GP Gorrill-Palmer Consulting Engineers, Inc.
Traffic and Civil Engineering Services

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April 4, 2006

Mr. Bill Needelman
City of Portland
389 Congress Street
Portland, ME 04101

RE: Longfellow Parking Garage and City Parcel Development
Portland, Maine

Dear Bill:

Gorrill-Palmer Consulting Engineers, Inc. is pleased to respond to the review comments made by Tom Errico of Wilbur-Smith Associates and Jim Carmody dated March 31, 2006 regarding the above referenced project. For ease of review, each comment has been repeated below followed by our response.

Comment 1 *– The Applicant needs to provide a recommendation on the provision of on-street parking on Middle Street between India Street and Hancock Street.*

Response – With a width of approximately 29 feet, Middle Street only has sufficient width to provide on-street parking on one side of the street. Based on a review of driveway locations and roadway alignment, it is the recommendation of our office that on-street parking be provided on the southeastern side of Middle Street between India Street and the proposed garage access. The remainder of the parking should be located on the northwest side of Middle Street between the proposed Village access and Hancock Street. Based on a length of twenty feet per on-street parking space, this would yield nine spaces. It should be noted, however, that the final layout for on-street parking should be determined when the final Application for the Village site is received.

Comment 2 *– The Applicant will be expected to make a financial contribution to the implementation of future improvements at the India Street/Middle Street intersection.*

Response – No response required.

Comment 3 *– Traffic impacts to the eastern promenade area including Mountfort Street has long been a concern associated with development activity in the Eastern Waterfront area. This project should participate in a monitoring program.*

Response – The Applicant is very sensitive to the concerns of the neighborhood residents in the eastern promenade area. The project has been designed to minimize impacts to this area to the extent possible.

***Comment 4** – The Traffic Impact Study illustrates a significant number of trips turn right from Middle Street onto India Street. It is unclear where these trips are destined to. An explanation should be provided.*

Response – Based on a review of the turning movement diagrams, the figures do show a significant amount of trips forecast from Middle Street eastbound to India Street southbound in the other development figures. These are largely due to the trip assignment associated with the Westin project (the former Jordan's site) and the Ocean Gateway project. In the case of the Ocean Gateway project, these movements could also occur at Fore Street. However, with the provision of an exclusive left turn lane from Franklin Street Arterial at Middle Street, it is expected that many of these trips will use Middle Street to India Street, rather than turning left at Commercial Street. For the purposes of the study, this results in a conservative analysis.

It should also be noted that any study referencing traffic from the Ocean Gateway is conservative, as the trip generation is based on the presence of two cruise ships docked at the facility simultaneously. Based on our prior work with the permitting of this project, it is anticipated that this would only occur several times per year.

***Comment 5** – I do not support the provision of a right-turn lane on Middle Street at India Street. Loss of on-street parking spaces in this area should be minimized.*

Response – Please refer to our response to Comment 6 below; our office will support the retention of the current one-lane approach on this street.

***Comment 6** – The Applicant should evaluate the feasibility of providing a multi-way stop sign installation at the India Street/Middle Street intersection. The Applicant should assess whether the intersection meets MUTCD warrants and assess queuing issues on India Street between Middle Street and Fore Street.*

Response – Our office examined the potential for a multi-way STOP intersection at the intersection of India Street and Middle Street. Based on the warrants detailed on Page 2B-8 of the MUTCD, the following criteria should be considered prior to installation of a multi-way STOP:

A. Where traffic control signals are justified, the multiway 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.

B. A crash problem, as indicated by five or more reported crashes in a twelve-month period that are susceptible to correction by a multiway stop installation. Such crashes include right- and left-turn collisions as well as right-angle collisions.

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 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the above values.

D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

Other criteria that may be considered in an engineering study include:

A. The need to control left-turn conflicts;

B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;

C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to reasonably safely negotiate the intersection unless conflicting cross traffic is also required to stop; and

D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multiway stop control would improve traffic operation and characteristics of the intersection.

