SMOLAK & VAUGHAN LLP
ATTORNEYS AT LAW

John T. Smolak, Esq.
T: 978-327-5215 | F: 978-327-5219
jsmolak@smolakvaughan.com

March 31, 2021

VIA EMAIL AND BY HAND
Planning Board
Town of Hudson
Attn: Brian Groth, Town Planner
12 School Street
Hudson, NH 03051

RE: Hudson Logistics Center – Site Plan, Conditional Use Permit and Lot Line Relocation Applications
Supplemental Information

Dear Brian:

On behalf of the Applicant, Hillwood Enterprises, L.P., enclosed for filing with the Board are twelve (12) copies of the following documents:

1. Letter to Town of Hudson Planning Board, dated March 31, 2021, from Brendan Quigley, Gove Environmental Services, Inc. (responding to March 24, 2021 letter from Marc Jacobs) Draft Proposed Site Plan Conditions; and,
2. Memorandum to Brian Kutz, Hillwood, dated March 30, 2021, responding to certain comments raised at the Board's March 24, 2021 meeting.

Please do not hesitate to contact me with any comments, questions or concerns. Thank you for your time.

Very truly yours,

John Smolak

John T. Smolak, Esq.

cc: Brian Kutz, Hillwood (email only)
Langan (email only)
Justin L. Pasay, Esq. (email only)

GOVE ENVIRONMENTAL SERVICES, INC.

March 31, 2021

Town of Hudson Planning Board
Attn: Timothy Malley
12 School Street
Hudson, NH 03051

Re: Wetlands Permit Application – Additional Information
Hudson Logistics Center
NHDES File Number: 2020-00956
43 Steele Rd, Hudson, Tax Map #234, Lot #5

Dear Mr. Malley:

This letter responds to the letter filed by Marc E. Jacobs, CWS, CSS, CPESC dated March 24, 2021 (the "Jacobs' Letter") regarding the Conditional Use Permit ("CUP") Application filed by Hillwood Enterprises LP (the "Applicant") in support of its proposed Hudson Logistics Center (the "HLC" or the "Project") which was the subject of multiple Conservation Commission and Planning Board hearings and which obtained a favorable recommendation for approval from the Conservation Commission. This letter also responds to Mr. James Crowley's Planning Board presentation on March 24, 2021 which asserts arguments similar to those raised by Mr. Jacobs.

The Applicant stands on its previous filings in this matter to include all reports and filings by Gove Environmental Services, Inc., Langan Engineering and Environmental Services, and Lucas Environmental, LLC filed on behalf of the Applicant, as well as the Hudson Logistics Center – Conditional Use Permit Application Supplemental Filing (the "CUP Supplemental Filing") dated January 18, 2021, which was filed by Donahue, Tucker & Ciandella, PLLC. Those filings, in conjunction with all of the Applicant's public testimony and analysis, and the CUP Application itself, demonstrate the Applicant's compliance with the applicable CUP criteria within Article IX of the Town's Zoning Ordinance.

Although the Jacobs' Letter provides no new evidence, information, or precedent, a few of Mr. Jacobs' assertions warrant specific responses from the Applicant to correct the record. Those responses are outlined below.

First, though the "executive summary" of the Jacobs' Letter states that the analysis will "discuss how the project design submitted by [the Applicant] . . . does not comport with local, state and federal laws regulating impacts", Mr. Jacobs does not once refer to Article IX of the Zoning Ordinance which regulates the Town of Hudson's Wetland Conservation Overlay District (the "District") and the Conditional Use Permit review and approval process, and does not mention, acknowledge, address or refute the lengthy analysis and description of why the project meets the specific CUP criteria contained within Article IX of the Zoning Ordinance, which was included in the Applicant's CUP Supplemental Filing. Similarly, although not applicable at the local level, and while addressing the Applicant's State wetlands application filings, Mr. Jacobs does not once reference Env-Wt 311.07 which is the foundational State regulation which the Applicant has reviewed and analyzed at great length in filings with the State.

Instead of explaining why or how the Applicant's proposal does not comply with Article IX of the Town's Zoning Ordinance, the Jacobs' Letter rests nearly entirely on Mr. Jacobs' interpretation of the doctrine of avoidance and minimization. In that context, Mr. Jacobs' assertions are unsupported. Mr. Jacobs' cites no case law, no State Wetlands Council rulings, and no other precedent that supports his interpretations.

Ultimately, Mr. Jacobs' analysis and Mr. Crowley's analysis, which historically suggested that Building C should be removed altogether to accommodate the relocation of the Project's roundabout to further avoid and minimize wetland impacts, and which more recently has suggested that the northern accessway from Walmart Boulevard must be realigned to be consistent with the Town's Zoning Ordinance, fails for the same reason: **neither the Town of Hudson's Zoning Ordinance nor the State of New Hampshire's wetland regulations can be interpreted and applied in a manner that obviates a Project Purpose. Mr. Jacobs' and Mr. Crowley's assertions that rerouting accessways and removing and/or reducing the size of prototype buildings or buildings which have already been designed to minimize impervious footprint and comply with minimum industry standards, is required to comply with applicable regulations, is a distortion of the rule of law in Hudson and in New Hampshire in this context. These comments are made in a vacuum without regard or any consideration for operational, logistical, safety, financial, and other considerations which have informed the whole Hudson Logistics Center design and proposal.**

Most surprisingly, neither Mr. Jacobs or Mr. Crowley reference the significant and comprehensive restoration and mitigation efforts proposed by the Applicant.

The Applicant's responses to specific arguments raised in the Jacobs' Letter are below.

1) **Mr. Jacobs misinterprets the Applicant's characterization of its Project Purpose and ignores the evidence presented regarding same.**

Mr. Jacobs repeatedly misinterprets the Applicant's characterization of the Project Purpose. To summarize, Mr. Jacobs' argument in this context is that the real project purpose is to use the contiguous uplands on the Property for big buildings and that the Applicant "conflates the size of the proposed buildings with the project purpose." The assertion here is that it is improper to frame a project purpose around the nature and size of the buildings which will comprise the development and make it a viable endeavor, a conclusion which by itself strains common sense. The size of the buildings is directly related to the proposed use which is inseparable from the Project Purpose. The expressed intent to utilize the contiguous upland on the property is to reinforce the Applicant's intent to both avoid and minimize wetland impacts on the eastern side of the Property and along the Shoreline of the Merrimack River which have significant functional wetlands and wetland buffer areas, and to provide suitable and substantial areas for mitigation of unavoidable wetland impacts resulting from site access. Mr. Jacobs provides no evidence supporting his conclusion that the Applicant's definition of Project Purpose is inconsistent with the regulations.

The Jacobs' Letter also fails to mention the significant analysis provided by the Applicant to the Town and to the State regarding the actual Project Purpose and the significant ways the Applicant has deployed the concept of avoidance and minimization. That Project Purpose is inclusive of the construction of Buildings A, B, and C specifically, which collectively comprise the fulfillment center use proposed for the Property. Buildings A and B are prototypes and have been designed, down to the smallest of details, to accommodate Amazon's needs. They are the result of painstaking and comprehensive engineering and

logistical analyses utilized to produce building templates to maximize efficiencies of scale, accommodate the many multi-layer inter-related systems within the buildings, and processes and technology/equipment which are integral to their operation, and that promote the safety of employees and vendors alike. All details including the size and orientation of the buildings themselves, their interior configurations, their proposed vehicle and trailer parking configurations, the number of loading docks, and the proposed traffic patterns servicing the facilities, have been custom-designed to suit Buildings A and B. Similarly, though a larger building would be optimal, Building C has been designed to meet only the minimum dimensional standards for dual-load buildings to meet the high-demand in the area, as the Applicant has already explained.

The Applicant also has explained in great length that while the footprint sizes of the Buildings A, B and C cannot be altered any further, significant effort has been taken to avoid and minimize wetland and buffer impacts by, for example, proposing thousands of parking stalls less than what is required under the Town's Site Plan Review Regulations for industrial uses, and proposing parking stall dimensions which are smaller than what is required under the same Regulations, all in an effort to minimize impervious footprint. This effort has resulted in a reduction of approximately 22 acres of impervious area.

Rather than offering a rebuttal or even acknowledging the painstaking analysis offered by the Applicant as to why Buildings A, B and C have been designed in the manner they have been designed, Mr. Jacobs merely references the "expansive" size of the buildings to imply that the Applicant has arbitrarily determined building sizes in a manner that, in Mr. Jacobs' words "hardly sounds like a project design that has thoughtfully considered the inherent constraints of this particular site."

On the contrary, not only would this approach to development not make logical sense, the Project's projected wetland and buffer impacts, significantly reduced over the course of the Town's review, are a true success story, particularly in light of the Applicant's restoration and mitigation proposals. In fact, on the vast 375-acre Property, and despite significant wetlands which encumber the entire eastern portion of the site from which access is derived, 100% of all impacts proposed under the Hudson Zoning Ordinance are access impacts, 83% of which relate to Green Meadow Drive, including the roundabout, and the access from Walmart Boulevard. Of the remaining proposed impacts, only 585 SF of wetland impact (0.003% of all impacts and 0.00003% of the total Property area) relate to direct wetland impacts. The remaining 39,891 SF of access buffer impacts caused by the development will, after restoration efforts, be permanently protected, higher functioning wetland and wildlife areas than those areas are today, as maintained golf-course turf.

