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Barney Heath
Director

**M E M O R A N D U M**

**DATE:** November 22, 2019

**MEETING DATE:** December 2, 2019

**TO:** City Council

**FROM:** Barney Heath, Director of Planning and Development
Jennifer Caira, Chief Planner for Current Planning
Michael Gleba, Senior Planner

**CC:** Petitioner

**PETITIONS #425-18 & #426-18 156 Oak St., 275-281 Needham St. & 55 Tower Rd.**

**Petition #425-18-** for a change of zone to BUSINESS USE 4 for land located at 156 Oak Street (Section 51 Block 28 Lot 5A), 275-281 Needham Street (Section 51, Block 28, Lot 6) and 55 Tower Road (Section 51 Block 28 Lot 5), currently zoned MU1

**Petition #426-18-** for SPECIAL PERMIT/SITE PLAN APPROVAL to allow a mixed-use development.

This memo provides responses to questions raised at the November 18, 2019 City Council meeting regarding the Special Permit and Rezoning Petitions for the Northland Newton Development. Prior memos from the Planning Department and pertinent documents for this project can be found here: http://www.newtonma.gov/gov/planning/current/devrev/hip/northland.asp .

All Special Permit documents can be found here:
http://www.newtonma.gov/gov/aldermen/special_permits/northland.asp .

## Transportation

Questions were raised regarding how traffic predictions were generated; how proposed trip reductions were calculated; how ride share trips are factored into traffic predictions and counts; and whether the Upper Falls Greenway is identified as a project for off-site transportation mitigation.

Traffic Projections

The Traffic Impact and Access Study, prepared by VHB, dated October 2018 represents the petitioner's initial assessment of existing and future traffic conditions for the proposed project (at that time the proposal included 822 units, 180,000 square feet of leasable office space, and 237,000 square feet of retail/restaurant space). Existing analysis is based on traffic volumes and turning movements collected at various times in 2017 and early 2018. The analysis of future conditions assumes full buildout of the project in the year 2025. The build out analysis also includes the background growth that is anticipated, which includes both known projects in the vicinity and an additional growth rate of 0.5%. The trip projections for the project were calculated by utilizing the Institute of Transportation Engineers (ITE) Trip Generation Manual Mid-Rise Residential, General Office Building, and Shopping Center land use codes. These raw estimates are for stand-alone uses and are considered unadjusted as they do not consider things like the mix of uses on site, or the usage of alternative modes of transportation. The unadjusted trips were then adjusted based upon the mix of uses onsite, which is likely to reduce the number of trips as some trips can be accomplished onsite (internal capture), the reductions in trips that can be expected based on citywide census data for transit usage, walking and biking (mode share), the number of vehicles that are already driving by the project but now may make a stop on site (pass-by trips), or reductions that are anticipated as a result of the proposed transportation demand management (TDM) plan. The trip projections and adjustments were done according to industry standards and were peer-reviewed as appropriate assumptions by the City's peer reviewer. The traffic study presented these projections in a number of different ways: unadjusted trips, adjusted trips, total trips, net new trips (subtracting the trips associated with existing uses on site), and projected trips based upon a "robust shuttle service". The initial proposed robust shuttle service projected a 40% reduction in trips from the unadjusted trips (30% of trips were expected to be on transit and 10% would be walking and biking). Average daily and peak hour trip projections were included, with the peak hour calculated per the ITE Traffic Engineering Handbook (the highest hourly volume based on four consecutive 15-minute counts).

The traffic study went through several iterations based upon detailed feedback from the City's peer reviewer and subsequent revisions to the size of the project. The Planning Department and the peer reviewer also raised concerns about the ability of the proposed shuttle program to accomplish the trip reductions projected in the "robust shuttle service". There were several responses back and forth between the petitioner and the City's peer reviewer regarding the traffic study including: a traffic memorandum dated February 12, 2019 evaluated the change in traffic projections based on the revised program for the project (a reduction to 800 residential units and 115,000 square feet of retail/restaurant uses) and an expanded analysis from the petitioner dated March 28, 2019 (Expanded Revised Building Program Traffic Generation Memorandum, by VHB) which included the revised projections and expected transit and walk/bike trips. The March 28th analysis (and subsequent response by VHB to peer review comments dated April 16, 2019) provided updated unadjusted trip projections as well as projections for adjusted trips for the build condition with existing mode share and the build condition with the robust shuttle proposal. All projections were calculated through the same methodology as the original study, using the same ITE trip generation rates for the residential, office and retail land uses. At this time the petitioner was showing both the existing mode share and the robust shuttle mode share, which reduced unadjusted trips by 40%, and stated that the actual trips were likely to be somewhere in between. The petitioner had committed to a shuttle system, but not to a method of monitoring and enforcing a specified trip reduction.

