CITY OF NORTHAMPTON

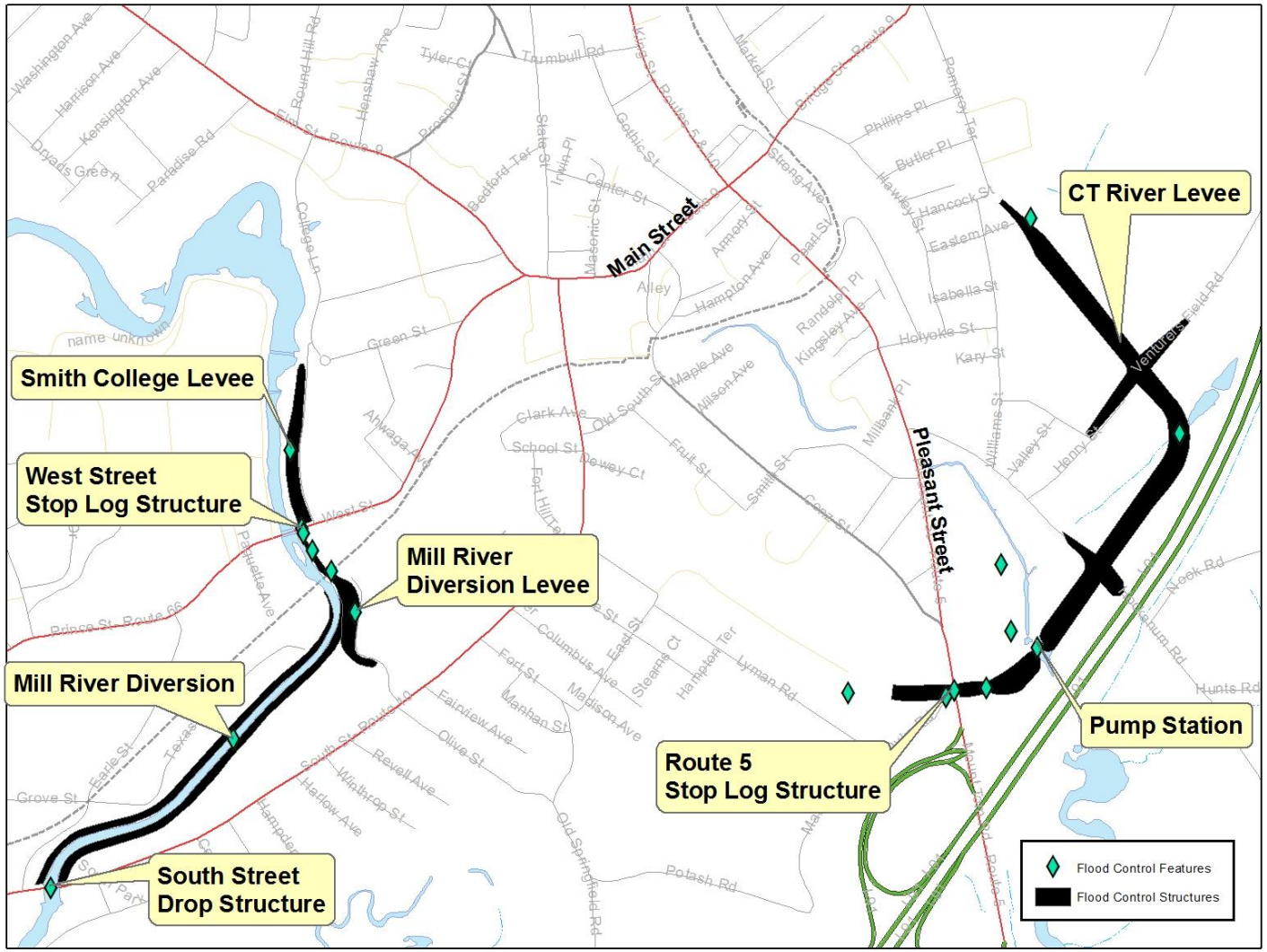
Flood Control and Stormwater Infrastructure Challenges

