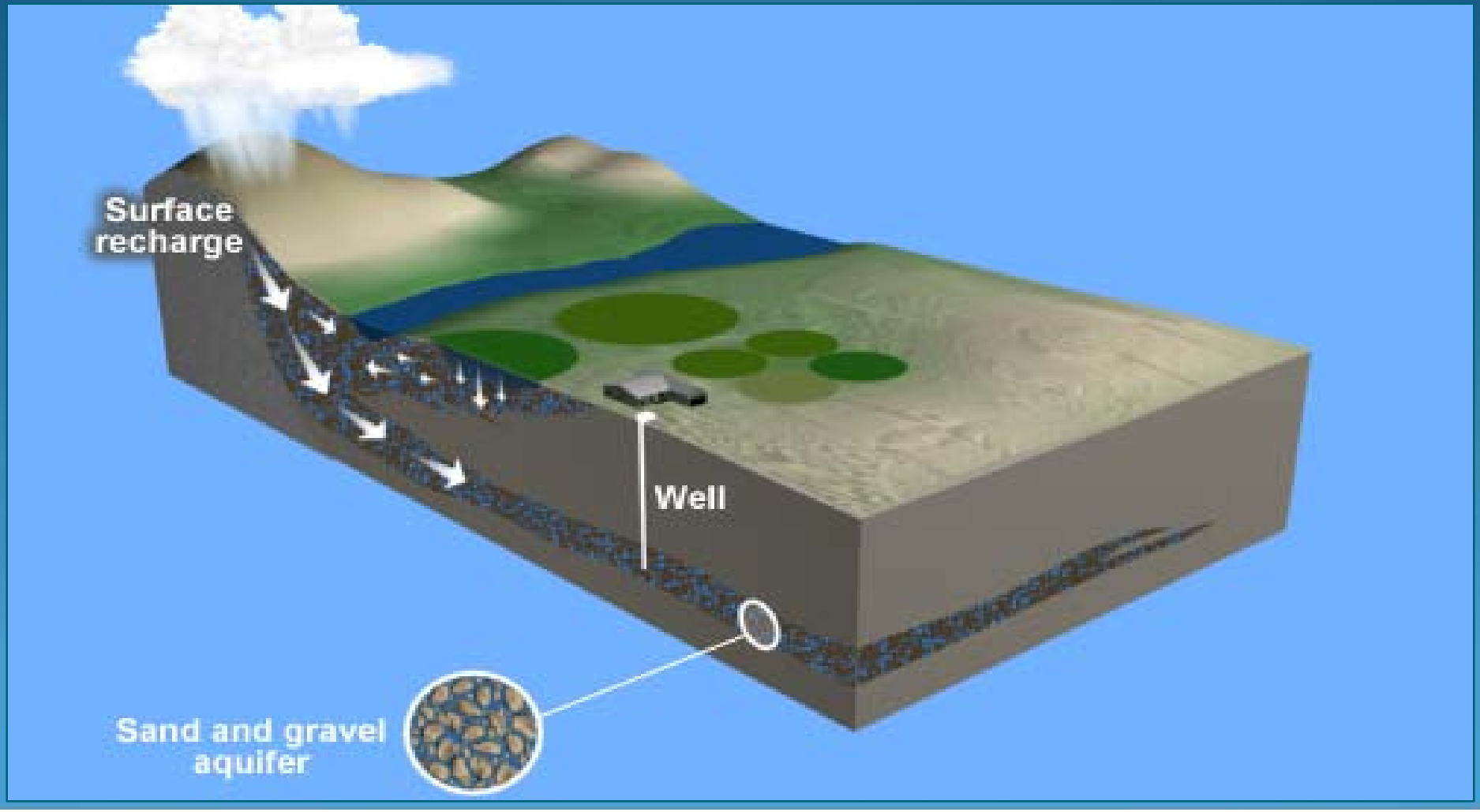
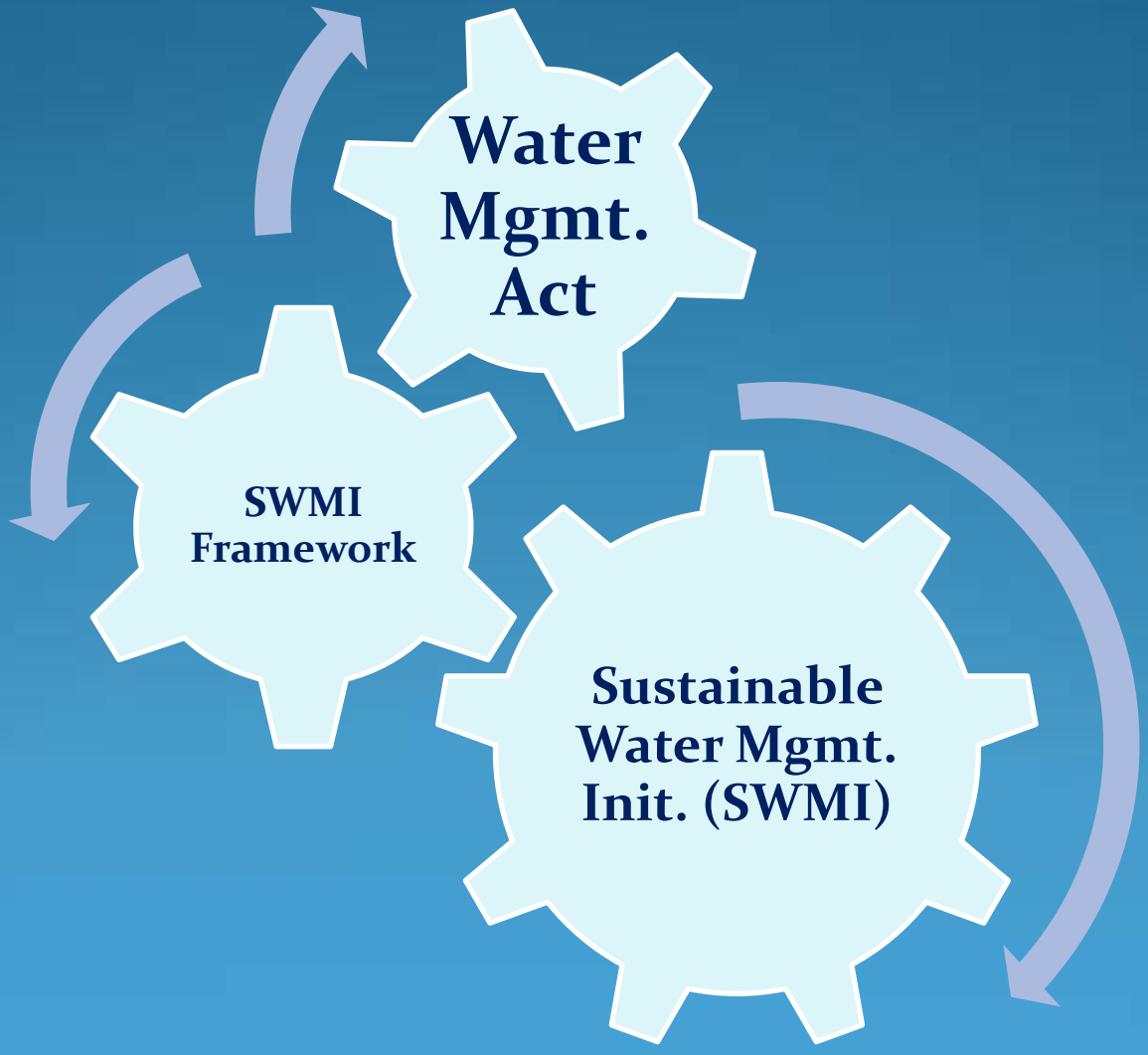
Sustainable Water Management Initiative / Water Management Act



