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DEPARTMENT OF INFRASTRUCTURE ENGINEERING

MEMORANDUM

TO: Leon Goodwin, Town Manager

FROM: Jason L. Mammone, P.E., Director of Engineering

DATE: January 29, 2020

SUBJECT: Update of Engineering Department Projects and Activities

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The following is a brief update on some of the projects that the Engineering Department is currently working on and/or involved with:

- **2019 I/I Inspection Project** – *completed* – This project involved the cleaning & TV inspection of approximately 134,000 linear feet (25.4 miles) of sewer mains, 91 private laterals and 577 sewer manholes. The project was completed in October. The total cost of this project was approximately $178,800.

- **2019 I/I Rehabilitation Project**– *completed* – The project was designed to remove an estimated 225,000 gallons of infiltration per day primarily through trenchless technologies. The project involved the installation of approximately 9,400 linear feet of cured-in-place pipe (CIPP), the installation of approximately 10 linear feet of short liners, the installation of 53 full-wrap lateral liners and approximately 250 vertical feet of sewer manholes cementitiously lined and exterior grouted, as well as testing and sealing of associated joints and services and manhole and sewer line root treatment. The total cost of this project was approximately $565,000.

- **Inflow and Infiltration Project** – *ongoing* – The Engineering Department has been working to reduce inflow and infiltration using an in-house approach to inspect, assess, design, and oversee improvements to the sanitary sewer system. Over the last thirteen years the Town has inspected approximately 1,893,500 linear feet (359 miles) of sewer main, performed approximately 6,352 manhole inspections, installed approximately 188,900 linear feet (36 miles) of cured-in-place liners, installed approximately 3,382 feet of short liners, installed approximately 203 full-wrap lateral liners, installed approximately 35 top hat lateral liners, cementitiously lined approximately 9,570 vertical feet of manholes and chemically root treated approximately 300,700 linear feet (57 miles) of sewer main. To date, the project has cost approximately $16.4 million and we estimate that we have conservatively removed 6.1 million gallons per day (MGD) of inflow & infiltration from the system. In addition, the Town's MWRA sewer assessments have

remained stable and our sewer rates have remained unchanged since 2008 as a result of our decreasing flow share. Assuming a no change in flow share scenario, we estimate that Dedham has cumulatively saved $12.3 million over the past thirteen years as a result of these efforts (See Chart 1).

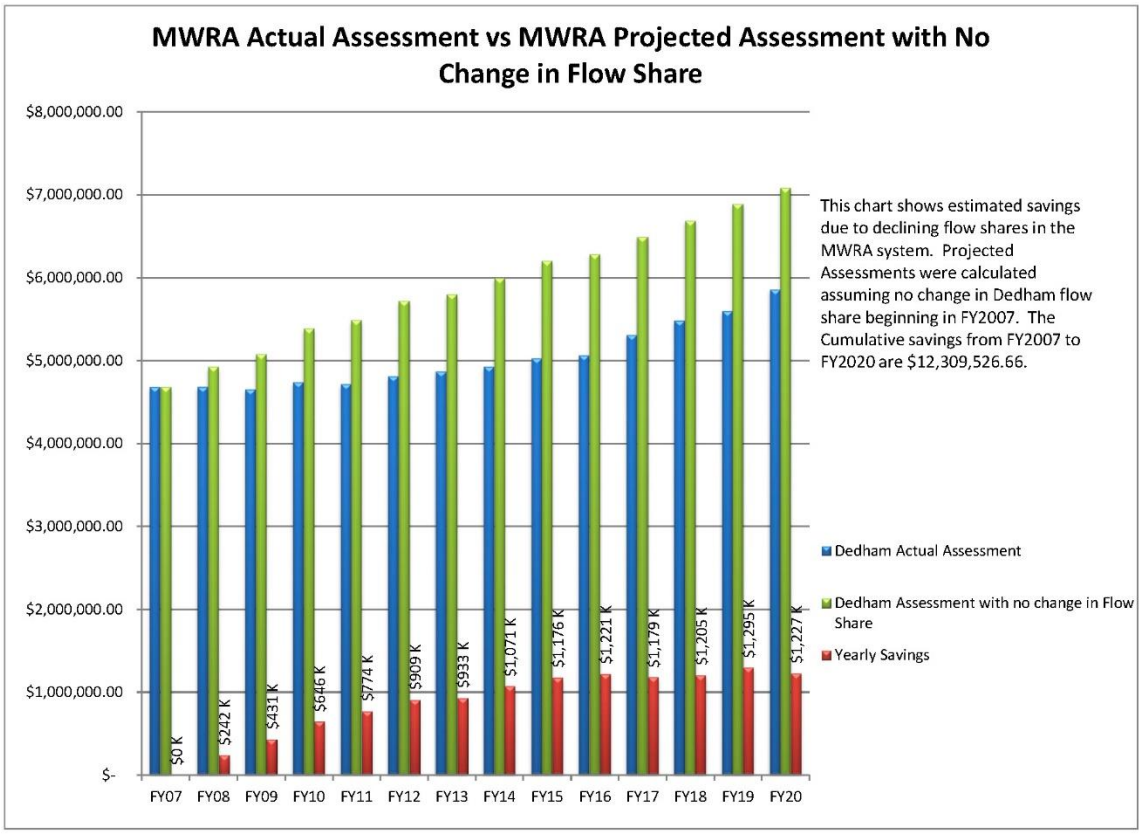

Chart 1

- **Private Infiltration Removal Policy –** *ongoing* – Over the past thirteen years, the Engineering Department has been removing inflow and infiltration from our public sewer system.

