

## TECHNICAL MEMORANDUM

**TO:** Giovanni Morabito, Technical Manager  
INTERFORM

**FROM:** Matthew W. Skelly, PE, PTOE  
Katherine O'Shea, EIT

**DATE:** July 8, 2021

**RE:** Traffic Analysis  
131 Rumford Avenue Cannabis Dispensary  
Fuss & O'Neill Reference No. 20190241.A12

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The forthcoming memorandum has been completed on behalf of INTERFORM to analyze the potential traffic impact of a proposed adult use cannabis facility at 131 Rumford Avenue in Newton, Massachusetts. The analysis includes an overview of the existing roadway network, a review of recent crash data, anticipated trip generation and distribution, and capacity analysis at the nearest signalized intersection.

### Existing Conditions

The development site area is identified as parcel 41031 0050 by the City of Newton Addressor and occupies approximately 0.47 acres. Access to the site is provided via one full access driveway on Rumford Avenue. The site is bounded by Rumford Avenue to the north, a storage facility to the east, and City of Newton landfill property to the west and south.

Rumford Avenue is an east/west roadway approximately 0.4 miles in length classified by Massachusetts Department of Transportation (MassDOT) as a local road. The roadway is not striped, but is approximately 30 feet wide and carries one lane of travel in each direction. On-street parking is available on the south side of the roadway. Sidewalks are provided on both sides of the roadway, and dedicated bicycle facilities are not provided.

### Study Area Intersections

The intersection of Rumford Avenue/River Street and Lexington Street and the intersection of the Site Driveway and Rumford Avenue were reviewed for this study.

Rumford Avenue/River Street and Lexington Street is a four legged, signalized intersection, with Lexington Street providing the northbound and southbound approaches, Rumford Avenue providing the eastbound approach, and River Street providing the westbound approach. One lane is provided on each approach. Sidewalks are provided on all four approaches, and crossing is permitted during an actuated exclusive pedestrian signal phase.

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The Site Driveway and Rumford Avenue is an unsignalized, T-style intersection, with Rumford Avenue providing the eastbound and westbound approaches, and the Site Driveway providing the stop-controlled northbound approach. One lane is provided on each approach. Sidewalks are provided both sides of Rumford Avenue in the vicinity of the site.

### **Traffic Volumes and Counts**

The greatest potential for traffic impact on the roadway network by the proposed development will occur during the afternoon peak hour, when commuter related trips are high, and midday Saturday, when the proposed dispensary is expected to generate its highest number of trips. In order to determine the traffic impact on adjacent street traffic, Fuss and O'Neill conducted turning movement counts (TMC) at the intersection of Rumford Avenue/ River Street and Lexington Street for the afternoon peak and Saturday midday hours on Saturday, June 19, 2021 and Tuesday, June 22, 2021.

TMC conducted in 2021 were approximately 25 percent lower than TMC conducted on Thursday, October 24, 2019 and Saturday, October 26, 2019 at the same location. The nearby Woerd Avenue Bridge was closed at the time that these counts were conducted, so traffic volumes were abnormally high due to detoured traffic. Nonetheless, counts conducted in 2019 were used in order to provide a conservative analysis. According to MassDOT seasonal volume data for 2019, traffic volumes during the month of October were approximately four percent higher than average. Therefore, volumes were not adjusted down in order to provide a conservative analysis.

In accordance with MassDOT Transportation Impact Assessment (TIA) guidelines, volumes were grown to a design year of 2028 at a rate of 0.5 percent per year. This growth rate was established upon review of historical count data as well as consultation with the city traffic engineer. The application of this growth rate develops the 2028 No-Build traffic volumes which are depicted in the attached *Figure 2*.

### **Proposed Conditions**

Pharmacann, Inc. intends to construct an adult use cannabis retail facility of approximately 5,000 square feet. Vehicles will access the facility via the existing site driveway that is shared with the adjacent property. A total of 25 parking spaces will be provided on-site, including two accessible spaces. An accessible concrete sidewalk will be constructed on-site, and a covered bike rack will also be provided.

