

Littleton Water Department

Littleton Master Plan Limitations

Water Quality and Quantity



Overview



- About the Littleton Water Department
- General Usage Information by type of customer
- General Usage Information by Season
- Water Rates
- Water Conservation Efforts
- LWD on-going and future projects
- LWD and the Master Plan

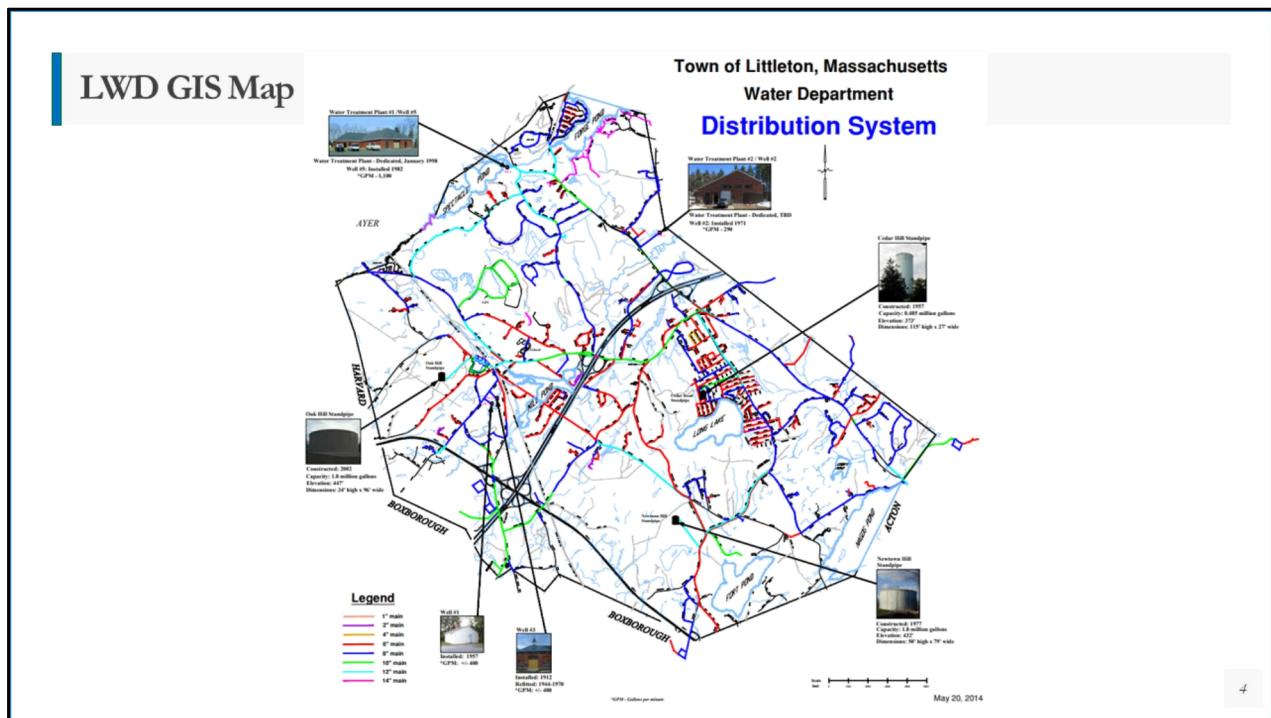
About Us

The Littleton Water Department provides clean drinking water to roughly 3000 customers throughout the Town of Littleton.

- » 100% Groundwater
- » Over 80 miles of water main throughout Littleton.
- » We take pride in our efforts to deliver outstanding water quality while protecting our environment.
- » Peak Demand: 43,013,717 Gallons (July, 2016)
- » Maximum Pumping Capacity: 2.45 Million Gallons per Day
- » Max Storage: 4.085 Million Gallons



The water department currently uses 100% ground water. Our peak demand month over the last twenty five years was 43 million Gallons in July of 2016. Our maximum pumping capacity is 2.45 MGD and our maximum storage is just over 4 Million Gallons.



