



June 7, 2022

Town of Billerica  
Planning Board  
365 Boston Road  
Billerica, Massachusetts 01821

Attn.: Ms. Erika Oliver Jerram, Director of Planning and Community Development

Re: **161 Concord Road - Peer Review - Planning**

Dear Ms. Jerram:

BETA Group, Inc. has received a copy of documents submitted for a **Proposed GMP Lab Building 0 & 161 Concord Road Billerica, Massachusetts**. This letter is provided to outline BETA's findings, comments, and recommendations.

### **BASIS OF REVIEW**

The following documents were received by BETA and will form the basis of the review:

- **Site Plan Special Permit Package for Proposed cGMP Lab Building 0 & 161 Concord Road Town of Billerica, Middlesex County** dated May 11, 2022, prepared by Bohler, Boston, MA, including the following attachments:
  - Cover Letter
  - Project Narrative
  - Form S Application for Site Plan Special Permit
  - Special Permit Checklist
  - Concept Plan – Elevations
  - Quickclaim Deed
  - Site Aerial Exhibit
  - Certified Abutters List
  - Fire Truck Turning Exhibit
  - Certificate of Decision Site Plan Special Permit 9/18/07
  - Special Permit Modification Decision 4/30/08
- **Site Plans (21 sheets) entitled Proposed Site Plan Documents for Berkeley Location of Site: 0 & 161 Concord Road Town of Billerica, Middlesex County, Massachusetts Map #68, Block #22, Lot #1, Map #69, Block #29, Lot #1** dated May 11, 2022, prepared by Bohler, Boston, MA
- **Transportation Impact Assessment Proposed Lab/cGMP 0 & 161 Concord Road Billerica, Massachusetts** dated May 2022, prepared by Vanasse & Associates, Inc., Andover, MA
- **Drainage Report for Proposed cGMP Lab Building 0 & 161 Concord Road Town of Billerica, Middlesex County** dated May 11, 2022, prepared by Bohler, Boston, MA
- **Notice of Intent Proposed cGMP Lab Building 0 & 161 Concord Road Billerica, Massachusetts** dated May 11, 2022, prepared by Lucas Environmental, Quincy, MA.

Review by BETA will include the above items along with the following:

- **Zoning By-Law of the Town of Billerica updated through June 20, 2020.**
- **Zoning Map of the Town of Billerica, Massachusetts** last updated October 11, 2016
- **Billerica Board of Health Rules and Regulations** updated June 2014

## INTRODUCTION

The predominately wooded 22.8± acre project site, comprised of two lots, assessor's map 68 block 22 lot 1 and Map 69, block 29, lot 2, is located on the west side of Concord Road. The project parcel is within the Industrial Zoning District. Abutting properties are also in the Industrial Zoning District.

The Concord River flows along the northwest border of the parcel with associated vegetated wetlands, FEMA mapped 100-year flood and Green Engineering flood zones. A perennial stream is located off the site and along the north and northeast border. Plans indicate wetlands and stream in the south and southwest portions of the site. The property is not in proximity to estimated habitats of rare or endangered species. NRCS soil maps indicates the presence of Scituate fine sandy loam with Hydrologic Soil Group Rating (HSGR) D (slow to very slow infiltration).

Applicant proposes to construct a 197,900± sq. ft. footprint Lab Facility with associated parking, loading, landscaping, utility services, and stormwater management systems within the limits of the existing parking area.

The project includes work within wetland resource areas, including buffer zones to bordering vegetated wetlands areas and bordering land subject to flooding which will require obtaining an Order of Conditions from the Billerica Conservation Commission. The project will disturb more than an acre of land, as well as will be within or within proximity of mapped flood zones, and therefore will require a Stormwater permit from the Board of Health. Stormwater management systems will need to comply with the MassDEP Stormwater Management Standards and the Billerica Stormwater Management Bylaw and regulations.

## ZONING

The project parcel is within the Industrial (I) Zoning District. The proposed use of Light Manufacturing is allowed by right. The proposed use of Office is allowed only with a special permit from the Planning Board. An application or a Special Permit was included in the submission.