2) **The Jacobs' Letter's use of the word "discretionary" to characterize wetland or wetland buffer impacts is unprecedented, unsupported, and misleading.**

Mr. Jacobs repeatedly refers to various proposed wetland and buffer impacts as "discretionary." Mr. Jacobs uses this characterization to repeatedly suggest there is a bright line rule that Hillwood is ignoring through its CUP proposal to the Town. This is unfair and misleading. To be clear, the word "discretionary" does not appear in Article IX of the Town of Hudson's Zoning Ordinance, which Mr. Jacobs does not mention. Mr. Jacobs' characterization is not the law in Hudson or New Hampshire. Wetland and buffer impacts in Hudson are characterized and categorized as indicated below.

3) The Jacobs' Letter claims that many of the Applicant's proposed impacts are "lot development impacts" and not "access impacts" as claimed by the Applicant, without referencing any of the pertinent language from Article IX of the Zoning Ordinance.

Without referencing or analyzing the language of Article IX of the Town of Hudson's Zoning Ordinance, which regulates the Town's Wetland Conservation District and controls the Planning Board's interpretation of the Applicant's CUP Application, the Jacobs' Letter simply claims that several of the proposed impacts are not access impacts, as represented by the Applicant. This is an unsupported conclusion.

To be clear, the Town of Hudson's Zoning Ordinance does not categorize wetland or buffer impacts to the District as "discretionary" or "nondiscretionary" as Mr. Jacobs implies, or uses the term "lot development impact." Rather, the Zoning Ordinance lists uses permitted within the Conservation Overlay District, uses not permitted in the District, and conditionally permitted uses which require a Conditional Use Permit from the Planning Board. If a use is a conditionally permitted use, it must meet the criteria outlined in the Article IX.

As relevant to this case, the "construction of streets, roads, and other access ways, including driveways, footpaths, bridges and utilities if essential to the productive use of the land beyond the [District]" is a conditionally permitted use. These are access impacts by definition. The Applicant has already detailed why all of its proposed impacts fit this definition of access impacts. To summarize, all the proposed impacts relate to the "construction of streets, roads, and other access ways, including driveways, footpaths, bridges and utilities." The Applicant also explained in detail why its proposed impacts meet the CUP criteria listed in Sections 334-36(C)(2) and 334-37 of the Zoning Ordinance. Remarkably, the Jacobs' Letter does not mention these critical definitions and criteria and does not offer an explanation or rebuttal for how or why the Applicant has not satisfied them. As a result, the Jacobs' Letter's conclusions in this context have no basis. Furthermore, the Applicant did provide an alternative analysis under Section 234-34(C)(4) of the Zoning Ordinance in the event the Conservation Commission or Planning Board interpreted wetland impacts 2, 3, 5, 7 or 8 as development impacts, which neither body has to date, which Mr. Jacobs also did not analyze or mention.

4) The Jacobs' Letter misinterprets the State's definition of "practicable" found in Env-Wt 313.03.

Central to the Jacobs' Letter conclusions is the interpretation of the word "practicable" found within Env-Wt 313.03. On page 7 of his letter, Mr. Jacobs correctly notes that under that rule, NHDES will not approve alterations of jurisdictional areas unless an applicant demonstrates that the potential impacts have been avoided to the maximum extent practicable, and that "practicable" is defined in the rules as "available and capable of being done in light of the **overall** project purposes." Mr. Jacobs then suggests that what the regulation "does not say is important." Specifically, Mr. Jacobs notes that the definition of "practicable does not say 'in light of explicit project purposes, such as precise building sizes.'" In other words, Mr. Jacobs is advising the Planning Board and the State that the proper way to interpret Env-Wt 313.03 is by considering what it doesn't say.

This approach is the opposite of how New Hampshire law tells us to interpret regulations. As the Applicant has explained, if a word in a regulation is a defined term, that definition is assigned to the word when used in the regulation. Where the word is not defined by the regulation, its plain language definition is assigned. Under these principals of regulatory interpretation, it is improper to read into a

regulation words which the legislative body did not see fit to include.

In this case, the word "overall" is not defined in the regulations, but its plain language definition is "in view of all the circumstances or conditions" and "with everyone or everything taken into account." As the Applicant has explained, the Project Purpose in this case is specifically inclusive of Buildings A, B and C as depicted on the site plan and as described in the Applicant's filings. Taking all three buildings and all of the circumstances and conditions of the Property into account, as discussed in all the Applicant's filings and testimony, the Applicant has avoided wetland and wetland buffer impacts to the greatest extent practicable, and where not practicable to avoid them, has minimized those impacts to the greatest extent practicable.

5) The Jacobs' Letter mischaracterizes buffer zone impacts and impacts to wetland functions and values.

Mr. Jacobs asserts on page 5 of his letter that the Applicant's impact analysis and rationale regarding the restoration of buffer impacts are invalid. The context of the text he cites was a response to Conditional Use Permit Criterion 334-36(c)(4)(a) which requires that the proposed impacts not "…significantly interfere with wetland functions and values…". This area of impact involves the 585 SF of direct wetland impact and 39,891 SF of buffer impact located along the eastern edge of the project. These direct wetland impacts and much of the impacted buffer zone are to a small swale-like feature of maintained golf course turf having none of the same more functional wetland characteristics as the balance of the wetland areas on the eastern portion of the site. The remainder of the impacts are to wetland buffer areas, more than 90% of which is for grading and these areas will be restored as the project is completed. Furthermore, over half of this buffer impact is existing managed golf course turf so the restoration of these disturbed buffers will represent a significant improvement over existing conditions.

The Applicant is confident that the project meets not only the specific Town of Hudson Zoning Ordinance criterion, but also the spirit of protecting and enhancing buffers and maintaining larger, integrated areas of wetland and associated buffer to preserve wetland and wildlife functions and values. Contrary to what Mr. Jacobs seems to think is happening at this site or what would happen if these principles were employed elsewhere, wetland buffers will be significantly expanded on most areas of this Property as a result of this project.

6) The Jacobs' Letter mischaracterizes the Best Management Practices for Avoidance and Minimization Manual

On page 5 of the Jacobs' Letter, Mr. Jacobs references the Best Management Practices for Avoidance and Minimization Manual to improperly suggest that the concept of avoidance and minimization principals can be used to materially alter a project. The excerpted figures from this manual depict an example project (a self storage facility) in which the imaginary project proponent has minimized impacts by eliminating three of the nine originally proposed buildings. This is presented to highlight what Mr. Jacobs perceives to be a deficiency in the HLC project, namely that the buildings must be downsized to further reduce impacts. Despite Mr. Jacobs' assertion, the manual, and the example project in particular, lack the detail necessary to reach this conclusion. There is little discussion of all the other elements that need to go into a successful site design, much less any discussion topics such as project purpose and practicability. The manual introduces only the most basic avoidance and minimization which include downsizing the project *when possible*, recognizing that in some cases it may not be. In the case of the HLC, we have demonstrated that it is not possible due to the requirements of the use as extensively

documented in prior submittals. It is worth noting that the HLC project incorporates most other suggested techniques in the Commercial and Industrial development section of this manual. Many of these do not directly deal with limiting the physical impact to wetlands highlighting the broader scope of what is considered in this process.

7) **Building C as a multi-tenant building**

Mr. Jacobs highlights a reference in the Applicant's CUP Supplemental Filing submittal to the design of Building C being suitable for potential multi-tenant occupancy. Mr. Jacobs suggests this "strongly implies" that the size of Building C is being driven by the desire to maximize tenants and not the minimum requirements for a dual-load warehouse building. Whether Building C is occupied by a single tenant utilizing the entire space or several which may share it, the size of the building is driven by the use and the market demand for space in this configuration, as has been detailed in our previous submittals. Furthermore, in recognition of the site constraints (and not despite them) Building C is smaller than would otherwise be optimal if maximizing square footage was the only goal.

Sincerely,

Brendan Quigley
Gove Environmental Services, Inc.

MEMORANDUM

To: Hudson Planning Board (Timothy Malley, Chair)
Brian Groth, Town Planner

Cc: Brian Kutz, Vice President, Development, Hillwood
John Plante, P.E., Langan
Brian Mueller, Ostergaard Acoustical Associates

From: John Smolak, Esq.
Justin Pasay, Esq.

