



# West Acton Sewer Extension Project

Acton Water Resources Advisory  
Committee Meeting  
March 12, 2008

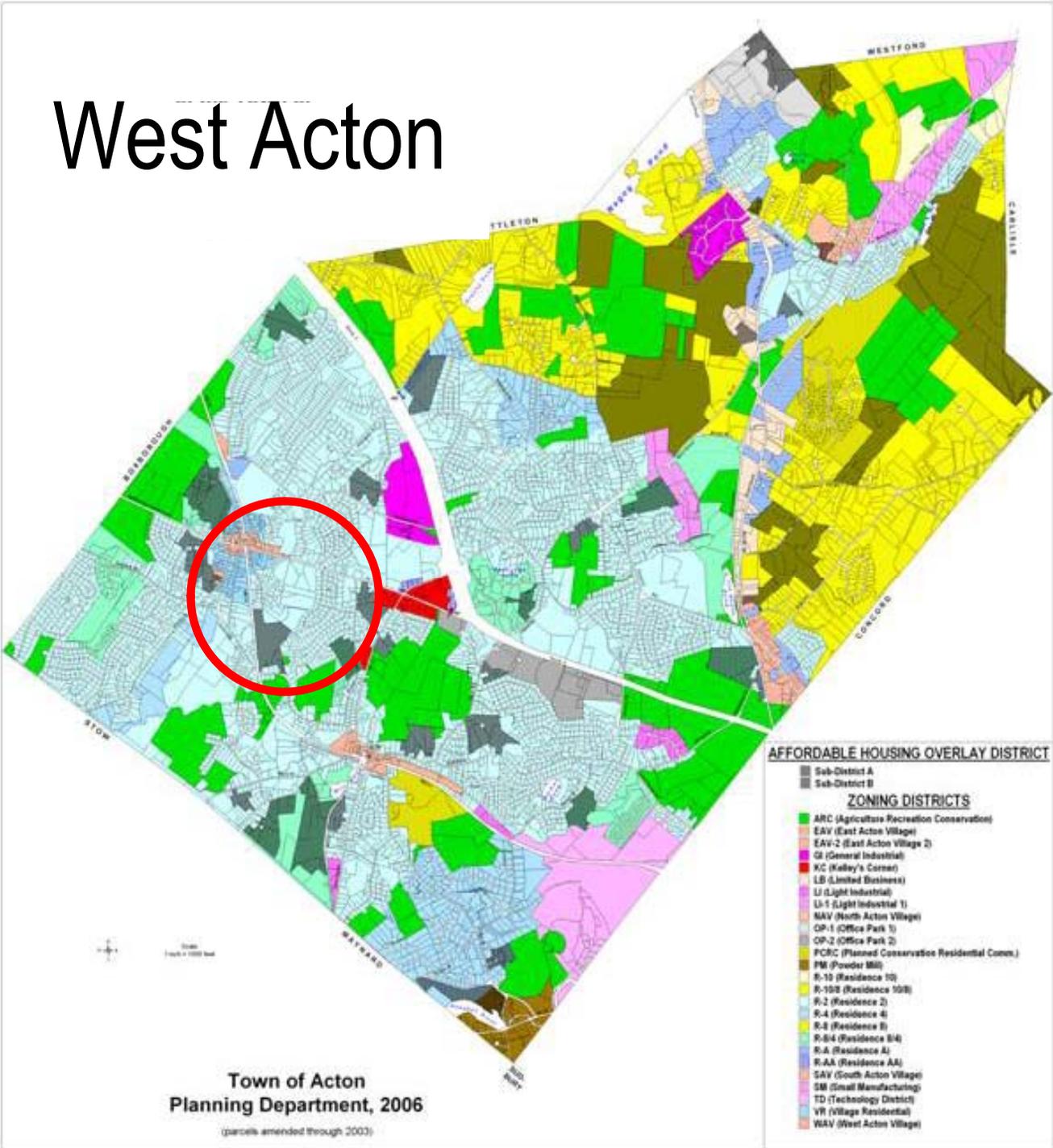
# West Acton Sewer Extension Project

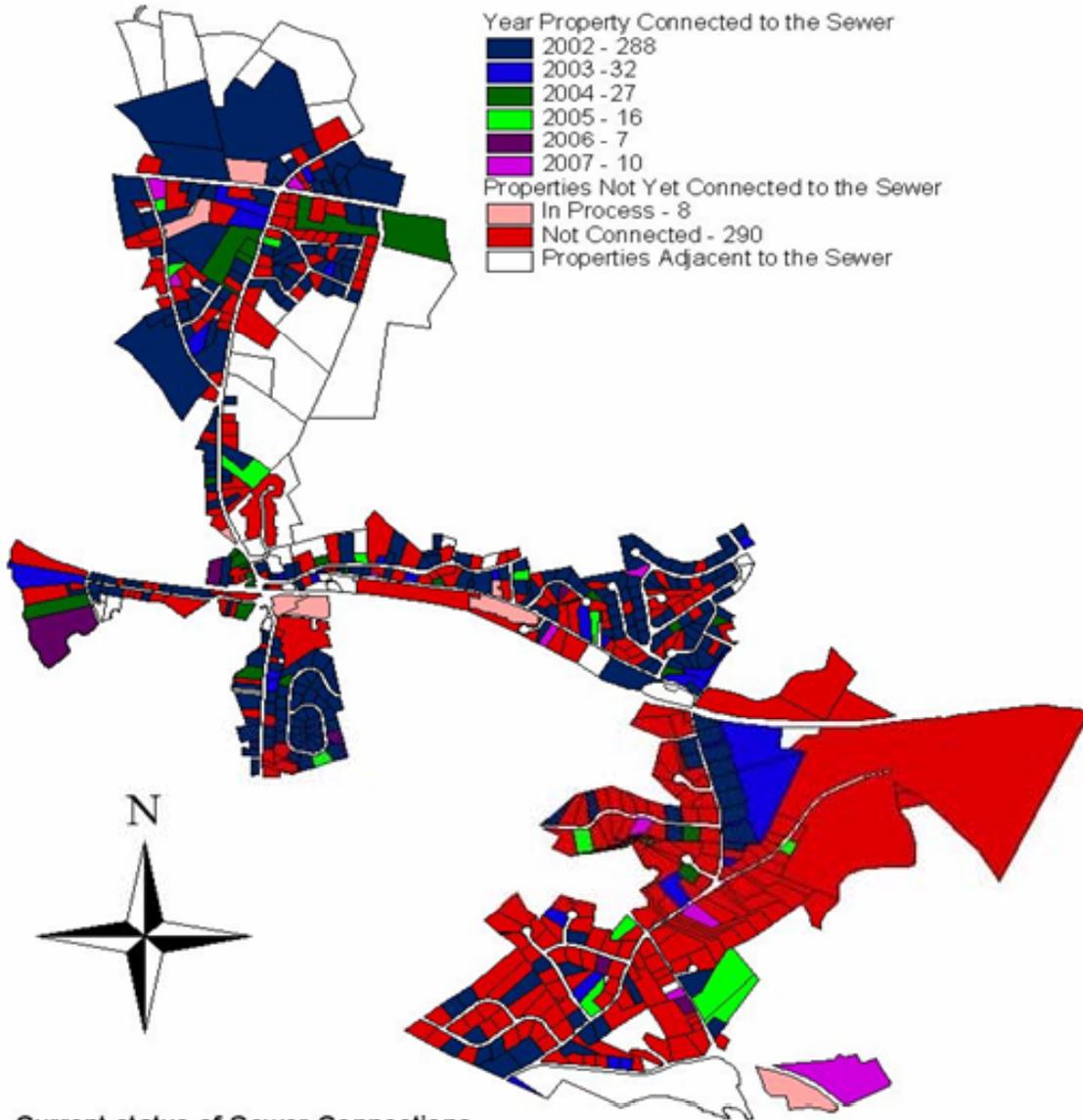


## Why West Acton?

- Identified in 2004 CWRMP as “Needs” areas requiring off-site wastewater solutions
  - Area 10: Spencer/Tuttle/Flint
  - Area 12: West Acton Center
- Goal of Study
  - Understand critical aspects of the project evaluation
  - Understand order of magnitude costs
  - Codify consensus with the Town and AWRAC

# West Acton





678 parcels in sewer area  
 380 parcels connected (56%)  
 1,841 SBUs in area  
 1092 Connected (59%)

**Current status of Sewer Connections**  
 Properties Connected represent 1200.58 Sewer Betterment Unit Equivalents  
 (including Privilege Fees, School and Town Assessments)  
 Properties not yet Connected represent 681.19 Sewer Betterment Unit Equivalents  
 (including W. R. Grace)