  Based upon the flow data provided by the MWRA, in FY2019 Dedham transported approximately 3.5 million gallons per day (MGD) of wastewater to the MWRA for treatment. Of this flow approximately 52% is actual wastewater, 37% is infiltration and 11% is inflow. That translates to 48% ($2.7 million) of our $5.6 million FY2019 MWRA Assessment being used to treat groundwater and stormwater that should not be in our sewer system.

  Over the past 5 to 6 years, many other MWRA communities have started to implement aggressive sewer rehabilitation programs, similar to Dedham's in an effort to reduce their MWRA sewer assessments by reducing the amount of flow being treated by the MWRA. As these other communities are improving their systems and reducing their flow share, it is now resulting in the Town's flow share to the MWRA to plateau and soon will likely

start increasing resulting in our annual MWRA assessments to increase at a higher rate than typical.

In a continued effort to reduce Dedham's infiltration, stabilize the increase in our annual MWRA assessments and maintain our current flow share to the MWRA, it is important to start looking beyond public sources of infiltration and start identifying private sources of infiltration. The mostly likely source of private infiltration will be groundwater that is leaking into property owner's sewer laterals. During our recent 2018 and 2019 wet weather investigations, we conducted TV inspections of laterals, that during our mainline inspections, showed indications of infiltration. Based upon the TV inspections, approximately 200,000 gallons per day (GPD) of removable infiltration was observed. This amount shows that private infiltration plays a role in our overall infiltration problem. Therefore, the Engineering Department has been working with our consultant, Town Manager and Board of Selectmen in 2018 to develop a Private Infiltration Removal Policy.

Over the past year, we made 2 presentations to the Select Board about the status on the policy, held a town-wide public meeting at the Dedham Middle School in April to discuss the proposed policy, conducted a Town-wide survey through sewer bill inserts and on the Town's website to get feedback on how best to construct the proposed policy and held a focus group with Dedham residents to spend time getting detailed feedback on the draft policy.

We are currently working with Town Counsel to finalize the language for the policy to be submitted to the Select Board in February or March for their support and then approved by the Town Manager to be included into the Town's Sewer Use Regulations.

- **2018 Rustcraft Road Sewer Improvements –** *ongoing* - At the Fall Town Meeting in November of 2018, Town Meeting approved an appropriation of $270,000 for the design of the Rustcraft Road Sewer Improvements based upon Weston & Sampson study. The Town hired Weston & Sampson to perform the design in December 2018.

  In 2019 at the May Town Meeting, Town Meeting members approved $3.2 million for the construction of this improvement. Timing for this project is critical and needs to be completed by the end of 2020 so as to not interfere or potentially postpone the start of our MassDOT TIP project that is to start in 2021 on Elm Street and Rustcraft Road.

  Weston & Sampson should be finished with the design in January for permitting with the Conservation Commission in February and put out to bid in March for a hopeful April start for construction.

- **Transportation Improvement Project (TIP) –** *ongoing* - In the winter of 2013/2014 the Engineering Department presented to the BOS four potential projects that could be considered a viable project for funding through the MPO TIP. The BOS selected moving forward with the sidewalk/corridor improvements for Bussey Street and Rustcraft Road/Elm Street. The Engineering Department hired BETA Group as the design consultants for the project.

  In April 2016, our State Representative, Paul McMurtry, Town Manager, Selectmen Mike Butler, Town Planner, Director of Public Works and I attended an MPO meeting in which prospective project proponents were provided an opportunity to speak on behalf of our project for consideration for funding by the MPO. In June 2016, the MPO voted to approve

funding for the Rustcraft Road/Elm Street project and programmed the start of the project for 2021.

To date, we have received the 100% design comments for the Rustcraft Road/Elm Street project back from MassDOT and were approved the required permits from the Conservation Commission. We anticipate submitting Plans, Specifications & Estimate (PS&E) design plans to MassDOT in the beginning of 2020. In December, the Engineering Department began the process of securing all Right-Of-Way Acquisitions required for this project. These acquisitions come in the form of temporary and permanent easements. For this project there are a total of 20 properties for which the Town must acquire 20 temporary easements and 9 permanent easements. An article will be placed on the warrant of upcoming Town Meeting to request the necessary funds to award damages for all the easement acquisitions to those property owners who requested an appraisal. Property owners also have the option to donate the easement(s) to the Town at no cost. The project is still on schedule to go to bid in the Fall/Winter of 2020 with construction starting in the Spring of 2021.

The Bussey Street 25% design submitted with MassDOT is still under review awaiting comments from MassDOT's bridge/structural group. MassDOT will schedule a 25% Design Public Hearing for the Bussey Street project once the review is complete. We are anticipating having that hearing in the first half of 2020. In 2018, the MPO approved funding for the Bussey Street project with construction to start in 2023.

- **McDonald Square Sidewalk Improvements –** *completed* - At the November 14, 2016 Fall Annual Town Meeting, the Town voted to approve $10,000 for a study to address accessibility and safety issues in the McDonald Square area of the Manor Neighborhood.