Mechanics of SWMI



Key Concept #1: Standard Conditions

- Water supply protection
- Wetlands monitoring
- 65 RGPCD
- 10% UAW
- Seasonal irrigation limits
- Water conservation

Key Concept #2: Baseline

- One of several key thresholds for determining what the permitting process will require
- Generally recent use (03-05) plus 5% or registered vol
- For most Neponset communities, baseline is less than current allocation, but more than current use

Key Concept #3: Ground Water Category

- Another key threshold that defines what is required
- 1,400 sub-basins across the state (~30 in Neponset)
- Ratio of “natural” August flow and actual withdrawals
- Categories: 1 (very healthy) to 5 (very impacted)

Key Concept #4: Tiers

- What you have to do (i.e. your tier) depends on your GWC and the volume you request relative to your baseline
- Requests below baseline must “minimize existing impacts to maximum extent feasible” in GWC 4-5, and just comply with standard conditions in GWC 1-3

Tiers Continued

Requests for more than Baseline must:

- "Minimize existing impacts to the greatest extent feasible," and
- "Mitigate impacts commensurate with impact from additional withdrawal [above baseline]"

Tiers Continued

Requests over Baseline that cause "backsliding" or in GWC 5, must:

- "Demonstrate no feasible alternative source that is less environmentally harmful" [and if none…]
- "Minimize existing impacts to the greatest extent feasible," and
- "Mitigate impacts commensurate with impact from additional withdrawal"

Minimization and Mitigation

Mostly similar activities with different levels of accounting rigor and different due dates

- Water conservation
- Stormwater recharge
- Wastewater recharge
- Sewer I/I reduction
- Source optimization
- Alternative sources
- Habitat restoration

More Details on SWMI

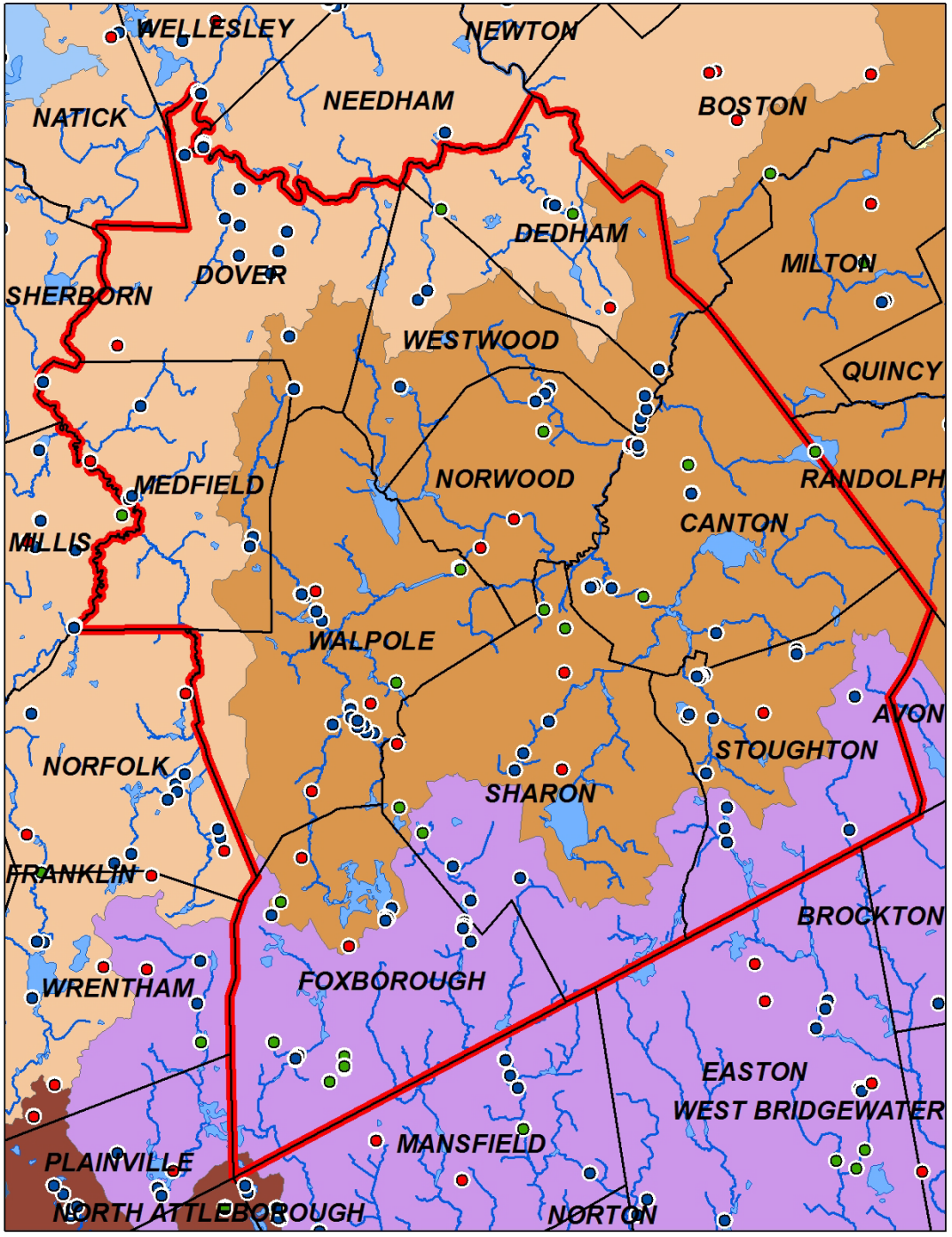
www.mass.gov/dep/water/resources/swmi.htm

- Interactive map
- Links to key documents and details

www.mass.gov/eea/air-water-climate-change/preserving-water-resources/sustainable-water-management

- Process documents

Neponset Water Management Act Pilot Project



Special Recognition to:

- Eileen Commane - **Dedham Westwood Water District**
- Ian Cooke, Steve Pearlman – **Neponset River Watershed Association**
- Martin Pillsbury, Julie Conroy, Tim Reardon, Armin Akhavan – **Metropolitan Area Planning Council**
- Blake Martin, Anthony Zerilli, Mel Higgins – **Weston & Sampson Engineers**

Neponset WMA Planning Project

- Water Demand and Efficiency
- Wastewater and I/I
- Optimization and Alternative Sources
- Stormwater
- Minimization and Mitigation Options Summary

Components of Water Use

The projections were made by estimating water use in four categories:

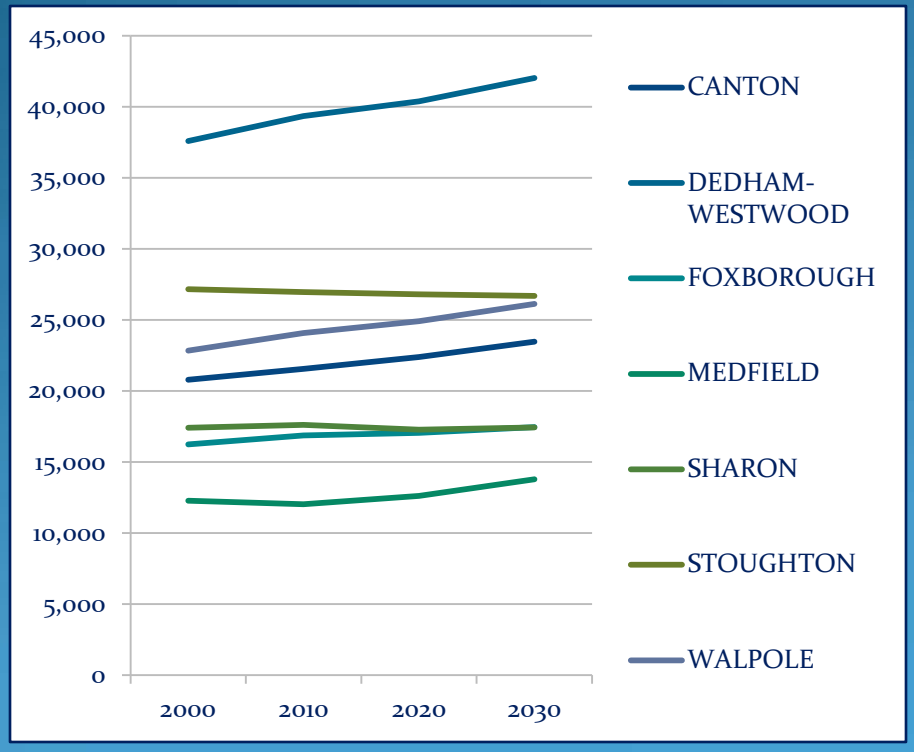
1. Residential
2. Industrial and Commercial
3. Municipal, Institutional, and Other
4. Unaccounted-for Water

