



Town of Holliston

# Draft Water Supply and Water Distribution Improvements

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# Agenda

1. Background
2. Water Supply Analysis
3. Water Distribution Analysis
4. Next Steps
5. Questions

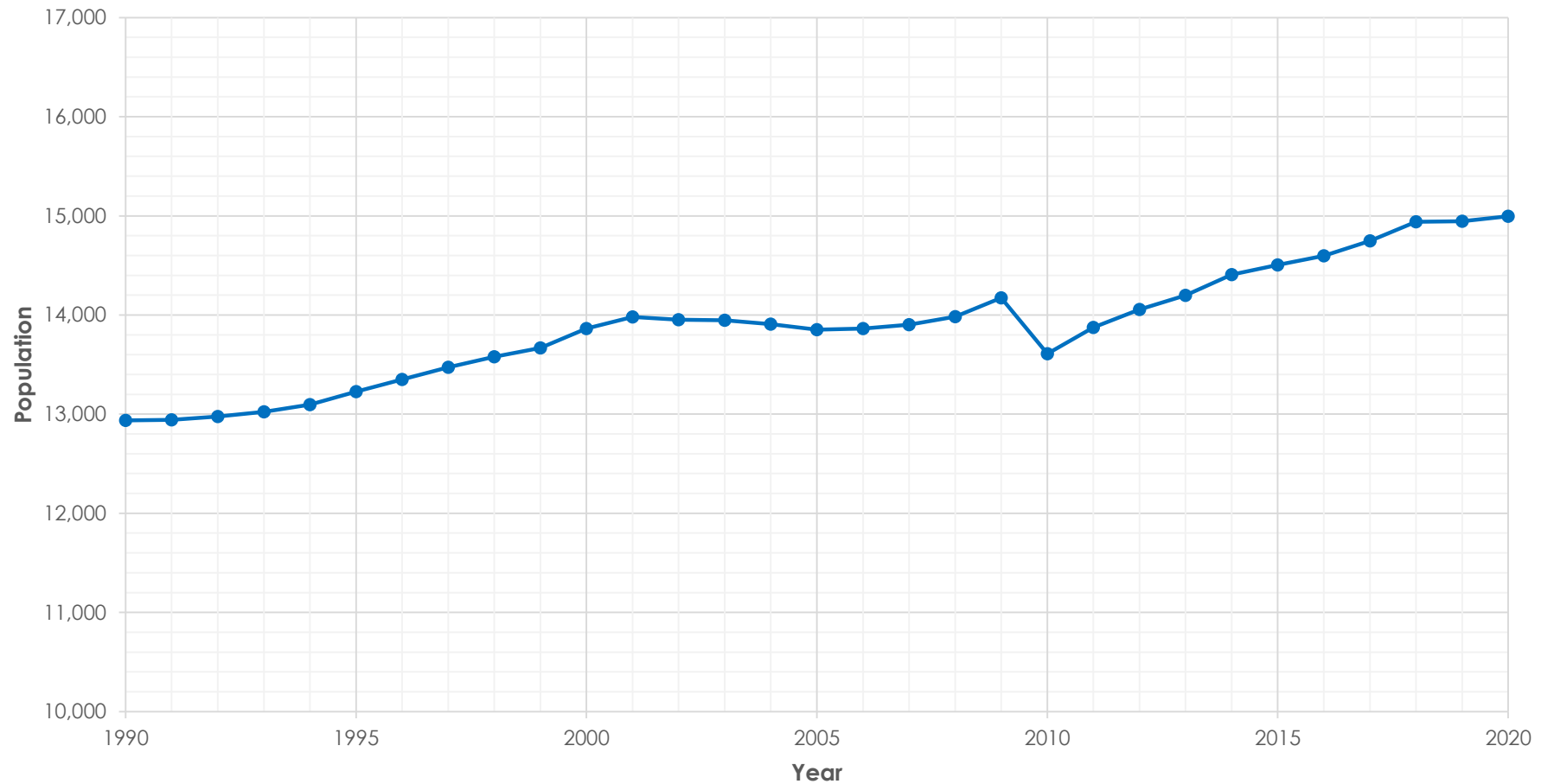
# Background

- Three on-going tasks with the Town
  - Sidewalk Analysis
  - Water Supply Evaluation
  - Water Distribution Improvements
- Planning level documents to guide infrastructure improvements

# Water Supply

- Review Historical Population Data and Projections
- Review water demand history
- Identify water demand projects
- Review existing sources of supply and are they sufficient to meet future water use