  The Engineering Department hired consultant BETA Group, Inc. which conducted its study of the area over the winter of 2016-17. The study concluded that there were sections of sidewalks and numerous accessible ramps that were not in compliance with the American Disabilities Act (ADA) and Massachusetts Architectural Access Board (MAAB). The study also observed poor pedestrian connectivity through the square and improvements that could be made to line striping at the intersection of Hooper Road and Sprague Street that may mitigate the confusion experienced by motorists trying to negotiate the intersection.

  Following the results of the study, the Engineering Department retained the services of BETA Group, Inc. and worked together to develop a plan to remedy the noncompliance and safety issues identified in their study. The Engineering Department paid for the design from its Professional/Technical Services operating account at a cost of $37,500.

  The design plans that were developed were presented to the Manor Neighborhood Association and also the residents and business owners of the Manor Neighborhood on few occasions at Public Meetings held at the Endicott Estate. These design presentations were used to solicit input from the neighborhood to be used to revise and adjust the plan so that they met the needs of the neighborhood as best as possible. The final plans include the construction of 5 to 7.5 foot wide asphalt sidewalks with vertical granite curbing, 13 ADA/MAAB accessible concrete ramps, 7 crosswalk locations, and roadway restriping at the intersection of Hooper Road and Sprague Street. The plans also include minor geometric changes to the roadways at the minor intersections throughout the Square to

improve sight lines and shorter street crossing distances to improve the safety for pedestrians.

BETA Group developed a cost estimate for this project of $120,000. At the time, the DPW did not believe they had time to handle the construction in-house and would have to bid the project out. Fortunately, there was a change in the DPW's schedule allowing them to do all the construction in-house at a cost of approximately $70,000 resulting in a project savings of $50,000.

- **106 Washington Street Sewer Extension –** *ongoing* – In 2016, the Town was approached by the property owner of 106 Washington Street. The property owner had a failed septic system and was under a consent order from MassDEP to connect to the Town's sewerage system. To connect to the Town's sewerage system would involve the installation of approximately 300 feet of new 8" sewer main within Washington Street along with the installation of approximately 50 feet of 6" PVC sewer pipe for the building connection and all other pertinent sewer infrastructure.

  Due to the cost estimate received by the property owner's engineer, the property owner did not have the financial means to pay for it. Therefore, the property owner requested if the Town could install the sewer utility and assess the property through a sewer betterment for the work. With a sewer betterment in place, the property owner would be able to make payments to the Town over a 20-year period. The Town is protected by the fact if the owner tries to sell the property, the betterment would have to be paid in full before the sale could be finalized.

  The Engineering Department was the project manager for this sewer project and began working with the Town Manager's Office, Treasurer's Office, Finance Department and Town Counsel to prepare an article for the 2016 Fall Town Meeting for the borrowing of funds from the Sewer Enterprise Fund and the assessment of a betterment to the property owner for the construction of the necessary sewer facilities to connect the property to the Town's sewerage system. The Engineering Department developed a cost estimate of $277,000 needed to perform the necessary work. Town Meeting approved the funding at the Fall Town Meeting.

  In 2018, the Town executed the Grant of Sewer Easement between the Town and the property owner. The Engineering Department hired consultant Weston & Sampson to design the sewer extension and connection for this project. Th consultant also assisted the Town in generating the plans and specifications for bidding and construction services. The contract went out for bid in 2019 and was awarded to Blue Diamond Construction Company. The contractor began work in July 2019 and completed the work in November 2019. We are currently working on the last payment requisition for this project and will then begin assessing betterments to the property. To date the project has cost $254,406.02.

- **Dedham Square Pedestrian Signal Evaluation –** *ongoing* - The Engineering Department in conjunction with consultant BETA Group was directed by the BOS to re-evaluate pedestrian safety in Dedham Square. The evaluation was specific to the pedestrian signals for the intersections of High Street at Eastern Avenue and High Street at Washington Street.

  BETA Group evaluated the existing pedestrian signal phasing for the pedestrian signals at those two intersections and also performed traffic and pedestrian counts to obtain current data relating to the average daily flow.

Based upon the data collected and reviewed, BETA Group presented 4 alternatives to the BOS at their November 2018 meeting that would improve pedestrian safety at both intersections. The 4 alterations were:

1. "No Turn on Red" signage on all approaches for both intersections.
2. Combined Exclusive Pedestrian Phase for both intersections.
3. Separate Exclusive Pedestrian Phases for both intersections.

3a. Separate Exclusive Pedestrian Phases for both intersections and "No Turn on Red" signage on all approaches for both intersections.

All alternatives improve pedestrian safety but result in different levels of improved safety along with varying levels of impact to traffic flow through the Square. Of the 4 alternatives, #3a was recommended by BETA as it provides the best combination of pedestrian safety with minimal impacts to traffic flow.

The Select Board voted to go with BETA's recommended option #3a. The DPW will install the "No Turn On Red" signage in January and BETA will also update the traffic signals to operate under their recommended separate exclusive pedestrian phases.