Re: Hudson Logistics Center – Site Plan, Conditional Use Permit, and Lot Line Adjustment/Merger Applications
Response to Public Comments

Date: March 30, 2021

On behalf of the Applicant, Hillwood Enterprises, L.P., the following sets forth the Applicant's responses to a list of comments made by the public at the Board's last meeting held on March 24, 2021. We continue to stand on the evidence provided, which the Applicant has developed to satisfy all regulatory criteria. Nevertheless, the Applicant rejects the opposition's efforts to turn this process into a referendum. For example, in the context of a demonstration of no significant diminution in property values, no expert or other credible evidence has been produced by the opposition to rebut the unchallenged foundational conclusions by the Applicant's experts. Nevertheless, we feel compelled to respond to certain technical misstatements provided below. Responses to these questions were prepared in consultation with certain members of the Applicant's Project Team, including Langan Engineering & Environmental Services, Inc., and Ostergaard Acoustical Associates

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Miscellaneous Comments on Traffic Impact

***Response**: The public comment continues to misrepresent the potential traffic impact of the project, making incorrect statements such as 4,000 trucks and how the 40% operations misnomer underestimates the traffic. The traffic associated with the proposed development and the potential impact on the roadway network has been prepared and reviewed by professional engineers, all with the conclusion that the proposed roadway improvements adequately accommodate the development. To further support this fact, the applicant has submitted a Sensitivity Analysis, dated Mach 3, 2021, and discussed the same at the Board's March 10, 2021 meeting. This Analysis reflects potential peak shopping season traffic volumes from the development, and it further confirms the additional capacity of the roadway network with the proposed improvements. See Memorandum to Brian Kutz/Hillwood, dated March 3, 2021, from John Plante, P.E., Langan, which is attached.*

Comments on Building A Gross Floor Area

***Response**: Building A gross-floor-area was also raised in an attempt to discredit the basis of the Applicant's trip generation methodology as a part of the traffic analysis. We would like to bring to your attention the Memorandum to Brian Desfosses/NHDOT, dated March 13, 2021, from John D. Plante, P.E., Langan, which indicates that the total gross-floor-area of the building does not impact the traffic analysis and resulting conclusions. This analysis was reviewed and confirmed by the NHDOT, as noted in email correspondence from William Cass, P.E., Assistant Commissioner, New Hampshire Department of Transportation, dated March 24, 2021. Both the March 13, 2021 Memorandum and March 24, 2021 email correspondence are attached.*

Presentation by James Crowley.

Responses:

- ***We would like to point out that Mr. Crowley's presentation consisted primarily of incorrect assertions, the misreading of the application documents, and misinterpretation of the design and design standards. A few specific examples are as follows:***

- Cited lack of emergency spillway at Pond A1-3
    - ***There is an emergency spillway in Infiltration basin A1-3 and it is shown on the plans. In the event of an overtopping emergency, all ponds are designed to safely direct overflow volumes away from buildings and appropriately downstream.***
- Questioned the forebay design of Pond A1-2.
    - ***The forebay design included for this, and all ponds, is a common and accepted form of pre-treatment. The design is in conformance with the NHDES stormwater manual and has been designed and peer reviewed by professional engineers.***
- Cited lack of infiltration testing at Pond A1-3.
    - ***This infiltration basin is proposed in the current location of the club house and main parking lot of the active golf course. Due to these physical constraints, and the designed basin elevation being 15 feet below existing grade, final infiltration testing will be conducted during construction to confirm the values used in the design. The values used in the design were based on actual soil data obtained in close proximity to Pond A1-3, and reflected similar soils in other infiltration testing areas.***
- Concern about dam failure at Pond A1-3.
    - ***Neither this pond, nor any other proposed stormwater ponds, are categorized as dams per the "New Hampshire Reservoir and Dam Safety Standards:***

Defining a Dam." This pond, in particular, has been designed as a depression, contained by large, horizontal areas of in-situ materials to remain undisturbed.

- Concern about side wall groundwater seepage at Pond A1-3.
  - ***The geotechnical data collected in the area of Pond A1-3 indicated the proposed pond design will not encounter groundwater.***
- Cannot guarantee infiltration rates.
  - ***Infiltration testing and data collected through the extensive geotechnical investigation performed by the applicant informs the professional engineers that the soils in the locations of the infiltration basins will have very high infiltration rates. As such, an amended soil will be placed in applicable infiltration basins to reduce infiltration rates, allowing for water quality benefits through a longer resident time. As with many aspects of the proposed application, the infiltration basins represent a conservative design allowing for any necessary adjustments to take place without the need for major modifications.***
- Suggested relocation of the northerly access drive.
  - ***The alignment proposed by Mr. Crowley would place the access drive directly adjacent to the vernal pool in that area. That is not an appropriate design suggestion as potential impacts of an active drive immediately next to the vernal pool should be avoid, as accomplished with the applicant's design.***
- Suggesting the stormwater design has pipes with slopes and velocities not in compliance with town code.
  - ***Town codes for stormwater design entitled "Town of Hudson Engineering Department Engineering Technical Guidelines & Typical Details" are what the title suggests, simply guidelines. The actual conditions in the field and the proposed development require professional judgement of professional engineers to be used in the design. This is why the town engineer, who is a licensed professional engineer himself, as well as a professional engineer performing peer review, both review the design. Langan discussed the few elements that varied from the guidelines and it was agreed that they were appropriate for the design and conditions.***
- Applicant does not provide rock or groundwater map.
  - ***A specific map is not a requirement of the design or application. Significant rock and groundwater information is provided in the geotechnical report, which is included as an Appendix to the stormwater management report on record with the town. This is the information which was used in the design and modeling of the proposed application.***
- The soil classification used is different than what is cited in USDA NRCS.
  - ***The USDA Natural Recourse Conservation Service (NRCS) data indicates a large amount of hydrologic soil group (HSG) class A soils on this site. The applicant has based the design on a Site-Specific Soil Survey Report and Map developed by a New Hampshire licensed professional soil scientist. This report is based on actual, site specific field data resulting in much more accurate information than the information contained within the USDA NRCS database. The site-specific***

report identified larger areas of HSG B rather than the NCRS classification of HSG A.

Comments on Noise / Sound Fence - The fence material the project is committing to was not the same as indicated in the report.

- ***Response: The earlier versions of the reports prepared by Ostergaard Acoustical Associates never specifically referenced the whole range of materials that were options to mitigate potential sound impacts. The fact that neither a wood or wood composite material in these reports was not an intention to exclude such an option. Ostergaard's reports, testimony, and acoustical modeling have always used a sound fence having a surface weight specification of at least 7 pounds-per-square-foot. The proposed composed wood material being proposing can meet this requirement and is sufficient to achieve the results provided in the acoustical model.***

Please let us know if you have any further questions and comments concerning the responses to the above questions. Thank you.

LANGAN

Memorandum

888 Boylston Street, Suite 510 Boston, MA 02199 T: 617.824.9100 F: 617.824.9101

To: Brian Kutz/Hillwood

From: John D Plante

Info: John Smolak/Smolak & Vaughn

Date: March 3, 2021

Re: **Trip Generation Sensitivity Analysis**
Hudson Logistics Center
Hudson, NH
Langan Project No.: 1501010101

Langan has prepared this sensitivity analysis in an effort to provide the Planning Board and the public additional information related to the trip generation and off-site improvements proposed by the project.

A traffic sensitivity analysis is an evaluation of a roadway network with exaggerated development trip generation volumes projected into the roadway network. In this specific analysis, Langan applied the peak season volumes, as illustrated in Table 5 in a Langan memorandum titled Potential Peak Season Trip Generation, dated September 22, 2020.

TABLE 5
POTENTIAL PEAK SHOPPING SEASON TRIP GENERATION USING TENANT AND ITE VOLUMES

LOCATION	AM Peak-Hour			PM Peak-Hour			ADT	Source
	IN	OUT	TOTAL	IN	OUT	TOTAL		
Lot A	184	54	238	187	197	384	1631	Tenant
Lot B	90	24	114	94	99	193	821	Tenant
Lot C	58	57	115	71	70	141	870	ITE
Unadjusted Total	332	135	467	352	366	718	3,322	
M-O Credit (5%)	-17	-7	-24	-18	-18	-36	-166	
Non-Peak Season Subtotal	315	128	443	334	348	682	3,156	
Peak Season Adjustment (x 60%)	+189	+77	+266	+200	+209	+409	+1,894	
Peak Season Total	**504**	**205**	**709**	**534**	**557**	**1,091**	**5,050**	

The peak season volume are a 60% increase in activity at the three proposed buildings, representing a potential worst case scenario of trip generation for the Hudson Logistics Center. These potential volumes were assign and distributed into the roadway network in a similar approach to the analysis presented in the Traffic Impact Study Supplement, dated September 2020. These potential volumes were then added to the non-peak season, No-Build traffic volumes to provide a representation of the conditions during an average day during the year, if the proposed development trip generation mimic the peak season volume all year long.

The five key intersections were then analyzed to determine their operating conditions under these circumstances, for both the potential opening year (2022) and the horizon year (2032). These results are illustrated on Tables 1, 2, 3, and 4, attached.

The table illustrate that even with the sensitivity analysis trip generation volumes added to the network, these intersections will continue to operate similarly to the Build With Improvements conditions presented in the Traffic Impact Study Supplement,

Similar to the Build With Improvement conditions, the sensitivity analysis conditions would either improve upon or match the operating condition in the No-Build condition, that is, conditions that would existing in the roadway network if the development did not exist.

This sensitivity analysis confirms that the developer's proposed improvements to the roadway network provide not only additional capacity to accommodate the anticipated average traffic of the development, but these improvement have additional capacity to handle additional trip generation beyond what is anticipated for an average day – the network would accommodate peak season volume without a negative impact to traffic operations.