Residential Water Use

Projections based on population and households

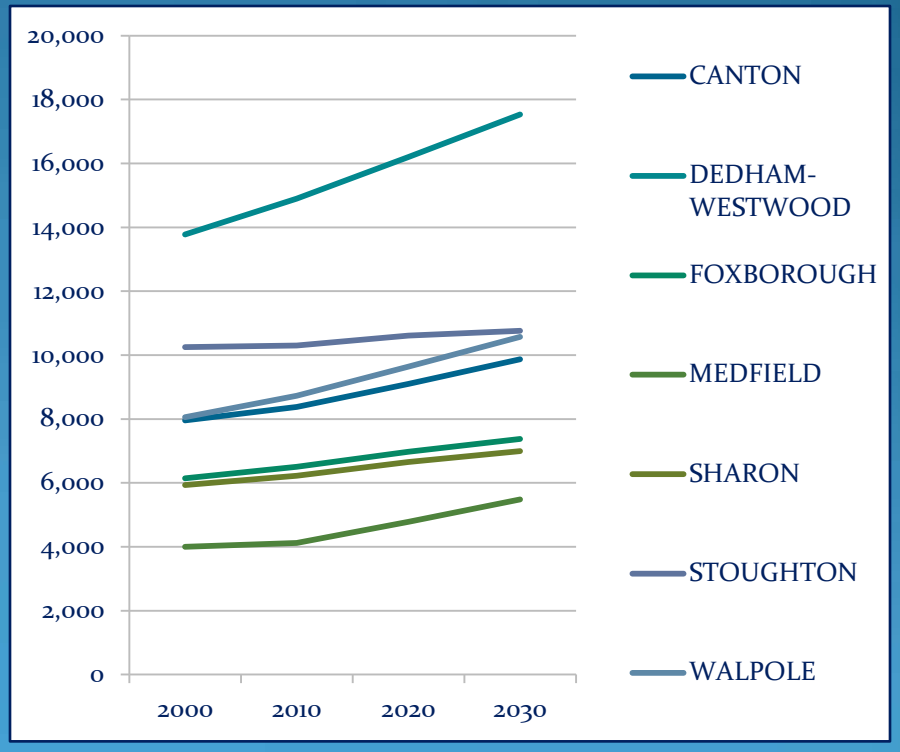
Population 2000-2030

Average increase 5%



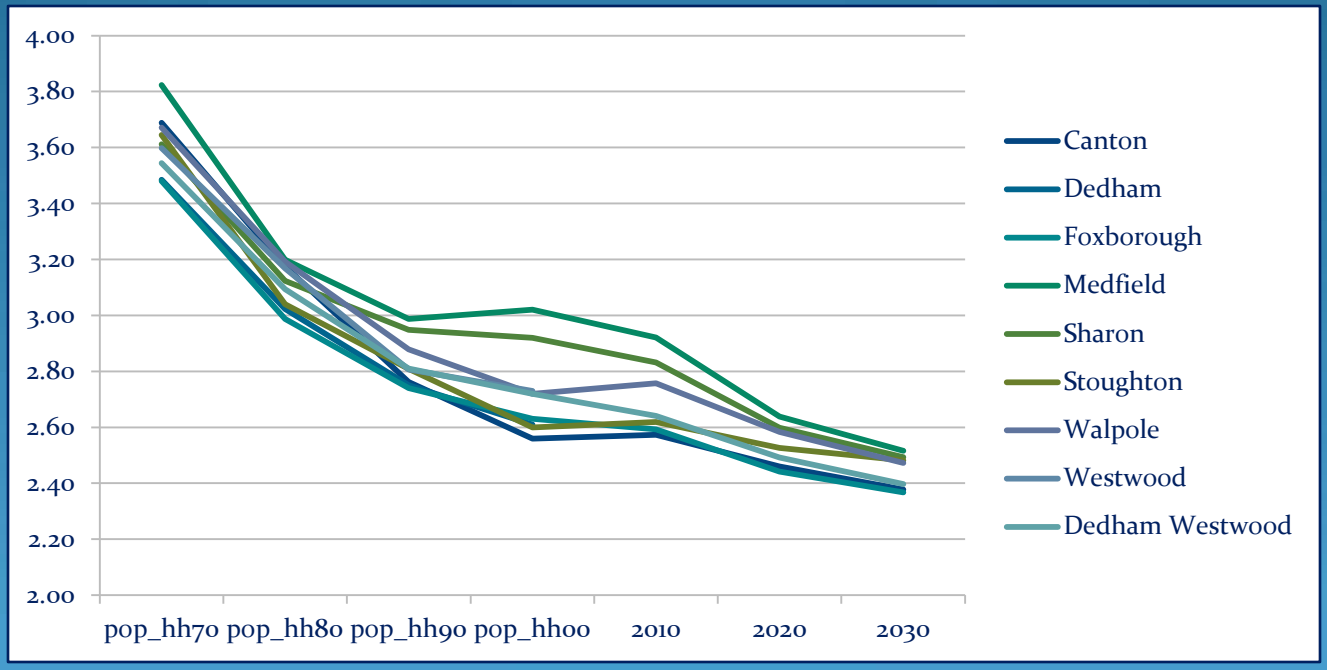
Households 2000-2030

Average increase 19%



Residential Water Use

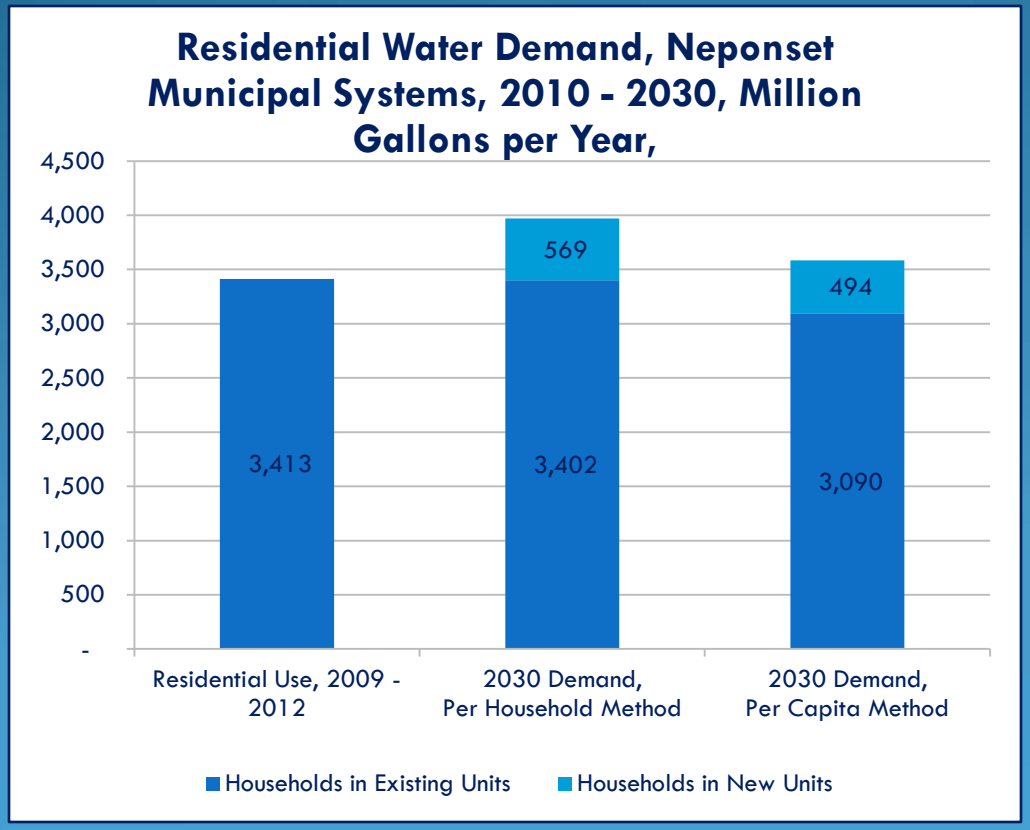
As households grow faster than population, average size of households size decreases. This is a long-term trend.



With fewer people in each household in 2030, water demand grows more moderately

Residential Water Use

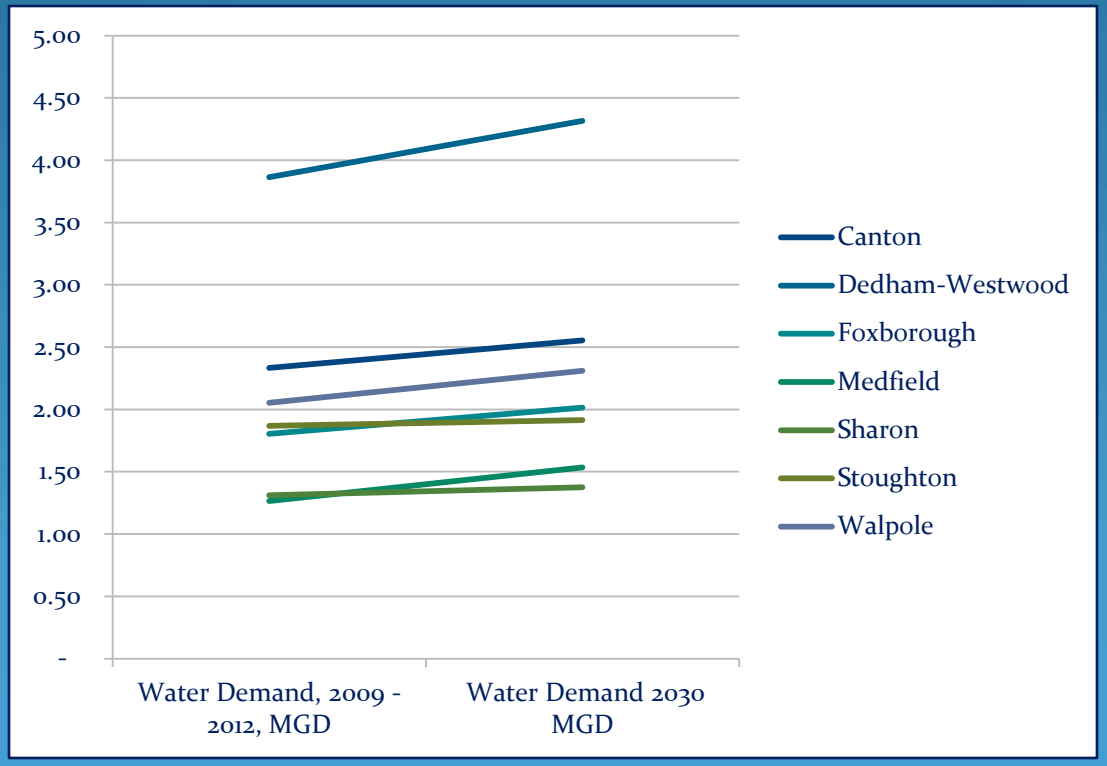
2030 Water Demand is estimated two ways, based on population and households, existing (2010) and new. These are then averaged.



The average increase for 2030 residential water demand is 11% for all eight Neponset towns

Total 2030 Projection

- **Total projected demand for the eight towns increases from 14.5 MGD to 16.1 MGD**



Infiltration & Inflow (I/I):

Extraneous flow that enters the sewer system through either direct illicit discharges to the sewer system and/or imperfections in the sewer infrastructure.

Possible Sources for Infiltration (Groundwater)

1. Leaking sewer mains,
2. Leaking sewer infrastructure,
3. Leaking sewer connections, or
4. Leaking Joints.

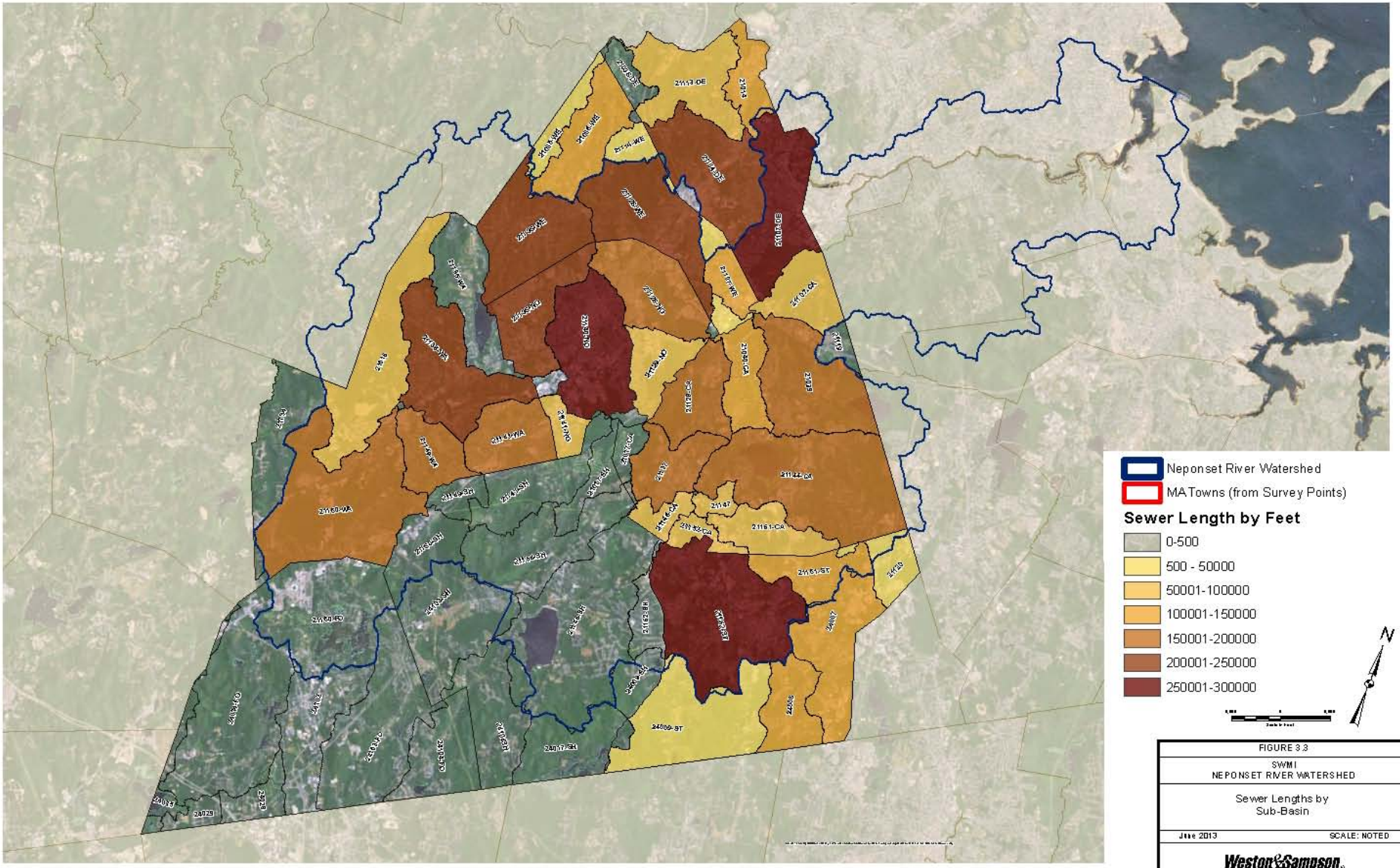
Possible Sources for Inflow (Stormwater)