- **Gonzalez Field Sewer Design –** *ongoing* – The Engineering Department was approached by the Parks & Recreation Commission to assist in the design and permitting for the sewer service for the future concession stand to be located at Gonzalez Field. The Parks & Recreation Commission were able to save money on the overall project by having our department handle this aspect of the overall project. All work associated with the design and permitting was done in house. We had to collect additional survey data to supplement what was collected for the Gonzalez Field Project since the proposed connection is located outside the project's limits of work. With assistance from the Department of Public Works we also performed test pits within East Street, where the proposed sewer service is to be connected to the Town's sanitary sewer system, to verify the location and depth of all utilities, especially the MWRA's 36" water line. The data collected was utilized to design the sewer connection for the future concession stand (to be constructed in 2019) and for the required 8M permit to the MWRA. To date the design is 75% complete and the 8M permit has been approved by the MWRA. The construction of the sewer service is anticipated to be completed in April 2020. We will also provide on-site observations and inspections as the service is constructed.

- **NPDES Phase II MS4 Permit –** *ongoing* - The Environmental Protection Agency (EPA) and Massachusetts Department of Environmental Protection (MassDEP) issued the new National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater General Permit for Small Municipal Separate Storm Sewer Systems (MS4) for the Commonwealth on April 13, 2016 and became effective on July 1, 2018. This new permit has a significant amount of requirements that the Town will be responsible for annually reporting on. Most of the new requirements affecting the Engineering Department pertain to Illicit Discharge Detection & Elimination (IDDE). IDDE involves the inspection and testing of our stormwater infrastructure for the presence of pollutants (i.e. ammonia, phosphorus, fecal coliform, surfactants, nitrogen, etc.). If any pollutants discovered exceed tolerable levels in our waterways, the source of the pollutant must be discovered and eliminated.

In our Year 2 submission (due 9/30/19) the Engineering Department will be responsible for providing information and/or confirmation on the following:

- Update as necessary our Inventory of all Town owned outfalls/interconnections with required pertinent information. Based upon our existing data we have 176 outfalls/interconnections that will require inspection and testing before the end of Year 3.
- Begin dry weather inspections in May for our Town owned outfalls/interconnections
- Prepare a report summarizing our dry weather inspections.
- Update as necessary our Inventory of all Town owned stormwater utilities
- Update as necessary all of the catchment areas responsible by the Town.
- Assist in the development of a written Operation & Maintenance procedure manual for all municipal activities.
- Assist in the development of a Stormwater Pollution Prevention Plan for the DPW facility.
- Annual IDDE training for all Engineering and DPW Staff

The Engineering Department is also responsible for obtaining the services of a consultant to assist the Town in its compliance with our permit. The Engineering Department also acts as the Town's MS4 coordinator for all the other departments that must perform work and activities that fall under their departments (DPW, Conservation, Environmental, Planning and Parks & Rec).

- **Sewer Fats, Oils, and Grease (FOG) Issues** – *ongoing* – As part of our overall inspection program the Engineering Department also has an aggressive FOG program to help eliminate back-ups and maintenance issues related to excessive grease in the sanitary sewer system. The Engineering Department has implemented a biological dosing program at key locations to help digest grease at known trouble spots.

    - **Legacy Place** – *ongoing* – The Engineering Department, in conjunction with the DPW and Health Department, has been monitoring the grease traps at Legacy Place. These grease traps have been improperly maintained to date and have been causing multiple problems at our Rustcraft Road Pump Station. We have been conducting random sampling of the grease traps throughout the year to determine if the establishments have been properly cleaning their grease traps according to their mandated cleaning schedule. When it is determined that an establishment is not cleaning their grease traps properly, the information is provided to the Health Department for their intervention. Our department will continue to monitor the grease traps to determine if the establishments are complying with the Board of Health's cleaning schedule.

- **Colburn Street Dam** – *completed* – In the beginning of 2017, our department along with the Town's consultant (Dewberry Engineers, Inc) completed all the required permitting necessary to finish the design of the dam's rehabilitation project. The project was sent out to bid in April with a bid opening on May 2017. The project was awarded to T. Ford Company, Inc. with a project start date of June 2017. Rehabilitation of the dam was completed in October 2017 at a final cost of approximately $727,000.

The rehabilitation project consisted of the following:

- Installing a temporary cofferdam to pump Mother Brook around the work area
- Excavating built up sediment and debris along the upstream face of the dam
- Installation of a concrete curtain wall extending from the existing bottom of the dam structure to the underlying bedrock.
- Removing the existing stop log system and installing a new aluminum stop log system.
- Installing a 4 to 5" inch layer of shotcrete along the upstream face of the dam
- Filling in the voids along the downstream face of the dam
- Pressure grouting the voids behind the dam face and below the existing dam structure
- Installation of erosion/scour control materials immediately downstream of the dam

Our Emergency Action Plan was submitted to DCR's Office of Dam Safety (ODS) in the start of 2019. We just formally received approval of our Emergency Action Plan from ODS in December. The Emergency Action Plan is overseen by the DPW, Police, Fire and Engineering Departments in any event that has the potential of resulting in structural damage to the dam.

- **MWRA's Southern Extra High Pipeline Project** – *ongoing* – The MWRA's project will be conducted in two phases (North and South Phase). Construction of the North Phase of the project started in December of 2017 and includes the installation of a 36-inch water line from the Town line on Dedham Boulevard to East Street. During construction, our department will be providing daily inspectional services to ensure that our sewer and drainage infrastructure remains intact. We will also be involved in attending construction meetings to stay up to date on construction activities and to address any issues to our infrastructure. The North Phase is anticipated to be completed in 2019. The South Phase started construction in 2019 and our department provides the same inspectional services as in the North Phase. The South Phase will go from East Street, down Rustcraft Road to the train station then under the track towards Route 128 where it will enter Westwood.