# Historical Population (US Census)



# Historical Water Use (MGD)

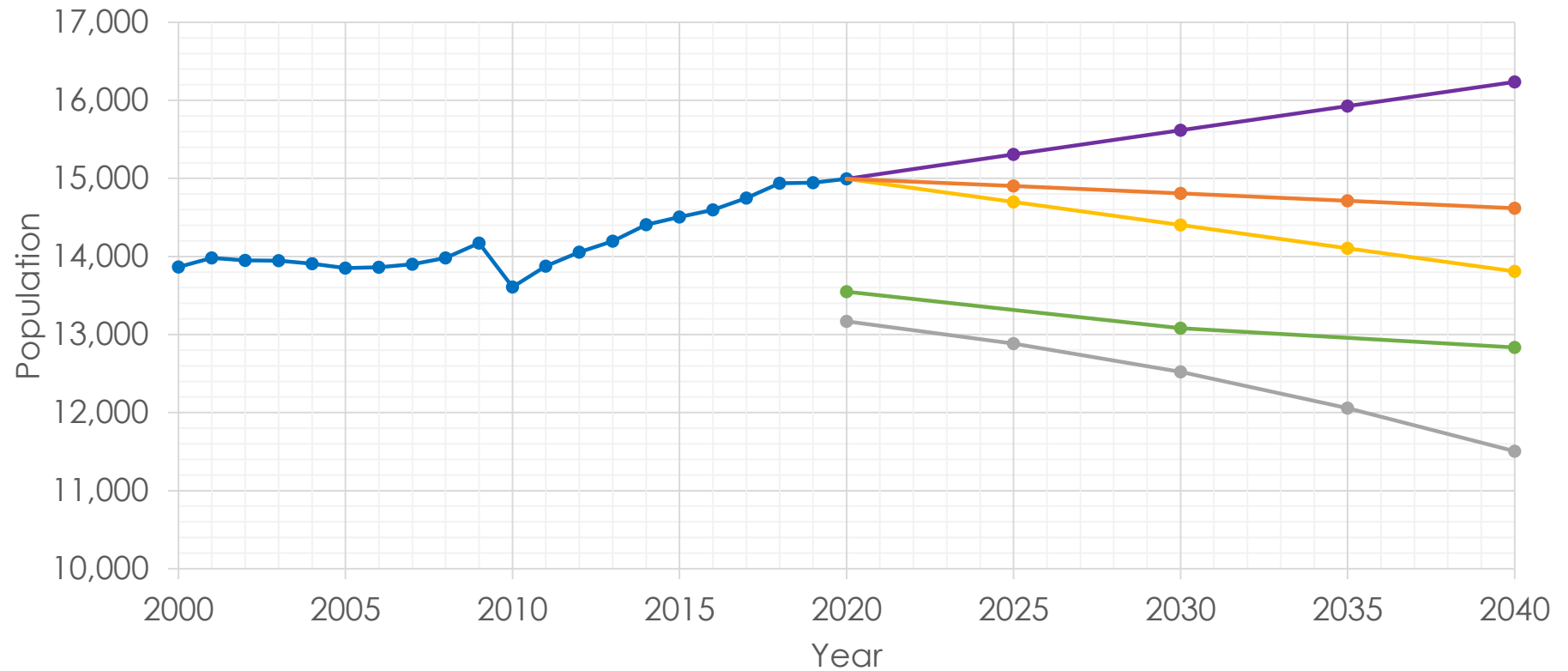
Year	Residential	Commercial/ Business	Agricultural	Industrial	Municipal/ Institutional/ Non-profits	Other	Total CEMU	UAW	Total
2009	0.681	0.069	0.002	–	0.009	0.011	0.100	0.193	1.06
2010	0.683	0.065	0.003	–	0.010	0.006	0.037	0.140	0.94
2012	0.663	0.061	0.003	–	0.010	0.007	0.014	0.133	0.89
2014	0.654	0.065	0.004	–	0.009	0.006	0.149	0.166	1.05
2015	0.675	0.067	0.002	–	0.015	0.008	0.126	0.066	0.96
2016	0.644	0.061	0.004	–	0.033	0.001	0.112	0.130	0.99
2017	0.818	0.055	0.003	–	0.019	0.006	0.054	0.105	1.06
2018	0.630	0.058	0.003	–	0.029	0.006	0.132	0.204	1.06
2019	0.603	0.066	0.004	–	0.029	0.005	0.211	0.083	1.00
2020	0.680	0.006	0.029	–	0.023	0.052	0.071	0.067	0.93
AVG	0.673	0.057	0.006	–	0.019	0.011	0.101	0.129	0.99