Littleton's water is provided by the Spectacle Pond Well, Whitcomb Avenue Wells, and the Beaver Brook Wells. Currently, Spectacle Pond is filtered using Koch Membrane technology and Ozone disinfectant while Beaver Brook is filtered using greensand filter media.

LWD has over 80 miles of water main throughout Littleton.

Littleton Master Plan

It is LWD's goal to help fulfill the wishes of the Citizens of Littleton as set forth in the Littleton Master.

- » LWD can sustain new restaurants, commercial buildings, apartments, hotels and data centers.

Building Type	Gallons Per Month
Residential	5,200
Apartment Building (per unit)	3,900
Hotel	196,337
Restaurant	290,000
Data Center	1,300,000
Bottling Plant	6,400,000



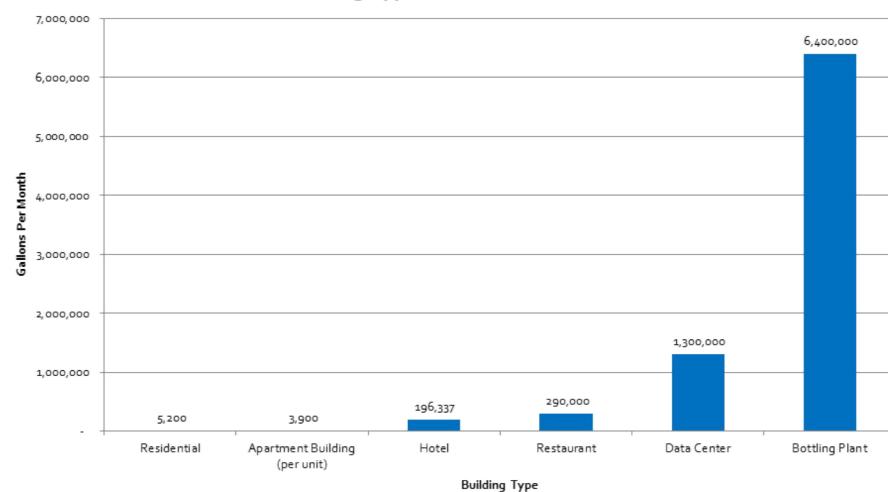
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The chart shows our estimated monthly usages for each type of customer. These estimations will help us and the Master Plan Committee plan for the future.

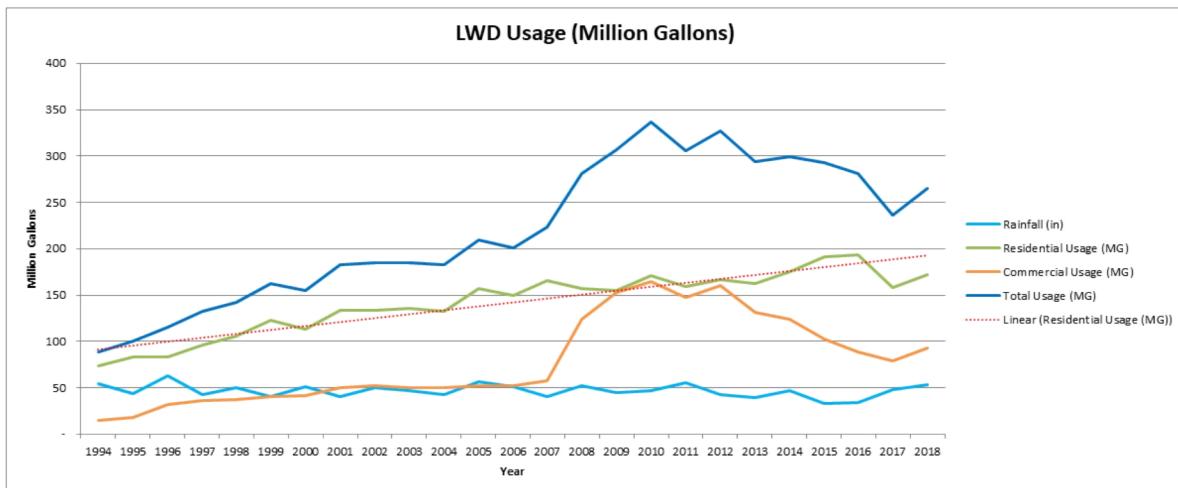
LWD would like to participate in any master plan implementation meetings that would require the advice or recommendations of LWD.