Portions of the Site are within the Flood Plain Overlay District due to the presence of a FEMA-mapped 100-year flood zone (Zone AE) and the green engineering flood plain (GEFP). All uses permitted by right in the underlying district are permitted in this district. No work is proposed within the limit of the flood zone or flood plain, though the limits of the GEFP may be depicted inaccurately on the plans (Refer to comment below).

- Z1. *Revise limits of GEFP to coincide with actual surveyed topography. GEFP elevation appears to vary but can be estimated as elevation 177' NGVD in the area of Concord Road and 122' NGVD in the area of the Concord River. Note that a 3' rollback is applicable to the GEFP elevation for the portion along the Concord River.*

## SITE VISIT

BETA conducted a site visit on 6/3/2022 to assess existing conditions. Due to the wooded nature of the Site, the visit was primarily conducted for those areas near to Concord Road. Field conditions were found to be generally in accordance with the existing conditions plan. Comments associated with this site visit are as follows and as noted throughout this report.

- SV1. *BETA notes that the existing Site includes a sign denoting the property's historical significance as part of the Middlesex Turnpike. BETA recommends the applicant consult with the Billerica Historical Commission to determine if any portion of the Site needs be preserved.*

## **SITE PLAN APPROVAL (§6)**

The project has been submitted for site Plan approval and is required to comply with this section of the Bylaw.

### **CONTENTS**

- SP1. Provide profile for proposed drainage system (§6.E.4.p.).*
- SP2. Indicate bulb type for proposed luminaires (§6.E.4.q.).*
- SP3. Indicate if new rubbish collection areas are proposed (§6.E.4.s.).*
- SP4. Provide description of the hours of operation of the proposed use (§6.E.4.ff).*

### **REVIEW CRITERIA**

BUILDINGS, STRUCTURES, AND SITE CHARACTER (1): See all comments provided herein.

TRAFFIC (2): See Traffic Assessment Review.

PARKING, LOADING AND LIGHTING (3): See Parking and Loading and Lighting sections.

STORMWATER AND SITE DRAINAGE (4): See review letter for stormwater, floodplain and wetlands for Conservation Commission and Board of Health under separate cover.

UTILITIES (5): See Utilities section.

TOWN SERVICES (6): BETA defers to the Town of Billerica.

VEGETATION AND LANDSCAPING (7): See Landscape Treatment section.

WETLANDS (8): See review letter for stormwater, floodplain and wetlands for Conservation Commission and Board of Health under separate cover.

### **DIMENSIONAL REGULATIONS**

The parcel meets the requirements for lot area, frontage, front yard, rear yard, lot coverage, building height, and green space.

Required side yard is not provided along the western lot line. The required side yard is 35 feet as the lot abuts a residential district and retaining walls over six feet in height are considered structures under the bylaw. The provided side yard in this area is only 30 – 35 feet at its narrowest point.

Refer to the Landscaping section below for findings related to green strips.

- D1. Clarify if the two lots included in this project are to be combined.*
- D2. Provide required side yard. Provide additional spot grades for the western retaining wall to determine which portions are greater than six feet in height.*

### **TRAFFIC ASSESSMENT REVIEW**

BETA reviewed the *Transportation Impact Assessment (TIA)*, dated May 2022, prepared by Vanasse & Associates, Inc. (VAI) and found the assessment to have been conducted in accordance with the MassDOT *Transportation Impact Assessment Guidelines* and current standards and professional practices. The following comments are provided in response to the review of the TIA and Site Plans.

The project intends to construct a 197,902± square foot laboratory/cGMP building on an existing vacant (wooded) site along the western side of Concord Road opposite Middlesex Turnpike. The primary access will be provided as the fourth leg to the Concord Road at Middlesex Turnpike signalized intersection. A short stub, currently gated, accommodates this leg with a dedicated left turn lane and a general purpose travel lane. Signal heads are provided on an existing mast arm but are dark/inactive. The signal heads generally accommodate the provided turning lanes. The Site also intends to provide a second driveway, right-in/right-out roughly opposite the southern driveway for the adjacent Middlesex Crossing residential complex.