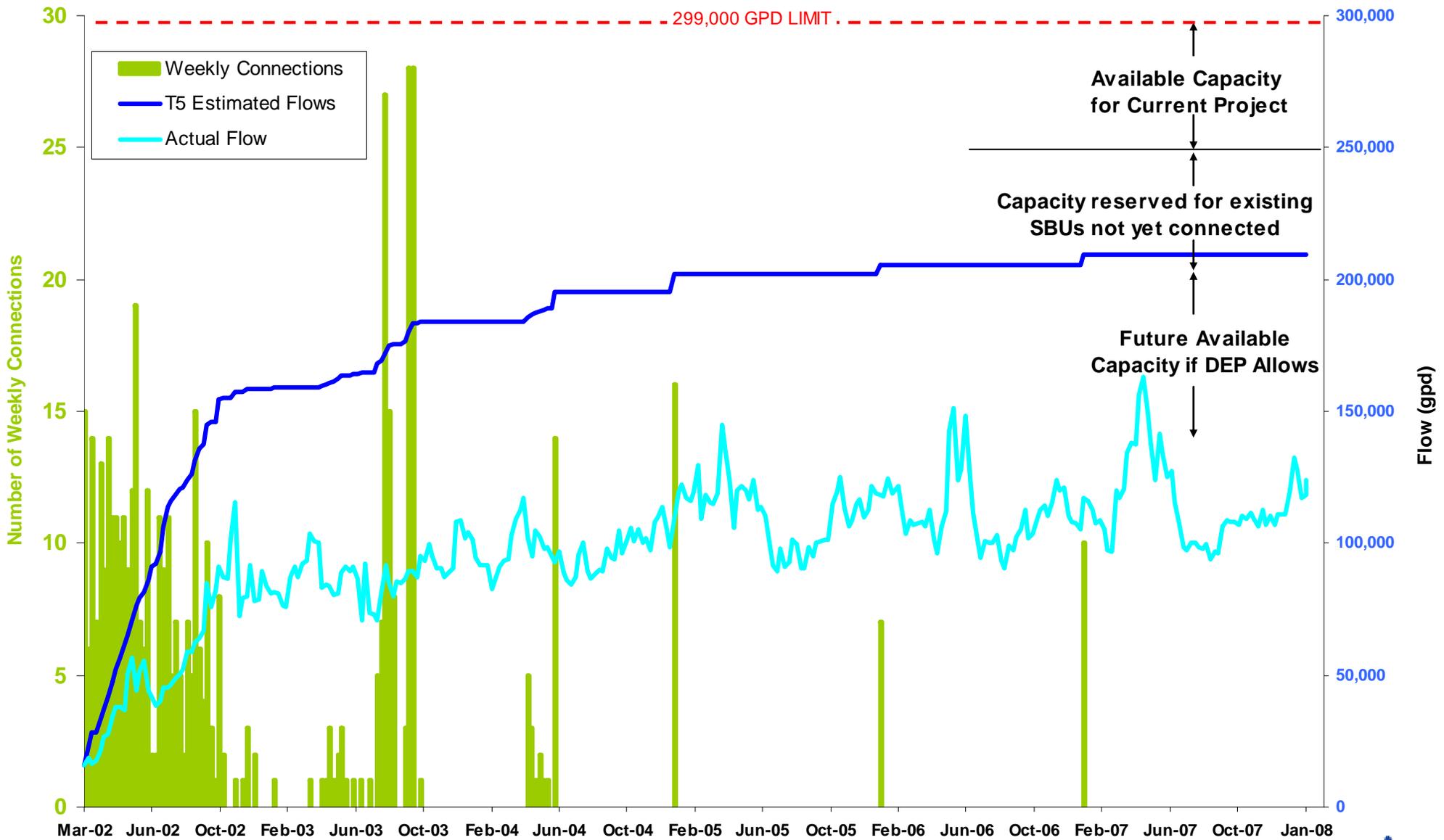
# Current Sewer Connections

# Available Wastewater Capacity



- WWTF Effluent Capacity = 299,000 gpd
- Current Average Daily Flow = 115,000 gpd
- Capacity unallocated and available = 49,000 gpd

**Town of Acton, MA**  
**T5 Estimated Flows vs Actual Flows**  
**Compared with Number of Weekly Connections to the Sewer System**