Littleton Master Plan Continued

Building Type - Gallons Per Month



Water Usage Historical Data



This graph depicts total system usage. The green line represents residential usage and the orange represents commercial usage.

- 1 Cubic Foot of water = 7.48 Gallons
- 2015 and 2016 were very dry years while 2017 and 2018 were very wet years. You can see on the graph how weather dependent residential usage can be

Summer Water Usage



Total Gallons Pumped per Month

Month	Total Pumped (MG)
Average January	22.88
Average February	21.52
Average March	23.77
Average April	24.62
Average May	30.11
Average June	34.00
Average July	37.43
Average August	36.50
Average September	31.91
Average October	26.83
Average November	22.63
Average December	21.70

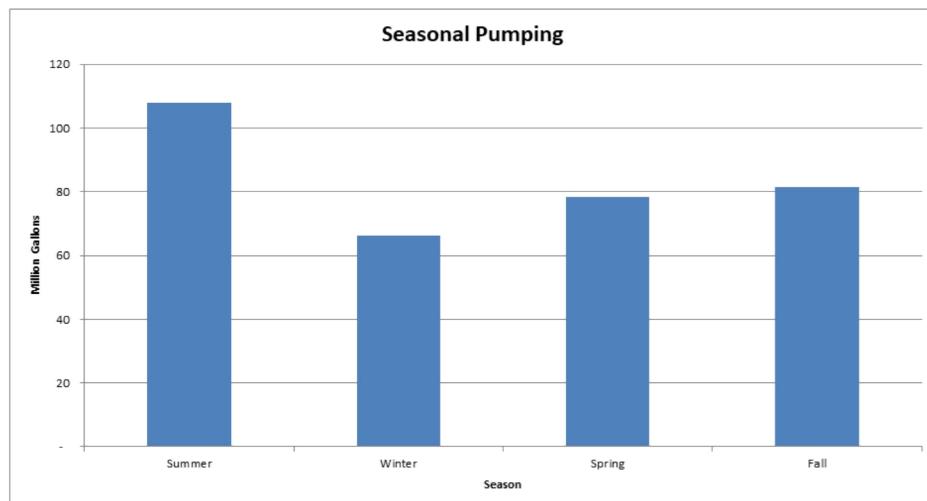
Total Gallons Pumped per Season

Season	Total Pumped (MG)
Summer	108
Winter	66
Spring	79
Fall	81

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These are monthly averages from the past five years. We also broke out gallons pumped per season.

Seasonal Water Usage



As you can see we are a summer peaking system.



Water Rate Schedule

Base Customer Charge: \$6.67 per month

Water Usage Charge: All Rate Classes

Water usage is billed in thousands of gallons per month, according to an ascending block rate schedule.

	<u>Usage (gallons)</u>	<u>FY20 Rate (per 1,000 gallons)</u>
Level 1	0 to 5,000	\$5.65
Level 2	5,001 to 10,000	\$7.07
Level 3	10,001 to 15,000	\$8.84
Level 4	15,001 to 20,000	\$11.00
Level 5	Greater than 20,000	\$12.20