### **STUDY AREA**

The TIA assessed the study area intersections of:

- Concord Road at Middlesex Turnpike
- Concord Road at Federal Street / Brightview Concord River Driveway
- Concord Road at Route 3 North ramps
- Concord Road at Route 3 South ramps
- Concord Road at Old Concord Road / 290 Concord Road Driveway (industrial/office park).

BETA finds the above study area to be appropriate.

### **TRAFFIC VOLUME**

The TIA assessed traffic volume conducted via Automatic Traffic Recorder (ATR) on Tuesday March 15, 2022 and Wednesday, March 16, 2022, a consecutive 48-hour period, on Concord Road south of Middlesex Turnpike. Turning Movement Counts (TMC) were collected at study area intersections on Thursday, March 17, 2022, between 7:00-9:00AM and 4:00-6:00PM. BETA finds the data collection to be appropriate.

Traffic volume were seasonally adjusted upwards by 2% to account for average month conditions. The seasonally adjusted volume was further adjusted upwards by 4% to account for the reduction in traffic due to the COVID-19 pandemic. BETA finds this methodology to be conservative.

The adjusted data found Concord Road accommodated approximately 22,625 vehicles per day (both directions) with peak hour volumes of approximately 2,000 vehicles per hour. Traffic generally is split with heavier volumes in the southbound direction towards Route 3. BETA notes the turning movement diagrams were balanced; this methodology is acceptable.

### **PEDESTRIAN AND BICYCLE INFRASTRUCTURE**

The TIA noted the location of pedestrian and bicycle features, noting a proposed Bike Path that will follow the west side of the Site and cross Concord Road immediately west of the signalized driveway.

*T1. Recommend showing the proposed bike path and how it relates to the Site, the Site Driveway, and the traffic signal.*

### **PUBLIC TRANSPORTATION**

This section was found to be adequate.

### **SPEED**

Travel speed was measured as part of the ATR data collection and found 85<sup>th</sup> percentile speed to be 43 miles per hour in each direction. The posted speed limit was noted to be 35 miles per hour. The data collection and summary are adequate.

## CRASH DATA

The most recent five years (2015-2019) of crash data were evaluated based on MassDOT's IMPACT system. This found the signalized intersection of Concord Road and Middlesex Turnpike had 21 crashes in five years, with an increasing trend from 2017 to 2019. Crashes were typically angle and rear-end. Crash rate was calculated to be lower than the MassDOT average rates for all study intersections.

T2. *Crash rates were calculated based on PM Peak Hour volumes with a K-Factor of 0.09, which is understood to be the MassDOT default value when K-Factor is not known. BETA notes that Table 2 of the TIA lists the PM Peak Hour K-Factor as 0.095 which is slightly different. It is not expected that the difference in K-Factor would significantly change the conclusion listed in Table 4 of the TIA.*

## FUTURE TRAFFIC GROWTH

The TIA utilized a 1.5% compounded growth rate over a seven-year design horizon to establish future year volumes. BETA finds this methodology to be conservative, noting that recent volume trends in the last five years have been relatively flat or slightly decreasing.

The TIA noted no nearby developments that would increase traffic in the study area.

T3. *BETA understands there are two similar cGMP buildings proposed for 600 Technology Park Drive and 300 Concord Road, as well as the commercial redevelopment of 480 Boston Road. Consider whether these projects will impact the Study Area.*

The TIA noted no known roadway improvement projects aside from routine maintenance. **See comment T1.**

The development of No-Build traffic volume was found to be in accordance with the methodology stated.

## PROJECT GENERATED TRAFFIC

Site related trips were estimated based on ITE *Trip Generation Manual, 11<sup>th</sup> Edition*, for Land Use Code (LUC) 140 – Manufacturing, and LUC 760 – Research and Development. BETA finds these land uses to be appropriate. The TIA states the 197,902 square foot building will be comprised of approximately 98,528 square feet of laboratory/office space and 99,374 square feet of cGMP (manufacturing) space. This exercise found the proposed Site would generate approximately 1,782 trips per day (891 in, 891 out) on a typical weekday; with 182 trips (145 in, 37 out) during the weekday morning peak hour, and 177 trips (38 in, 139 out) during the weekday evening peak hour. BETA finds the trip generation exercise to have been conducted in accordance with industry standards.