Based on a review of the intersection, the intersection does not satisfy criteria B. Although the minor street volumes referenced for the purposes of a traffic signal did not include the right turns, these would be included in the warrant for a multi-way stop. Although only three hours of data were available, is it the expectation of our office that at least eight hours of forecast traffic would satisfy the warrant. The volumes for this analysis were originally compiled in the traffic impact study and can be found in the appendix of that report. In addition, installation of a multiway STOP intersection would satisfy Other Criteria B and D. Although not currently residential, this portion of the City will be increasingly so in the future. Therefore, it is the opinion of our office that installation of multi-way stop control **is warranted.**

A review of the HCM results for this location indicates that significant delay would result in conversion to an all-way intersection. However, our office exported the study area network to SimTraffic, as it models gaps created in traffic by adjacent intersections and provides a more

realistic model of driver behavior. Our office compiled the average of five runs. The results for the intersection are shown in the following table:

Level of Service for India Street at Middle Street (Unsignalized)

Lane Group	PM Peak Hour: Postdevelopment Volumes			
	HCM Results		SimTraffic Results	
	Delay	LOS	Delay	LOS
Middle – EB LTR	91	F	27	D
Middle – WB LTR	32	D	10	B
India – NB LTR	>100	F	23	C
India SB LTR	48	E	18	C
Overall	**>100**	**F**	**21**	**C**

As can be seen in the above table, the SimTraffic results indicate acceptable levels of service. In addition, our office examined the queues based on the five SimTraffic runs, which are shown in the following table:

Level of Service for India Street at Middle Street (Unsignalized)

Lane Group	PM Peak Hour: Postdevelopment Volumes – SimTraffic Queues		
	Storage Available (ft.)	Average Queue (ft.)	95th Percentile Queue (ft.)
Middle – EB LTR	320 ft. (Hampshire St.)	150 ft.	310 ft.
Middle – WB LTR	175 ft. (Gateway Garage)	55 ft.	95 ft.
India – NB LTR	220 ft. (Fore St.)	135 ft.	205 ft.
India SB LTR	210 ft. (Newbury St.)	95 ft.	190 ft.

Based on this analysis, the average queues as well as the 95th percentile queues are not forecast to block adjacent intersections. Once again, we would note that the volumes used are conservative reflecting two cruise ships in port simultaneously at the Ocean Gateway project which will be infrequent.

Therefore, it is the opinion of our office that a multi-way stop treatment should be placed at this intersection. As forecast in the Eastern Waterfront Master Plan, this location will ultimately require a traffic signal, but as the forecast approach volumes with this project, the Village Project, the Ocean Gateway and the Westin site will not trigger the signal warrants, the signage will serve this intersection for the near future.

Comment 7 *– The trip generation calculations are based upon building areas that do not match those provided in the body of the report. An explanation should be provided.*

Response – The body of the text references the appropriate sizes for uses. However, two of the sheets enclosed in the Appendix (for the retail and office building) were not the sheets referencing the square footages as utilized in the study. The appropriate sheets are enclosed with this letter.

Please note that the trip generation in the report was based on the appropriate building sizes, and as such the trip generation in the report and the analysis is appropriate.

Comment 8 – *I do not fully endorse the adjustments included for traffic generation in the Traffic Impact Study. I support the concept of alternative journey-to-work modes for urban developments, but in my professional opinion insufficient information/research has been provided to make a definitive conclusion for Portland. However, in my opinion the adjustment incorporate was relatively minor and I do not believe the conclusions would change if no adjustment was applied.*

Response – It is the opinion of Gorrill-Palmer Consulting Engineers, Inc. that the trip generation adjustments for the project are, if anything conservative. As was discussed in the text of the report, the adjustments were only ten percent, and did not include the office component. The reduction for the residential component, at ten percent, is less than half the reduction utilized (twenty-three percent) and accepted in housing components for prior studies on the peninsula. The information was based on journey to work information for the Portland Peninsula from the 2000 Census, and is therefore based on actual journey-to-work surveys.

The rates utilized in the *Trip Generation* publication are most appropriate to suburban uses and therefore representative of a high percentage of trip to work via automobile. As such, it is our opinion that short of completing a peninsula-wide trip generation study of different uses on the Peninsula, there is no feasible way to provide improved documentation on trip generation.

As for the remaining uses with a trip generation reduction, MaineDOT typically allows for a ten percent shared trip generation reduction for commercial sites with multiple complementary uses, and for locations in a suburban setting. If anything, the location of this project in a downtown area with a significant amount of office and proposed housing space would provide a much greater opportunity for shared trips.