November 2012

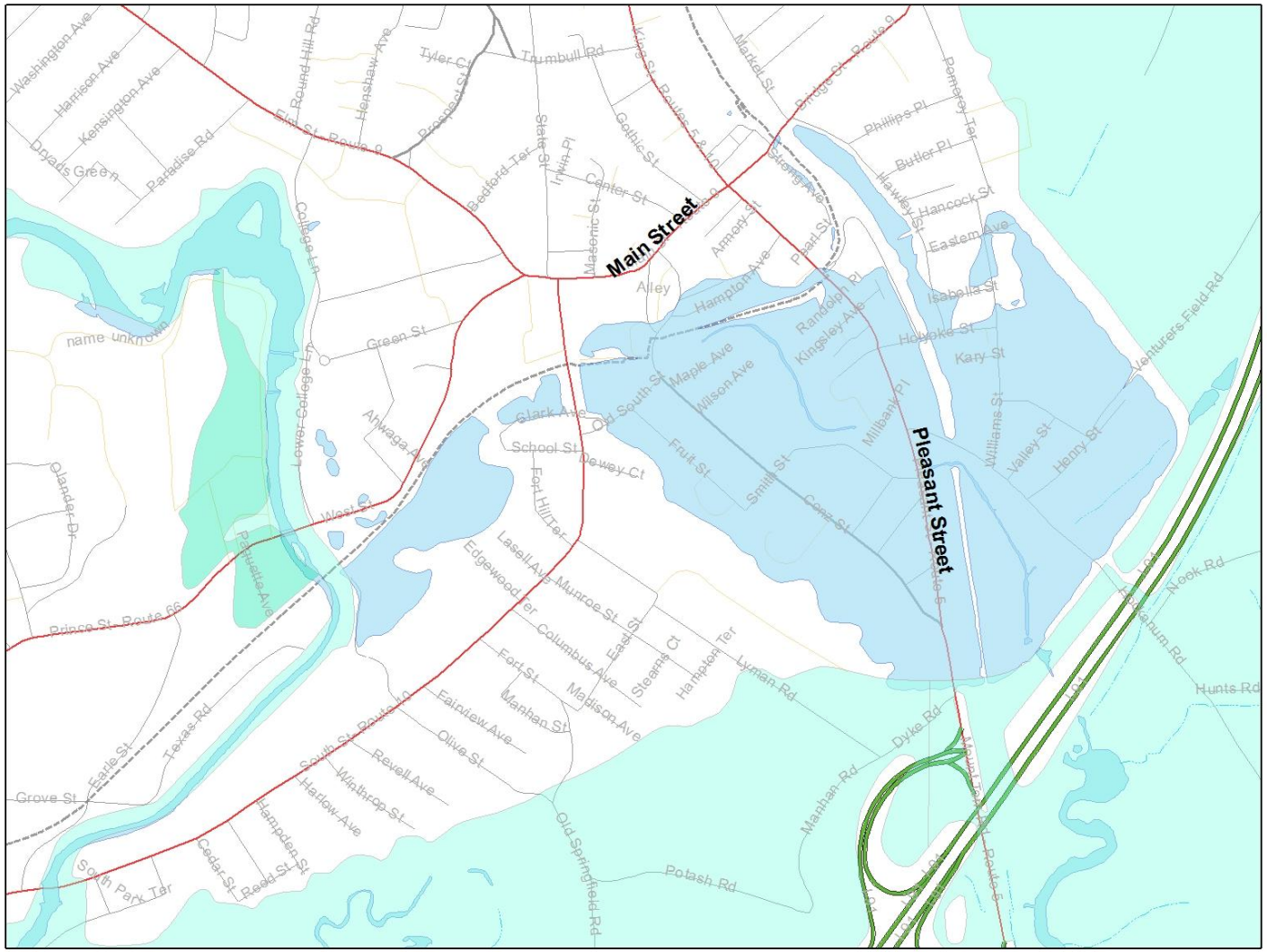
Flood Control - Overview

- Two Systems Constructed by Federal Government (Army Corps) – 1940
- Levees and Pumps built in response to Flooding in 1936 and 1938
- Connecticut River Levee and Pump Station
- Mill River Levee, Pump Station and River Diversion

Northampton Flood Control Structures



Northampton Flooding at Elevation 127’ with no Flood Control System



Property Values - Cost of Failure

- 2012 Assessor's values includes inside-the-dike value of land & buildings inundated:

$ 199,610,148

Total building value: $ 54,203,450

Acres: 189 (under water inside the dike system in a 127' elevation flood)