1. Cross connections with storm drains,
2. Illicit discharges (sump pumps, roof down spouts, etc.),
3. Leaking Sewer Infrastructure (manhole covers, etc.).

Average I/I Removal Coefficients

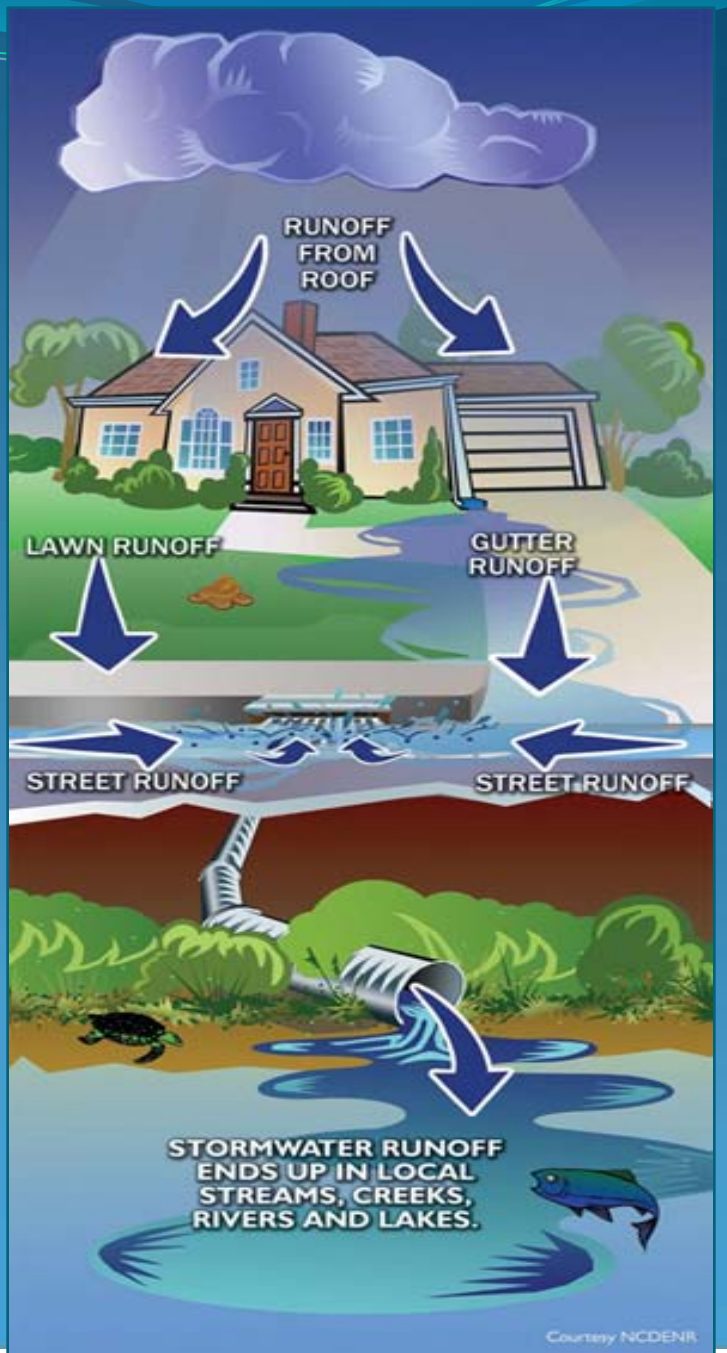
Average GPD I/I Removed per Linear Foot of Sewer Investigated and Rehabilitated						
Town	Calendar Year	Sewers Inspected (LF)	Sewers Rehabilitated (LF)	Estimated Average Infiltration Removed (GPD)	GPD Removed/LF Inspected	GPD Removed/LF Rehabilitated
Stoughton	2006	26,141	4,364	48,483	1.85	11.11
Stoughton	2007	23,246	6,109	15,708	0.68	2.57
Stoughton	2008	29,992	3,417	47,349	1.58	13.86
Stoughton	2009	55,283	11,088	12,247	0.22	1.10
Stoughton	2010	20,105	7,249	4,471	0.22	0.62
Stoughton	2011	51,914	3,193	17,340	0.33	5.43
Stoughton	2012	63,293	10,501	21,190	0.33	2.02
Stoughton	2013	29,046	9,214	11,353	0.39	1.23
Walpole	2007	24,500	14,625	150,960	6.16	10.32
Walpole	2008	63,850	14,400	33,227	0.52	2.31
Walpole	2009	58,225	8,465	19,989	0.34	2.36
Walpole	2010	42,302	2,600	867	0.02	0.33
Walpole	2011	26,900	13,516	53,151	1.98	3.93
Walpole	2012	61,632	19,613	10,178	0.17	0.52
AVERAGE		**41,174**	**9,168**	**31,894**	**1.06**	**4.12**