On June 26, 2019 the petitioner submitted a revised TDM plan which committed to a specific, measurable reduction in the number of vehicular trips during the weekday morning and evening peak hours for the office and residential uses. The TDM plan proposes a free shuttle running every ten minutes to the Newton Highlands MBTA station, MBTA incentives for residents and workers, an onsite fulltime TDM coordinator and a number of other measures designed to incentivize alternative forms of transportation. The new adjusted trip generations with TDM were calculated based on the same unadjusted trips from the original and updated traffic studies (based upon ITE rates). The unadjusted morning and evening weekday peak hour volumes for office and residential uses were then reduced for internal capture (trips that never occur due to the mix of uses onsite), and for the existing citywide mode share. This adjusted number was then further reduced by 20%, resulting in a 37% reduction from unadjusted trips in the weekday morning peak hour (from 459 trips to 289 trips) and a 58% reduction from unadjusted trips in the weekday evening peak hour (from 525 trips to 220 trips). These numbers represent the maximum trip count that the Council Order requires the petitioner to stay below. This commitment was just for office and residential trips as retail trips are historically difficult to reduce through TDM measures and a successful development with thriving commercial spaces and popular public open spaces is desirable. The proposed Council Order also includes requirements for a total site trip count (to be measured during weekday morning and evening peak hours and the Saturday midday peak hour), which will be based upon the adjusted residential and office trips as well as the unadjusted retail trips. The petitioner must also maintain compliance with this and will be required to pursue additional TDM measures if they exceed the total trip count, even if they are in compliance with the residential and office trips.

The petitioner's traffic projections have been based upon the same industry standard ITE rates throughout the process. The primary changes have been the commitments to trip reductions and methods of reducing trips.

Ride Share

The impact of transportation network companies (TNCs), or ride share such as Lyft and Uber, has been a primary focus of the project. It has been critical that the TDM program is attractive enough to incentive residents and workers to take transit, particularly during peak hours, rather than Lyft or Uber, which result in additional trips. As data is limited and the nature of TNCs has and will continue to evolve, it is not heavily factored into accepted trip generations. However, the petitioner will be held to both a maximum number of trips for the office and residential uses and a maximum number of trips for the entire site. In both instances ride share trips will be counted. For the office and residential trip count we will use intercept surveys, where someone will be stationed at every residential and office entrance and exit to quickly ask people how they arrived or how they are leaving. These surveys are an accepted practice in other municipalities across the country. This will capture guests, any pickup/drop offs, and deliveries. For the total site count, the number of trips will be automatically counted at each driveway, which will also include any ride share use.

Greenway Improvements

Exhibit B, included in the clean version of the Council Order, provides guidance for the future expenditure of the $5 million off-site transportation mitigation fund. It includes three categories of

priorities for the use of the funds in the vicinity of the project: bicycle and pedestrian improvements; village enhancements and traffic calming; and traffic safety and coordination. Each category includes examples of projects within that category but does not limit spending to just those examples. The examples included for bicycle and pedestrian improvements include extending the Greenway to Newton Highlands and/or Elliot Stations, as well as studying and providing access across and to/from the Christina Street bridge.

**School Enrollment**

A question was raised regarding a July 2018 memo from Tischler Bise, which included a proposed student generation rate, which would result in a total of 218 students for Northland, as opposed to the 138 students predicted in the February 2019 Fiscal Impact Analysis. Prior to 2018, the School Department had used a methodology for student generation rates that was largely based on data from three large, fully occupied developments (Arbor Point, Avalon – Needham Street, and Avalon – Chestnut Hill). With a number of pending developments, the School Department revisited their methodology and created an interim methodology, which was applied to the Northland project and is reflected in the February 2019 Fiscal Impact Analysis. The Tischler Bise methodology weighted the number of students projected differently based on the unit type (one-bedroom, two-bedroom, three-bedroom, etc.) based on Census data and this analysis was incorporated into the School Department's interim student generation methodology. This method of weighting unit types is incorporated into existing data from the three large, occupied developments, to provide a student generation rate that is an average of three methods (weighting unit types, taking an average based on the three large developments without consideration of unit mix, and weighting affordable vs. market rate units differently based on historical data). This methodology was an update to the prior methodology based solely on data from the three large, occupied developments. The School Department continues to refine the student generation rates based on new information and data.