We hope this provides the Planning Board with additional technical information to illustrate that the proposed improvements could accommodate significantly more traffic than the developer and tenant anticipated for the site.

TABLE 1
OPENING YEAR (2022) SENSITIVITY ANALYSIS SUMMARY – WEEKDAY A.M. PEAK-HOUR

INTERSECTION	CONTROL TYPE	LANE USE	STORAGE LENGTH (ft)	NO-BUILD CONDITIONS					BUILD WITH BASE IMPROVEMENTS CONDITIONS							BUILD WITH BASE IMPROVEMENTS PEAK SEASON TRIP GENERATION				
				LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%
River Road (Route 3A)/ Lowell Road (Route 3A) & Dracut Road & Steele Road	ACTUATED-COORDINATED	**Overall**		**B**	**19.6**	**0.84**			**Overall**		**B**	**17.3**	**0.66**			**B**	**16.6**	**0.65**		
		EB-L	±580'	D	40	0.03	2'	9'	EB-L	±590'	D	40	0.03	2'	9'	D	40	0.03	2	9'
		EB-RR	50'	A	0	0.01	0'	0'	EB-RR	50'	A	0	0.01	0'	0'	A	0	0.01	0	0'
		NB-L	200'	A	0	0	0	0'	NB-L	200'	A	0	0	0'	0'	A	0	0	0'	0'
		NB-TTR	±760'	C	32.8	0.39	84'	118'	NB-TTR	±760'	C	34.1	0.41	88'	127'	D	36.9	0.48	98'	128'
		SB-L	775'	D	37.3	0.74	293'	362'	SB-L	775'	C	24.4	0.38	110'	101'	C	22.4	0.35	89'	112'
		SB-TTR	±1730'	A	3.4	0.22	114'	2'	SB-TTR	±1730'	A	3.8	0.41	3'	7'	A	2.3	0.41	8'	18
		NWB-LL	100'	D	36	0	1	5'	NWB-LL	100'	D	37	0.01	1'	5'	D	37	0.01	1	5'
		NWB-R	>1000	B	15.2	0.84	166'	319'	NWB-R	>1000'	B	15.3	0.66	161'	287'	B	14.6	0.65	123'	257'
Lowell Road (Route 3A) & Green Meadow Drive/ Rene Avenue	ACTUATED-COORDINATED	**Overall**		**A**	**7.9**	**0.44**			**Overall**		**B**	**12.6**	**0.58**			**B**	**12.8**	**0.59**		
		EB-LT	±510	D	38	0.03	2'	11'	EB-LL		D	50.2	0.58	55'	116'	D	51.8	0.59	47'	95'
		EB-R	50	A	0	0.02	0'	0'	EB-TR	±510'	A	0.3	0.07	0'	0'	A	0.2	0.06	0'	0
		WB-LTR	±560	B	17.1	0.24	1'	28	WB-LTR	±560'	C	20.3	0.29	1'	30'	C	20.3	0.29	1'	30'
		NB-L	300	D	40.5	0.13	9'	15'	NB-L	300'	D	42.4	0.3	28'	38'	D	42.6	0.36	37'	47'
		NB-TTR	±1730	A	3.8	0.44	106'	193'	NB-TTR	±1730'	A	8.9	0.58	187'	257'	A	9.2	0.57	166'	259'
		SB-L	350'	C	24.4	0.06	4'	10'	SB-L	350'	D	38.6	0.06	4'	10'	D	37.4	0.06	4	9
		SB-TTR	±980	B	11	0.39	230'	162'	SB-TTTR	±980'	A	8.9	0.46	58'	70'	B	10	0.51	50'	89
Lowell Road (Route 3A) & Wal-Mart Boulevard	ACTUATED-COORDINATED	**Overall**		**B**	**18.5**	**0.62**			**Overall**		**B**	**15**	**0.54**			**B**	**14.6**	**0.56**		
		EB-LL	175'	D	39.6	0.31	29'	54'	EB-LL	175'	D	45.6	0.5	40'	70'	D	47.5	0.56	45'	77'
		EB-T	±400	C	34.2	0.01	2	12	EB-T	±400'	D	36.2	0.01	2'	12'	D	36.2	0.01	2'	12'
		EB-R	175'	A	0.8	0.15	0	0'	EB-R	175'	A	1.8	0.11	0'	9'	A	2.2	0.12	0	12'
		WB-LL	150'	D	38.7	0.06	4	14'	WB-LL	150'	D	38.7	0.06	4'	14'	D	38.7	0.06	4'	14
		WB-T	±450'	D	38.8	0.04	3'	15'	WB-T	±450'	D	38.4	0.04	3'	14'	D	38.4	0.04	3	14'
		WB-R	200'	A	2.4	0.28	0'	0'	WB-R	200'	A	3.9	0.19	0'	19'	A	3.9	0.19	0'	19
		NB-LL	350'	D	42.5	0.23	17'	44'	NB-LL	350'	D	44.9	0.28	26'	50'	D	45.3	0.5	31'	54'
		NB-TT	±980'	B	13.2	0.62	250'	85'	NB-TTTR	±980'	B	13.2	0.54	142'	137'	B	11.8	0.53	96'	140'
		NB-R	175'	A	0.1	0.03	0	0'												
		SB-LL	350'	D	48.9	0.27	25	56	SB-LL	350'	D	47.2	0.28	25'	35'	D	46.8	0.28	25'	32
		SB-TT	>1000'	B	15.5	0.5	255'	339'	SB-TTT	±1190'	B	11.9	0.45	112'	240'	B	12.5	0.48	125'	272'
		SB-R	725'	A	0.3	0.07	1'	1'	SB-R	400'	A	0.6	0.16	0'	1'	A	0.6	0.21	0	0
Lowell Road (Route 3A) & Sagamore Bridge Road	ACTUATED-COORDINATED	**Overall**		**C**	**21.7**	**1.02**			**Overall**		**B**	**15.9**	**0.83**			**B**	**15.8**	**0.83**		
		EB-LL	>1000'	D	38.4	0.88	266'	416'	EB-LL	>1000'	C	33.7	0.82	259'	334'	C	33.7	0.82	259'	334
		EB-R	>1000	A	1.2	0.54	0'	0	EB-R	>1000'	A	2.5	0.7	0'	0'	A	3.8	0.78	0'	0
		NB-LL	525'	E	60.2	1.02	313'	425'	NB-LLL	525'	C	25.7	0.83	221'	231'	C	27.5	0.83	218	231
		NB-TT	±1190'	A	2.9	0.19	7	4'	NB-TT	±1190'	A	4.4	0.22	16'	12'	A	4.3	0.22	17	15'
		SB-TT	>1000'	D	37.2	0.56	102'	136	SB-TT	±1000'	C	33.6	0.77	118'	132'	D	35.5	0.83	128	145'
		SB-R	200'	A	1	0.6	0	0'	SB-RR	200'	A	3.8	0.6	83'	96'	A	3.9	0.6	89'	96'

TABLE 1
OPENING YEAR (2022) SENSITIVITY ANALYSIS SUMMARY – WEEKDAY A.M. PEAK-HOUR

INTERSECTION	CONTROL TYPE	LANE USE	STORAGE LENGTH (ft)	NO-BUILD CONDITIONS					BUILD WITH BASE IMPROVEMENTS CONDITIONS							BUILD WITH BASE IMPROVEMENTS PEAK SEASON TRIP GENERATION				
				LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%
Lowell Road (Route 3A) & Flagstone Drive/ Wason Road	ACTUATED-COORDINATED	**Overall**		**D**	**54.4**	**1.04**			**Overall**		**D**	**47.3**	**0.97**			**D**	**48.9**	**0.99**		
		EB-LT	±810	F	87.4	0.86	111'	184	EB-LT	±810'	F	112.3	0.94	86'	147'	F	113.3	0.94	86'	147'
		EB-R	250'	D	46	0.68	257'	388'	EB-R	250'	C	22.1	0.6	111'	166'	C	22.1	0.6	111'	168'
		WB-L	200	E	71.2	0.83	336'	540'	WB-L	200'	E	72.6	0.95	205'	382'	E	72.8	0.95	205'	382'
		WB-LT	±590'	E	71.5	0.83	342'	546	WB-LT	±590'	E	73.2	0.95	209'	388'	E	73.2	0.95	209'	386'
		WB-R	75'	A	0.2	0.06	0'	0	WB-R	75'	A	0.2	0.06	0'	0'	A	0.2	0.06	0	0'
		NB-L	575'	F	121.9	1.04	349'	491	NB-L	575'	F	81.3	0.95	186'	319'	F	81.1	0.95	199'	319'
		NB-TT	±1000	C	32.3	0.5	308'	445'	NB-TT	±1000'	B	19.3	0.55	125'	198'	B	19	0.55	124'	197'
		NB-R	275'	A	1	0.16	0	22'	NB-RR	275'	A	0.1	0.1	0'	0'	A	0.1	0.1	0'	m0'
		SB-L	175'	F	84.4	0.22	16	48'	SB-L	175'	D	44.9	0.18	9'	29'	D	44.9	0.18	9'	29
		SB-TTR	±1520	D	50.3	0.78	390'	485	SB-TTTR	300'	D	53	0.97	259'	336'	E	58	0.99	268'	350