Sewer Lengths by Subwatershed

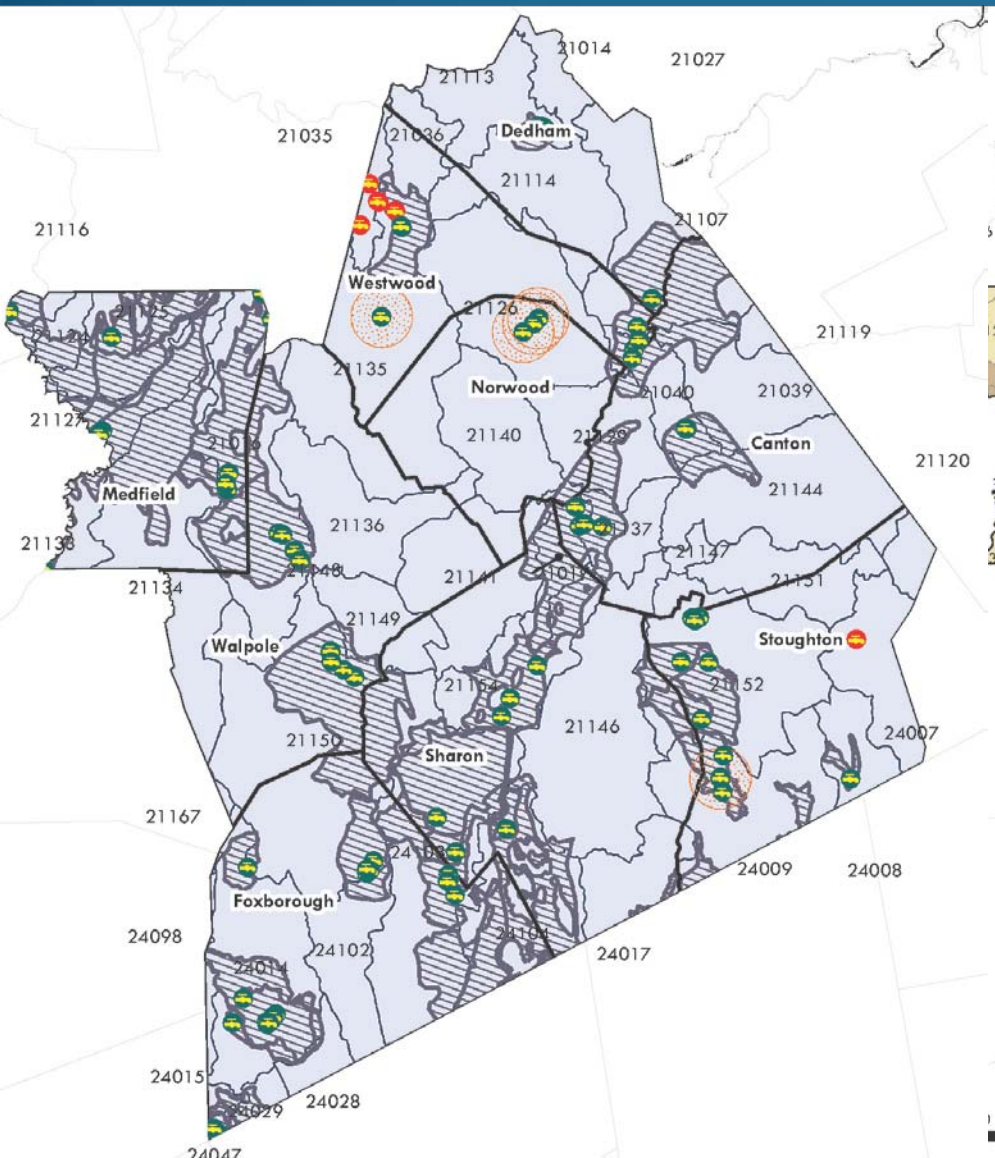


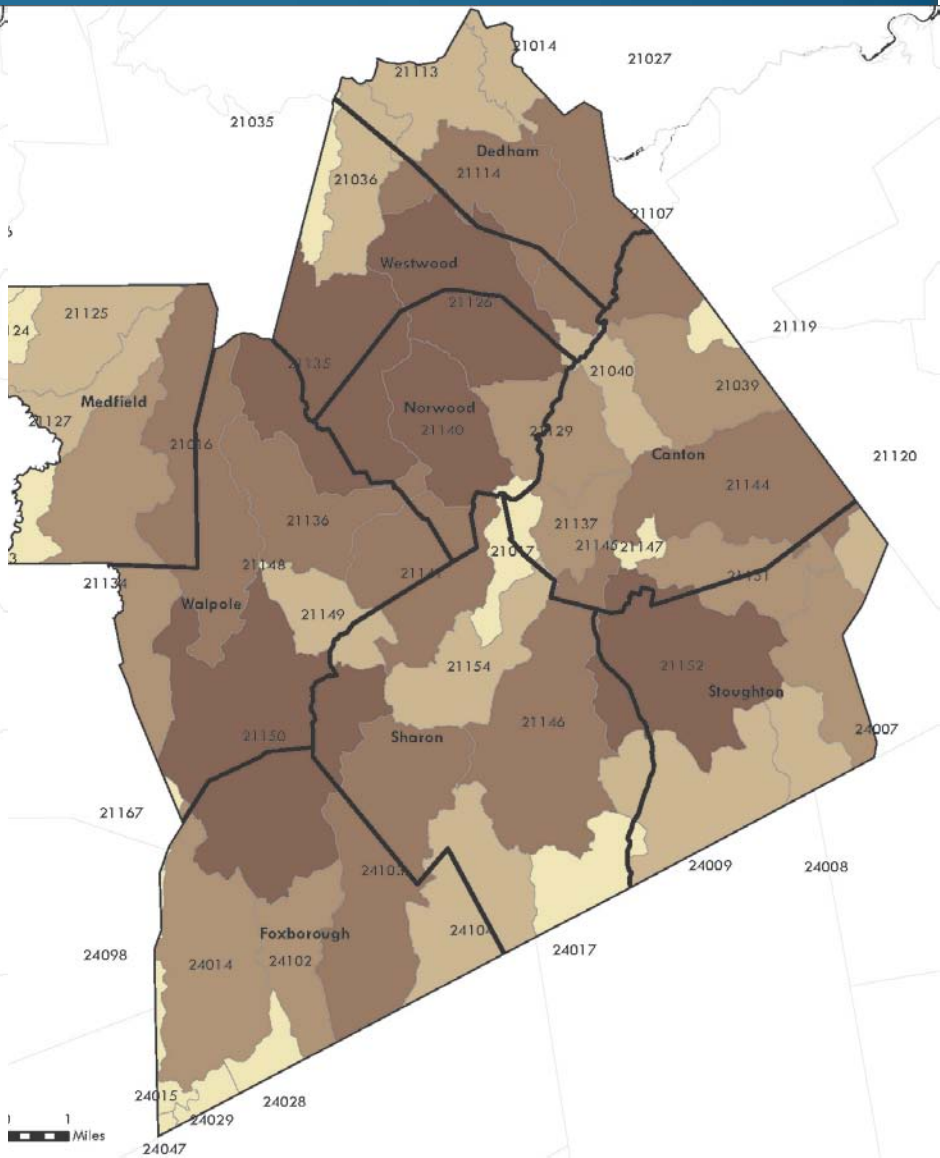
Recharge - Benefits

- Keeps water local
- Replenishes groundwater
- Supplies drinking water sources
- Pollutant treatment

