

**Rodney C. Emery**  
Traffic Consultant  
*Technical Memorandum*

**Date:** January 18, 2019  
**To:** Michael Aveni, Cummings Properties  
**From:** Rodney C. Emery, P.E., PTOE  
**Subject:** Site Plan Review – 50 Dunham Road - 44 Dunham Ridge, Beverly, MA.

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This technical memorandum has been prepared to assist with Site Plan Review for a proposed manufacturing facility to be known as 44 Dunham Ridge. In particular, we have been asked to provide a comparison of the number of daily and peak hour trips to be generated by this proposed manufacturing facility compared to the trips that were considered and approved as part of the applicant's recent Environmental Notification Form (ENF)<sup>1</sup> submission. The 54-acre +/- site located on Dunham Road in Beverly has been the subject of a series of traffic studies in the past few years since the applicant<sup>2</sup> acquired the parcel in 2011.

**Background-ENF/TIA Approved Development**

Since July 2013, the Beverly Planning Board has approved the construction of the following projects at Dunham Ridge: a 151,538, square foot mixed-use building known as 48 Dunham Ridge; a 143,145 square foot mixed-use building and known as 52 Dunham Ridge; and Vitality Senior Living, LLC's construction of a four-story structure known as 54 Dunham Ridge, consisting of 118 units of subsidized elderly housing. Besides the Planning Board approval, an ENF was submitted to the Executive Office of Energy and Environmental Affairs (MEPA) who subsequently found that no Environmental Impact Report (EIR) would be required. According to the ENF, when construction of these previously permitted buildings is complete, the property will have a total of four buildings and 1,377 (structured and surface) parking spaces required by special permit. In addition to these permitted uses, the ENF and attached Transportation Impact analysis (TIA)<sup>3</sup> projected the future land uses for 42 Dunham Ridge as consisting of up to 75,000 gsf of General Warehouse use and up to 75,000 gsf of additional Manufacturing space, and up to [250] parking spaces. Table 1 summarizes the approved developments described in the ENF.

Subsequently, the Beverly Planning Board approved the construction of a 97,396 gsf manufacturing facility at 42 Dunham Ridge (Harmonic Drive, LLC). This was considered in the ENF and TIA as "Future Development".

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<sup>1</sup> Beverly-Dunham Ridge: ENF (EEA#15820), prepared by Dunham Ridge, LLC

<sup>2</sup> Applicant is Dunham Ridge, LLC

<sup>3</sup> Transportation Impact Analysis, Dunham Ridge Plan prepared for Dunham Ridge, LLC; prepared by Jacobs, February 2018

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Going forward, the development described above will be referred to as the *Previously Approved Original Development*.

Table 1: Development Totals Analyzed in TIA  
(Volume 2, Table 3-1 dated February 16, 2018)

<i>Building Description</i>	<i>General Office</i>	<i>Manufacturing</i>	<i>R&amp;D</i>	<i>Congregate Care</i>	<i>Office Park</i>	<i>General Warehouse</i>	<i>TOTALS</i>
<b>#48 Dunham</b>	60,195 gsf	62,802 gsf	21,705 gsf	-	-	-	144,702 gsf
<b>#52 Dunham</b>	57,258 gsf	71,572 gsf	14,315 gsf	-	-	-	143,702 gsf
<b>#54 Dunham</b>	-	-	-	118 units	6500 gsf	-	118/6500 gsf
<b>Future (#42 Dunham)</b>	-	75,000 gsf	-	-	-	75,000 gsf	150,000 gsf
<b>Total Area</b>	117,453 gsf	209,374 gsf	36,020 gsf	118 units	6500 gsf	75,000 gsf	

### **Trip Generation-ENF/TIA**

The following table summarizes the *Previously Approved Original Development* trip generation values described in the TIA, submitted and approved as part of the ENF. The traffic generated was estimated using ITE's *Trip Generation Manual 10<sup>th</sup> Edition*. The results of this Trip Generation analysis is shown in Table 1.

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Table 2: Trip Generation Summary-TIA  
(Volume 2, Table 4-2 dated February 16, 2018)

		<i>General Office (ITE Code# 710)</i>	<i>Manufacturing (ITE Code# 140)</i>	<i>R&amp;D (ITE Code# 760)</i>	<i>Congregate Care (ITE Code# 253)</i>	<i>Office Park (ITE Code# 750)</i>	<i>General Warehouse (ITE Code#150)</i>
<b>Trips</b>				<b>Weekday AM</b>			
	<b>Enter</b>	117	94	11	5	8	10
	<b>Exit</b>	19	36	4	3	1	3
	<b>Total</b>	<b>136</b>	<b>130</b>	<b>15</b>	<b>8</b>	<b>9</b>	<b>13</b>
				<b>Weekday PM</b>			
	<b>Enter</b>	22	43	3	11	1	4
	<b>Exit</b>	113	97	15	10	6	10
	<b>Total</b>	<b>135</b>	<b>140</b>	<b>18</b>	<b>21</b>	<b>7</b>	<b>14</b>
				<b>Daily</b>			
	<b>Mon-Fri</b>	<b>1144</b>	<b>823</b>	<b>406</b>	<b>238</b>	<b>72</b>	<b>131</b>

The TIA included with and approved as part of the ENF described existing and proposed traffic conditions in the vicinity of the site. Significant roadway improvements along Brimbal Avenue and Sohler Road have been implemented as Phase I of the Exit 19 interchange improvements. In addition to the Phase I traffic improvements at Exit 19, the applicant has funded additional traffic improvements at the Brimbal Avenue / Dunham Road / Route 128 southbound off-ramp intersection. These planned traffic improvements, to be implemented by the City of Beverly, include widening a section of Dunham Road to create an additional exclusive left turn lane (to turn south on Brimbal Avenue) and the signalization of both Dunham Road and the Route 128 southbound off-ramp intersections with Brimbal Avenue.