The TIA assessed travel mode split based on US Census Data for the Site area. This found approximately 93% of residents drive to work alone, with 2% choosing to carpool and 5% choosing to use alternative modes (transit, walk, bike, etc.). Despite this, the TIA did not adjust the above trip generation to account for other mode use. BETA finds this to be appropriate given the Site location and land use.

Trip distribution was approximated based on Census Journey to Work data which generally found 45% of trips destined to/from the north via Route 3, 28% of trips destined to/from the east via Concord Road, and 17% of trips destined to/from the south via Route 3. Other roadways such as Middlesex Turnpike, Concord Road to the south, and Old Concord Road (Riverhurst Road) to the west had approximately 5% or fewer trips. BETA finds the trip distribution to be acceptable.

Site trip distribution applied all traffic from Concord Road to the north as entering via the northern site drive (right-in/right-out). Exiting traffic to the south (Route 3, Concord Road, Old Concord Road) was split 47% from the primary driveway and 20% from the northern driveway. Based on the Site Plan, the northern driveway

provides quicker, more direct access to the parking area; while the primary driveway provides more direct access to the rear of the building and the loading docks.

T4. *Clarify the necessity of the northern (right-in/right-out) driveway given the primary driveway is accommodated by a full-access traffic signal. It is generally expected that all trucks would use the main driveway.*

Trips were assigned to the No-Build network in accordance with the trip distribution percentages to form the Build traffic volume networks. BETA finds this to be acceptable.

Based on the above, the TIA found the project represents an increase in 3% of traffic along Concord Road and an increase in 6% in traffic volume for Route 3 (north of Concord Road). BETA notes that the Route 3 comparisons are deceiving as they do not include through volume on Route 3 and therefore more accurately represent the combined ramps rather than a point on Route 3.

### **TRAFFIC OPERATIONS**

Study area traffic operations was assessed using Synchro software. This methodology is appropriate. For the Build Conditions, the traffic signal at Middlesex Turnpike must be re-timed and phased to incorporate the new driveway. It is noted that the traffic signal heads and marked lanes are provided, but gated or turned off. This existing signal was stated to operate with a southbound left turn lead phase, a combined north/south phase, an exclusive Middlesex Turnpike phase, and an exclusive pedestrian phase. The intersection was noted to operate with LOS B overall in the morning and LOS E overall in the evening. This was degraded to LOS F in the evening given traffic growth. The evening/afternoon peak hour is generally noted to be the worst, with the Middlesex Turnpike movements seeing 100-220 seconds of delay per vehicle under existing conditions. This is exacerbated to 318 seconds per vehicle in the future year given traffic growth. The re-timing and installation of the Site resulted in significant reductions in delay for Middlesex Turnpike (318 to 85 seconds per vehicle), at the expense of significant increase in delay for Concord Road southbound left turns (31 to 201 seconds per vehicle). The Concord Road northbound queue was found to double as a result of the retiming (11 to 22 vehicles). Southbound queues were found to be between 7 and 11 vehicles in both peak hours. This is noted to not necessarily block the northern site driveway, but it is approaching it.

T5. *The TIA does not propose any alternative changes to the intersection beyond updates to timing and phasing. The existing Middlesex Turnpike provides a dedicated left turn lane and a shared left/thru/right lane. This two-lane left turning condition cannot receive a green signal at the same time as the Proposed Site Driveway without causing conflicts. The traffic signal analysis should be updated to show Split Phasing for the Site Driveway and Middlesex Turnpike.*

T6. *Consider whether changes to the lane uses for the Site Driveway may improve operations for Concord Road. A dedicated right turn lane exiting the Site could be run as an overlap with northbound left turns. This may be desirable in a condition where the northern site drive is not accessible/present.*

T7. *The intersection of Federal Street and the opposing driveway is unsignalized and generally found to operate with significant delays for the STOP controlled driveways. The TIA notes in the conclusion section that this intersection is controlled by a traffic detail during peak periods, which was not stated previously. Synchro cannot accurately model the actions of a traffic detail. The provided analysis does not provide significant detail for comparison of changes resulting from the Site Operations given it was recommended that the police detail be retained.*

All other intersections were found to operate with acceptable levels of service.