Connecticut River 2011

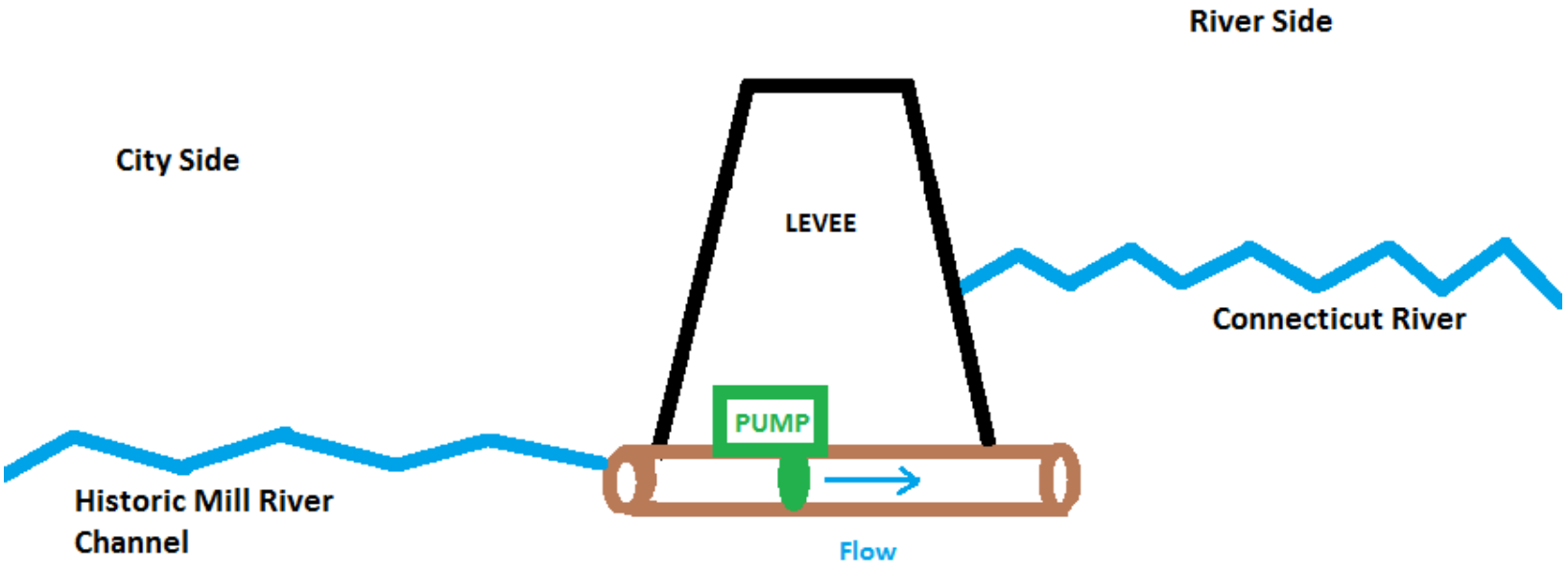
Connecticut River

Levee System holds back river water in August 2011.

Pleasant Street
Flood of 1936

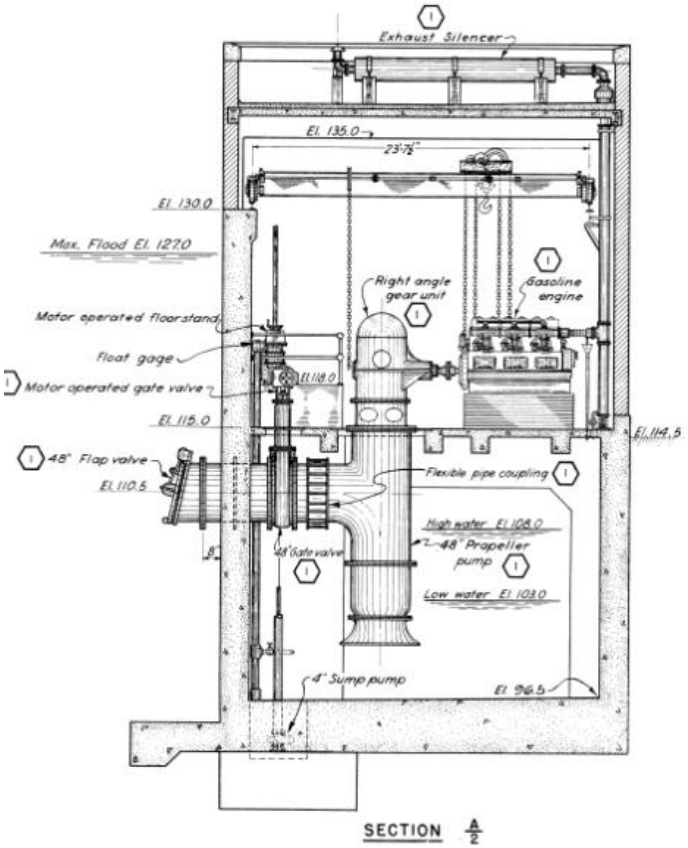
Downtown Underpass
Flood of 1936

Flood Control Pump Station at Flood Stage



Hockanum Road Pump Station

Pump Engine


Exhaust Silencer
El. 135.0
23'-7½"
El. 130.0
Max. Flood El. 127.0
Right angle gear unit
Gasoline engine
Motor operated floor stand
Float gage
El. 118.0
Motor operated gate valve
El. 115.0
El. 114.5
48" Flap valve
El. 110.5
Flexible pipe coupling
High water El. 108.0
48" Gate valve
48" Propeller pump
Low water El. 103.0
4" Sump pump
El. 96.5
SECTION A/2