# Max Day vs Average Day (MGD)

Year	Maximum Day Demand (MGD)	Average Day Demand (MGD)	Maximum Day to Average Day Ratio
2009	1.959	1.065	1.84
2010	*	0.945	–
2012	1.507	0.890	1.69
2014	1.879	1.053	1.78
2015	1.914	0.959	2.00
2016	1.605	0.985	1.63
2017	1.729	1.060	1.63
2018	1.591	1.063	1.50
2019	1.602	1.000	1.60
2020	1.461	0.929	1.57
AVERAGE	1.661	0.987	1.68

# Population Projections

Water Supply



- Historical Population
- Stantec Population Projection (Considering Historical Data Only)
- MAPC Population Projection
- Stantec Population Projection (Considering MAPC and UMDI Data Only)
- UMDI Population Projection
- Stantec Projection (Considering Historical, MAPC, and UMDI Data)



# Water Management Act Authorization

- Average Demand ~ 1 MGD
- WMA Registration 1.14 MGD

Year	Total
2009	1.06
2010	0.94
2012	0.89
2014	1.05
2015	0.96
2016	0.99
2017	1.06
2018	1.06
2019	1.00
2020	0.93
AVG	0.99

# Water Distribution System

- Previous studies completed around 2010
  - Water System Asset Management Plan
  - Water Distribution System Evaluation (Hydraulic evaluation)
- Improvements driven by
  - Age of infrastructure
  - Pipe material
  - Proximity to wetlands
  - History of breaks and leaks
  - Known water quality issues
  - Known problem areas
  - Hydraulic improvements
  - Looping

# Prioritizing water improvements

- Compared water priorities to other infrastructure work
  - Sidewalk improvements
  - Sidewalk gap analysis
  - Complete Streets recommendations
  - Upcoming paving plan
- Water improvements are the priority due to infrastructure age
- When water improvements are planned, investigate need for other infrastructure improvements
  - Reduce impact to residents
  - Identify paving approach following water work

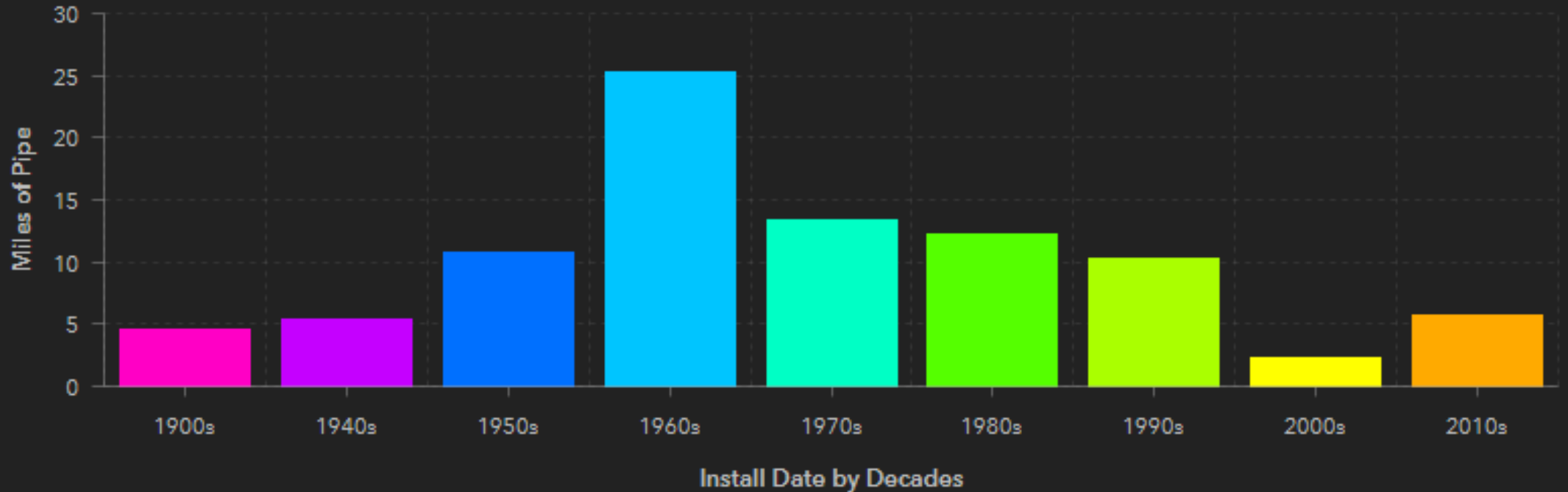
# Looping improvements

- Dead ends can not be completely eliminated
- The ability to flush dead ends can address most issues
- Looping improvements should be focused on:
  - Areas where there are hydraulic improvements (fire flows, reliability)
  - Where easements are not required or are easily obtained
- Looping does not guarantee water quality improvements and can exacerbate issues