# Available Capacity at WWTP

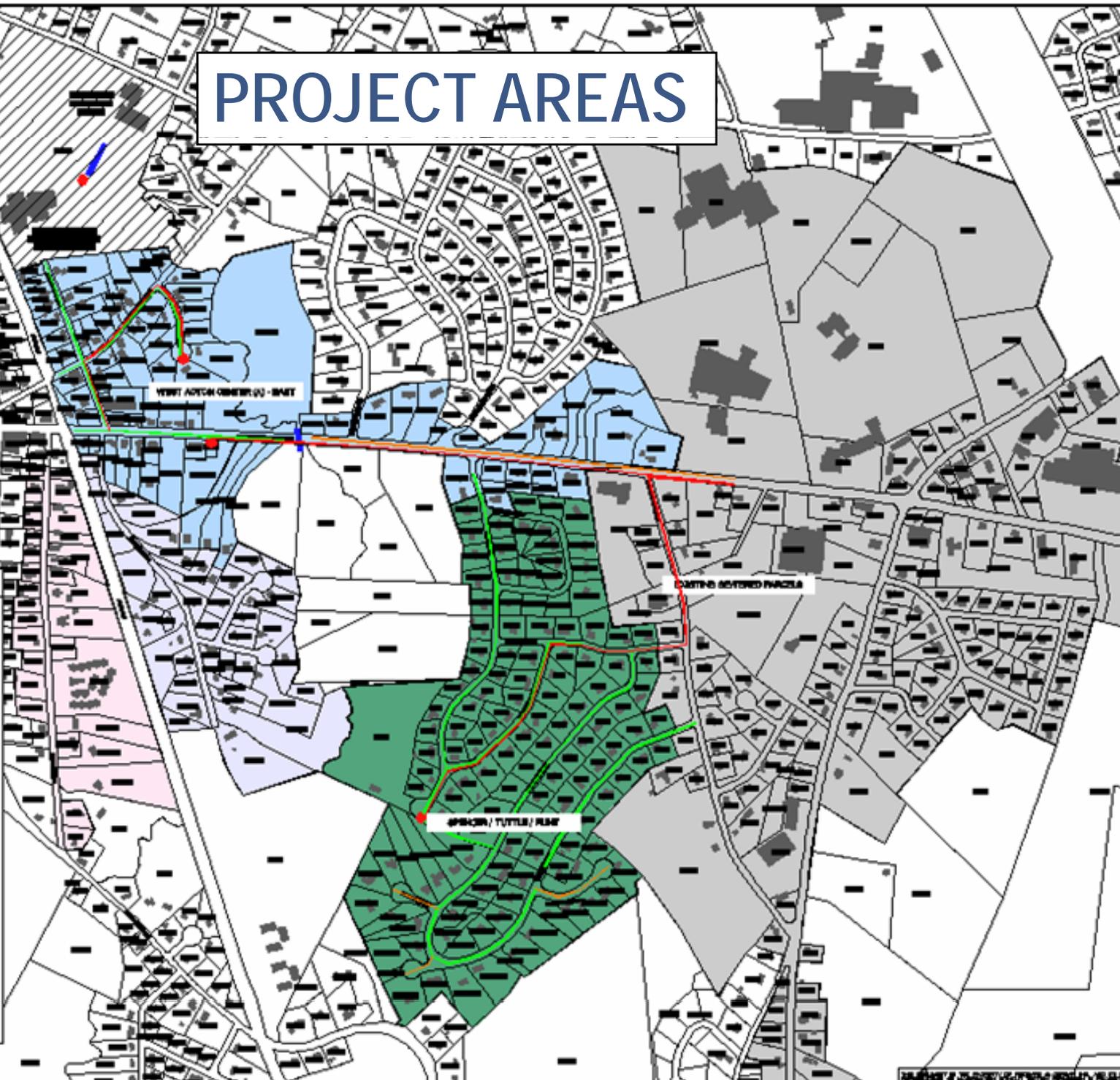
# PROJECT AREAS

**LEGEND**

- SPENCER/TUTTLE/FLINT
- WEST ACTON CENTER
- EXISTING SEWERED AREA
- PUMPING STATION
- GRAVITY SEWER
- FORCE MAIN
- LOW PRESSURE SEWER
- STREAM/RIVER CROSSINGS
- RAILROAD CROSSINGS
- GATES & DOUGLAS SCHOOLS

SCALE: 1" = 100'

CHECK MAP SCALE BEFORE USING









# Sewer Layout Criteria

- Areas defined in Scope of Work (excluding Douglas & Gates Schools)
- Current Zoning limits – “West Acton Village Zoning” & “Village Residential”
- Natural Topography – sewer depth/rivers
- Actual winter flows up to 49,000 gpd (available capacity)