TABLE 2
OPENING YEAR (2022) SENSITIVITY ANALYSIS SUMMARY – WEEKDAY P.M. PEAK-HOUR

INTERSECTION	CONTROL TYPE	LANE USE	STORAGE LENGTH (ft)	NO-BUILD CONDITIONS					BUILD WITH BASE IMPROVEMENTS CONDITIONS						BUILD WITH BASE IMPROVEMENTS PEAK SEASON TRIP GENERATION				
				LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%
River Road (Route 3A)/ Lowell Road (Route 3A) & Dracut Road & Steele Road	ACTUATED-COORDINATED	**Overall**		**E**	**70.2**	**1.26**			**Overall**		**C**	**23.2**	**0.79**			**C**	**23**	**0.8**		
		EB-L	±590'	E	61.1	0.38	34'	63'	EB-L	±590'	E	61.1	0.38	34'	63'	E	61.1	0.38	34	63
		EB-RR	50'	A	0.2	0.02	0'	0'	EB-RR	50'	A	0.2	0.02	0'	0'	A	0.2	0.02	0	0'
		NB-L	200'	D	55	0.01	1'	7'	NB-L	200'	D	55	0.01	1'	7'	D	55	0.01	1'	7'
		NB-TTR	±760	E	58.5	0.84	250'	321'	NB-TTR	±760'	D	44.2	0.66	243'	334'	D	44.2	0.66	249'	346'
		SB-L	775'	F	151.5	1.26	961'	1,218'	SB-L	775'	B	19.2	0.79	121'	61'	B	17.4	0.79	122	62'
		SB-TTR	±1720'	A	4.1	0.18	18'	65'	SB-TTR	±1730'	A	3.1	0.35	59'	178'	A	3.6	0.38	59'	227'
		NWB-LL	100	D	51	0.03	3	15'	NWB-LL	100'	D	52	0.03	3'	15'	D	52	0.03	3'	15'
		NWB-R	>1000'	B	14.3	0.68	144'	316	NWB-R	>1000'	B	19.9	0.78	197'	371'	C	20.9	0.8	209'	400'
Lowell Road (Route 3A) & Green Meadow Drive/ Rena Avenue	ACTUATED-COORDINATED	**Overall**		**A**	**7**	**0.6**			**Overall**		**B**	**16.0**	**0.75**			**B**	**17.6**	**0.84**		
		EB-LT	±510'	E	61.9	0.47	45'	30	EB-LL		E	61.5	0.75	121'	176'	E	65.3	0.84	193	267'
		EB-R	50	A	0.8	0.09	0	0'	EB-TR	±510'	A	0.5	0.12	0'	0'	A	0.5	0.14	0	0'
		WB-LTR	±560	A	0.9	0.1	0'	0'	WB-LTR	±560'	A	0.9	0.1	0'	0'	A	1	0.1	0	0
		NB-L	300'	E	69	0.02	0'	1	NB-L	300'	E	64.2	0.3	30'	40'	E	65.7	0.37	41'	53'
		NB-TTR	±1730'	A	7	0.5	160	236'	NB-TTR	±1730'	B	13.6	0.58	200'	605'	B	14.5	0.61	200'	613
		SB-L	350	D	47	0.22	20'	36'	SB-L	350'	E	68	0.22	22'	45'	E	68.2	0.22	22	43'
		SB-TTR	±960'	A	3.9	0.47	76'	168	SB-TTTR	±980'	A	5.7	0.51	85'	87'	A	6.9	0.59	69'	89
Lowell Road (Route 3A) & Wal-Mart Boulevard	ACTUATED-COORDINATED	**Overall**		**C**	**28.6**	**0.82**			**Overall**		**C**	**29.3**	**0.89**			**C**	**31.1**	**1.05**		
		EB-LL	175	D	54.8	0.61	107'	144'	EB-LL	175'	E	73.3	0.89	161'	239'	F	105.9	1.05	208	305
		EB-T	±400	D	42.9	0.06	10'	29'	EB-T	±400'	D	45.2	0.05	10'	30'	D	45.2	0.05	10'	30'
		EB-R	175	A	9.6	0.38	0'	44	EB-R	175'	A	9.1	0.3	7'	56'	B	10.5	0.32	13'	64'
		WB-LL	150'	E	55.1	0.36	39'	63	WB-LL	150'	E	58.1	0.4	39'	65'	E	58.1	0.4	39'	65'
		WB-T	±450'	D	50.5	0.14	17'	41	WB-T	±450'	D	53.6	0.15	17'	42'	D	53.6	0.15	17'	42'
		WB-R	200	C	25	0.76	28	102'	WB-R	200'	C	25	0.56	99'	175'	C	25	0.56	99'	175
		NB-LL	350'	E	70.5	0.37	45	76'	NB-LL	350'	E	66.4	0.68	48'	66'	E	70.5	0.73	50	92'
		NB-TT	±980'	C	33.7	0.82	289	670	NB-TTTR	±980'	C	22.9	0.67	246'	250'	C	31.9	0.71	221	283
		NB-R	175	A	0.5	0.11	3'	0'												
		SB-LL	350	E	61.9	0.67	135	157'	SB-LL	350'	E	76.2	0.86	139'	154'	E	72	0.88	139'	142
		SB-TT	>1000'	C	21.1	0.66	401	532	SB-TTT	±1180'	B	13.5	0.52	185'	217'	B	14.1	0.55	189'	214'
		SB-R	725'	A	1.5	0.24	0	21'	SB-R	400'	A	0.2	0.27	0'	0'	A	0.2	0.32	0	0
Lowell Road (Route 3A) & Sagamore Bridge Road	ACTUATED-COORDINATED	**Overall**		**D**	**50.3**	**1.2**			**Overall**		**D**	**40.3**	**1.06**			**D**	**50.9**	**1.16**		
		EB-LL	>1000'	F	92.6	1.1	717'	854	EB-LL	>1000'	E	78.5	1.06	678'	815'	E	78.5	1.06	678'	815
		EB-R	>1000'	A	2.8	0.73	0	0'	EB-R	>1000'	A	9.3	0.9	0'	5'	B	19.2	0.96	0	200
		NB-LL	525	F	128.6	1.2	560'	673'	NB-LLL	525'	E	73.4	1.05	433'	523'	F	110.6	1.15	517	575
		NB-TT	±1190'	A	9.1	0.36	147	120'	NB-TT	±1190'	B	16	0.4	221'	225'	B	14.5	0.42	220	226
		SB-TT	±1000'	E	55.4	0.77	192	250'	SB-TT	±1000'	E	63.6	0.94	245'	342'	E	71.6	0.98	257'	387
		SB-R	200'	A	0.6	0.49	0'	0'	SB-RR	200'	A	1.8	0.49	58'	39'	A	1.7	0.49	56'	35

TABLE 2
OPENING YEAR (2022) SENSITIVITY ANALYSIS SUMMARY – WEEKDAY P.M. PEAK-HOUR

INTERSECTION	CONTROL TYPE	LANE USE	STORAGE LENGTH (ft)	NO-BUILD CONDITIONS					BUILD WITH BASE IMPROVEMENTS CONDITIONS							BUILD WITH BASE IMPROVEMENTS PEAK SEASON TRIP GENERATION				
				LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%
Lowell Road (Route 3A) & Flagstone Drive/ Wason Road	ACTUATED-COORDINATED	**Overall**		**D**	**50.6**	**0.94**			**Overall**		**C**	**34.6**	**0.83**			**C**	**34.9**	**0.83**		
		EB-LT	±810'	F	90.4	0.78	167'	276'	EB-LT	±810'	E	75.8	0.78	138'	188'	E	75.6	0.79	136'	188'
		EB-R	250'	E	70.5	0.94	521'	686'	EB-R	250'	D	40.4	0.83	317'	384'	D	40.3	0.83	317'	384'
		WB-L	200'	D	53.6	0.56	227'	359'	WB-L	200'	E	69.2	0.82	196'	344'	E	69.8	0.83	198'	344'
		WB-LT	±690'	D	52.4	0.56	227'	358'	WB-LT	±690'	E	68.5	0.82	196'	343'	E	69.1	0.82	198'	343'
		WB-R	75'	A	0.2	0.06	0'	0'	WB-R	75'	A	0.2	0.06	0'	0'	A	0.2	0.06	0'	0'
		NB-L	575'	E	68.4	0.48	144'	239'	NB-L	575'	E	58.2	0.4	116'	134'	E	57.7	0.4	114'	134'
		NB-TT	±1000	D	51	0.82	567'	663'	NB-TT	±1000'	C	28.8	0.71	251'	253'	C	29	0.73	261	263'
		NB-R	275	C	28.4	0.89	643	992	NB-RR	275'	A	2.3	0.5	15'	25'	A	2.4	0.5	2[illegible]	27'
		SB-L	175'	F	90.4	0.59	85'	151'	SB-L	175'	E	77.7	0.65	63'	123'	E	77.7	0.65	63'	123'
		SB-TTR	±1520	D	52.3	0.69	339	379'	SB-TTTR	300'	D	41.6	0.69	264'	316'	D	42	0.7	273'	326'