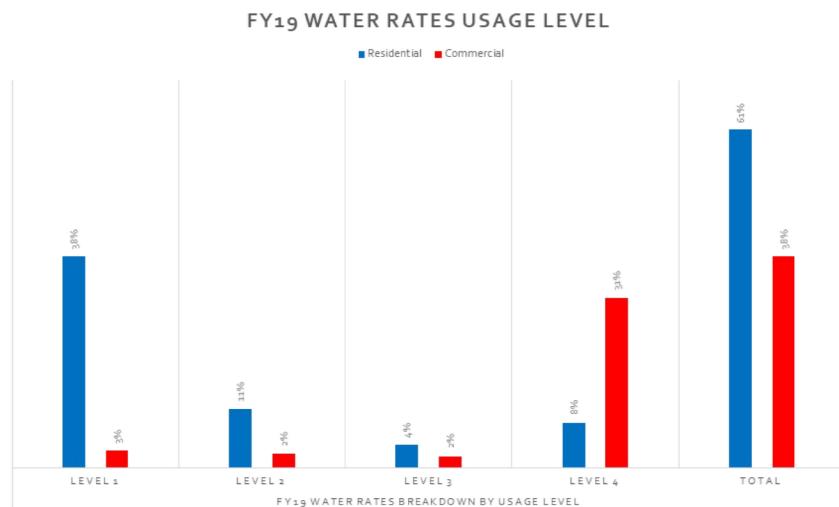
Debt Service Charge: All Rate Classes

	<u>Usage (gallons)</u>	<u>FY20 Rate (per 1,000 gallons)</u>
All usage		\$2.45

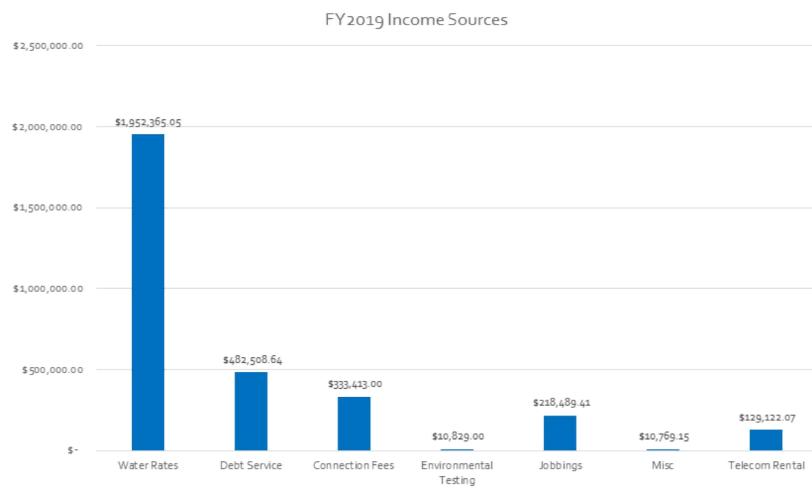
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Our water rate is divided into 5 different levels. Most residential customers fall into the level 1, 2 and 3 category. This format was recently adopted to be more fair to our ratepayers.

LWD Water Rates Breakdown by Usage Level



LWD Sources of Income



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We generate almost all of our revenue through the water rates.

Water Conservation



- » LWD implements outdoor watering restrictions when required to do so by the Massachusetts DEP.
- » This summer our water conservation gauge changed from the Merrimac River to the Concord River.
- » Once the Concord River streamflow drops below a certain level then we are required to enforce water conservation.
- » Typically we generally restrict lawn watering, car washing, pool filling and general outdoor landscaping uses between certain hours of the day.

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When the streamflow drops below a level, we will enforce a restriction for all customers from 9AM-5PM every day.

In the next few years, DEP will tighten up restrictions and only allow watering outside of the restriction time, one day per week.

We also just implemented an emergency water ban right now. With the discovery of PFAS in our system we are taking precautionary measures and minimizing the use of our Spectacle Pond wells.