# Direct Costs: Construction Cost Categories at Concept Level



- 8" PVC Sewer – varying depths
- 6" PVC Service Stubs per structure
- PVC Low Pressure Sewer
- Pumping Stations
- Paving Trenches – Local & State roads
- Paving Overlay – Local & State roads
- Water main & drain pipe replacement
- Ledge & Rock Removal

# Indirect Cost Categories at Concept Level



## Based on Construction Costs

- Design & Permitting – 10%
- Procurement & Construction Engineering – 15%
- Administration (Police, Financing, Legal) – 10%
- Contingency – 5%



**Table 1: West Acton Sewer Extension Project - Cost Comparison of Alternatives**

Items	Unit	Unit Cost	Alt. 1: WAC-1		Alt 5: STF-1	
			Quantity	Cost	Quantity	Cost
<b>Direct Costs</b>						
8" PVC Sewer (8-12 feet)	L.F.	135	2535	\$342,225	7260	\$980,100
8" PVC Sewer (12-16 feet)	L.F.	150	1065	\$159,750	2140	\$321,000
8" PVC Sewer (16-20 feet)	L.F.	180	50	\$9,000	600	\$108,000
8" PVC Sewer (>20 feet)	L.F.	220	0	\$0	0	\$0
6" PVC Service Stubs (40 lf each)	L.F.	85	3160	\$268,600	5080	\$431,800
PVC Forcemain	L.F.	60	4900	\$294,000	4000	\$240,000
PVC Low Pressure Sewer	L.F.	70	2650	\$185,500	850	\$59,500
Paving - Trenches in Local Streets (3" depth)	Sq Yd.	15	1,914	\$28,717	10,198	\$152,967
Paving - Trenches in State Roadway (3" depth)	Sq Yd.	15	3,356	\$50,333	0	\$0
Paving - CDF in Local Roads	Cu.Yd	110	0	\$0	1,000	\$110,000
Paving - CDF in State Roads	Cu.Yd	110	3,461	\$380,722	0	\$0
Paving - Overlay Local Roads (3")	Sq Yd.	10	6,933	\$69,333	31,344	\$313,444
Paving - Overlay State Roads (3")	Sq Yd.	10	14,733	\$147,333	0	\$0
Water Main Relocation (15% total sewer l.f.)	L.F.	85	945	\$80,325	1,628	\$138,338
Drainage Pipe Relocation (5% total sewer l.f.)	L.F.	50	315	\$15,750	543	\$27,125
Ledge Removal (10% total sewer l.f. in ledge)	Cu. Yd.	85	1,386	\$117,810	2,387	\$202,895
Grinder Pumps	Each	4,200	17	\$71,400	13	\$54,600
Pump Stations	Each	400,000	2	\$800,000	1	\$400,000
Easements	L.F.	100	0	\$0	500	\$50,000
Stream and/or Railroad Crossings	Each	200,000	1	\$200,000	0	\$0
Construction Contingency Low - 5%	---	5%		\$161,040		\$179,488
Subtotal - Conceptual Construction Costs Low				\$3,382,000		\$3,769,000
Subtotal - Conceptual Construction Costs High				\$3,865,000		\$4,307,000
<b>Indirect Costs</b>						
Design & Permitting (10% of Construction)	Des. Cost	10%	---	\$338,200	---	\$376,900
Procurement & Constr. Engineering (15%)	Con. Cost	15%	---	\$507,300	---	\$565,350
Administration (Police, Financing, Legal, etc. - 10%)	Con. Cost	10%	---	\$338,200	---	\$376,900
Indirect Contingency - 5%	Ind. Cost	5%	---	\$193,250	---	\$215,350
Subtotal - Conceptual Indirect Costs Low				\$1,183,700		\$1,319,150
Subtotal - Conceptual Indirect Costs High				\$1,546,000		\$1,722,800
<b>Total Project Conceptual Costs Low</b>				<b>\$4,566,000</b>		<b>\$5,088,000</b>
<b>Total Project Conceptual Costs High</b>				<b>\$5,411,000</b>		<b>\$6,030,000</b>
Total LF of Collection Sewer (LF)				\$6,300		\$10,850
\$/Ft of Sewer Low				\$725		\$469
\$/Ft of Sewer High				\$859		\$556
Estimated SBUs Low			100		120	
Estimated SBUs High			130		130	
Sewers 1 (x1000 ft)			6.3		10.9	
SBU Density Low (SBUs per 1000 LF of sewer)			15.9		11.1	
SBU Density High (SBUs per 1000 LF of sewer)			20.6		12.0	
Conceptual Construction Costs per SBU Low				\$35,000		\$39,000
Conceptual Construction Costs per SBU High				\$54,000		\$50,000
Estimated Flow (5-year winter flow average)	GPD		17,081		20,668	
Title 5 Flows	GPD		54,925		49,610	
ENR Construction Cost Index (February 2008)			8,094			