### **Trip Distribution**

The distribution of traffic entering and exiting the proposed site was applied to the road network based on the existing local traffic distributions and the layout of the adjacent roadway network. During the peak hours, the following arrival distributions of traffic are anticipated:

- 80 percent from Rumford Avenue east of the site

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- 20 percent from Rumford Avenue west of the site

A regional arrival/departure pattern for the new site generated traffic traveling to and from the project site is shown in the attached *Figure 3*.

### Trip Generation

The greatest potential for traffic impact on the surrounding roadway network will occur during weekday afternoon and Saturday peak hours. The expected number of peak hour vehicle trips to be generated by the proposed development was calculated using empirical data from the Institute of Transportation Engineers (ITE) publication, Trip Generation Manual, 10<sup>th</sup> edition, 2017. This publication is an industry-accepted resource for determining trip generation.

The site driveway is shared with the self-storage facility on the adjacent property. Land Use Code (LUC) 151 “Mini Warehouse” was used to estimate the trips generated by this existing facility. Based on 900 total storage units, this facility is expected to generate 18 trips (9 entering, 9 exiting) during the afternoon peak hour, and 29 trips (16 entering, 13 exiting) during the Saturday peak hour. Trips generated by this facility are depicted in the attached *Figure 1*.

LUC 882 “Marijuana Dispensary” was used to model the proposed land use of this development. Based on the proposed 5,000 square foot gross floor area 109 vehicle trips (54 entering, 55 exiting) are expected during the weekday afternoon peak hour, and 182 vehicle trips (91 entering, 91 exiting) are expected during the Saturday peak hour.

It is important to note that the ITE Trip Generation publication data for the Marijuana Dispensary land use is thought to be conservative, as data was collected in mostly suburban environments in Colorado and Oregon during the 2010s.

Fuss & O’Neill conducted customer counts at nearby dispensaries in March of 2021 to gain an understanding of the traffic generated by these dispensaries and to assess any latent demand. The data collected at these dispensaries is summarized in Table 1 below.

**Table 1 – Collected Massachusetts Marijuana Dispensary Data**

Dispensary	Location	Size (sf)	Observed PM Peak Hour Customers	ITE PM Peak Hour Customers*	Observed Saturday Peak Hour Customers	ITE Saturday Peak Hour Customers*
Ethos	Watertown, MA	3,870	48	42	53	71
Seed	Boston, MA	6,000	44	65	36	110
Nature’s Medicine	Fall River, MA	2,021	17	22	18	34

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*\*Assumes two trips per customer*

The dispensaries counted are generating, on average, 14 percent less traffic during the afternoon peak hour, and 47 percent less traffic during the Saturday peak hour than what is estimated by ITE Trip Generation. It is our belief that as more dispensaries have opened in eastern Massachusetts, demand that was previously unfulfilled has been sufficiently satisfied.

Nonetheless, in order to provide a conservative analysis, ITE Trip generation was used for analysis. The total trips generated by the cannabis dispensary, depicted in the attached *Figure 5*, were added to the No-Build volumes to yield the 2028 Build volumes, shown in the attached *Figure 6*.

Additionally, it is important to note that the 5,000 square feet of commercial land use already approved for the site under the 137 Rumford Avenue special permit approval could generate significantly more traffic than the proposed dispensary. For example, based on 5,000 square feet of retail space, LUC 851 – “Convenience Market” would be expected to generate more than twice as much vehicle traffic than a dispensary, with 246 vehicle trips (125 entering, 121 exiting) during the afternoon peak hour, and 396 vehicle trips (198 entering, 198 exiting) during the Saturday peak hour. Such a land use is allowed by right in Newton’s BU2 zone, and a development of that nature could be built without further approval.

### **Intersection Capacity Analysis**

Capacity analyses for the study area intersections was conducted using Synchro Professional Software, version 10.0.

In discussing intersection capacity analyses results, Level of Service (LOS) is used to describe the operating condition of the road or intersection. LOS is a measure of the delay experienced by stopped vehicles at an intersection. LOS is rated on a scale from A to F, with A describing a condition of very low delay (less than 10 seconds per vehicle), and F describing a condition where delays will exceed 50 seconds per vehicle for unsignalized intersections and 80 seconds per vehicle for signalized intersections. Delay is described as a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Therefore, intersections with longer delay times are less acceptable to most drivers.