### **SIGHT DISTANCE**



The TIA noted sight distance is adequate given the trimming/pruning of vegetation at each of the Site driveways. BETA finds the assessment to be adequate and notes that sight distance evaluations are generally not necessary for signalized intersections given the traffic signal manages traffic flow.

**RECOMMENDATIONS**

The TIA issued several recommendations, notably including (but not limited to):

- Continued operation of the existing lane uses opposite Middlesex Turnpike as the primary site driveway. **See Comment T6.**
- Provide a Signal Ahead warning sign on the Concord Road eastbound approach to Middlesex Turnpike
- Provide a secondary driveway east of Middlesex Turnpike that is right-in/right-out. **See Comment T4.**
- Circulating aisles should be 24 feet in width.
- Internal drives should be designed to accommodate WB-67 design vehicle.
- Perpendicular parking aisles shall be a minimum of 23 feet in width. **BETA recommends utilizing a 24-foot wide minimum in accordance with guidance from the Institute of Transportation Engineers and the Urban Land Institute. The 24-foot width is shown on the Site Plans. No response required.**
- All signs and markings shall be MUTCD compliant.
- Provide ADA accessible ramps at all crossings
- Provide a pedestrian connection to the existing sidewalk on Concord Road.
- Signs and landscaping shall not block lines of sight.
- Snow windrows shall not block lines of sight.
- Adjust traffic timing and phasing to the Concord Road at Middlesex Turnpike / Site Driveway intersection prior to the issuance of the Certificate of Occupancy
- Continue to utilize a traffic detail officer during the peak period for Concord Road at Federal Street
- Institute a Transportation Demand Management Program

BETA supports the recommendations presented in the TIA pending the response to **Comment T4, Comment T5, and Comment T6.**

**PARKING**

The Traffic Assessment did not evaluate parking demand. Estimating parking demand based on ITE’s *Parking Generation Manual, 5<sup>th</sup> Edition* in accordance with Land Uses identified in the Project Trip Generation exercise [Land Use Code 760 – Research and Development and Land Use Code 140 – Manufacturing] revealed a typical demand for the combined parcel of 345 spaces. The Research and Development use was found to generate approximately 74% of the parking demand. It is noted that the above demand is slightly lower than that required in the Town By-Law and as shown as provided on the Site Plan. *No Response Required.*

The proposed Site includes one building with Office and Industrial Uses. Required parking for these uses (per the Town By-Law) is as follows:

Use	Area (SF) or Employee	Rate (Space / SF or Space / Employee)	Required Parking
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Industrial	118,910 SF	1 / 800 SF	149
Industrial (Per Employee)	178	1 / 2 Employees	89
Office	39,411 SF	1 / 300 SF	132
<u>Total:</u>			<u>370</u>

Parking is provided at the front, rear, and eastern sides of the proposed building. A total of 370 parking spaces are provided. Eight of these spaces are designed are accessible with two designed as van accessible. Eight loading spaces are provided at the rear of the proposed building.

Proposed parking spaces are designed to be 9’ wide and 18’ deep with min. 24’ aisles. Proposed loading spaces are 15’ wide and 60’ deep.

T8. *Revise parking spaces to be a minimum of 19’ deep (§8.C(1)).*

**SITE ACCESS AND CIRCULATION**

Site access is provided via one new and one existing curb cut at Concord Road. The western curb cut (existing) is identified as a former portion of the Middlesex Turnpike and is located at an existing traffic signal controlled intersection. The eastern curb cut (new) is located 200’ ± northeast of the Middlesex Turnpike. Driveways extend from these locations and circle around the entire perimeter of the proposed building, providing access to parking and loading areas. A wetland crossing is proposed along the western driveway to cross over an existing stream.