Additional questions were raised regarding the cost per student. The School Department has previously presented both a total cost and a marginal cost per student. At the time of analysis, the total cost per student was around $18,000, however this includes all fixed costs and is much higher than the actual marginal cost to add additional students. The School Department has utilized a marginal cost per student of $14,383, which is what was incorporated into the February 2019 Fiscal Impact Analysis. This marginal cost is still conservative and does not factor in state funding. Also, given the predicted declining enrollment at Countryside School, it is expected that the marginal cost of adding students from the Northland development will be significantly less.

**Inflow & Infiltration (I&I)**

In addition to commitments towards community benefits, including $5 million for off-site transportation improvements, $1.5 million towards Countryside School, and the land and $1 million towards a spray park, the petitioner is required to pay $1.85 million into the sewer inflow and infiltration (I&I) fund. A memo from the Commissioner of Public Works responding to questions raised regarding the calculation of the I&I contribution and the assessment of sewer infrastructure in the area is attached.

City of Newton

DEPARTMENT OF PUBLIC WORKS
OFFICE OF THE COMMISSIONER
1000 Commonwealth Avenue
Newton Centre, MA 02459-1449

Ruthanne Fuller
Mayor

November 22, 2019

To: City Council

From: James McGonagle, Commissioner of Public Works

Subject: Northland Development
Calculation of Sewer Infiltration/Inflow Mitigation

*Councilor Gentile has asked for an explanation of the Sewer Infiltration/Inflow mitigation calculation for the Northland Development, an assessment of the sewer infrastructure in that area, and what portion of the required payment is needed to complete the work.*

Sewer Improvement Program

The City of Newton embarked on a comprehensive capital improvement program to improve the city's sewer infrastructure in 2013. One of the primary goals was to decrease inflow (stormwater from direct illegal connections) and infiltration (groundwater that gets into the sewer pipes through cracks and other imperfections), otherwise known as I&I.

The City has been systematically addressing our approximately 300 miles of sewer mains and related manhole structures. The plan was designed to begin with areas that had significant inflow and infiltration problems as well as those experiencing flooding or sewer surcharging problems. The work in each project area is divided into 3 phases: Inspection and Assessment, including heavy cleaning; Design of repair work; and Construction, including post-construction flow assessment. Each project area generally is completed over a two-year period.

The Northland project is not located in an area of the City that required immediate attention. Rather, it is in Project Area 8 and 9.

By coincidence, the Northland project is before the City Council just as our strategic sewer investment plan is turning to this part of the city.

In FY2021, regardless of the vote by the City Council on the Northland project, Public Works is completing Post Construction Flow Evaluation in Project Area 6, completing Construction in Project Area 7, completing Design and starting Construction in Project Area 8, and completing Inspection and Assessment and Design for Project Area 9. (See the attached Sewer System CIP Progress Map.) The Capital Improvement Plan already includes the funding plan for this work and the rate schedule covers the anticipated costs.

Infiltration and Inflow Mitigation Ordinance

The City Council updated our ordinance on inflow and infiltration just a few weeks ago (Ordinance No. B-45, Article VII of Chapter 29). It notes the range of problems infiltration and

inflow causes and the old age and capacity issues facing our sewer infrastructure. It calls for new developments to help fund the removal of infiltration and inflow. It lays out a method for the city engineer to calculate current and proposed flows and fees for new developments. It also allows the City Council, for good cause, to abate in whole or in part the infiltration/inflow mitigation fee for projects subject to a special permit.

The Northland Project

The City of Newton hired a peer reviewer to analyze the net new wastewater flows from the Northland project. The city engineer's sewer infiltration/inflow mitigation calculation is based upon the following estimated net new wastewater generation from the VHB peer review report, April 18, 2019, page 3:

Northland Sewer Infiltration/Inflow Mitigation Calculation

| Proposed use | Size | Title V Design Flow Basis | Gallons per day |
|---|---|---|---|
| Residential | 1200 bedrooms | 110 gpd/bedroom | 132,000 |
| Retail | 60,000 sf | 0.05 gpd/sf | 3,000 |
| Office | 180,000 sf | 0.075 gpd/sf | 13,500 |
| Restaurant | 1,190 seats | 30 gpd/seat | 35,700 |
| Medical Offices | 6 Doctor | 250 gpd/Dr | 1,500 |
| Medical Offices | 2 Dentist | 200 gpd/Dn | 400 |
| Commercial | 10,000 sf | 0.075 gpd/sf | 750 |
| Community | 4,000 sf | 0.05 gpd/sf | 200 |
| TOTAL | | | 187,050 |
| Conversion factor (low flow fixtures) 187,050 x 0.5 = | | | 93,525 |
| Mitigation calculation: 93,525 gallons/day x 4:1 x $19.77 = | | | $7,395,957 |

The mitigation calculation can be interpreted in the following way. Northland will have a new wastewater average daily flow of 93,525 gallons per day. The mitigation formula calls for a new development to fund the removal from the public sewer at a rate of four gallons for each gallon of wastewater that it generates using the current average cost for this removal. This calculation comes to $7.4 million. This amount may be abated in part or in whole by the City Council. (As of January 1, 2020, a lower amount calculated using the net new wastewater will be used in the mitigation calculation per the updated ordinance.)