Littleton Common Revitalization

SCENARIO 03 – SOME ZONING CHANGES WITH SEWERING



Scenario 03 recalibrates zoning regulations and assumes the implementation of a municipal sewer system. The most notable zoning changes include the increase of maximum height for multi-story buildings with retail on the ground floor; the increase in allowed density via FAR, the reduction of setbacks, the reduction of parking ratios, the prescribed placement of parking lots, and the increase in impervious surface percentages. These regulatory reliefs help to create a more consistent streetscape lined with retail and commercial uses, reduced areas for parking now relegated to the sides and rears of lots, added density for potential new multi-family housing, buildings scaled and designed to the context, and a variety of commercial uses.

Scenario 03 represents a potential future for Littleton that realistically accommodates market-viable redevelopment balanced against acceptable trade-offs in increased scale and density. If the Town decides to vote against Form-Based Zoning (see Form-Based Zoning below), it is recommended that the Town consider placing a limit on the number of buildings per parcel or a limit on the maximum size of any one building, regardless of lot size or FAR limits. For instance, the Town may want four smaller buildings on one large parcel instead of the possibility of one large building on the same parcel.



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Scenario 03 for reference

Littleton Common Revitalization

SCENARIO 04 – GREATER ZONING CHANGES WITH SEWERING



Scenario 04 recalibrates zoning regulations in the same direction as Scenario 03, but to a greater degree. For example, parking ratios are further reduced, height allowances are allowed for any combination of use, and allowed density is increased.

The spirit and goal of these changes remain the same, but the resultant urban form may be larger in scale and the attendant impacts would proportionally increase, such as added density and housing units, more office and retail space, added jobs, and increased tax revenues.

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Scenario 04 for reference

Littleton Common Revitalization

Estimate Water Demand for Scenarios 3 and 4.

	Estimated Water Demand Per Unit (GPD)	Housing Units Scenario #3	GPD Demand Scenario #3	Housing Units Scenario #4	GPD Demand Scenario #4
Housing	82.5	193	15922.5	394	32505
	Estimated Water Demand Per Seat (GPD)	Restaurant Seats Scenario #3	GPD Demand Scenario #3	Restaurant Seats Scenario #4	GPD Demand Scenario #4
Retail - Restaurant	35	910	31850	2162.5	75687.5
	Estimated Water Demand Per 1000 sf	Retail SF x 1000 Scenario #3	GPD Demand Scenario #3	Retail SF x 1000 Scenario #4	GPD Demand Scenario #4
Retail	50	36.438	1821.9	86.513	4325.65
	Estimated Water Demand Per 1000 sf	Office SF x 1000 Scenario #3	GPD Demand Scenario #3	Office SF x 1000 Scenario #4	GPD Demand Scenario #4
Office	75	47.725	3579.375	136.8	10260
Total Gallons Per Day Demand			53173.78		122778.2



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In this slide we use our estimated water demands for each type of customer. We then multiplied by the number of units or square feet for each scenario.

As you can see in each scenario the retail/restaurant additions would be the largest users. We estimate that scenario 3 would be about 53K GPD and scenario 4 would be just over 120K GPD.

Estimated Costs



- Great Road Infrastructure Upgrades:
 - Cost estimated at \$250 per linear foot - \$600,000.
 - New Hydrants and Gates would likely add another \$120,000.
 - This work should be done at the same time as the Sewer Main, which would hopefully help to cover costs for paving and police details, which will be extensive.
- King Street Infrastructure Upgrades:
 - Cost estimated at \$240 per linear foot - \$528,000.
 - New Hydrants and Gate would likely add another \$60,000
 - Again, tie this work in with the sewer to limit costs for paving and police details.

