GORRILL PALMER

707 Sable Oaks Drive, Suite 30
South Portland, Maine 04106
207.772.2515

Driveway Capacity Analysis
Fore Street / Hancock Street All-Way Stop Analysis
Portland Gateway Hotel Project – Portland, ME
JN 2969

Date: April 15, 2016
Subject: Driveway Capacity and Fore / Hancock All-Way Stop Evaluation
Portland Gateway Hotel Project
To: Ara Aftandilian, Nell Donaldson, Tom Errico
From: Randy Dunton, Gorrill Palmer (JN 2969)

As requested at the April 5, 2016 Scoping Meeting for the Portland Gateway Hotel located in Portland, Maine, the following is an assessment of the operation of the site driveway / Fore Street intersection and the traffic control evaluation at the intersection of Fore Street / Hancock Street.

Driveway Operation

The proposed stop controlled site driveway is located on Fore Street, approximately 120 feet to the west of Hancock Street. Gorrill Palmer used Synchro/SimTraffic computer software to complete a capacity analysis for the site driveway. Level of service rankings are similar to the academic ranking system where an 'A' is very good with little control delay and an 'F' represents very poor conditions. The intersection was evaluated using both vehicles in and out of the driveway and the consideration of the valet service using the parking garage. The following table summarizes the relationship between control delay and level of service for unsignalized intersections:

Level of Service Criteria for Unsignalized Intersections

Level of Service	Control Delay per Vehicle (sec)
A	Less than 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.0

The results of the capacity analysis for the site driveway are summarized as follows:

Level of Service Summary

Approach	Level of Service	
	AM Postdevelopment	PM Postdevelopment
Fore Street / Site Driveway		
Site Driveway NB	A	A
Fore Street EB	A	A
Fore Street WB	A	A

As shown in the table, the site driveway is forecast to operate at high levels of service during both the AM and PM peak hours.

All-Way Stop Evaluation at Fore Street / Hancock Street

At the April 5, 2016 Scoping Meeting the question was raised if the intersection of Fore Street / Hancock Street should be an all-way stop. The existing intersection is stop controlled, with stop signs on both Hancock Street approaches and marked crosswalks across the northbound and westbound approaches. The following is an evaluation of the intersection to determine if an all-way stop is warranted:

Source: Manual on Uniform Traffic Control Devices, Section 2B.07

Support: "Multi-way stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multi-way stops include pedestrian, bicyclists, and all road users expecting other road users to stop. Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal."

Criterion A: *"Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal."*

This intersection is not anticipated to require a traffic control signal, so **Criterion A is not met**.

Criterion B: *"Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions."*

As shown on the attached collision diagram, there were four collisions at this intersection, and three of those would be susceptible to correction by a multi-way stop. This is less than the required five crashes, so **Criterion B is not met**.

Criterion C: Minimum Volumes

1. *"The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day;* ***and****"*
2. *"The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour;* ***but****"*
3. *"If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volumes warrants are 70 percent of the values provided in Items 1 and 2."*

The major street at this intersection is Fore Street and the minor street is Hancock Street.

1. The vehicular volume entering the intersection from Fore Street is 447 during the AM peak hour and 538 during the PM peak hour based on the 2016 Postdevelopment DHV. The peak hour volumes appear to meet the requirement, but since this Criterion is based on 8 hours of an average day, more information would be needed to make a final determination.
2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from Hancock Street is 103 during the AM peak hour and 210 during the PM peak hour based on the 2016 Postdevelopment DHV. Although this appears to meet the Criterion during the PM peak hour, the volumes for 8 hours of an average day are not expected to meet the Criterion.
3. The speed limit on Fore Street is 25 mph and the 85th-percentile speed does not exceed 40 mph, so this is not met.

Since both Items 1 and 2 must be met to warrant an all-way stop at the intersection, the traffic volumes **do not meet Criterion C**.

Based on this evaluation, none of the Criteria for an all-way stop are met for the intersection of Fore Street / Hancock Street, so an all-way stop is not required at this intersection.