- **Liana Estates Subdivision** – *ongoing* – In recent history, most newly proposed subdivisions that are reviewed by the Planning Board seek waivers and propose to be developed as private ways. The developer for the Liana Estates subdivision located off of East Street proposed to construct a roadway that meets Town Standards in hopes that it would be accepted by the Town as a Public Way. The major obstacle in doing so was the cost associated with hiring a third party engineer to perform the required inspections of all earthwork operations within the right-of-way to verify that the work was performed to Town Standards. Realizing the importance of having this roadway constructed to Town Standards and accepted as a Public Way, the Engineering Department along with the Public Works Department offered to perform all of the required inspections, with in-house staff, of earthwork activities within the right-of-way with the exception of the asphalt testing of the roadway. This cost savings to the developer allowed them to move forward as proposed. The right-of-way construction is 100% complete and was done meeting Town standards. The Town is now working with the developer and Town Counsel to prepare a warrant in an upcoming Town Meeting for the acceptance of Liana Lane as a Public Way.

- **Fox Meadow Lane Crosswalk Design –** *ongoing* – A concerned resident in the Greenlodge area of Town approached the SB about the potential to add a crosswalk on Fox Meadow Lane at the intersection with Intervale Road. The SB requested the Engineering Department to evaluate the intersection and determine if a crosswalk could be installed.

The Engineering Department performed a traffic study including sight line distance calculations. This section of Fox Meadow Lane has an S curve with several large diameter trees and landscaping at the back of the existing sidewalk on either side of the road which restricts the ability for a motorist to adequately see a pedestrian wanting to use the crosswalk. It took many site visits and manually checking the required sight line distances to determine if there was any location that would be safe to utilize as a crosswalk. We were fortunate enough to find a location that would provide just enough sight distance for motorists and pedestrians to adequately see each other. The crosswalk was then designed in-house along with new accessible access ramps on either side of the road for ADA compliance. As part of the design the existing Yield sign on Intervale Road at the intersection was changed toa Stop sign and multiple advance warning signs are to be installed alerting motorists that they are approaching a crosswalk and should drive cautiously. The DPW intended to install the crosswalk, accessible ramps and signage in the Spring of 2020.

- **Pavement Management** – *ongoing* – The Engineering Department, in conjunction with the Department of Public Works, has continued the pavement management program which began in 2007. Through thirteen years of the program, the Town completed approximately $25 million worth of repairs and maintenance to approximately 75 miles of roads and 23 miles of sidewalks. During this time the pavement condition index has risen from 70 to 88. A new 3-year road program is currently being generated and is to be considered for approval by the SB in April or May of 2020.

- **Traffic Calming** – *ongoing* – In 2012, The Board of Selectmen approved the traffic calming policy created by the Engineering Department. The Engineering Department will continue to work with the Board of Selectmen and the Town Manager to refine and revise the policy, as needed, in order to give clear guidance to residents wishing to implement traffic calming strategies in their neighborhoods through the submission of Traffic Calming Request Forms to the Transportation Advisory Committee (TAC). The Engineering Department sits as an ex-officio member of the TAC responsible for general oversight of the committee and performing preliminary investigations consisting of traffic counts, intersection turning movement counts, and speed surveys using in-house equipment and labor.

  To date, the TAC has received and decided on twelve (12) traffic calming requests. The majority of the requests were determined not to require traditional traffic calming measures based upon the initial traffic evaluations performed by our department (i.e. speed tables, speed humps, road narrowing). However, for those requests that did not warrant traditional traffic calming measures, the TAC does provide low cost traffic calming alternatives that the concerned neighborhood could implement on their own (i.e. staggered parking, step 2 kid alert). Of the ten requests, only two (Lower East Street & Upland Road) were determined to require traditional traffic calming based upon the results of the initial traffic evaluation. The Engineering Department generated a Traffic Calming Needs Assessment report for both of these roadways to determine what traffic calming measures would be appropriate. For Lower east Street we recommended a combination of roadway width narrowing, sidewalk construction and realigned intersections. A ballot was sent out via certified mail to all affected property owners on the streets that would be impacted by the installation of the proposed traffic calming measures. The ballots returned did not meet the minimum percentage of approvals required to move forward with requesting capital funding to construct the traffic calming measures. For Upland Road we recommended

temporary speed humps be installed on Upland Road and Tophill Avenue. The SB approved the installation of the temporary speed humps which will be install in April 2020. The Engineering Department will evaluate the speed humps effectiveness until they are removed before the winter. If proved to be effective, the TAC will generate a ballot for the neighborhood to vote on the proposed permanent traffic calming measure.

All meeting, minutes, evaluations and decisions are posted on the Town's website.

- **Private Ways** – *ongoing* – The Town By-laws for acceptance of private ways as public ways were updated at the 2014 Annual Town Meeting. The Engineering Department worked with the private ways subcommittee that developed the updated policy/standard by which the residents of a private way would have to adhere to in order to become a public way. The policy also includes the construction standards/specifications by which a private way must be reconstructed. There are 3 phases that must be completed and approved by the BOS in order for a Private Way to be presented at Town Meeting for acceptance as a Public Way. Those phases include the "Public Way Layout Petition Form"(Phase 1), "Acceptance of Conceptual Overlay Plan Form"(Phase 2), and Design and Layout (Phase 3).