Comment 9 – *The Traffic Impact Study suggests that Travel Demand Management techniques be incorporated, including Promotion of Public Transit, Ridesharing Program, and provision of Bicycle Amenities. The Applicant should elaborate on these items and how they will be implemented.*

Response –The Applicant would be responsible for providing a point of contact for TDM measures. A representative of the Applicant would serve as a transportation coordinator for the facility (and potentially other facilities held by the Applicant) and would hold the responsibilities of coordinating ride share, providing transit information, and promoting use of alternate modes.

Gorrill-Palmer Consulting Engineers, Inc. appreciates the opportunity to respond to these comments and looks forward to your review of our responses. Should you have any questions or require any additional information, please feel free to contact me.

Sincerely,

Gorrill-Palmer Consulting Engineers, Inc.

Thomas L. Gorrilll, P.E., PTOE
President

Copy: Drew Swenson
Dave Senus, Woodard and Curran

TLG/rmg/JN934/Needleman04-03-06

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	118	103	178	42	133	60	98	332	81	38	179	109
Peak Hour Factor	0.87	0.87	0.87	0.83	0.83	0.83	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	136	118	205	51	160	72	109	369	90	42	199	121

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	459	283	568	362
Volume Left (vph)	136	51	109	42
Volume Right (vph)	205	72	90	121
Hadj (s)	-0.19	-0.12	-0.04	-0.16
Departure Headway (s)	8.4	9.1	8.5	8.7
Degree Utilization, x	1.07	0.72	1.34	0.87
Capacity (veh/h)	427	383	432	402
Control Delay (s)	91.3	32.1	194.3	48.0
Approach Delay (s)	91.3	32.1	194.3	48.0
Approach LOS	F	D	F	E

Intersection Summary			
Delay	106.9		
HCM Level of Service	F		
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

3: Commercial St. & India Street Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	8.5	8.1	10.7	9.9	9.1	9.3
St Del/Veh (s)	6.5	6.2	9.1	8.3	7.4	7.6

4: Middle Street & India Street Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	18.1	22.2	27.8	21.3	15.0	20.9
St Del/Veh (s)	15.6	19.9	25.9	19.1	12.4	18.6

7: Fore St. & Garage RT Drive Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	1.5	1.6	1.8	1.7	1.4	1.6
St Del/Veh (s)	0.6	0.7	0.9	0.7	0.5	0.6

9: Fore St. & Condo Drive Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	0.8	0.8	0.9	0.9	0.8	0.9
St Del/Veh (s)	0.2	0.3	0.4	0.3	0.2	0.3

11: Middle Street & Village Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	3.0	3.3	2.8	3.3	3.7	3.2
St Del/Veh (s)	2.1	2.3	1.9	2.3	2.7	2.3

17: Commercial St. & Franklin St. Art. Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	24.1	24.0	26.1	25.0	26.0	25.1
St Del/Veh (s)	21.0	20.8	22.9	21.7	22.8	21.8

19: Fore St. & Hancock Street Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	2.4	2.3	2.5	2.5	2.7	2.5
St Del/Veh (s)	1.6	1.4	1.6	1.6	1.8	1.6

22: Commercial St. & Hancock Street Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	2.2	2.6	2.4	2.3	2.4	2.4
St Del/Veh (s)	1.1	1.4	1.4	1.2	1.3	1.3

38: Fore St. & Franklin St. Art. Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	21.8	20.3	23.3	23.1	19.3	21.6
St Del/Veh (s)	18.7	17.3	20.1	19.9	16.5	18.5

39: Fore St. & India Street Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	16.6	16.4	19.0	17.5	15.0	16.9
St Del/Veh (s)	13.7	13.6	16.1	14.6	12.2	14.1

43: Middle Street & Franklin NB Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	20.6	19.2	20.2	20.5	19.5	20.0
St Del/Veh (s)	17.1	15.9	16.8	17.0	16.2	16.6

210: Middle Street & Hancock Street Performance by run number

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	2.0	1.6	1.8	2.1	2.0	1.9
St Del/Veh (s)	1.2	0.9	1.0	1.2	1.2	1.1