# Financial Impacts



- **Spencer/Tuttle Flint**
  - \$45k to \$93k per SBU
- **West Acton Center**
  - \$33k to \$82k per SBU
- **Combined Project**
  - \$39k to \$88k per SBU

# Economy of Scale if both areas a completed at once



- Larger projects – Reduced mobilization and oversight costs
- Indirect Costs are reduced
  - One round of permitting
- Optimize Design – i.e. Replace portion of low pressure sewer with gravity sewer along Mass Ave

# Moving Forward

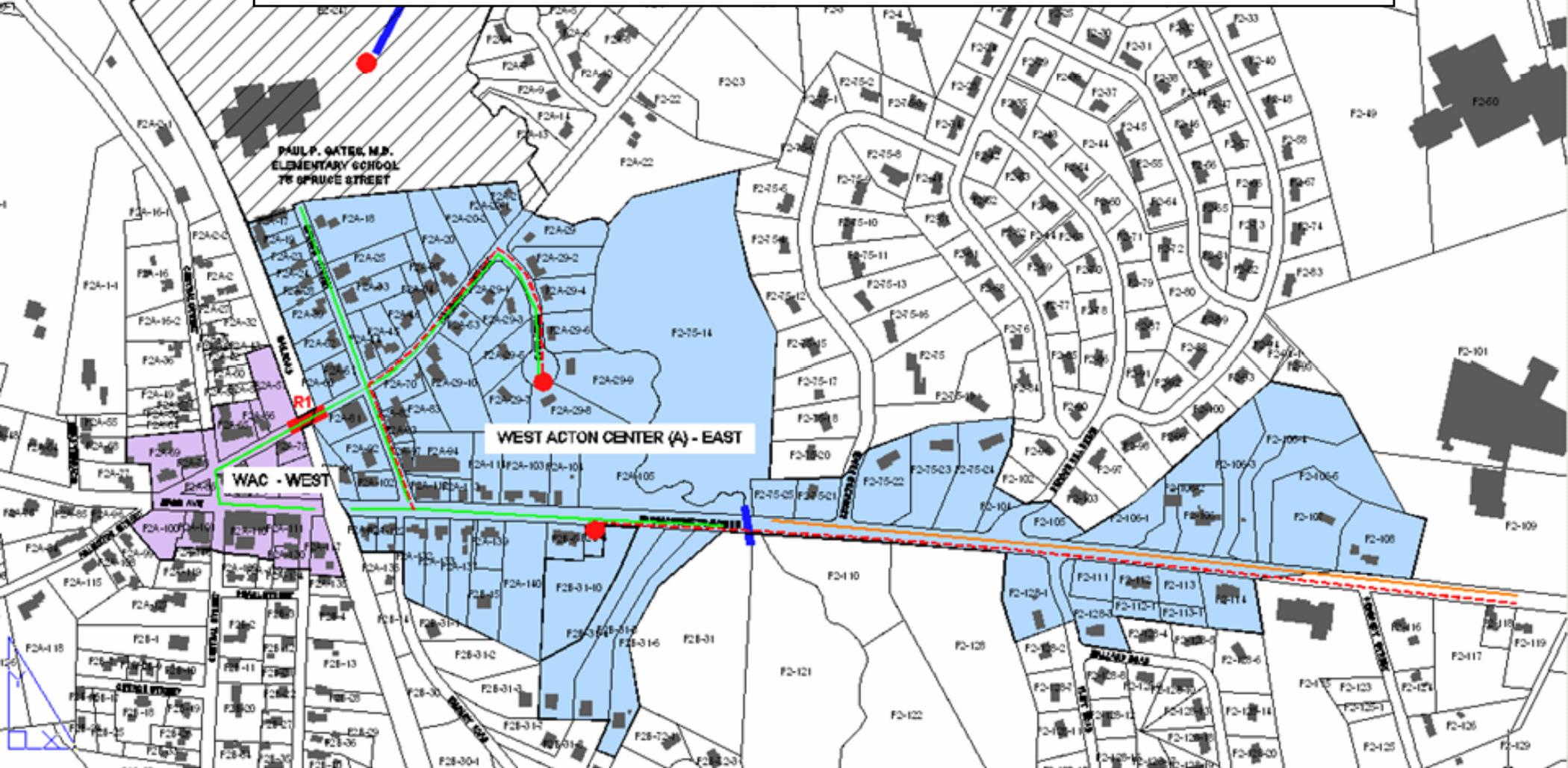


<b>West Acton Sewer Extension Project</b>	