  Below is a summary, by year, of those Private Ways that have requested Public Way Petition Forms from the Engineering Department and their to date progress:

  - **2015**
    - Arcadia Ave – Phase 1 ongoing (Stalled due to lack of participation)
    - Birch Street – Completed. Accepted as a Public Way at the 2017 ATM
    - Clough Road – Phase 1 ongoing (Stalled due to lack of participation)
    - Gould Street – Phase 1 ongoing (Stalled due to lack of participation)
    - Manning Road – Phase 1 ongoing (Stalled due to lack of participation)
  - **2016**
    - Quarry Road – Completed. Accepted as a Public Way at the 2018 ATM
  - **2017**
    - Argyle Road – Phase 1 complete, Phase 2 ongoing (Stalled due to lack of participation)
    - Churchill Place – Phase 1 complete, Phase 2 ongoing
    - Lewis Lane – Phase 1 ongoing (Stalled due to lack of participation)
    - Mosely Road – Phase 1 ongoing (Stalled due to lack of participation)
  - **2018**
    - Coventry Road – Phase 1 ongoing (Stalled due to lack of participation)
    - Hyde Park Street – Phase 1 ongoing
    - Park Street – Phase 1 ongoing
  - **2019**
    - Grant Avenue – Phase 1 ongoing

  All of these Private Ways that are ongoing in a particular phase have either stalled due to 100% of the abutters to the Private Way not agreeing to have their way become Public or the applicant is still acquiring signatures from all abutters required to move forward in the acceptance process.

- **Sewer Billing Project** – *ongoing* – The Engineering Department has been working with the Collectors Office to identify properties which were likely on sewer but not receiving bills using billing data and GIS information. To date 156 properties have been added to the sewer billing system. Of the 156 properties, 24 are properties located in Westwood and 3 are properties located in Boston. We are currently utilizing our sewer TV inspection data and GIS to plot locations where active sewer connections are made to the Town's system to identify additional properties that are likely connected but not receiving bills. We are hopeful in 2020 to develop another round of lettering, similar to the letters sent in 2010 & 2011 to residents believed to be connected to sewer but not receiving bills. We will be working again with the Collector's Office, Town Manager and Board of Selectmen with this effort.

- **Pump Station Operation** – *ongoing* – The Engineering Department, in conjunction with the DPW, oversees the operation of the three sanitary sewer pumping stations, including the weekly maintenance, routine and emergency repairs, and upgrades of various components. The Engineering Department and DPW monitors alarms at all stations 24 hours a day and responds as needed.

- **Sewer Connection, Extension, and Repair Inspections** – *ongoing* - The Engineering Department reviews, issues, and inspects permits for the installation and satisfactory testing of sewer lines and manholes on a daily basis. We spend a great deal of time responding to questions from residents and builders and we provide them with locations of existing facilities from record plans or television inspections. Over the past year, the Department reviewed, issued and/or inspected 43 permits. In addition to sewer permits, our department administered Drainlayer Licenses to 26 bonded and insured sewer contractors.

- **Storm Drainage Improvements/Inspections** – *ongoing* – The Engineering Department routinely responds to complaints and flooding issues throughout Town. As part of our evaluations of drain lines we have cleaned and inspected approximately 27.2 miles of pipe. In addition, we design improvements as needed. Over the past year the Town has installed 6 new deep sump catch basins.

- **Neponset Stormwater Partnership** – *ongoing* - The Engineering Department sits as one of the representatives from Dedham as part of the regional stormwater collaborative with 14 other Neponset Valley Communities. This partnership was formed through the Community Innovation Challenge Grant awarded to the MAPC and Neponset River Watershed Association. The collaborative is working together to prepare the communities for the challenges that are anticipated to arise from the new MS4 permit to be issued to the Commonwealth from the EPA.

- **Subdivision and Site Plan Review** – *ongoing* - The Engineering Department reviews numerous site plans and subdivisions for consistency with Town regulations and acceptable design standards. We provide written comments to the respective boards on the adequacy of those plans and calculations.

- **Town of Dedham Construction & Design Standards** – *ongoing* – The Engineering Department is responsible for updating the Town's Design and Construction Standards. Every few years we review all the standards and update and/or revise those standards to

meet local and state requirements. Our last update/revision of the standards took place in 2018.