In discussing two way stop controlled unsignalized intersection capacity analyses, LOS is used to provide a description of the delay and operational characteristics of the turns from the minor street (stop sign controlled) to the major street, and turns from the major street to the minor street. Through vehicles are not delayed by the minor street and do not experience delay, therefore they are not rated with a level of service.

The definition for LOS, as well as the methodology for conducting unsignalized intersection capacity analyses, are taken from the “Highway Capacity Manual 6<sup>th</sup> Edition” published by the Transportation Research Board.

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The determination of the traffic impact from the proposed development is made through a comparison of the no-build condition LOS (without the proposed development) versus the build condition LOS (with the proposed development).

Using the above referenced methodologies, weekday afternoon, and Saturday midday peak hour capacity analyses were conducted at the unsignalized intersection of Rumford Avenue and the Site Driveway, as well as the signalized intersection of Lexington Street and Rumford Avenue/River Street.

At the Site Driveway, the westbound left turn into the site performs at LOS A during the afternoon and Saturday peak hours under the No-Build and Build conditions. The northbound approach operates at LOS B during both the afternoon and Saturday peak hours under the No-Build and Build conditions.

The signalized intersection of Lexington Street and Rumford Avenue/River Street is currently operating with timings designed to accommodate additional traffic at the intersection during the closure of the Woerd Avenue Bridge. Analysis for the Build condition was performed with optimized timings now that the bridge has reopened. Recommended timings are depicted in the capacity analysis worksheets, included as an attachment to this memorandum.

The signalized intersection of Lexington Street and Rumford Avenue/River Street operates at LOS D during the weekday afternoon peak hour and LOS B during the Saturday peak hour under No-Build and Build Conditions.

Tables 2 and 3 below present a summary of the levels of service and delay at the study intersections for both the No-Build and Build conditions. Copies of the analysis worksheets for the afternoon and Saturday peak hours have been included as attachments to this memorandum.

**Table 2- Unsignalized Intersection Level of Service**

Critical Movement	Afternoon Peak Hour		Saturday Peak Hour	
	No-Build	Build	No-Build	Build
<b>Rumford Avenue at Site Driveway</b>				
Westbound Left Turn	LOS A	LOS A	LOS A	LOS A
Northbound Approach	LOS B	LOS B	LOS B	LOS B

**Table 3- Signalized Intersection LOS**

Intersection/ Approach	Afternoon Peak Hour		Saturday Peak Hour	
	No-Build	Build	No-Build	Build
Lexington St. at River St./Rumford Ave.	LOS D	LOS D	LOS B	LOS B

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### Queue Analysis

No-Build and Build condition 95<sup>th</sup> percentile (design) queue lengths were reviewed at each intersection in the study area. The 95<sup>th</sup> percentile queue lengths represent the maximum queue lengths that can be expected at each of the critical approach lanes of the study area intersections. The queue lengths are provided in the attached Synchro capacity analysis worksheets.

The maximum increase in queue length of four vehicles occurs during on River Street during the Saturday peak hour. Otherwise, queue lengths are expected to increase by no more than two vehicle lengths. At the Site Driveway, queue lengths are expected to be no more than one vehicle length for both entering and exiting vehicles. Table 4 below provides a summary of the queue lengths for the critical lanes at each study intersection.

**Table 4- Peak Hour Queue Length Summary\***

Critical Movements	Afternoon Peak Hour		Saturday Peak Hour	
	No-Build	Build	No-Build	Build
<b>Lexington Street at Rumford Avenue/River Street</b>				
Eastbound Through	320 feet	315 feet	175 feet	255 feet
Westbound Through	290 feet	250 feet	200 feet	230 feet
Northbound Through	440 feet	420 feet	215 feet	265 feet
Southbound Through	810 feet	665 feet	395 feet	415 feet
<b>Rumford Avenue at Site Driveway</b>				
Northbound Approach	0 feet	10 feet	5 feet	15 feet
Westbound Left Turn	0 feet	5 feet	0 feet	5 feet

\*Queue lengths reported have been rounded to the nearest five feet

### Crash Analysis

Crash data was gathered via the MassDOT Interactive Mapping Portal and Crash Tracking (IMPACT) system and the Newton Police Department Accident Report History for the following intersections in the vicinity of the proposed site:

- Lexington Street at Rumford Avenue/River Street
- Rumford Avenue and the Site Driveway

A summary of the crash records for the most recent five years of available data, 2016-2020, is attached to this memorandum.