TABLE 3
HORIZON YEAR (2032) SENSITIVITY ANALYSIS SUMMARY – WEEKDAY A.M. PEAK-HOUR

INTERSECTION	CONTROL TYPE	NO-BUILD CONDITIONS						BUILD WITH BASE IMPROVEMENTS CONDITIONS							BUILD WITH BASE IMPROVEMENTS PEAK SEASON TRIP GENERATION				
		LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%
River Road (Route 3A)/ Lowell Road (Route 3A) & Drouot Road & Steele Road	ACTUATED-COORDINATED	**Overall**		**B**	**18.9**	**0.88**			**Overall**		**B**	**18.3**	**0.89**			**B**	**19.2**	**0.91**		
		EB-L	±590	D	40	0 03	2'	9	EB-L	±590'	D	40	0.03	2'	9'	D	40	0.03	2'	9
		EB-RR	50	A	0	0.01	0	0	EB-RR	50'	A	0	0.01	0'	0'	A	0	0.01	0	0'
		NB-L	200'	A	0	0	0'	0'	NB-L	200'	A	0	0	0'	0'	A	0	0	0'	0
		NB-TTR	±760'	D	43 2	0 68	102'	131'	NB-TTR	±760'	D	43.8	0.7	106'	135'	D	44 1	0 71	108'	136
		SB-L	775'	C	28 8	0 67	251	455'	SB-L	775'	B	17.2	0.36	89'	102'	B	17 8	0 36	96'	115'
		SB-TTR	±1730'	A	2 5	0 24	104'	2'	SB-TTR	±1730'	A	3.4	0.46	3'	8'	A	2.8	0 46	11'	24'
		NWB-LL	100'	D	36	0	1'	5'	NWB-LL	100'	D	36	0	1'	5'	D	36	0	1	5'
		NWB-R	>1000'	B	16	0.85	182'	726'	NWB-R	>1000'	B	18.8	0.89	215'	774'	C	20.6	0.91	233'	799'
Lowell Road (Route 3A) & Green Meadow Drive/ Rene Avenue	ACTUATED-COORDINATED	**Overall**		**A**	**7.2**	**0.49**			**Overall**		**B**	**12.8**	**0.64**			**B**	**13.1**	**0.64**		
		EB-LT	±510'	D	36	0 02	2	10'	EB-LL		D	53.7	0.64	83'	118'	E	55 5	0 64	51'	96
		EB-R	50'	A	0	0 02	0'	0'	EB-TR	±510'	A	0.3	0.07	0'	0'	A	0 3	0 08	0	0
		WB-LTR	±560'	B	17	0 26	1'	29'	WB-LTR	±560'	C	20.3	0.31	1'	31'	C	20 3	0 31	1'	31'
		NB-L	300	D	40 7	0 13	10'	12'	NB-L	300'	D	40.7	0.3	28'	32'	D	40 8	0 36	37'	40'
		NB-TTR	±1730'	A	4 2	0 48	137'	234'	NB-TTR	±1730'	A	9.8	0.63	186'	261'	A	9 3	0 62	186	263'
		SB-L	350'	C	25 9	0 06	4'	10'	SB-L	350'	D	36	0.06	5'	10'	D	36 6	0 06	5'	10'
		SB-TTR	±980	A	9.6	0.42	196	226	SB-TTTR	±980'	A	9	0.49	53'	89'	B	10.7	0.54	42'	120'
Lowell Road (Route 3A) & Wal-Mart Boulevard	ACTUATED-COORDINATED	**Overall**		**B**	**17.4**	**0.69**			**Overall**		**B**	**15.9**	**0.58**			**B**	**16.1**	**0.57**		
		EB-LL	175'	D	39.5	0.31	29'	54'	EB-LL	175'	D	45.6	0.5	40'	70'	D	47 5	0 56	45'	77'
		EB-T	±400	C	34 2	0 01	2'	12'	EB-T	±400'	D	36.5	0.02	2'	12'	D	36 5	0 01	2	12
		EB-R	175'	A	0.8	0 15	0	0'	EB-R	175'	A	0.9	0.17	0'	0'	A	1	0.18	0'	0
		WB-LL	150'	D	38.7	0 06	4'	14	WB-LL	150'	D	38.7	0.06	4'	14'	D	38 7	0 06	4	14'
		WB-T	±450'	D	38 8	0.04	3'	15'	WB-T	±450'	D	38.8	0.04	3'	15'	D	38 8	0 04	3'	15
		WB-R	200'	A	2 4	0 28	0'	0	WB-R	200'	A	2.4	0.28	0'	0'	A	2 4	0 28	0'	0'
		NB-LL	350	D	44 6	0 23	14'	44	NB-LL	350'	D	44.9	0.27	27'	46'	D	45	0.29	31'	50
		NB-TT	±960'	B	15 4	0 68	277'	312'	NB-TTTR	±960'	B	13.9	0.56	246'	187'	B	14 7	0 57	124	170'
		NB-R	175'	A	0	0.03	0	0'												
		SB-LL	350'	D	48 9	0 27	25'	43	SB-LL	350'	D	48.7	0.29	25'	34'	D	48 2	0 28	25'	30'
		SB-TT	>1000	B	18 4	0 55	290'	381'	SB-TTT	±1190'	B	13.5	0.49	215'	278'	B	14 2	0 52	238'	300'
		SB-R	725	A	0.3	0.07	0	0'	SB-R	400'	A	0.8	0.2	0'	0'	A	1	0.26	0	0'
Lowell Road (Route 3A) & Sagamore Bridge Road	ACTUATED-COORDINATED	**Overall**		**D**	**35.9**	**1.2**			**Overall**		**B**	**19.9**	**0.97**			**C**	**21.5**	**0.97**		
		EB-LL	>1000'	D	45 1	0 93	315'	482	EB-LL	>1000'	D	51.3	0.97	320'	457'	D	52 3	0 97	320'	457'
		EB-R	>1000	A	1 5	0 59	0'	0'	EB-R	>1000'	A	3.4	0.76	0'	0'	A	5 6	0 84	0'	0'
		NB-LL	525	F	129 8	1 2	378'	491'	NB-LLL	525'	C	26	0.86	78'	240'	C	31.3	0 86	175'	247
		NB-TT	±1190	A	2 2	0 22	3'	4	NB-TT	±1190'	A	4.4	0.23	11'	16'	A	4.8	0 23	13'	19'
		SB-TT	±1000'	D	37.7	0.82	110'	152'	SB-TT	±1000'	D	49.3	0.79	124'	133'	D	50.3	0.83	132'	139

TABLE 3
HORIZON YEAR (2032) SENSITIVITY ANALYSIS SUMMARY – WEEKDAY A.M. PEAK-HOUR

INTERSECTION	CONTROL TYPE	NO-BUILD CONDITIONS							BUILD WITH BASE IMPROVEMENTS CONDITIONS							BUILD WITH BASE IMPROVEMENTS PEAK SEASON TRIP GENERATION				
		LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%
Lowell Road (Route 3A) & Flagstone Drive/ Wason Road	ACTUATED-COORDINATED	SB-R	200'	A	1.2	0.66	0	0'	SB-RR	200'	A	4.6	0.66	261'	269'	A	4.6	0.66	264'	268
		Overall		**E**	**63.7**	**1.29**			**Overall**		**E**	**55.3**	**1.26**			**E**	**57**	**1.25**		
		EB-LT	±810	F	95.6	0.7	130	192'	EB-LT	±810'	F	120.4	0.98	69'	152'	F	120.4	0.98	69'	152
		EB-R	250'	E	58.1	0.76	336'	433	EB-R	250'	C	28	0.7	134'	197'	C	28	0.7	134	197'
		WB-L	200'	E	79.4	0.88	418'	655	WB-L	200'	F	82.8	1	229'	422'	F	82.8	1	229	422'
		WB-LT	±590'	E	79.4	0.88	424'	660	WB-LT	±590'	F	82.5	1	231'	425'	F	82.5	1	231'	425'
		WB-R	75'	A	0.2	0.07	0'	0'	WB-R	75'	A	0.2	0.06	0'	0'	A	0.2	0.06	0	0'
		NB-L	575'	F	184.1	1.25	488'	777'	NB-L	575'	F	155.8	1.25	236'	293'	F	155.8	1.25	236	292'
		NB-TT	±1000'	D	35.1	0.56	396	507'	NB-TT	±1000'	B	16.3	0.62	241'	285'	B	16.7	0.62	256'	294'
		NB-R	275'	A	1	0.17	0	23'	NB-RR	275'	A	3.8	0.11	20'	26'	A	3.8	0.11	20'	26'
		SB-L	175'	F	90.4	0.27	22	55	SB-L	175'	D	45.8	0.21	11'	33'	D	45.8	0.21	11'	33'
		SB-TTR	±152U'	D	53.1	0.79	458'	547'	SB-TTTR	300'	D	53.2	0.98	285'	367'	E	55.1	1	285'	360'

