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Town of Boxborough Planning Board
Mr. Simon Corson, Town Planner
29 Middle Road
Boxborough, MA 01719

Nitsch Project #12995
1414 Massachusetts Avenue
Traffic Study Peer Review
Boxborough, MA

Dear Mr. Corson,

Nitsch Engineering (Nitsch) has been retained by Level Design Group, LLC to assess the traffic impacts associated with the full occupation of the vacant facility located at 1414 Massachusetts Avenue in Boxborough, Massachusetts (formerly the Cisco office building). To do so, we gathered available information provided in previous Traffic Impact Reports that would assist in estimating future traffic volumes.

In January 2015, VHB developed a Traffic Impact Report (TIR) for the Jefferson at Beaver Brook residential development (now called Paddock Estates), located across Massachusetts Avenue from the proposed project site. To confirm the accuracy of VHB's Traffic Impact Report (TIR), we compared the traffic volumes presented in the report to the projected future site-generated traffic volumes for 1414 Massachusetts Avenue. We found that they were consistent, therefore we used the Jefferson at Beaver Brook for our analysis.

Jefferson at Beaver Brook TIR (2015)

To summarize VHB's TIR, the following intersections were studied for existing and future conditions:

- Massachusetts Avenue (Route 111) at I-495 Southbound Ramps
- Massachusetts Avenue (Route 111) at I-495 Northbound Ramps
- Massachusetts Avenue (Route 111) at Cunningham Road
- Massachusetts Avenue (Route 111) at Adams Place West Driveway/Gulf Station Driveways
- Massachusetts Avenue (Route 111) at Adams Place East Driveway
- Massachusetts Avenue (Route 111) at Hill Road/Burroughs Road
- Cunningham Road at Hill Road

Consistent with current traffic engineering standards, VHB contacted the planning board to obtain information related to previous studies and future planned developments that would affect their findings. Through coordination, it was indicated that traffic volumes collected in the vicinity did not accurately represent the typical conditions because the Adams Place office development was operating with vacancies at the time. Therefore, it was recommended that they use 2007 traffic volumes (when the office development was fully occupied) which were representative of the typical conditions.

Based on the 2007 traffic data, the Cisco Development generated 238 vehicle trips (185 entering / 53 exiting) during the peak one-hour period in the morning and 258 vehicle trips (55 entering / 203 exiting) during the peak one-hour period in the evening.

Upon calculating the total future network volumes, VHB conducted a capacity analysis for the existing and future conditions which indicates the number of vehicles queued and the vehicle delays at each intersection. They concluded that the study area intersections currently operate and are anticipated in the future to also operate with an acceptable number of queued vehicles and delay.

Future Development

The future development at 1414 Massachusetts Avenue will include two tenants, both consisting of research and development space and office space. Table 1 shows the future building program.

Table 1 – Future Building Program: 1414 Massachusetts Avenue

Land Use	Gross Floor Area (SF)
Tenant A – Vibalogics	
Office	16,481
Research and Development	49,442
Total	*65,923*
Tenant B – Arranta	
Office (assume 50%)	100,158
Research and Development (assume 50%)	100,157
Total	*200,315*
Combined Building	
Office	116,639
Research and Development	149,599
Total	*266,238*

To estimate the future project-generated trips, we used the Institute of Transportation Engineers *Trip Generation Manual, 10th Edition*, which is consistent with industry-standard methodology. The manual calculates the number of anticipated trips generated in the one-hour period that experience the greatest amount of traffic. The estimated trips are based on studies of similar developments for use, size, and location (i.e. urban vs. suburban vs. rural) within the country.

As the facility is expected to serve two land uses, we calculated the number of trips based on the size and location for a typical "Research and Development Center" and a typical "General Office Building." The number of trips is based on trip generation rates per gross floor area. For example, a typical Research and Development Center in a suburban area generates an average of 0.42 trips/1,000 square feet of gross floor area during the peak one-hour period in the morning and an average of 0.49 trips/1,000 square feet of gross floor area during the peak one-hour period in the evening. A typical General Office Building in a suburban area generates an average of 1.16 trips/1,000 square feet of gross floor area during the peak one-hour period in the morning and an average of 1.15 trips/1,000 square feet of gross floor area during the peak one-hour period in the evening.

Based on the size of the Vibalogics development and the Arranta development, we calculated the future one-hour peak period trips for the future development, which is shown in Table 2.

Table 2 – Vehicular Trip Generation Comparison

Land Use	Daily			Weekday Morning Peak Hour			Weekday Evening Peak Hour		
	Enter	**Exit**	**Total**	**Enter**	**Exit**	**Total**	**Enter**	**Exit**	**Total**
Tenant A – Vibalogics									
Office	80	81	161	16	3	19	3	16	19
Research and Development	278	279	557	16	5	21	3	21	24
Tenant B – Arranta									
Office	488	488	976	100	16	116	18	97	115
Research and Development	564	564	1,128	31	11	42	7	42	49
Combined Future Trips	**1,410**	**1,412**	**2,822**	**163**	**35**	**198**	**31**	**176**	**207**
Former Site Trips: Cisco at Full Occupancy *from 2015 TIR by VHB*	N/A	N/A	N/A	185	53	238	55	203	258
Net Trips	**---**	**---**	**---**	**-22**	**-18**	**-40**	**-24**	**-27**	**-51**

N/A = Not Available in 2015 TIR by VHB

Conclusion

As shown, the number of trips VHB presented in the Jefferson at Beaver Brook TIR generated by the Cisco building at full occupancy exceeds the number of trips that are now expected to be generated by the future project at 1414 Massachusetts Avenue in both weekday morning and evening peak hours. Therefore, the study area intersections are expected to operate at acceptable levels of queuing and delay in the future Build conditions with Vibalogics and Arranta occupying the site. As a result, it can be concluded that this project is expected to have not have a traffic impact to the surrounding area.

Please do not hesitate to contact us should you require any further information.

Very truly yours,

Nitsch Engineering, Inc.

Bryan Zimolka, PE, ENV SP
Project Manager