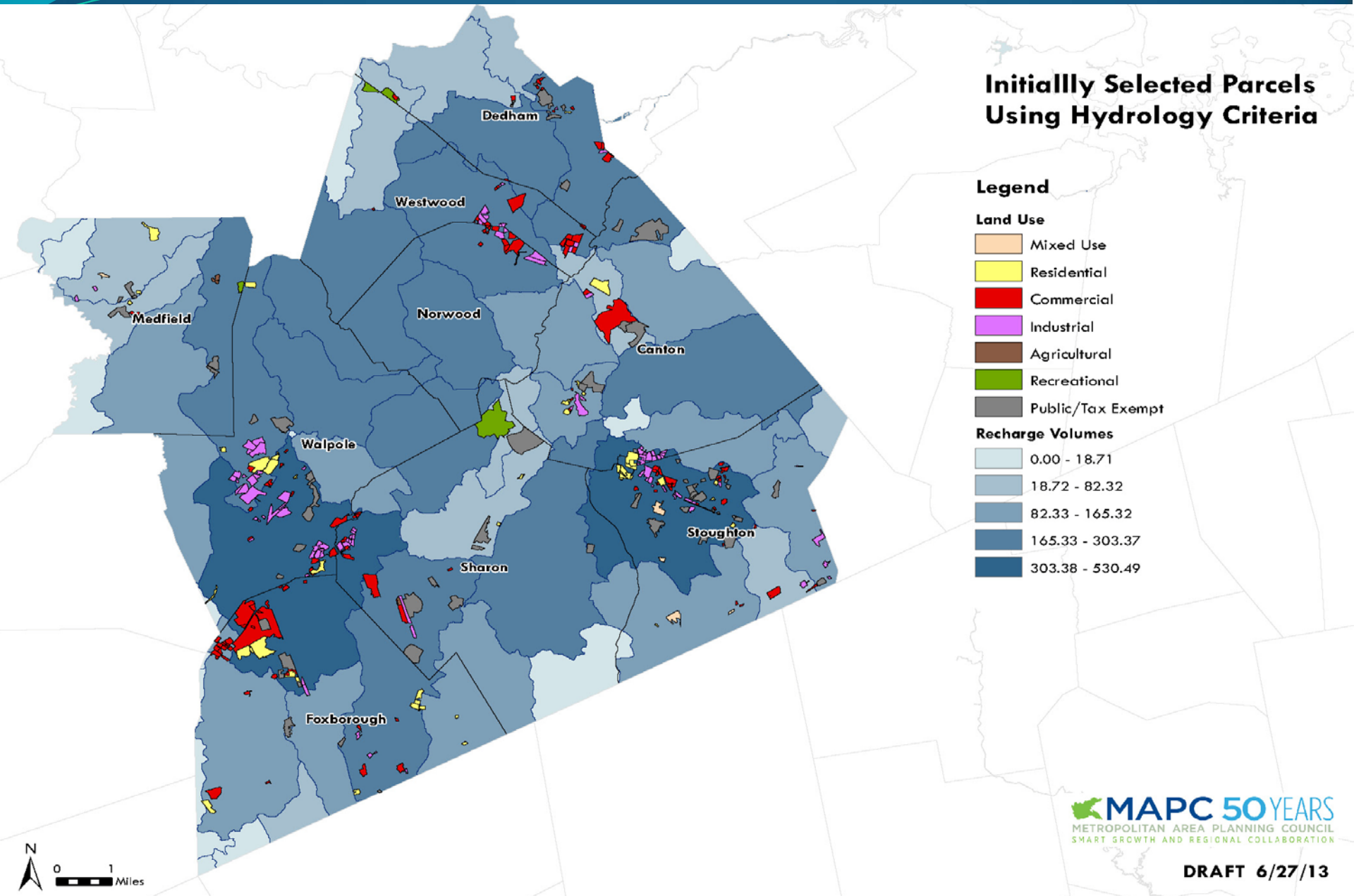


Existing Conditions

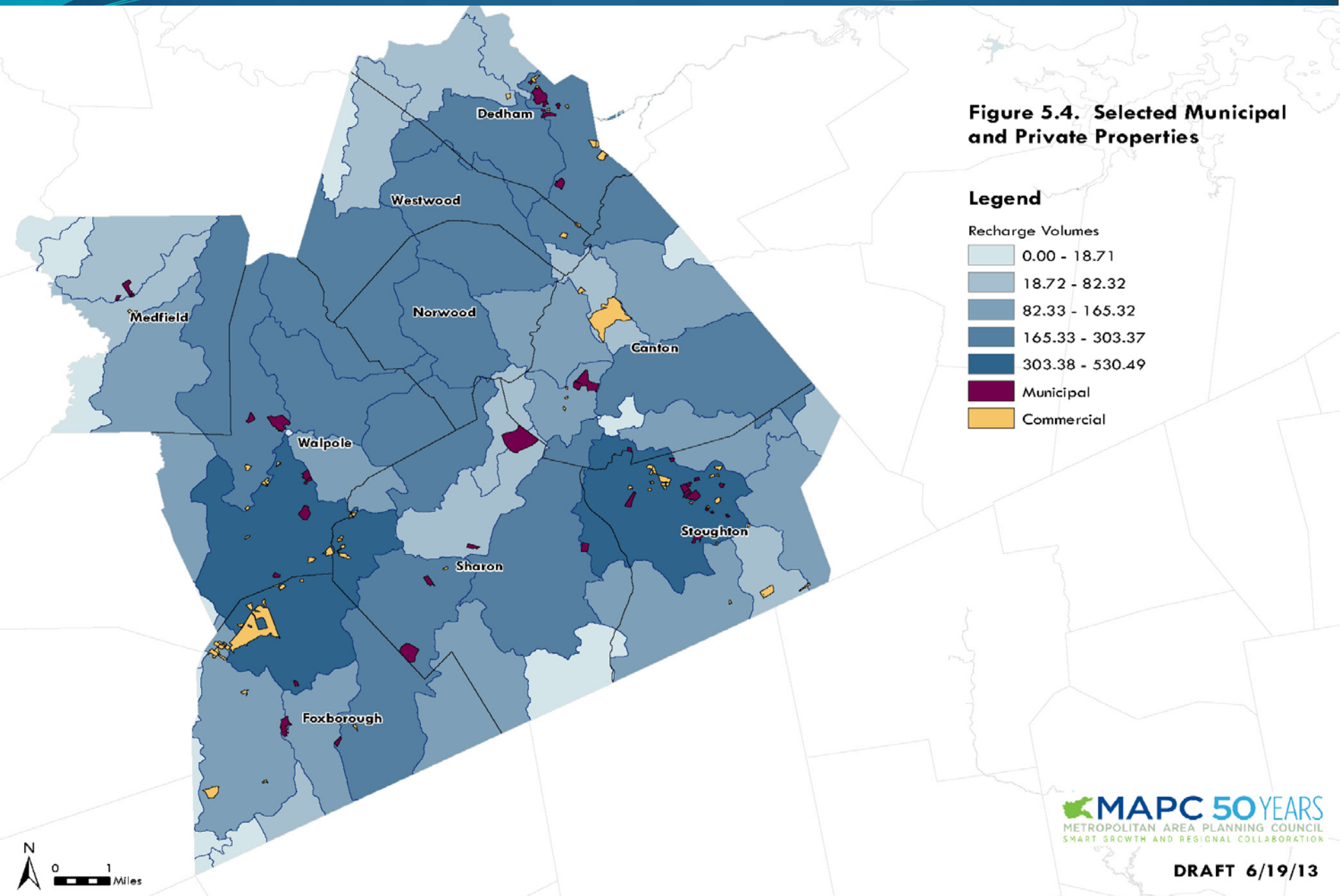




Site Selection



Ranking

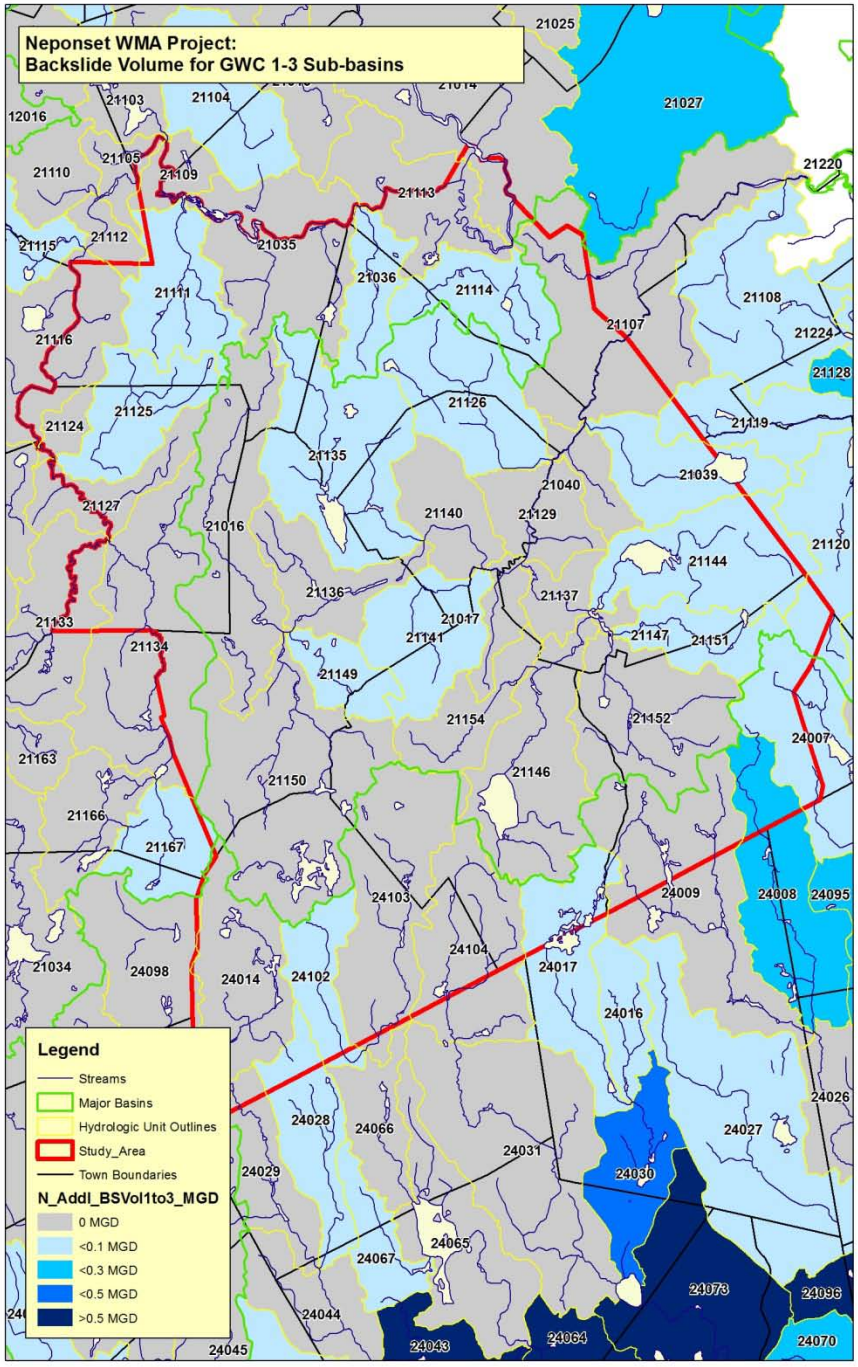

Dedham
Westwood
Medfield
Norwood
Canton
Walpole
Stoughton
Sharon
Foxborough
Figure 5.4. Selected Municipal and Private Properties
Legend
Recharge Volumes
0.00 - 18.71
18.72 - 82.32
82.33 - 165.32
165.33 - 303.37
303.38 - 530.49
Municipal
Commercial
N
0
1
Miles
MAPC 50 YEARS
METROPOLITAN AREA PLANNING COUNCIL
SMART GROWTH AND REGIONAL COLLABORATION
DRAFT 6/19/13

Results

	INITIAL SITE SCREENING		FINAL SITE SELECTION	
Town	**# Parcels**	**Stormwater Recharge (MGD)**	**# Parcels**	**Stormwater Recharge (MGD)**
Canton	34	0.16	8	0.05
Dedham-Westwood	50	0.22	19	0.08
Foxborough	40	0.49	23	0.31
Medfield	18	0.05	5	.02
Norwood	15	0.12	0	0
Sharon	38	0.16	12	0.07
Stoughton	89	0.31	34	0.13
Walpole	60	0.33	15	0.07
TOTALS:	**344**	**1.85**	**116**	**0.73**

Optimization

- ✓ Shift pumping downstream
- ✓ Shift pumping to less depleted sub-basins
- ✓ Shift pumping seasonally to less connected wells
- ✓ More opportunities than you would expect
- ✓ Many are feasible if the timeframe is long
- ✓ Some involve “bad” environmental tradeoffs


Neponset WMA Project:
Backslide Volume for GWC 1-3 Sub-basins
Legend
Streams
Major Basins
Hydrologic Unit Outlines
Study_Area
Town Boundaries
N_Addl_BSVol1to3_MGD
0 MGD
<0.1 MGD
<0.3 MGD
<0.5 MGD
>0.5 MGD

Alternate Sources

- Very few opportunities in such a developed and depleted basin
- One good one that town was already considering anyway

Interconnections

- All systems have interconnection options
- MWRA is best option in almost all cases
- Five have existing physical interconnection
- Two would need significant new infrastructure
- Limited seasonal use could be helpful

Town	Optimization	Alternative Soures	Inter-Connections
Canton	+	X	+