The combination of the Phase I improvements and additional traffic improvements funded by the applicant has been designed to accommodate the increase in traffic from the full build out of the Dunham Ridge Project, as documented in the TIA. As noted above, the TIA included "Future Development" of the 42 Dunham Road site totaling 150,000 gsf of Manufacturing and General Warehouse space.

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### Revised Development Analysis

The TIA for the project analyzed “Future Development” as 75,000 gsf of Manufacturing and 75,000 gsf of General Warehouse space. The approved 42 Dunham Ridge (Harmonic Drive) and proposed 44 Dunham Ridge would equal a total of 147,996 gsf. of new manufacturing space. The combination of 42 and 44 comprise the “Future Development “accounted for in the approved TIA.

The revised land use totals for the Dunham Ridge project would now consist of 289,206 gsf of manufacturing uses (an increase of 79,832 gsf) and the elimination of the 75,000 gsf of General Warehouse space.

Table 3 illustrates the revised land use values.

Table 3: Proposed Development

<i>Building Description</i>	<i>General Office</i>	<i>Manufacturing</i>	<i>R&amp;D</i>	<i>Congregate Care</i>	<i>Office Park</i>	<i>General Warehouse</i>	<i>TOTALS</i>
<b>#48 Dunham</b>	60,195 gsf	69,638 gsf	21,705 gsf	-	-	-	151,538 gsf
<b>#52 Dunham</b>	57,258 gsf	71,572 gsf	14,315 gsf	-	-	-	143,145 gsf
<b>#54 Dunham</b>	-	-	-	118 units	6500 gsf	-	118/6500 gsf
<b>#42 Dunham</b>	-	97,396 gsf	-	-	-	0 gsf	97,396 gsf
<b>#44 Dunham</b>		50,600 gsf					50,600 gsf
<b>Total Area</b>	117,453sf	289,206 gsf	36,020 gsf	118 units	6500 gsf	0 gsf	

Using similar methodologies to those used in the ENF-TIA, the proposed land use development scenario, summarized in Table 3 above, was converted into trip generation data utilizing ITE’s 10 th Edition Trip Generation Manual. With these revisions to the proposed development at 42 & 44 Dunham, a new trip generation table was developed for the entire Dunham Ridge campus. Table 4 represents the new trip generation values.

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Table 4 Proposed Trip Generation Summary

		General Office (ITE Code# 710)	Manufacturing (ITE Code# 140)	R&D (ITE Code# 760)	Congregate Care (ITE Code# 253)	Office Park (ITE Code# 750)	General Warehouse (ITE Code#150)
<b>Trips</b>				<b>Weekday AM</b>			
	<b>Enter</b>	117	132	11	5	8	0
	<b>Exit</b>	19	52	4	3	1	0
	<b>Total</b>	136	184	15	8	9	0
				<b>Weekday PM</b>			
	<b>Enter</b>	22	59	3	11	1	0
	<b>Exit</b>	113	134	15	10	6	0
	<b>Total</b>	135	193	18	21	7	0
				<b>Daily</b>			
	<b>Mon-Fri</b>	1144	1137	406	238	72	0

### Conclusions

This document has been prepared considering the development as presented in Table 3. The *Previously Approved Original Development* was estimated to generate 311 trips in the morning peak and 335 trips in the afternoon peak hour. An analysis of existing and proposed conditions was provided in the TIA that was reviewed and approved by MEPA, with input from the state and local officials. A program of mitigation described in the report and was deemed sufficient to offset the increases in traffic due to the development of the site.

The proposed land-use considering both 42 and 44 Dunham Drive will result in 41 additional peak hour trips in both the morning and 39 additional trips in the afternoon peak hour, resulting in a new total of 352 trips in the morning peak and 374 trips in the afternoon peak.

Table 5 summarizes the changes in daily and peak hour trips.

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Table 5 Net Change in Trip Generation Summary

		<i>ENF/TIA</i>	<i>New Trips</i>	<i>Revised Total</i>
<b>Trips</b>			<b>Weekday AM</b>	
	<b>Enter</b>	245	+28	273
	<b>Exit</b>	66	+13	79
	<b>Total</b>	<b>NC</b>	<b>+41</b>	<b>352</b>
			<b>Weekday PM</b>	
	<b>Enter</b>	84	+12	96
	<b>Exit</b>	251	+27	278
	<b>Total</b>	<b>335</b>	<b>+39</b>	<b>374</b>
			<b>Daily</b>	
	<b>Mon-Fri</b>	<b>2814</b>	<b>+155</b>	<b>2969</b>

The change in land-use, increasing the size of the manufacturing component by 79,832 gsf and eliminating the 75,000 gsf of general warehouse will result in no change in the conclusions of the “Build” analysis for the project and ultimately the impacts and mitigation previously approved for the development.

The traffic operations analyses (LOS) at the Intersection of Brimble Avenue and Dunham Road was calculated for the proposed development described herein and found to continue to operate at a “C” LOS with only a minor increase in delays, in the order of less than 2 seconds for the overall intersection. This proposal has no measurable effect on traffic conditions within the study area.