## Existing water distribution mains

### Current Miles Distribution by Install Decade





## Draft Recommendations

- Significant “backlog” of improvements that are “past due” for replacement based on analysis
- Assumed about a mile a year - \$1.3M annually
- Some years may be less and some more but average ~\$1.3M annually
- Priorities are generally based on areas where there are known water quality or operational issues
- Consideration could be given to implementing more than \$1.3M/year but should be weighed against impact to community (proximity of projects)

Project	Plan Year	Street	Install Year	Diameter (in)	Material	Length (ft)	Cost (\$)
FISKE, BULLARD, CENTRAL EXPANSION & LOOP	1	FISKE STREET	1974	8	AC - Asbestos Cement	1,158	\$ 347,400
	1	FISKE STREET	1974	8	AC - Asbestos Cement	418	\$ 125,400
	1	CENTRAL STREET	-	8	-	1,450	\$ 435,000
						<b>3,026</b>	<b>\$ 907,800</b>
FISKE, BULLARD, CENTRAL EXPANSION & LOOP	2	BULLARD STREET	-	8	-	3,090	\$ 927,000
						<b>3,090</b>	<b>\$ 927,000</b>
NORFOLK STREET	3	NORFOLK STREET	1975	8	ST - Steel	2,384	\$ 476,800
	3	NORFOLK STREET	1966	10	AC - Asbestos Cement	1,377	\$ 344,250
	3	NORFOLK STREET	1975	8	ST - Steel	2,024	\$ 404,800
						<b>5,785</b>	<b>\$ 1,225,850</b>
NORFOLK STREET	4	NORFOLK STREET	1952	6	AC - Asbestos Cement	1,023	\$ 204,600
	4	NORFOLK STREET	1960	8	AC - Asbestos Cement	1,445	\$ 289,000
	4	NORFOLK STREET	1960	8	AC - Asbestos Cement	327	\$ 65,400
	4	NORFOLK STREET	1960	8	AC - Asbestos Cement	391	\$ 78,200
						<b>3,186</b>	<b>\$ 637,200</b>
GOULDING STREET NEIGHBORHOOD	5	ALDEN ROAD	1960	6	AC - Asbestos Cement	1,140	\$ 228,000
	5	DUDLEY ROAD	1960	6	AC - Asbestos Cement	412	\$ 82,400
	5	GREGORY ROAD	1960	6	AC - Asbestos Cement	1,407	\$ 281,400
	5	GOULDING PLACE	2005	6	PVC - Poly Vinyl Chloride	590	\$ 118,000
	5	GOULDING STREET	1960	8	AC - Asbestos Cement	2,299	\$ 574,750
						<b>5,848</b>	<b>\$ 1,284,550</b>

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GOULDING STREET NEIGHBORHOOD	6	ADAM WHEELER LANE	1960	6	AC - Asbestos Cement	905	\$	181,000
	6	BRADFORD JAY ROAD	1960	6	AC - Asbestos Cement	1,002	\$	200,400
	6	HIGH ROCK ROAD	1960	6	AC - Asbestos Cement	940	\$	188,000
	6	HOLLY LANE	1960	6	AC - Asbestos Cement	2,330	\$	466,000
	6	SWEET GRASS LANE	1960	6	AC - Asbestos Cement	959	\$	191,800
	6	TRACY LYN ROAD	1964	6	AC - Asbestos Cement	1,116	\$	223,200
	6	ADAM WHEELER LANE	1960	6	AC - Asbestos Cement	591	\$	118,200
						<b>7,843</b>	<b>\$</b>	<b>1,568,600</b>
CENTRAL STREET	7	CENTRAL STREET	1970	8	AC - Asbestos Cement	2,570	\$	514,000
	7	CENTRAL STREET	1996	8	AC - Asbestos Cement	641	\$	128,200
	7	CENTRAL STREET	1996	8	AC - Asbestos Cement	418	\$	83,600
	7	CENTRAL STREET	1996	8	AC - Asbestos Cement	195	\$	39,000
						<b>3,824</b>	<b>\$</b>	<b>764,800</b>
CENTRAL STREET	8	CENTRAL STREET	1946	6	AC - Asbestos Cement	1,024	\$	204,800
	8	CENTRAL STREET	1972	8	AC - Asbestos Cement	3,818	\$	763,600
	8	CENTRAL STREET	1972	12	AC - Asbestos Cement	1,491	\$	372,750
						<b>6,333</b>	<b>\$</b>	<b>1,341,150</b>
CONCORD STREET	9	CONCORD STREET	1949	8	AC - Asbestos Cement	1,702	\$	425,500
	9	CONCORD STREET	1953	12	AC - Asbestos Cement	3,761	\$	1,128,300
						<b>5,463</b>	<b>\$</b>	<b>1,553,800</b>
WASHINGTON STREET PARALLEL WATER MAIN	10	WASHINGTON STREET	1953	8	AC - Asbestos Cement	613	\$	153,250
	10	WASHINGTON STREET	1953	12	AC - Asbestos Cement	2,310	\$	693,000
	10	WASHINGTON STREET	1900	8	AC - Asbestos Cement	1,586	\$	396,500
	10	WASHINGTON STREET	1900	8	AC - Asbestos Cement	1,633	\$	489,900
	10	WASHINGTON STREET	1953	12	AC - Asbestos Cement	1,332	\$	399,600
						<b>7,474</b>	<b>\$</b>	<b>2,132,250</b>