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Delay / Veh (s)	52.7	52.2	59.8	56.1	50.1	54.2
St Del/Veh (s)	42.1	41.9	49.2	45.2	39.7	43.7

3: Commercial St. & India Street Performance by approach

Approach	EB	WB	SB	All
Delay / Veh (s)	11.0	6.9	7.3	9.3
St Del/Veh (s)	9.5	4.9	5.3	7.6

4: Middle Street & India Street Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	26.8	9.8	23.4	17.7	20.9
St Del/Veh (s)	23.6	8.1	21.7	14.8	18.6

7: Fore St. & Garage RT Drive Performance by approach

Approach	EB	WB	SB	All
Delay / Veh (s)	1.4	1.3	7.3	1.6
St Del/Veh (s)	0.4	0.4	7.6	0.6

9: Fore St. & Condo Drive Performance by approach

Approach	EB	WB	NB	All
Delay / Veh (s)	0.6	1.0	9.9	0.9
St Del/Veh (s)	0.0	0.4	9.2	0.3

11: Middle Street & Village Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	1.9	0.7	5.5	3.4	3.2
St Del/Veh (s)	0.7	0.3	4.5	3.4	2.3

17: Commercial St. & Franklin St. Art. Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	27.7	33.7	18.3	20.0	25.1
St Del/Veh (s)	23.6	29.5	17.3	17.3	21.8

19: Fore St. & Hancock Street Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	0.8	0.9	11.7	8.7	2.5
St Del/Veh (s)	0.1	0.2	9.7	7.7	1.6

22: Commercial St. & Hancock Street Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	1.6	0.3	6.0	6.8	2.4
St Del/Veh (s)	0.3	0.0	4.1	4.6	1.3

38: Fore St. & Franklin St. Art. Performance by approach

Approach	WB	NB	SB	NE	All
Delay / Veh (s)	39.6	8.4	19.8	23.4	21.6
St Del/Veh (s)	36.1	6.2	15.7	21.3	18.5

39: Fore St. & India Street Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	22.3	6.6	14.2	23.2	16.9
St Del/Veh (s)	18.4	5.1	11.1	20.4	14.1

43: Middle Street & Franklin NB Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	36.4	18.0	7.6	22.8	20.0
St Del/Veh (s)	31.5	15.0	5.3	19.2	16.6

210: Middle Street & Hancock Street Performance by approach

Approach	EB	NB	SB	All
Delay / Veh (s)	4.6	1.2	0.3	1.9
St Del/Veh (s)	3.2	0.3	0.1	1.1

Total Network Performance

Delay / Veh (s)	54.2
St Del/Veh (s)	43.7

Intersection: 3: Commercial St. & India Street

Movement	EB	B18	WB	SB
Directions Served	LT	T	TR	LR
Maximum Queue (ft)	164	127	73	97
Average Queue (ft)	109	14	46	51
95th Queue (ft)	172	70	70	85
Link Distance (ft)	93	310	82	227
Upstream Blk Time (%)	15		0	
Queuing Penalty (veh)	69		0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Middle Street & India Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	369	102	205	240
Average Queue (ft)	147	55	132	93
95th Queue (ft)	307	91	204	187
Link Distance (ft)	494	145	168	656
Upstream Blk Time (%)	0	0	5	
Queuing Penalty (veh)	1	0	21	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Fore St. & Garage RT Drive

Movement	EB	WB	SB
Directions Served	T	TR	R
Maximum Queue (ft)	75	71	48
Average Queue (ft)	14	15	21
95th Queue (ft)	52	54	46
Link Distance (ft)	71	61	146
Upstream Blk Time (%)	0	1	
Queuing Penalty (veh)	1	2	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: Fore St. & Condo Drive

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	53	69	36
Average Queue (ft)	5	10	9
95th Queue (ft)	27	41	31
Link Distance (ft)	61	91	163
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: Middle Street & Village

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	R	LR
Maximum Queue (ft)	49	22	94	29	50
Average Queue (ft)	9	2	45	4	25
95th Queue (ft)	34	14	78	20	46
Link Distance (ft)	145	142	160	160	147
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: Commercial St. & Franklin St. Art.