West Street (Mill River)
August 2011

Mill River Levee

Mill River level rising during Tropical Storm Irene – Smith College

August 2011

Flood Control Mandates

- Army Corps mandated engineering studies and maintenance requirements
  - Analysis includes seismic, hydraulics, stability and settlement, topographic surveys and geotechnical borings.
- Mill River System - Maintenance and Analyses Deadline - January 2013
- Connecticut River System - Maintenance and Analyses Deadline - January 2014

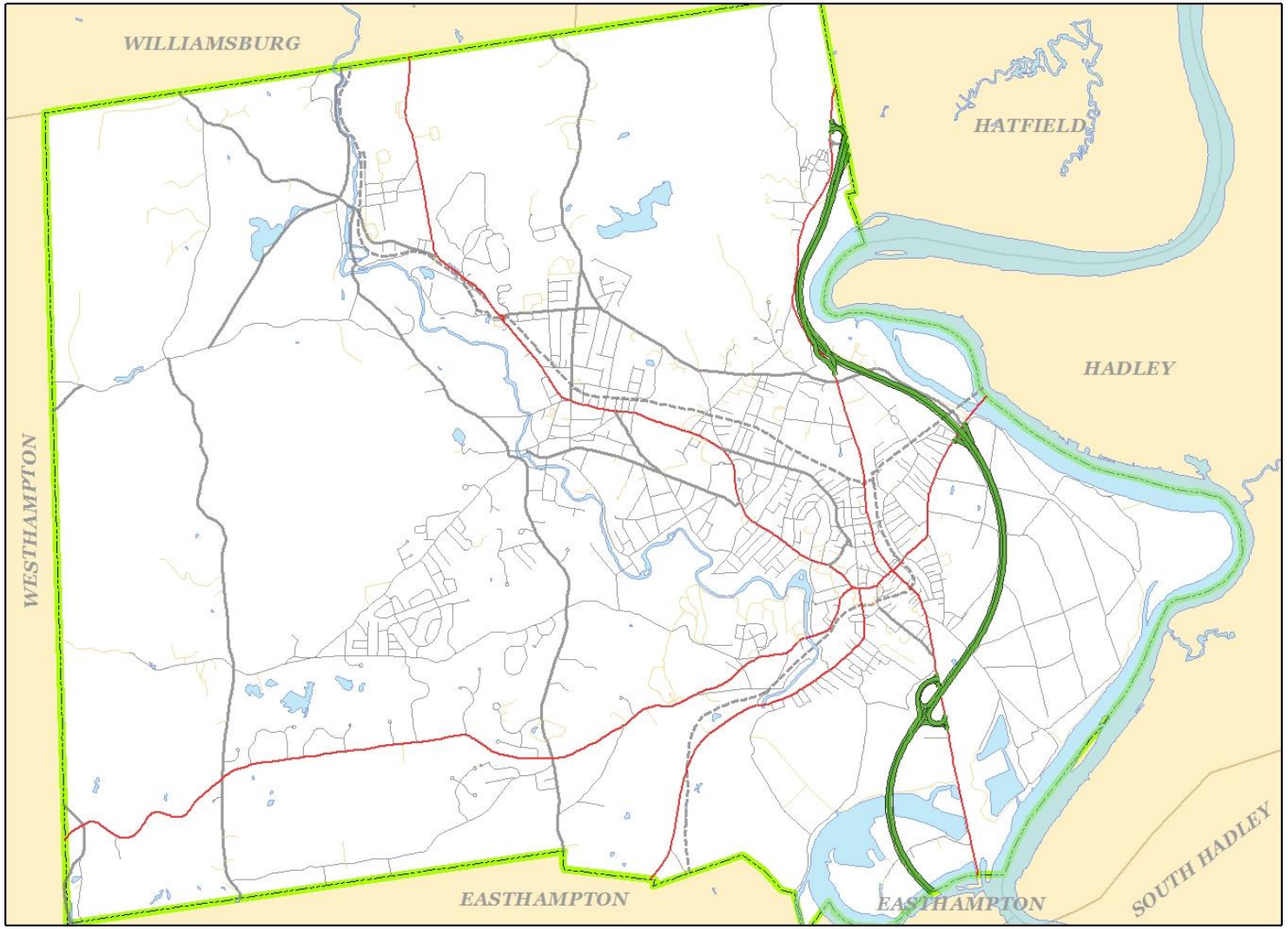
Flood Control Mandate (cont.)