TABLE 4
HORIZON YEAR (2032) SENSITIVITY ANALYSIS SUMMARY – WEEKDAY P.M. PEAK-HOUR

INTERSECTION	CONTROL TYPE	LANE USE	STORAGE LENGTH (ft)	NO-BUILD CONDITIONS					BUILD WITH BASE IMPROVEMENTS CONDITIONS						BUILD WITH BASE IMPROVEMENTS PEAK SEASON CONDITIONS				
				LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%
River Road (Route 3A)/ Lowell Road (Route 3A) & Dracut Road & Steele Road	ACTUATED-COORDINATED	**Overall**		**F**	**101.9**	**1.46**			**Overall**		**C**	**25.9**	**0.79**			**C**	**24.4**	**0.81**		
		EB-L	±590'	E	61.5	0.4	38'	68'	EB-L	±590'	E	61.5	0.4	38'	68'	E	61.5	0.4	38'	68'
		EB-RR	50'	A	0.2	0.02	0'	0'	EB-RR	50'	A	0.2	0.02	0'	0'	A	0.2	0.02	0'	0'
		NB-L	200'	D	55	0.01	1'	7'	NB-L	200'	D	55	0.01	1'	7'	D	55	0.01	1'	7'
		NB-TTR	±760'	E	64.1	0.82	288'	402'	NB-TTR	±760'	D	51	0.79	284'	478'	D	52.5	0.81	269'	482'
		SB-L	775'	F	334	1.48	>1169'	1470'	SB-L	775'	C	25.7	0.77	134'	128'	C	20.7	0.78	103'	95'
		SB-TTR	±1730'	A	1.3	0.21	2'	48'	SB-TTR	±1730'	A	1.9	0.38	4'	8'	A	1.2	0.38	3'	15'
		NWB-LL	100'	D	51.2	0.03	4'	17'	NWB-LL	100'	D	54.6	0.05	4'	17'	D	54.6	0.05	4'	17'
		NWB-R	>1000'	C	22.4	0.81	270'	446'	NWB-R	>1000'	B	16	0.79	183'	342'	B	16.8	0.8	195'	368'
Lowell Road (Route 3A) & Green Meadow Drive/ Rena Avenue	ACTUATED-COORDINATED	**Overall**		**C**	**30.1**	**1.19**			**Overall**		**B**	**16.6**	**0.8**			**B**	**19.7**	**0.91**		
		EB-LT	±510'	F	155.9	1.19	303'	438'	EB-LL		E	66.4	0.8	126'	176'	E	75.2	0.91	199'	267'
		EB-R	50'	A	5.2	0.16	0'	18'	EB-TR	±510'	A	0.5	0.12	0'	0'	A	0.6	0.14	0'	0'
		WB-LTR	±560'	A	0.4	0.07	0'	0'	WB-LTR	±560'	A	1	0.11	0'	0'	A	1.1	0.11	0'	0'
		NB-L	300'	E	64.5	0.3	30'	34'	NB-L	300'	E	66.8	0.3	30'	38'	E	70.7	0.37	41'	49'
		NB-TTR	±1730'	B	17.5	0.69	565'	688'	NB-TTR	±1730'	B	16.7	0.66	547'	678'	B	17.7	0.68	555'	686'
		SB-L	350'	E	56.8	0.23	23'	29'	SB-L	350'	E	66.5	0.23	23'	46'	E	66.2	0.23	23'	43'
		SB-TTR	±980'	B	17.9	0.85	201	356'	SB-TTTR	±980'	A	6.1	0.56	80'	94'	A	7.4	0.65	81	97'
Lowell Road (Route 3A) & Wal-Mart Boulevard	ACTUATED-COORDINATED	**Overall**		**E**	**56.8**	**1.15**			**Overall**		**C**	**27.9**	**0.89**			**C**	**31**	**1.05**		
		EB-LL	175'	E	58.2	0.76	155'	205'	EB-LL	175'	E	73.3	0.89	161'	239'	F	105.9	1.05	208'	305'
		EB-T	±400'	D	40.9	0.05	10'	28'	EB-T	±400'	D	45.4	0.06	10'	30'	D	45.4	0.06	10'	30'
		EB-R	175'	A	9.7	0.38	0'	53'	EB-R	175'	A	5.4	0.36	0'	23'	A	6.6	0.41	0'	33'
		WB-LL	150'	E	55.1	0.36	39'	63'	WB-LL	150'	E	58.1	0.4	39'	65'	E	58.1	0.4	39'	65'
		WB-T	±450'	D	50.4	0.14	17'	41'	WB-T	±450'	D	54.2	0.16	17'	42'	D	54.2	0.16	17'	42'
		WB-R	200'	C	30.7	0.8	44'	123'	WB-R	200'	C	29.1	0.81	29'	125'	C	29.1	0.81	29'	125'
		NB-LL	350'	E	57.9	0.41	48'	87'	NB-LL	350'	E	64.4	0.62	49'	86'	E	61.7	0.66	52'	85'
		NB-TT	±980'	F	100.7	1.15	821'	954'	NB-TTTR	±980'	C	21.6	0.73	199'	261'	C	22.7	0.77	216'	310'
		NB-R	175'	A	1.8	0.11	0'	6'												
		SB-LL	350'	E	57.6	0.67	125'	122'	SB-LL	350'	E	65.6	0.84	130'	131'	E	62.3	0.64	131'	123'
		SB-TT	>1000'	C	32.2	0.93	627'	756'	SB-TTT	±1180'	B	16.8	0.57	345'	349'	B	17.4	0.6	369'	344'
		SB-R	725'	A	3.9	0.39	8'	32'	SB-R	400'	A	0.3	0.33	0'	0'	A	0.2	0.39	0'	0'
Lowell Road (Route 3A) & Sagamore Bridge Road	ACTUATED-COORDINATED	**Overall**		**F**	**106.9**	**1.66**			**Overall**		**E**	**57.3**	**1.26**			**E**	**68.5**	**1.26**		
		EB-LL	>1000'	F	153.4	1.25	550'	987'	EB-LL	>1000'	F	154.9	1.26	850'	987'	F	154.9	1.26	850'	987'
		EB-R	>1000'	C	20.8	0.98	0'	216'	EB-R	>1000'	C	20.8	0.98	0'	216'	D	41.8	1.05	145'	409'
		NB-LL	525'	F	322.5	1.66	890'	807'	NB-LLL	525'	E	63.7	1.04	451'	549'	F	98.2	1.13	540'	602'
		NB-TT	±1190'	A	7.7	0.42	128'	100'	NB-TT	±1190'	A	7.7	0.42	130'	165'	A	7.7	0.44	138'	150'
		SB-TT	±1000'	E	63.9	0.89	245'	337'	SB-TT	±1000'	E	72.5	1.02	251'	358'	F	84.6	1.06	284'	384'

TABLE 4
HORIZON YEAR (2032) SENSITIVITY ANALYSIS SUMMARY – WEEKDAY P.M. PEAK-HOUR

INTERSECTION	CONTROL TYPE	NO-BUILD CONDITIONS						BUILD WITH BASE IMPROVEMENTS CONDITIONS							BUILD WITH BASE IMPROVEMENTS PEAK SEASON CONDITIONS				
		LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LANE USE	STORAGE LENGTH (ft)	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%	LOS	DELAY (sec)	V/C RATIO	QUEUES (ft) 50th%	QUEUES (ft) 95th%
Lowell Road (Route 3A) & Flagstone Drive/ Wason Road	ACTUATED-COORDINATED	SB-R	200'	A	0.8	0.54	0	0	SB-RR	200'	A	2	0.54	72'	46'	A	2	0.54	69'	48'
		Overall		**E**	**68.7**	**1.13**			**Overall**		**C**	**35**	**0.9**			**D**	**35.2**	**0.9**		
		EB-LT	±810'	F	107.3	0.87	216'	306'	EB-LT	±810'	F	92.1	0.9	148'	232'	F	92.1	0.9	148	232'
		EB-R	250'	F	128.6	1.13	749'	836'	EB-R	250'	D	48.1	0.9	373'	439'	D	48.1	0.9	373	439'
		WB-L	200'	E	57.4	0.58	283'	402'	WB-L	200'	E	73.5	0.87	221'	382'	E	73.5	0.87	221'	382'
		WB-LT	±590'	E	57.1	0.57	281'	400'	WB-LT	±590'	E	72.3	0.86	220'	378'	E	72.3	0.86	220	378'
		WB-R	75'	A	0.2	0.05	0'	0'	WB-R	75'	A	0.3	0.07	0'	0'	A	0.3	0.07	0'	0'
		NB-L	575'	E	77.6	0.58	167'	256'	NB-L	575'	E	57.6	0.4	111'	117'	E	57.6	0.4	111	118
		NB-TT	±1000'	E	63.0	0.93	705'	823'	NB-TT	±1000'	B	19.5	0.81	200'	161'	C	20	0.83	223'	175
		NB-R	275'	D	53.8	0.97	993'	1512	NB-RR	275'	A	0.6	0.57	5'	1'	A	0.7	0.57	6'	2'
		SB-L	175'	F	101.3	0.68	102'	186'	SB-L	175'	F	93.6	0.77	71'	155'	F	93.6	0.77	71'	155
		SB-TTR	±1520'	E	55.8	0.73	414'	455'	SB-TTTR	300'	D	45.4	0.79	300'	346'	D	46.2	0.81	309'	356'

LANGAN

Memorandum

888 Boylston Street, Suite 510 Boston, MA 02199 T: 617.824.9100 F: 617.824.9101

To: Brian Desfosses/NHDOT

From: John D Plante

Info: John Butler/NHDOT
Brian Kutz/Hillwood
John Smolak/Smolak and Vaughan
Frank Holmes/Langan

Date: March 13, 2021

Re: **Hudson Logistics Center**
Building A/Trip Generation
Hudson, NH
Langan Project No.: 151010101

This memorandum provides additional information relative to Building A of the proposed Hudson Logistics Center and associated trip generation.