- **Geographic Information System (GIS) Administration** – *ongoing* - The GIS Division, led by its GIS Manager, manages the administration of the GIS for the Town. The role of the GIS Division within the Engineering Department is to respond directly to the various needs of the Town's various departments, as they relate to GIS. Some of the responsibilities of the GIS Division include database administration, software application development, generating reports, creating maps and updating the Town's geospatial data. Below is a listing of some of the projects that the GIS division has been involved with:
    - **Addressing** – *ongoing* – The GIS Division is responsible for maintaining an up-to-date Master Street List and Master Address File (MAF), and for carrying out the duties contained within its regulations. This data is crucial for the First Responders, all departments, residents and the general public. The GIS division continues to add new addresses, modify and update existing addresses and solve conflicts.
    - **Planimetric Update (phase II)** – *ongoing* – Working with the consultant on Phase II of The Town of Dedham, MA Spring 2017 (2018) Aerial Photography and Mapping Services Project which will consist of:
        - New DTM to support creation of accurate Orthorectification
        - Set of 1-foot contours and spot elevations
        - New 40 scale Planimetric mapping features from stereo
        - Add new, modify, delete, migrate and consolidate the existing data with the newly collected data while maintaining integrity
    - **Data Integrity –** *ongoing* –The criticality of having and providing accurate data is imperative, and data integrity is key in facilitating that. Therefore, The GIS Division continues to not only conduct deep and thorough evaluation, modification and maintenance of the existing and newly created data, but also continue to embrace and adopt the standard recommended structures by the GIS community.
    - **Data Update –** *ongoing* –The GIS Division continues to update the underlying data such as parcels, road centerline, street regulation, right of way…etc. to better represent/replicate the real world.
    - **Partnership with ESRI** – *Ongoing* –The Town's GIS Division has recently partnered and collaborated with a GIS consultant (ESRI) to work together to draft a plan to not only leverage ESRI's latest technologies and available services, but also taking into consideration migrating the current Town wide GIS system to be in alignment with the current industry wide path going forward. The contract will end in October/November of 2020.
    - **Mapillary** – *Ongoing* – The Town's GIS Division has recently collaborated with Mapillary to provide a street level images for the whole Town that is captured by the Town and to the Towns preferred accuracy. This technology allows the Town to capture its own georeferenced high resolution images and geographically attach it the street allowing for a 3D view, this capability allows the Town to check features such as asset type, sign syntax, and visibility of structures from street which enable the Town to update its assets and data in the office instead of a site visit, which saves time and effort. First set of images capture for the Town was completed in September 2019.
      (Please click on the **link** to access the application)

- **Department Outreach –** *ongoing* – The GIS Division continues to conduct informational sessions with individuals and/or small groups of departments' representatives to have a focused discussion and better understand their needs.
- **Department Training –** *ongoing* – The GIS Division continues to train individuals and/or small groups of departments on utilizing the GIS technology to meet their needs.
- **Departments' Special Projects –** *ongoing* – The GIS Division continues to work closely with many departments to create, and produce data, and maps that can facilitate and support their needs and decision making by migrating, modifying, evaluating and analyzing the available information.
- **Web GIS for Town staff –** *ongoing* **–** The GIS division has been implementing cloud and web-based GIS technology called ArcGIS Online. This technology provides GIS capabilities to departments and staff that do not otherwise have GIS. These tools allow sharing and collaboration of information between departments. The GIS Division continues to develop new content on ArcGIS Online to enhance the Town's GIS.
- **Public Web/Mobile GIS –** *ongoing* – The GIS Division continues to maintain, enhance, update and publish mapping content through the Town of Dedham Maps Online application. Information is available as downloadable PDF files, web maps, and applications.
- **Infrastructure Engineering Operations** – *ongoing* – As part of the MS4 Permit the Town is required to inspect, test and monitor its outfall. The GIS Division worked closely with The Engineering Department to analyze the need, propose solutions, create data, design, test and implement a web based application that enables the Town Engineer to report the inspected outfall in the field using any a mobile device. The application allows the Engineers to report findings and monitor the inspection status on the fly. The application is designed to maintain a historical record of the activities associated with each outfall allowing the Engineers to analyze the data and generate the needed reports and information required for the Permit.
- **Sewer Billing Project** – *ongoing* – The GIS Division has been working with the Engineering Department, Collectors Office, Department of Public Works, Dedham Westwood Water District, and Boston Water and Sewer Commission to identify properties which were likely on sewer but not receiving bills. Properties determined to be severed will be notified and billed, which will allow the Town to collect money for the services provided. In order to get to this goal, data from various departments and agencies were collected, compared, field verified in some cases, and a new set of data was generated and is being maintained.
- **Stormwater Outfall Catchment area** – *Ongoing* – As part of the MS4 Permit the Engineering Department is required to submit a detailed geo-analytical report for each outfall catchment area. the GIS Division performed several data manipulation and analysis to create the outfall network, assign the related structures a unique identifier, and factor in data (geographically and tabular) gathered from other departments to generate the catchment delineation statistics.
- **Work Order and Asset Management for Public Works –** *ongoing* **–** The GIS Division surveyed and analyzed the Department of Public Work needs. is working with the consultant to implement a new work order and asset management solution allowing Public Works staff to create, assign and track service requests and work orders to completion. The implementation will allow DPW to track maintenance history on specific assets (e.g. sign, sidewalk, Drain Manhole, etc.).