Dedham-Westwood	+	-	+
Foxborough	-	-	-
Medfield	+	X	-
Sharon	X	+	+
Stoughton	-	X	+
Walpole	-	-	+

summary table.xlsx, Overall Min Mit Summary

Table 6.7 Summary of Mitigation and Minimization Requirements and Opportunities								
Community	Current Use (MAPC 2009-2012, MGD)	Presumed 2030 Request (DCR 65/10 WNF MGD)	Mitigation Volume at Presumed Request (MGD)	Minimization Volume at Presumed Request (MGD)	Potential Water Conservation Credit, (MAPC 2030 Cons. Scenario, MGD)	Volume of UAW >10% Included in MAPC 2030 Conservation Scenario (MGD)	Potential Sewer Infiltration Credit (80% of 5-year removal, MGD)	Potent Stormw Credit Priority S Only (M
Canton	2.33	2.56	2.18	0.38	0.21	0.07	0.15	0.15
DWWD*	3.86	4.62	0	4.62	0.67	0.55	0.46	0.21
Foxborough	1.80	1.95	0	1.95	0.1	0.06	0.00	0.49
Medfield*	1.26	1.46	0	1.46	0.07	0.19	n/d	0.05
Norwood**	n/a	n/a	n/a	n/a	n/a	n/a	0.15	0.12
Sharon	1.31	1.55	0	1.55	0.28	0.05	0.00	0.16
Stoughton	1.87	2.77	0.51	2.26	0.99	0.04	0.12	0.31
Walpole	2.05	2.07	0	2.07	0	0.00	0.23	0.32

Key "Takeaways"

- Community involvement and education will be necessary for compliance
- Most communities in Neponset will be able to comply with incremental changes
- Regional planning efforts and tools like the MAPC demand forecasting tool will allow communities to test their own scenarios

Key "Takeaways" (continued)

- Efficiency gains could more than offset demand growth in Neponset
- I/I represents a potentially significant volume of water (7 – 12% of current use)
- Potential stormwater recharge credits represent 5 – 12% of current use
- Optimization and interconnection options exist but some may require more regional cooperation

SUMMARY

For SWMI information:

www.mass.gov/dep/water/resources/swmi.htm

For copies of the report:

http://www.neponset.org/

For copies of the demand forecasting tool:

http://www.mapc.org/

QUESTIONS