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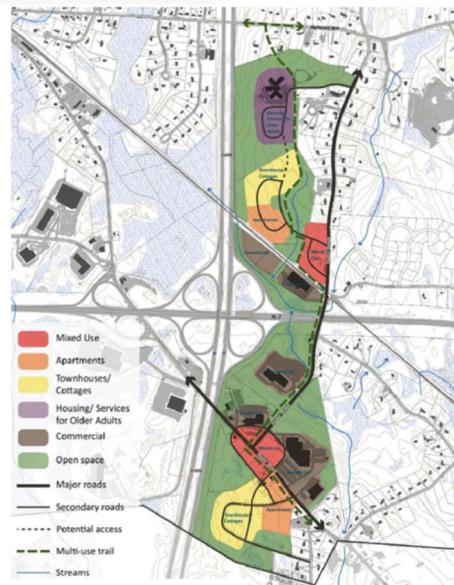
To support these efforts, LWD would need to upgrade infrastructure in these areas as well.

LWD would likely need to make an investment in upgrading the water main along Great Road going east from Robinson Road, and King Street from the Littleton Common to the Westford Town Line. We plan to apply for a MassWorks Grant in 2020 to replace water main in Great Road within this area, and at this time we have not made plans to address King Street.

Great Road – Install approximately 2400 linear feet of new 12" CLDI Water Main from Robinson Road (approximate) to Old Stagecoach Road. This would replace undersized AC Water Main, and link to the 10" main on Old Stage Coach Road which ties into King Street through the Kimball Property.

King Street – Install 2200 linear feet of 10" CLDI Water Main from the Intersection with Great Road to Partridge Lane. This would replace both 6" and 8" main. This will complete the loop from Kimball Farm.

MBTA-Taylor Street Revitalization



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Taylor Street/MBTA Maximum Buildout

MBTA-Taylor Street Revitalization

Estimate Water Demand for the MBTA area.



North Housing	Estimated Water Demand Per Unit (GPD)	Housing Units North	GPD Demand North
Cottages (110 gpd)	110	50	5500
Townhouses (220 gpd)	220	120	26400
Apartments (82.5 gpd)	82.5	280	23100
South Housing	Estimated Water Demand Per Unit (GPD)	Housing Units South	GPD Demand South
Cottages (110 gpd)	110	25	2750
Townhouses (220 gpd)	220	60	13200
Apartments (82.5 gpd)	82.5	368	30360
Restaurant Space	Estimated Water Demand Per Seat (GPD)	Restaurant Seats North	GPD Demand North Restaurant s

North Restaurant	35	200	7000	Estimated 5000 sf Restaurant Space
South Restaurant	35	400	14000	Estimated 10000 sf Restaurant Space
Retail Space	Estimated Water Demand Per 1000 sf	Retail SF x 1000 Scenario #3	GPD Demand Scenario #3	
North Retail	50	15	750	Estimated 15000 sf Retail Space
South Retail	50	50	2500	Estimated 50000 sf Retail Space
Office Space	Estimated Water Demand Per 1000 sf	Office SF x 1000 Scenario #3	GPD Demand Scenario #3	
North Office	75	15	1125	Estimated 15000 sf Office Space
South Office	75	50	3750	Estimated 50000 sf Office Space
Total Gallons Per Day Demand				130435

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Here we used the same philosophy from the Littleton Common estimates. We used the estimated water demands for each type of customer and multiplied them by the number of units or square feet for each scenario.

As you can see, the housing units are the largest user in this scenario.

We estimate that in this scenario this will need approximately 130K GPD.

As for construction, much of Foster Street's infrastructure upgrades will be addressed with the 2024 Mass Works Grant already on the schedule.

