatly from multi-lane highways, because drivers are more limited in their mobility and speed. Any additional cars on the road can have significant impacts on traffic. For motorized vehicles, the three service measures used to determine LOS are: average travel speed (highway segment length divided by average travel time), percent time spent following (average time spent in groups behind slow vehicles), and percent of free-flow speed. On two-lane highways, there is also a bicycle LOS (BLOS) score, based on traveler perception. There are 5 considerations to the BLOS score: average effective width of the outside through lane, vehicle volumes, vehicle speeds, heavy vehicle volumes, and pavement conditions. LOS scores for motorized vehicles are defined as:

**LOS A:** High operating speeds at or near the FFS. Platooning is limited or unlikely, and motorists can pass easily.

**LOS B:** There is a balance between passing demand and capacity, and vehicle platooning occurs. There are small speed reductions.

**LOS C:** Speeds are noticeably reduced, and platoons occur for most vehicles.

**LOS D:** There is increased speed reduction, and significant platooning. Passing demand is high, but capacity is severely restricted, increasing percent time spent following.

**LOS E:** Speed is greatly reduced, and demand is almost at capacity, making passing impossible. At the lower end of LOS E, roads hit capacity.

**LOS F:** This occurs when the demand in at least one direction exceeds capacity, creating heavy congestion.

LOS	Class I Highways		Class II Highways	Class III Highways
	ATS (mi/h)	PTSF (%)	PTSF (%)	PFFS (%)
A	>55	≤35	≤40	>91.7
B	>50-55	>35-50	>40-55	>83.3-91.7
C	>45-50	>50-65	>55-70	>75.0-83.3
D	>40-45	>65-80	>70-85	>66.7-75.0
E	≤40	>80	>85	≤66.7
F	Demand exceeds capacity			

HCM: Motorized Vehicle LOS for Two-Lane Highways

**Site Generated Traffic**

The estimated volume of site generated exiting trips seems low at peak hours of 76 for 261 additional units. That is roughly 30% of the units.

Can information be shown how the 11<sup>th</sup> Edition of Trip Generation in the ITE determines the trips based on the housing unit count. Should consideration not be given to how many are residential units and how many are categorized as tourism?

Can the figures 3-6 be explained in the analysis. Does figure 3 represent current conditions of count and figure 4 the conditions when hotel is opened? The numbers seem not much different. Opening the hotel should change the numbers quite a bit with hotel employees.

Then figure 5 is the trip analysis based on ITE manual. Can it be explained how they justify their trip evaluation.



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Reviewing the trip generation, 50% of the generated additional trips will end up on either Middle Road or South Road adding to the congestion since Lighthouse Road joins both roads with its trip generation as contributory to those routes. The 76 AM generated trips from the hotel in comparison to the already generated existing trips of 565 on South Road and 1066 on Middle Road would generate an increase of 3% - 6% of traffic volume in the morning. Maybe not an overwhelming number in comparison to the US but in BDA will contribute to a potential adverse traffic impact. Each vehicle entering the main route will add to the queue at the next intersection, causing a ripple effect down to the Paget Light bottle necking of Middle Road and South Road and then to Trimmingham roundabout at Hamilton entrance.

**2. Recommendations**

BDA unique restricted traffic network should be considered when comparing or using the US classifications or HCM manuals. Each mayor junction or development such as a hotels, grocery stores, school and gas stations should be considered as a mayor traffic generating delay. There are no alternative routes to avoid our 2 main routes into Hamilton or to head back west to Dockyard. Traffic delays, queuing time are already at a disadvantage when coming from the west.

Suggestions of improvements for Middle Road would be to implement a traffic light at hotel access road and Lighthouse Road to join into Middle Road or a roundabout.

South Road and hotel access could improve with a traffic light that only activates with queuing time from hotel side to allow for them to enter South Road at a set phasing.

Paget Light at Middle Rd & South Rd traffic light phasing will need to be adjusted for the increase in AM & PM rush hour traffic.

Consideration should be given to the South Road sharp and steep s-bend along the South Road Townhomes. Improvements could include to adjust the tightness of the bend by straightening it out and adjusting the road elevations. That particular s-bend has been the cause of many accidents.

Hotel could consider a shuttle service to specific locations to cut down on vehicle trip generations in and out of development or promote public transportation usage vs using own vehicle to reduce the impact of increased traffic based on additional residential and tourism units.

I would gladly meet with Brunel to go over these items.