Movement	EB	EB	EB	B16	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	T	LT	R	LT	T	R	L	T	R
Maximum Queue (ft)	226	362	66	51	316	176	111	80	66	154	206	144
Average Queue (ft)	155	163	29	4	147	37	58	25	30	50	83	64
95th Queue (ft)	237	326	72	31	258	123	102	63	55	112	166	123
Link Distance (ft)		313		320	310		194	194	194		275	275
Upstream Blk Time (%)		1			0						0	
Queuing Penalty (veh)		0			1						0	
Storage Bay Dist (ft)	200		40			150				300		
Storage Blk Time (%)	5	31	1		9	0					0	
Queuing Penalty (veh)	19	104	3		5	0					0	

Intersection: 19: Fore St. & Hancock Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	52	74	91	57
Average Queue (ft)	9	9	36	23
95th Queue (ft)	35	39	64	44
Link Distance (ft)	91	257	240	153
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 22: Commercial St. & Hancock Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	47	14	30	64
Average Queue (ft)	11	1	7	34
95th Queue (ft)	38	8	28	54
Link Distance (ft)	256	275	256	240
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 38: Fore St. & Franklin St. Art.

Movement	WB	B6	NB	NB	SB	SB	NE	NE	B211	B37
Directions Served	<LR	T	LT	TR	LT	TR	L	R>	T	T
Maximum Queue (ft)	304	16	110	103	240	225	186	214	89	14
Average Queue (ft)	175	1	34	24	179	74	85	114	4	0
95th Queue (ft)	284	16	81	72	268	178	155	194	46	10
Link Distance (ft)	269	167	275	275	201	201	155	155	207	127
Upstream Blk Time (%)	3				11	0	1	4	0	
Queuing Penalty (veh)	8				33	1	0	0	0	
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 39: Fore St. & India Street

Movement	EB	B6	WB	NB	NB	SB
Directions Served	LTR	T	LTR	L	TR	LTR
Maximum Queue (ft)	235	136	107	64	218	201
Average Queue (ft)	148	14	64	22	104	126
95th Queue (ft)	248	75	103	60	190	209
Link Distance (ft)	167	269	71		227	168
Upstream Blk Time (%)	11		5		1	8
Queuing Penalty (veh)	47		20		3	33
Storage Bay Dist (ft)				35		
Storage Blk Time (%)				2	29	
Queuing Penalty (veh)				6	9	

Intersection: 43: Middle Street & Franklin NB

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB	B123
Directions Served	L	TR	LT	R	LT	TR	L	T	TR	T
Maximum Queue (ft)	175	382	207	106	182	184	225	359	278	43
Average Queue (ft)	121	140	80	44	83	83	105	138	85	2
95th Queue (ft)	188	293	161	95	151	157	205	277	192	24
Link Distance (ft)		546	494		201	201		332	332	377
Upstream Blk Time (%)		0			0	0		2	0	
Queuing Penalty (veh)		0			0	1		0	0	
Storage Bay Dist (ft)	150			100			200			
Storage Blk Time (%)	7	4	5	0			3	4		
Queuing Penalty (veh)	15	10	9	0			8	6		

Intersection: 210: Middle Street & Hancock Street

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	49	31
Average Queue (ft)	28	2
95th Queue (ft)	49	15
Link Distance (ft)	142	153
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Nework Summary

Network wide Queuing Penalty: 438

JN: 934
Project Description: The Longfellow
Project Location: Portland, Maine
Date: February 22, 2006

Gorrill-Palmer Consulting Engineers, Inc.
P.O. Box 1237
15 Shaker Road
Gray, Maine 04039

Specialty Retail Center
Land Use Code (LUC) 814

Gross Floor Area (ft^2): 19,994

Average Rate

Time Period	ITE Trip Rate	Trip Ends	Number of Studies	Directional Split * IN	Directional Split * OUT	Directional Distribution IN	Directional Distribution OUT	R^2
Weekday	T = 44.32 (X)	886	4	50%	50%	443	443	—
Peak Hour of Adjacent Street Traffic 7-9 AM**	T = 0.74 (X)	15	N/A	60%	40%	9	6	
Peak Hour of Adjacent Street Traffic 4-6 PM	T = 2.71 (X)	54	5	45%	55%	24	30	---
AM Peak Hour of Generator	T = 6.84 (X)	137	4	50%	50%	69	68	—
PM Peak Hour of Generator	T = 5.02 (X)	100	3	55%	45%	55	45	—
Saturday	T = 42.04 (X)	841	3	50%	50%	421	420	—
Saturday Peak Hour of Gen.* **	**T = 6.63 (X)**	**133**	3	**50%**	**50%**	**67**	**66**	**---**