<b>Conceptual Schedule</b>	
<b>Task</b>	<b>Date</b>
Feasibility / Design Basis	April 2008
Preliminary Engineering	July - Sept. 2008
Funding Applications	August 2008
Special Town Meeting	Fall 2008
Determining Funding Options	January 2009
Approve Design & Construction Funds	Spring 2009
Design & Permitting	July 2009 - October 2009
SRF Submittal (if appropriate)	October 2009
Advertise for Bid	Winter 2010
Start Construction	April 2010
Finish Construction	December 2010
Start Connections	January 2011

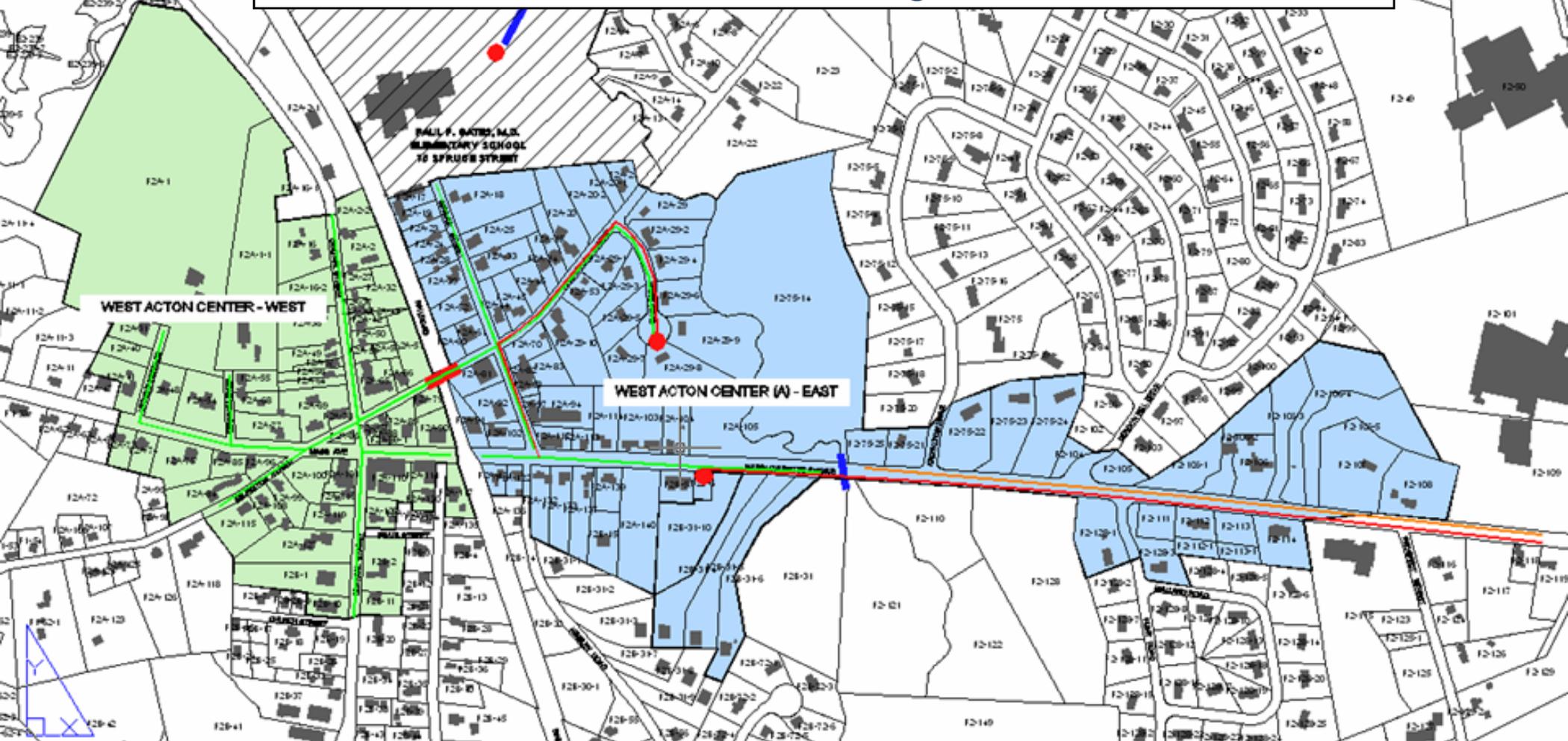


Questions?