T9. *Indicate if modifications are proposed to the traffic signal at Concord Rd / Middlesex Turnpike to facilitate traffic into/out of the proposed development. Applicant should provide a traffic signal plan or any required updates to the existing traffic signal plan for review.*

T10. *Recommend restriping the existing pavement markings at the western site entrance, which were found to be partially faded during BETA’s site visit.*

T11. *Provide calculations for design of proposed retaining walls.*

**SIGNS AND LIGHTING**

The submitted documents indicate several signs:

<u>Sign Designation</u>	<u>Location</u>
Unknown	Western Site Entrance
“Stop”	Southwestern Building Corner
“Stop”	Eastern Site Entrance
“Right Turn Only” & “No Left Turn”	Eastern Site Entrance
“No Left Turn”	Eastern Site Entrance
“Signal Ahead” (Existing to be Retained)	Eastern Site Entrance
Accessible Parking Signs	Accessible Parking Spaces

A lighting plan has been provided showing location of 13 building mounted luminaires and 35 pole mounted luminaires.

L1. *Relocate “Right Turn Only” and “No Left Turn” signs to the median at the eastern site egress to ensure visibility.*



- L2. *Provide detail or description for proposed sign at western Site entrance. Note that signs are considered structures under the bylaw and are subject to front/side yard requirements unless a variance is sought (§9.B(2)). Confirm that this sign is in compliance with §9.E, §9.F, and §9.G.*
- L3. *Provide detail for proposed traffic signs.*
- L4. *Indicate proposed treatment of the existing sign near the western site entrance which denotes the Middlesex Turnpike.*
- L5. *Provide detail of luminaire.*

## UTILITIES

The project plans indicate connections to public water, sanitary sewer, gas, and electric services. The connections will link to existing services beneath Concord Road. Four new hydrants are proposed within the property for firefighting activities.

- U1. *Clarify design of sewer interconnection. As depicted, the proposed sewer connection terminates at a new doghouse SMH with no connection to an existing public sewer.*
- U2. *Provide detail for crossing of water and sewer lines.*
- U3. *Provide information on expected domestic water required.*
- U4. *Confirm that there is sufficient flow capacity and pressure to meet the fire services requirement.*
- U5. *Indicate proposed treatment of the existing hydrant located along the former Middlesex Turnpike. If this hydrant is to be retained, confirm what water pipes to this hydrant are currently active.*

## LANDSCAPE TREATMENT

The project proposes landscaping around the building perimeter and throughout the parking islands consisting of trees and seeding. Additional plantings are proposed in the front portion of the Site consisting of densely planted evergreen trees. The project further proposes to retain existing vegetation along the perimeter of the Site.

A Green Strip consisting of trees and seeding is proposed around approximately 80% - 85% of the building perimeter. Green strip widths are generally 20' for the south side of the building, 15' for the east side, 8' for the north side, and 2' for the west side.

The applicant generally proposes to retain existing vegetation for use as the lot perimeter green strip. Additional tree plantings are proposed in select portions of the front yard where existing vegetation is inadequate. The required green strip is not provided in the area near to the northeast corner of the building. The applicant has noted this inadequacy on the plans. BETA notes that this area is influenced by unusual lot geometry and existing vegetation is present in this area beyond the property line.

- LA1. *BETA defers to the Town regarding the quality of proposed/existing screening. The proposed building floor elevation is located approximately 10' – 20' above the lot to the west and thus it may be readily visible from abutters.*
- LA2. *BETA defers to the Town regarding required widths for building perimeter green strips.*
- LA3. *Provide additional trees and shrubs for the building perimeter green strip. At least one native tree and 8 shrubs per 50 feet of green strip are required (§7.G(2)). For the proposed building perimeter of 1,680 ft ±, the required number of trees is 25 and the required number of shrubs is 202. Only 13 trees have been provided at the building perimeter.*

- LA4. *BETA defers to the Town regarding the lot perimeter green strip deficiency near the northeast corner of the building.*
- LA5. *Surveyed existing conditions data indicates several areas where existing vegetation does not provide a 20' green strip (e.g. near FES-2). Provide required green strip in such areas.*

If we can be of any further assistance regarding this matter, please contact us at our office.

Very truly yours,  
BETA Group, Inc.



Stephen Borgatti, PE, MENG  
Project Engineer



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Philip F Paradis, Jr., PE,  
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