

MEMORANDUM

Ref: 1428A

To: Joseph Persechino, P.E.
Tighe & Bond, Inc.

From: Stephen G. Pernaw, P.E., PTOE

Subject: Student Housing Development
Durham, New Hampshire

RECEIVED
Town of Durham

AUG 22 2012

**Planning, Assessing,
Zoning & Code Enforcement**

Date: August 16, 2012

As requested, our office has conducted a preliminary trip generation analysis for the 460-bed student housing project proposed on Mast Road by Peak Campus Development, LLC. We initially considered standard trip generation rates and equations published by the Institute of Transportation Engineers¹ (ITE); however the ITE database does not include a land use category for this specific type of use. Consequently, the trip estimates contained herein are based on local trip rates that were previously established for "The Gables," a similar student housing project in Durham. In this case, trip rates were determined for the various modes of travel including cars, trucks and buses, pedestrians, joggers, bicycles, skateboards and rollerblades. The trip estimates for the subject site were adjusted upwards to reflect the possibility that very few will walk to campus. The following table summarizes the trip generating characteristics for the 460-bed facility, given that a shuttle bus system will serve the cottages.

Table 1

Trip Generation Summary

		619 Student Housing Beds
Weekday AM Peak Hour		
In		11 veh
Out		<u>22 veh</u>
Total		33 trips
Weekday PM Peak Hour		
In		37 veh
Out		<u>45 veh</u>
Total		82 trips

The derivation of these estimates is attached.

¹ Institute of Transportation Engineers, *Trip Generation*, 8th Edition (Washington, D.C., 2008)

TRIP GENERATION CALCULATIONS - 460 Student Housing Beds

A. Weekday AM Peak Hour

I. Apply local trip generation rates from The Gables

Pedestrians	0.069	X	460	=	32	trips	(2 entering, 30 exiting)
Vehicles	0.037	X	460	=	17	trips	(6 entering, 11 exiting)
Buses	0.017	X	460	=	8	trips	(4 entering, 4 exiting) infers 15 min. headways
Service vehicles	0.001	X	460	=	0	trips	(0 entering, 0 exiting)

II. Convert pedestrian volume to vehicle-trips

Assume 25% drive	0.25	X	32	=	8	trips	(1 entering, 7 exiting)
Assume 75% use shuttle	0.75	X	32	=	24	persons	(utilizes one of the bus trips above)

III. Summary

Pedestrian who drive	8	trips	(1 entering, 7 exiting)
Vehicles	17	trips	(6 entering, 11 exiting)
Buses	8	trips	(4 entering, 4 exiting)
Service vehicles	0	trips	(0 entering, 0 exiting)

33	trips	(11 entering, 22 exiting)
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B. Weekday PM Peak Hour

I. Apply local trip generation rates from The Gables

Pedestrians	0.174	X	460	=	80	trips	(48 entering, 32 exiting)
Vehicles	0.122	X	460	=	56	trips	(22 entering, 34 exiting)
Buses	0.014	X	460	=	6	trips	(3 entering, 3 exiting), infers 20 min. headways
Service vehicles	0.001	X	460	=	0	trips	(0 entering, 0 exiting)

II. Convert pedestrian volume to vehicle-trips

Assume 25% drive	0.25	X	80	=	20	trips	(12 entering, 8 exiting)
Assume 75% use shuttle	0.75	X	80	=	60	persons	(utilizes one of the bus trips above)

III. Summary

Pedestrian who drive	20	trips	(12 entering, 8 exiting)
Vehicles	56	trips	(22 entering, 34 exiting)
Buses	6	trips	(3 entering, 3 exiting), infers 20 min. headways
Service vehicles	0	trips	(0 entering, 0 exiting)

82	trips	(37 entering, 45 exiting)
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Table 1A

Weekday Trip Generation Rates - The Gables

Travel Mode	AM Peak Hour		PM Peak Hour		Total Count (7 AM to 6 PM)		
	Trips	Trip Rate	Trips	Trip Rate	Trips	Trip Rate	Percent
Pedestrian	76	0.063	170	0.141	1,140	0.945	49%
Jogger	0	0.000	16	0.013	66	0.055	3%
Bicycle	7	0.006	18	0.015	84	0.070	3%
Skateboard	0	0.000	6	0.005	12	0.010	1%
Motorcycle	1	0.001	2	0.002	29	0.024	1%
Passenger Car	43	0.036	145	0.120	772	0.640	33%
Shuttle Bus	20	0.017	17	0.014	206	0.171	9%
Truck	1	0.001	1	0.001	26	0.022	1%
TOTAL	148	trips (entering plus exiting)	375	trips (entering plus exiting)	2,335	trips (entering plus exiting)	100.0%