The city engineer will continue to analyze what additional work and funding is needed above and beyond the work plan for Project Areas 8 and 9 already in place. The existing sewer system in the Northland area may be sufficiently sized currently to accept the net new wastewater average daily flow from the Northland development once the work is done to address age and condition issues in the sewer system near Northland. The work to address age and condition issues is underway and the funding is available with our current water, sewer and stormwater fee schedule.

The Northland Development lies in sewer capital improvement Project Area 8, which also flows into sewer capital improvement Project Area 9. It is also adjacent to sewer Project Area 7. These sewer areas are already scheduled to undergo improvements in the upcoming fiscal years FY2021, FY2022, and FY2023.

Project Area 7 - Going out to bid (regardless of the Northland approval) within a month with Construction beginning in late Winter/early Spring 2020 at an estimated cost of $8.5 million. It is

estimated that 267,051 gallon per day (GPD) of peak I&I will be removed. This area is primarily located north of Boylston Street and only approximately 10% of this area is contributary to the Northland Development located at the intersection of Needham & Oak Streets.

Project Area 8 – Design has just begun and is approximately 10% complete. Construction is scheduled for Spring 2021 at an estimated cost of $9 million. It is estimated that 751,755 GPD of peak I&I will be removed. This area is 100% contributary to the Northland redevelopment at Needham and Oak Streets.

Project Area 9 – This project is in the Inspection & Assessment phase of the project (approximately 82% complete) and still needs to be designed. Construction is estimated to start Winter/Spring 2022. Cost and I&I removal quantities associated with this project has not been precisely determined at this time but is estimated in the Capital Improvement Plan at $5 to $10 million. This area is upstream and downstream of the Northland redevelopment at Needham at Oak Streets, and I&I removal in this project area will increase capacity downstream of this redevelopment.

We anticipate most of the sewer work to focus on cleaning and lining of sewer mains. Some sewer pipe spot repairs will also be necessary. Sewer Project Area 9 abuts the Charles River, so particular care will be made in sewer cleaning and lining to prevent flow from the Charles River into the sewer mains or visa versa.

The city has already proposed funding the removal of sewer infiltration and inflow in Project Areas 7, 8 and 9 using sewer capital improvement funds. Notably, if approved, the buildings at Northland will be constructed and occupied over several years. Meanwhile, the sewer improvements will be underway and Northland's wastewater flows will be measured regularly.

As the work in this area is already underway with the associated funding, the city engineer is recommending using mitigation funds from the developer for potential additional work in future years, if necessary. More specifically, during discussions with our consulting engineers, we anticipate, after all sewer area capital projects are completed in FY2025 through Project Area 11, another round of sewer investigation and repairs will be done in the out years. Sewer flow monitoring and further infiltration/inflow removal will be done as appropriate. We recommend setting aside approximately 25% of the $7.4 million for this future potential use.