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HOLLIS STREET	11	HOLLIS STREET	1949	8	AC - Asbestos Cement	2,812	\$	562,400
	11	HOLLIS STREET	1949	8	AC - Asbestos Cement	1,826	\$	365,200
	11	HOLLIS STREET	1949	8	AC - Asbestos Cement	279	\$	55,800
	11	HOLLIS STREET	1949	8	AC - Asbestos Cement	271	\$	54,200
						5,188	\$	1,037,600
PRENTICE AND CHAMBERLAIN STREET EXTENSION AND LOOP	12	PRENTICE STREET	-	8	-	3,586	\$	717,200
	12	CHAMBERLAIN STREET	-	8	-	2,592	\$	518,400
						6,178	\$	1,235,600
WASHINGTON STREET	13	WASHINGTON STREET	1949	10	AC - Asbestos Cement	1,771	\$	531,300
	13	WASHINGTON STREET	1953	10	AC - Asbestos Cement	2,304	\$	691,200
	13	WASHINGTON STREET	1953	12	AC - Asbestos Cement	603	\$	180,900
						4,678	\$	1,403,400
HIGH STREET	14	HIGH STREET	1949	6	AC - Asbestos Cement	2,360	\$	590,000
	14	HIGH STREET	1949	8	AC - Asbestos Cement	2,030	\$	507,500
						4,390	\$	1,097,500
HIGH STREET	15	WOODLAND STREET	1985	12	DI - Ductile Iron	4,400	\$	1,320,000
						4,400	\$	1,320,000

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CABOT ROAD NEIGHBORHOOD	16	BIRCH ROAD	1971	6 AC - Asbestos Cement	934	\$	186,800
	16	CABOT ROAD	1975	6 AC - Asbestos Cement	934	\$	186,800
	16	COTTAGE DRIVE	1975	6 AC - Asbestos Cement	916	\$	183,200
	16	LAKE SHORE DRIVE	1971	6 AC - Asbestos Cement	1,271	\$	254,200
	16	CEDAR ROAD	1953	8 AC - Asbestos Cement	462	\$	92,400
	16	LAKE SHORE DRIVE	1971	6 AC - Asbestos Cement	103	\$	20,600
					<b>4,620</b>	<b>\$</b>	<b>924,000</b>
OAK STREET NEIGHBORHOOD	17	EVERGREEN ROAD	1966	6 AC - Asbestos Cement	499	\$	99,800
	17	HEMLOCK DRIVE	1960	6 AC - Asbestos Cement	1,877	\$	375,400
	17	OAK STREET	1953	6 AC - Asbestos Cement	1,393	\$	278,600
	17	WALNUT ROAD	1976	6 AC - Asbestos Cement	571	\$	114,200
	17	OAK STREET	1959	8 AC - Asbestos Cement	1,490	\$	298,000
	17	OAK STREET	1953	6 AC - Asbestos Cement	751	\$	150,200
					<b>6,581</b>	<b>\$</b>	<b>1,316,200</b>

First 17 Years - ~\$20M

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## Next Steps

- Review future development projects in Town to aid in population projects
- Identify if existing sources can meet future demands
- Refine water distribution recommendations
- Develop draft memorandum summarizing analysis and recommendations



Questions?

**Erica Lotz**  
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