**Based on ratio of AM/PM traffic for LUC 820, Shopping Center and applied to 814 PM rate.
***Saturday Peak Hour comes from a ratio of PM to Saturday trip rates from LUC 820 - Shopping Center
* Percentages rounded to nearest 5%

Fitted Curve Equation

Time Period	ITE Trip Rate	Trip Ends	Number of Studies	Directional Split * IN	Directional Split * OUT	Directional Distribution IN	Directional Distribution OUT	R^2
Weekday	T = 42.78 (X) + 37.66	893	4	50%	50%	447	446	0.69
Peak Hour of Adjacent Street Traffic 7-9 AM	---	---	N/A	---	---	---	---	---
Peak Hour of Adjacent Street Traffic 4-6 PM	**T = 2.40 (X) + 21.48**	**69**	5	**45%**	**55%**	**31**	**38**	**0.98**
AM Peak Hour of Generator	T = 4.91 (X) + 115.59	214	4	50%	50%	107	107	0.90
PM Peak Hour of Generator	---	---	3	---	---	---	---	---
Saturday	---	---	3	---	---	---	---	---
Saturday Peak Hour of Gen.	---	---	3	---	---	---	---	---

* Percentages rounded to nearest 5%
(---) Not Given

AM Peak of Adjacent Street 7-9 AM* **	**T = 0.275 (PM Peak Hour)**	**19**	**60%**	**40%**	**11**	**8**
Saturday Peak Hour**	T = 1.325 (PM Peak Hour)	91	50%	50%	46	45

**Saturday Peak Hour comes from a ratio of PM to Saturday trip rates from LUC 820 - Shopping Center
***AM Peak Hour of Adjacent Street comes from a ration of PM to AM trip rates from LUC 820 - Shopping Center

JN: 934
Project Description: The Longfellow
Project Location: Portland, Maine
Date: February 22, 2006

Gorrill-Palmer Consulting Engineers, Inc.
P.O. Box 1237
15 Shaker Road
Gray, Maine 04039

General Office Building
Land Use Code (LUC) 710

Gross Floor Area 23,789

Trip Ends Based on Fitted Curve Equation

Time Period	ITE Trip Rate	Trip Ends	Number of Studies	Directional Split *		Directional Distribution		R^2
				IN	OUT	IN	OUT	
Weekday	Ln (T) = 0.77 Ln (X) + 3.65	442	78	50%	50%	221	221	0.80
AM Peak Hour	**Ln (T) = 0.80 Ln (X) + 1.55**	**59**	217	**90%**	**10%**	**53**	**6**	**0.83**
PM Peak Hour	T = 1.12 (X) + 78.81	105	235	15%	85%	16	89	0.82
Saturday	T = 2.14 (X) + 18.47	69	17	50%	50%	35	34	0.66
Peak Hour of Generator	Ln (T) = 0.81 Ln (X) - 0.12	12	10	55%	45%	7	5	0.59

* Percentages rounded to nearest 5%

Trip Ends Based on Average Rate

Time Period	ITE Trip Rate	Trip Ends	Number of Studies	Directional Split *		Directional Distribution		R^2
				IN	OUT	IN	OUT	
Weekday	T = 11.01 (X)	262	78	50%	50%	131	131	---
AM Peak Hour	T = 1.55 (X)	37	217	90%	10%	33	4	---
PM Peak Hour	T = 1.49 (X)	35	235	15%	85%	5	30	---
Saturday	T = 2.37 (X)	56	17	50%	50%	28	28	---
Saturday Peak Hour of Gen.	T = 0.41 (X)	10	10	50%	50%	5	5	---

* Percentages rounded to nearest 5%

PM Peak Hour:	**T = 1.49/1.55 (AM Peak)**	**57**		**15%**	**85%**	**9**	**48**	**0.82**