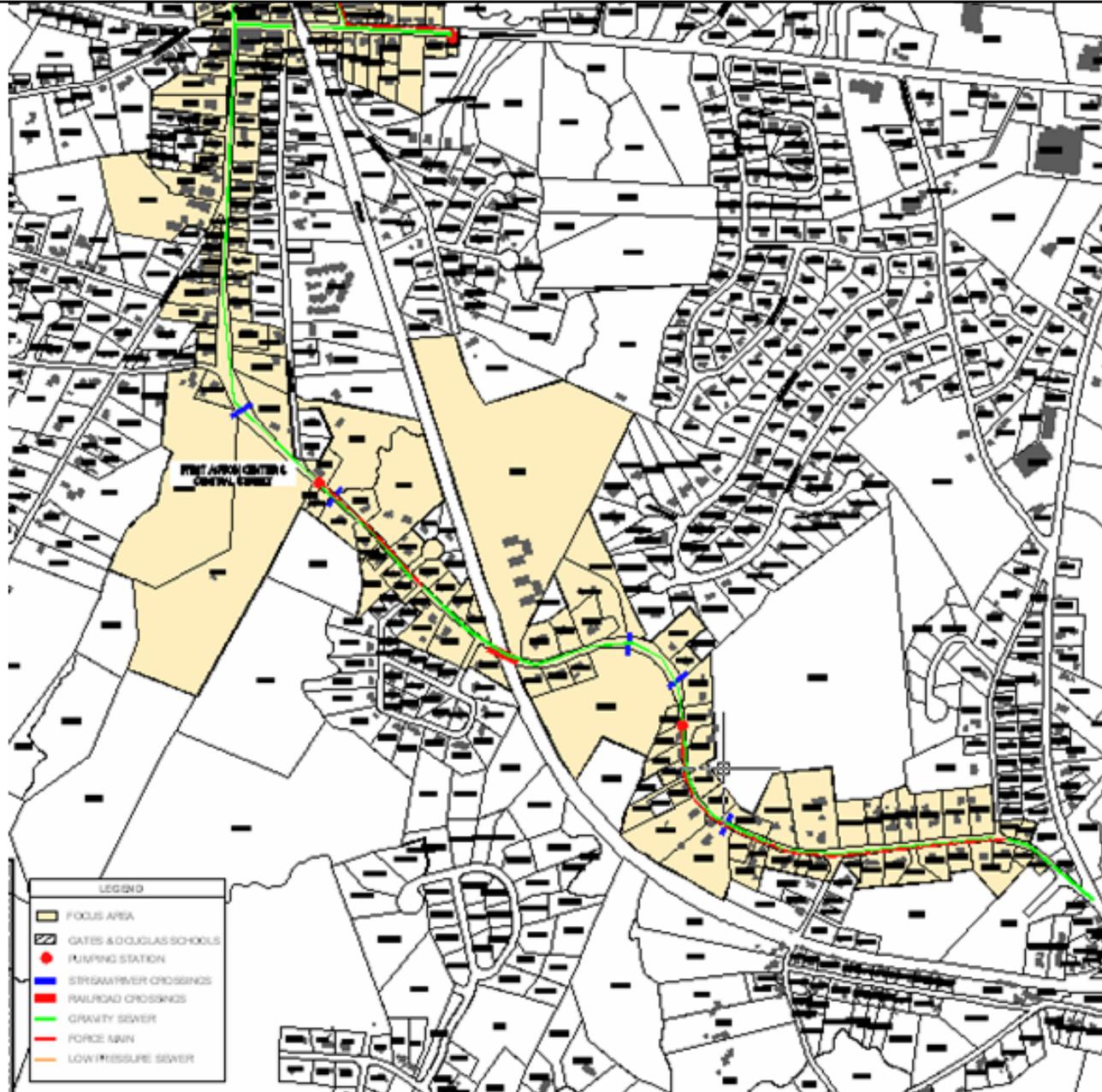
# West Acton Center – 2: West of Railroad (Limits of Zoning)



# West Acton Center – 3: West of Railroad (Limit of Gravity Sewer)



# West Acton Center – 4: West of Railroad (Routing along Central Street)



# STF - 2: Routing along Central Street