- **Citizen Access Service Requests –** *ongoing* - The GIS Division is working with DPW and its consultant to implement new applications for the public to be able to report issues and for the Department Public Works to receive, categorize, assign, resolve and manage all reported issues in a timely manner. The solution will have both a web interface and mobile application. Applications will integrate directly into the new Public Works work order management system, allowing staff to access all service requests.
- **Catch Basin Cleaning for Public Works –** *ongoing* **–** Working closely with the Department of Public Works, the GIS Division was able to analyze the need, create data, design, test and implement a web based application that empower DPW staff and contractor to inspect, collect and report Catch Basin information in real time, such as whether it was cleaned or not, by whom and when, type of pollutant (if existed), number of scoops collected , condition…etc.
- **Cemetery** – *ongoing* – Continue to maintain and enhance the data and web application for the Brookdale Cemetery. The Brookdale Cemetery web application was redesigned for better support on various tablet and mobile devices. This allows the Cemetery Division to access burial record information from the field. The same application was repackaged for the Village Cemetery.
- **Clerk** – *ongoing* – Verify and update the Town Precinct and Street List Voting data and Map. Data from Census, State voting list, Town active street name list and active addresses is being used to generate an up to date Street voting list and map.
- **Police** – *ongoing* – Automated mapping of incident information from the police database. The process provides the police with a secured web map of incident data updated every six hours. The data is also made available to other GIS users for mapping of accident or other relevant police incident information
- **Drug and Zoning Violation** – *ongoing* – To fully enforce the law, evidence must be provided. In some cases, location-based analysis and maps can be one of the essential proofs of violation. The GIS Division works with Police to generate and produce these specific kinds of maps that gets submitted to the court.
- **Police Sectors** – *Completed* – Police depend on maps to identify and assign police to different sectors. Street name list and key facility locations along with police sectors were updated to produce an accurate map for the Police to use.
- **Safety - School safety** – *ongoing* – In an effort to protect against the threats that Dedham schools may encounter, and to ensure safety for all students, teachers, parents and other individuals involved in the education system, the Police department took proactive and precautionary measures to generate safe escape routes and plans for quick and effective response. The GIS Division is working closely with the Police department to generate these plans that will be used in various scenarios for all Dedham schools. A set of plans has been produced for the escape routes for all Dedham public schools. A set of control plans for Dedham public schools has been completed and is currently working to expand the solution to the private schools and major malls in the Town.
- **Economic Development** – *ongoing* – Working closely with the departments on various projects to collect, extract, link and analyze data, and produce maps to better assist in decision making.
- **Providence Highway - Create Better Corridor** – *ongoing* – When the Town is well informed about its resident opinion, it can take the right decision that will affect the Town future, that is why the Providence Highway - Create Better Corridor crowdsource application was implemented to gather not only ideas for

improving but points of shortage, categorized in well-defined groups that will be the foundation for the next step of the project.

- **Planning and Zoning** – *ongoing* –Firearms regulation, adult use overlay district and housing study are some of the many projects that needed the data to be collected, extracted, linked and analyzed to better assist the department and the board in the decision making process.
- **Environmental Department** – *ongoing* – Collecting, modifying and validating the Town's Trail Inventory to better serve the resident and be able to evaluate the different areas' needs along with other projects
- **Conservation Department** – *ongoing* – Protecting our nature is important, therefore the GIS Division is working with the Conservation Department to generate an inventory of Potential Vernal Pool, and implement an application that will allow Conservation Department to collect and maintain the data and for the public to view.
- **Information Technology** – *ongoing* – Supporting and solving IT related issues during the transition period to minimize the impact on the GIS database and the availability of GIS applications and data to all of its customers.
- **State/Regional Collaboration –** *ongoing* –
  - **MassGIS** – *ongoing* - Working with MassGIS staff to provide updated standardized structure data for the Town of Dedham to the state. Standardized parcel and structure information are critical data layers for creating statewide address information to support E911 services.

- **Other notable completed projects**:

  - Needham Street Bridge (2017)
  - Dedham Mother Brook BMP Implementation Project (2017)
  - Greenlodge School Parking Lot Expansion (2017)
  - Dedham Square Improvement Project (2016)
  - Town-Wide Flow Monitoring Project (2016)
  - Sewer System Hydraulic Flow Model Project (2016)
  - Vincent Road – Illicit Connection Detection & Elimination (2016)
  - Massachusetts Avenue Stormwater Utility Design (2016)
  - Lancaster Road/Kennsington Road Sewer Design (2016)
  - 2015 Inflow Investigations (2015)
  - Violet Avenue at Pine Street Intersection Realignment (2015)
  - 2014 Inflow Investigations (2015)
  - Striar Property (2015)
  - Private Building Inspections (2014)
  - Violet Avenue Drainage Study (2014)
  - Gonzalez Field – Accessible Parking Design (2014)
  - 2013 Inflow Investigations (2014)
  - Washington Street Discontinuance (2013)
  - Municipal Building Inspections (2012)
  - Town Wide Inflow & Investigation & Rehabilitation Program (2012)
  - Lowder Street at Highland Street Intersection Realignment (2012)
  - Town-Wide Flow Monitoring Project (2011)
  - Highland Street Sidewalk Design (2011)
  - High/Lowder/Westfield Street Traffic Calming (2011)
  - Stormwater BMP Retrofit Grant (2012)

- Lowder Street Culvert Replacement (2011)
- Cedar Street Culvert Replacement (2011)
- Colburn Street Reconstruction (2011)
- Pacella Drive Illicit Discharge Removal (2010)
- Traffic Regulations Update (2010)
- East Street Reconstruction – Phase II (2009)
- East Street Reconstruction – Lowe's Money (2009)
- Condon Park Parking Lot Design (2009)
- Bussey Street Culvert Abandonment (2009)
- Maverick Street Wall Replacement (2009)
- Zoar Avenue Sewer Replacement (2009)
- Rustcraft Road Sewer Replacement (2009)
- Gaffney Road Sewer Improvements (2009)
- Brookdale Cemetery Expansion (2008)
- Flanagan Place/Orphan Line Drainage (2008)
- Bridge Inspections (2008)
- Intersection Redesign, Greenlodge Street at Sprague Street (2008)
- East Street and Washington Street Sewer Replacement (2007)
- Street Opening Regulations Update (2006)
- Sewer Regulations Update (2006)
- Salt Shed (2006)

Cc: Board of Selectmen
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