LWD Projects



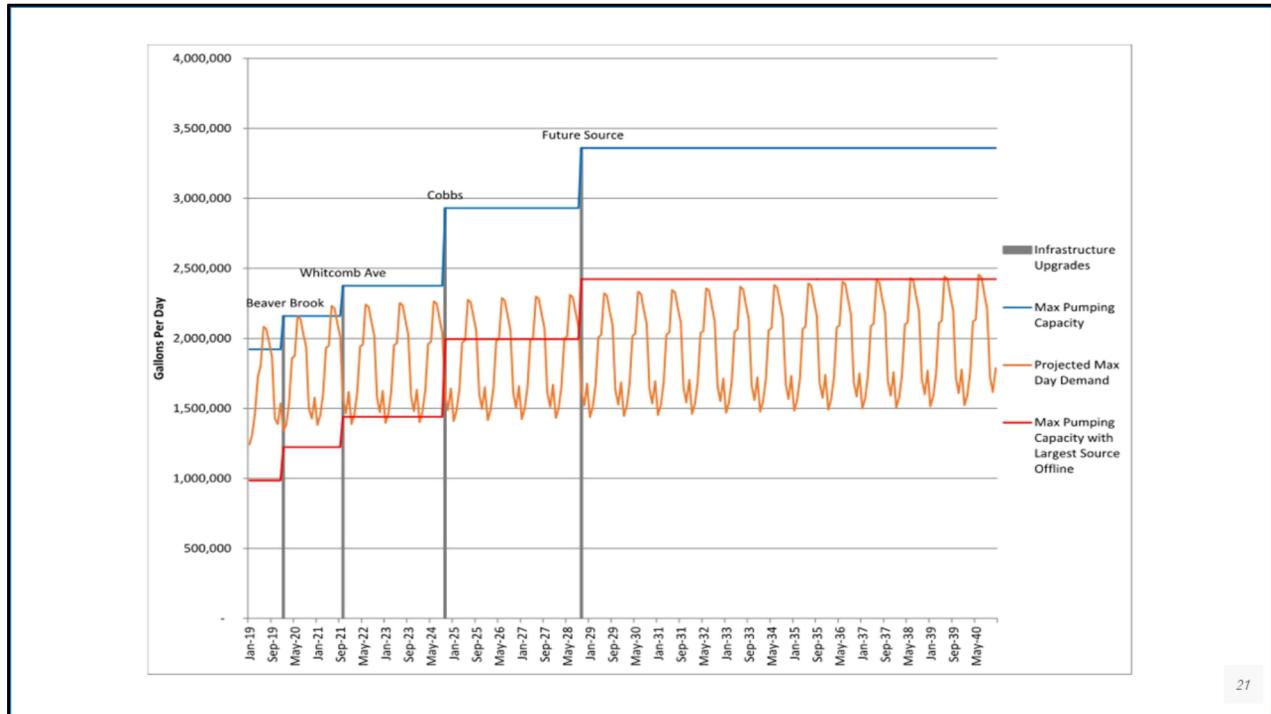
- Whitcomb Ave Treatment Plant & Well Replacement – additional pumping capacity to meet growing demand.
- Cobbs Wells and potential treatment facility – This will increase Littleton's capacity by 30%.
- Cedar Hill Tank Replacement – supports the revitalization of the common.
- Beaverbrook Water Treatment Plant increased Yield – increased yield from existing source to support growing demand.
- Nagog Pond Water Rights.
- Replaced 400 linear feet of water main over the Russell Street bridge.
- Various town development additions.
- Preventative Maintenance.

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Whitcomb Avenue Drinking Water Treatment Facility – This will result in 100% of Littleton's water being filtered to remove Iron and Manganese. Filtration for Per- and polyfluoroalkyl substances is also being engineered currently.

12" Ductile Iron Water Main installation in 2015 along Great Road over Rte 495. – Provided a new link to our Beaverbrook Water Treatment Plant – Better Flow to the Common from this plant.

12" Ductile Iron Main over Rte. 495 on Taylor Street in 2014. Coupled with the 2024 Water Main Replacement on Foster Street, this provides a strong connection to Porter Road and our Pumping Facilities at Whitcomb Ave.



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The attached graph, which, when looked at alongside the demand estimates, gives you a sense for when we would be able to accommodate this additional growth (this assumes that people stop suing us and let us get on with improving the water system).

All scenarios don't look too concerning, since I assume we are at least several years away from full buildout of any of these scenarios.

Questions?



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