As presented in the Traffic Impact Study (TIS), Amazon is the perspective tenant for Building A and as such, tenant specific information was considered for use in the study. This tenant-specific information accounted for the entire building area, including a mezzanine. Building A is a non-sort fulfillment warehouse with a specific role in the e-commerce supply chain, with the internal operations defined based on this specific building. Complete information on the number of anticipated daily employees, the specific shift operations and associated trip generation is included in the TIS. Building area was not a consideration in the tenant trip generation for Building A.

The TIS and supplemental information details the methodology used in developing the trip generation for the proposed project. A conservative approach was utilized in developing the trip generation, such as, using the higher peak-hour volumes of either the tenant volumes or the Institute of Transportation Engineers (ITE) volumes and considering the peak-hours of the generator and the existing roadway network were coincident.

TABLE 4
HUDSON LOGISTIC CENTER – UNADJUSTED ANTICIPATED TRIP GENERATION

LOCATION	LAND USE CODE	PEAK HOUR SCENARIO	Independent Variable		AM Peak-Hour			PM Peak-Hour			ADT	No. of Studies
			Amount	Unit	IN	OUT	TOTAL	IN	OUT	TOTAL		
Lot A	Fulfillment Ctr N-S I UC 155	Generator	Tenant		184	54	238	187	197	384	1631	Tenant
Lot B	Fulfillment Ctr N-S I UC 155	Generator	1,001,700	GFA	110	110	220	135	135	270	1830	1/1/22
Lot C	Fulfillment Ctr N-S I UC 155	Generator	522,000	GFA	58	57	115	71	70	141	870	1/1/22
UNADJUSTED TOTAL					352	221	571	393	402	795	4331	

The area of Building A has been depicted as the building footprint at 1,079,700 square-feet. The building includes a mezzanine, dedicated to storage and staff facilities, such as bathrooms and break areas. The total area of the building is approximately 1,330,825 square-feet. The anticipated number of employees, 683, has not change and was based operations, which was based on this total building area. The trip generation included in the TIS (Table 4 above) and approved by the NHDOT is valid.

To confirm this, the following analysis employs follows the same methodology used in determining the trip generation projections in the TIS, while incorporating the total area of the building. Also included is the ITE trip generation during the adjacent street peak hour based on employees, for reference (ITE does not have a generator peak hour for the employee independent variable).

HUDSON LOGISTIC CENTER – BUILDING A UNADJUSTED ANTICIPATED TRIP GENERATION

LOCATION	LAND USE CODE	PEAK HOUR SCENARIO	Independent Variable		AM Peak-Hour			PM Peak-Hour			No. of Studies
			Amount	Unit	IN	OUT	TOTAL	IN	OUT	TOTAL	
Lot A	Fulfillment Ctr N-S LUC 155	Generator	Tenant		184	54	238	187	197	384	Tenant
Lot A	Fulfillment Ctr N-S LUC 155	Generator	1,330,825	GFA	237	56	293	140	219	359	ITE 1/1/22
Lot A	Fulfillment Ctr N-S LUC 155	Adjacent Street Traffic	1,330,825	GFA	162	38	200	83	130	213	ITE 22/22/22
Lot A	Fulfillment Ctr N-S LUC 155	Adjacent Street Traffic	683	Employees	72	17	89	43	66	109	ITE 7/7/7

As illustrated on the table above and in the TIS analysis the PM peak-hour is the critical period relative to the impact of the development on the roadway network. The PM peak-hour represent the higher peak hour volumes from the development, primarily due to the timing of the morning and evening shift changes. It is the impact of the PM peak-hour volumes that dictate the off-site roadway improvements proposed by the developer and conceptually accepted by the NHDOT.

Although not the critical period to the analysis and the resulting proposed improvements, the table above indicates that the trip generation volumes used in the AM peak hour is representative of the ITE volumes, in between the two different peak hour scenarios.

The table above provides a comparison of the approved unadjusted tenant trip generation and the unadjusted ITE volumes for the total building area, for both the Generator and Adjacent Street Traffic peak periods. The comparison of the critical PM peak-hour period indicates that the tenant provided volumes are greater than either the ITE Generator or Adjacent Street Traffic volumes.

Therefore, the previously approved traffic analysis and the proposed roadway and traffic signal improvements continue to adequately address and mitigate the anticipated impact of the proposed Hudson Logistics Center.

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From: Cass, William [mailto:William.J.Cass@dot.nh.gov]
Sent: Wednesday, March 24, 2021 1:07 PM
To: John Plante
Cc: Desfosses, Brian; ODonnell, Michael; Butler, John (DOT); Frank Holmes; John Smolak; Brian.Kutz@hillwood.com; Bergeron, Michael
Subject: RE: Hudson, NH 3A, proposed logistics center (Amazon), building size issue

John (Plante):

We have reviewed your March 13 Memo regarding the discrepancy in the size of Building A and how it relates to the approved Traffic Impact Study . The memo compares two methods of calculating trip generation, one based on tenant-specific data and the other based on ITE data.

In the TIS, Langan had previously provided tenant-specific data for this operation that we accepted. Our current understanding is that the operation itself is not changing, but the documentation of the square footage of building A has been re-stated in this memo at a higher value. We further understand this is specific to Building A and that the building sizes for Building B & C, and the corresponding ITE trip calculations are unaffected.

The March 13 memo adjusts the ITE data upward based on the higher floor area of the building and compares that revised trip generation to the tenant specific data. The two trip generation methodologies are similar, with the tenant-specific data being a little higher in the PM, and a little lower in the AM, as compared to ITE.

We would conclude that the tenant-specific data provides a reasonable estimate as compared to the ITE method. With the PM peak hour being the critical case, and the PM trip generation for the tenant being higher than he revised ITE rates, this method appears to provide a reasonably conservative estimate of the trips added by the development. We concur that The Traffic Impact Study and traffic analysis comprised within are therefore unaffected by the discrepancy in the area of Building A. The Department reiterates our previous determination that, based on these analysis in the TIS, the proposed geometric modifications and adaptive signal control will handle the existing and added traffic reasonably well and is supportive of the proposed development and traffic mitigation.

Any questions, please don't hesitate to contact me.

William Cass, P.E.
Assistant Commissioner
New Hampshire Department of Transportation
PO Box 483, 7 Hazen Drive
Concord NH 03302-0482
271-1486 Cell – 724-7220

From: Butler, John (DOT) <John.D.Butler@dot.nh.gov>
Sent: Friday, March 19, 2021 11:19 AM
To: ODonnell, Michael <Michael.T.ODonnell@dot.nh.gov>
Cc: Sanders, Nicholas <Nicholas.B.Sanders@dot.nh.gov>; Desfosses, Brian <Brian.A.Desfosses@dot.nh.gov>; Cass, William <William.J.Cass@dot.nh.gov>; Dugas, Michael <michael.j.dugas@dot.nh.gov>
Subject: Hudson, NH 3A, proposed logistics center (Amazon), building size issue

Mike O,

Please review the attached document from Langan (traffic engineer for the proposed development) and let Brian Desfosses and me know if you agree with their conclusion that the recently-identified discrepancy in building size for Building A does not affect the trip generation and traffic analyses in their original September 2020 TIS. My email is also attached where I requested this information from Langan.

Obviously, Nick is much more familiar with the past TIS iterations and history than you, so I would hope that he could review this if Mike Dugas is OK with that. This project is pretty controversial with much public scrutiny from opponents so we (NHDOT) want to be confident in our response to this. Project opponents are focusing on this building size discrepancy issue.

I am requesting your review and response by 4/5 if possible. Thanks.

John

From: John Plante <jplante@Langan.com>
Sent: Friday, March 19, 2021 10:29 AM
To: Desfosses, Brian <Brian.A.Desfosses@dot.nh.gov>; Butler, John (DOT) <John.D.Butler@dot.nh.gov>
Cc: Kutz, Brian <Brian.Kutz@hillwood.com>; John Smolak (JSmolak@smolakvaughan.com) <JSmolak@smolakvaughan.com>; Frank Holmes <fholmes@langan.com>
Subject: HLC

Brian and John, if reference to your inquiry on the building area of Building A of the HLC, please find the attached memo supporting the trip generation methodology.

If you have any questions please let us know.

Thanks, John

John D Plante, P.E.
Managing Principal/Corporate Secretary

LANGAN

Direct: 617.824.9100 x9031

Mobile: 203.314.1841
File Sharing Link

Phone: 617.824.9100 Fax: 617.824.9101
888 Boylston Street, Suite 510
Boston, MA 02199
www.langan.com

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