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The intersection of Lexington Street at River Street and Rumford Avenue experienced 12 crashes, averaging approximately two to three crashes per year. The majority of these crashes (5) were rear-end collisions. Additionally, the intersection experienced three angle collisions, two sideswipe collisions, one head-on collision, and one pedestrian collision. Of the 12 total crashes, 11 resulted in property damage only, and one resulted in a non-fatal injury.

The collision with the pedestrian occurred on July 20, 2018 at 8:50 AM. The vehicle was travelling south on Lexington Street and continuing straight ahead when the pedestrian was struck in the crosswalk on the northern end of the intersection. The pedestrian suffered a non-fatal injury.

The intersection of Rumford Avenue and the site driveway experienced 3 crashes during the study period, an average of 0.6 crashes per year. The three crashes included, one angle collision, one sideswipe collision, and one single-vehicle crash. None of these collisions resulted in injury.

The type and frequency of crashes reported at the study area intersections are not considered abnormal for the traffic volumes and geometric characteristics of the study intersections. The proposed development is not expected to exacerbate existing crash patterns or negatively impact overall traffic safety of the study area.

### **Intersection Sight Distance Analysis**

Intersection sight distances were calculated at the proposed site driveway in accordance with criteria set forth in the 2006 MassDOT *Project Design and Development Guide* (PDDG). The sight distance is measured from a point 15 feet back from the edge of the travel-way at a height of 3.5 feet, the standard height of a driver's eye.

The 85<sup>th</sup> percentile speed on Rumford Avenue is 30 miles per hour. In accordance with the criteria set forth in the 2006 PDDG, 335 feet of intersection sight distance is required for passenger vehicles turning left out of the proposed site and 290 feet of intersection sight distance is required for passenger vehicles turning right out of the proposed site.

The sight distance for vehicles turning out of the site driveway is approximately 350 feet looking right (east) approximately 585 feet looking left (west). Therefore, available sight distance exceeds the criteria set forth in the PDDG for safe egress from the site.

### **Conclusion**

The purpose of preparing this traffic analysis memorandum is to identify the impact of the proposed adult use cannabis facility at 131 Rumford Avenue in Newton, Massachusetts on existing local traffic. The study efforts have indicated that the proposed development will generate a total of 109 vehicle trips (54

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entering, 55 exiting) during the weekday afternoon peak hour and 182 vehicle trips (91 entering, 91 exiting) during the Saturday midday peak hour.

Timing changes at the signalized intersection of Lexington Street and Rumford Avenue/River Street are proposed during the afternoon peak hour to accommodate the change in traffic patterns now that the Woerd Avenue bridge has reopened.

With the application of the recommended timing changes, the intersection operates at LOS D under the No-Build and Build conditions of the afternoon peak hour, and LOS B during the No-Build and Build conditions of the Saturday peak hour.

95<sup>th</sup> percentile queues are not expected to increase by more than four vehicle lengths. Queues at the site driveway are not expected to be greater than one vehicle length.

The type and frequency of crashes reported at the study area intersections are not considered abnormal for the traffic volumes and geometric characteristics of the study intersections. The proposed development is not expected to exacerbate existing crash patterns or negatively impact overall traffic safety of the study area.

Sight distance at the site driveway exceeds the criteria set forth in the PDDG for safe egress from the site.

Based on the results of the foregoing analysis, it is the professional opinion of Fuss and O'Neill, Inc. that upon implementation of the previously recommended timing changes at the intersection of Lexington Street and Rumford Avenue/River Street, the proposed development at 131 Rumford Avenue will not have a significant impact on traffic operations within the study area.

Attachments:                   Traffic Counts  
                                      Traffic Volume Figures  
                                      Capacity Analysis Worksheets  
                                      Crash Data Summary Table