Sincerely,

James McGonagle
Commissioner Public Works

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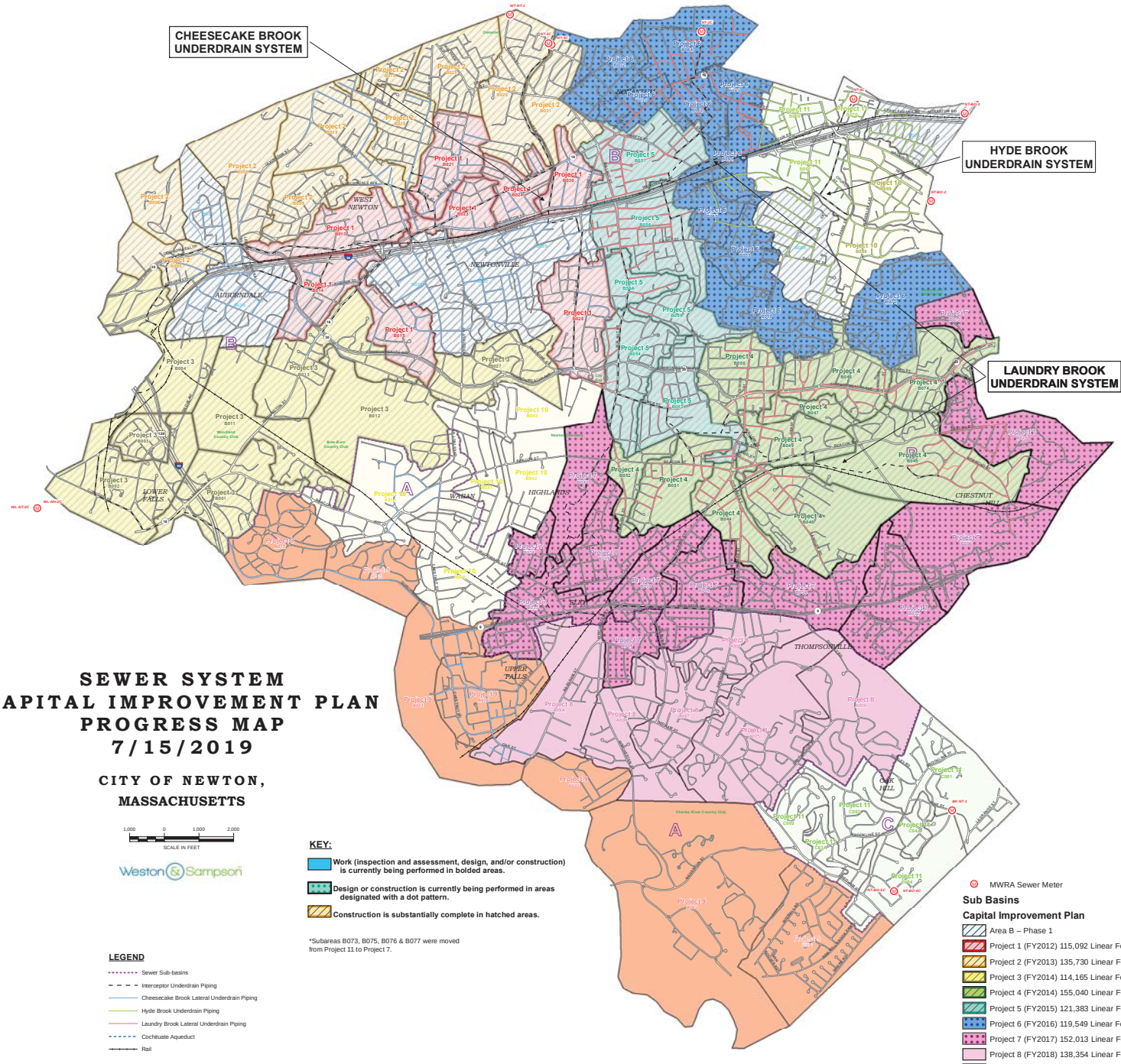


# SEWER SYSTEM CAPITAL IMPROVEMENT PLAN PROGRESS MAP 7/15/2019

## CITY OF NEWTON, MASSACHUSETTS

1,000 0 1,000 2,000

SCALE IN FEET

Weston & Sampson

**KEY:**

- Work (inspection and assessment, design, and/or construction) is currently being performed in bolded areas.
- Design or construction is currently being performed in areas designated with a dot pattern.
- Construction is substantially complete in hatched areas.

*Subareas B073, B075, B076 & B077 were moved from Project 11 to Project 7.

**LEGEND**

- Sewer Sub-basins
- Interceptor Underdrain Piping
- Cheesecake Brook Lateral Underdrain Piping
- Hyde Brook Underdrain Piping
- Laundry Brook Lateral Underdrain Piping
- Cochituate Aqueduct
- Rail

MWRA Sewer Meter

**Sub Basins**

**Capital Improvement Plan**

- Area B – Phase 1
- Project 1 (FY2012) 115,092 Linear Feet
- Project 2 (FY2013) 135,730 Linear Feet
- Project 3 (FY2014) 114,165 Linear Feet
- Project 4 (FY2014) 155,040 Linear Feet
- Project 5 (FY2015) 121,383 Linear Feet
- Project 6 (FY2016) 119,549 Linear Feet
- Project 7 (FY2017) 152,013 Linear Feet
- Project 8 (FY2018) 138,354 Linear Feet
- Project 9 (FY2019) 127,261 Linear Feet
- Project 10 (FY2020) 121,682 Linear Feet
- Project 11 (FY2021) 106,380 Linear Feet