- Estimated minimal cost is $1,200,000 for engineering and maintenance construction
- Unknown $$ to repair possible deficiencies
- Estimated mandates at the pump station are in the $1,000,000 range

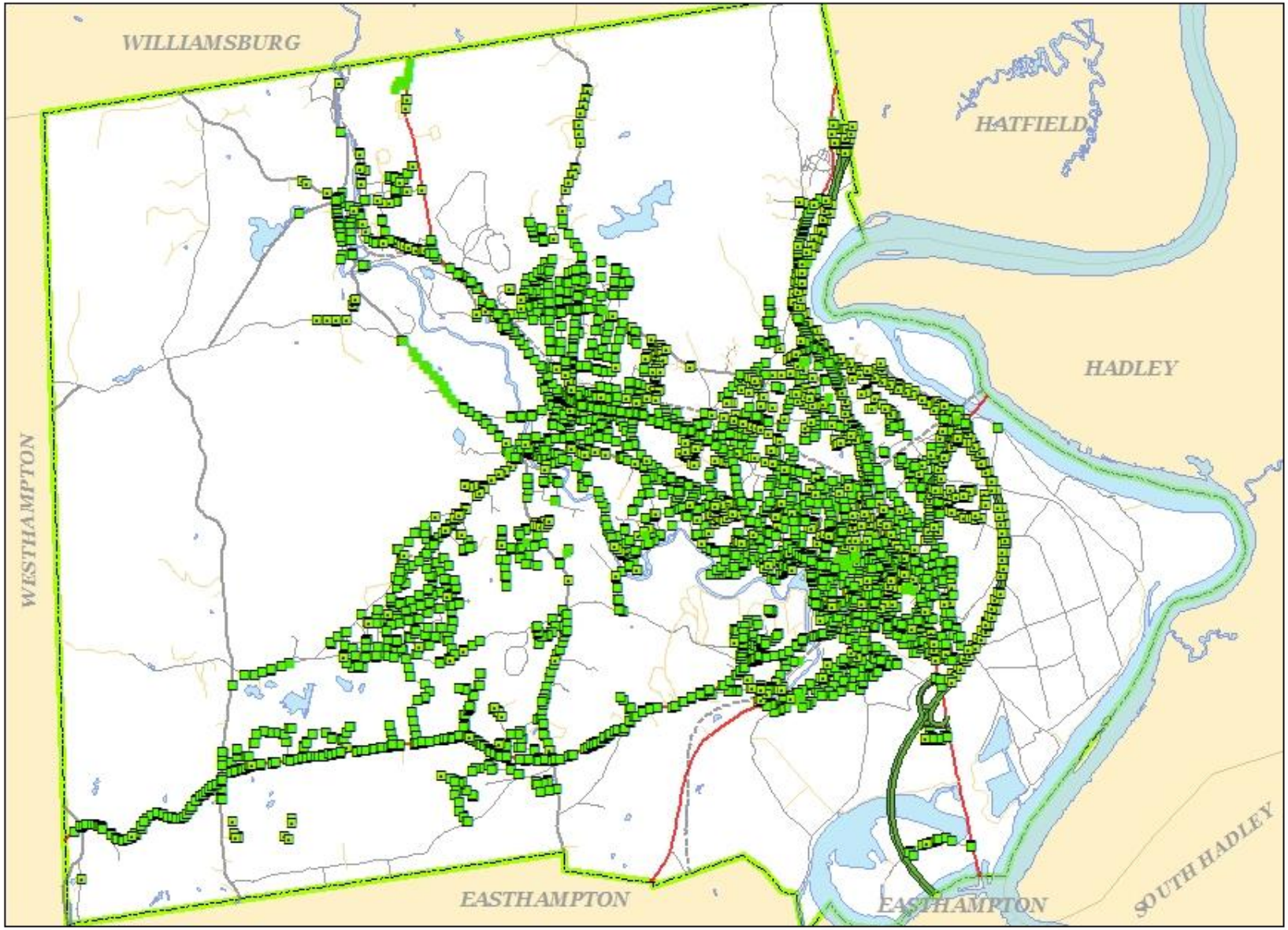
Aging Stormwater Infrastructure

- System is over 100 years old in many areas
- System is under capacity in many areas
- Some City areas don’t have drainage systems and need improvements
- Limited funds for replacing/repairing/constructing

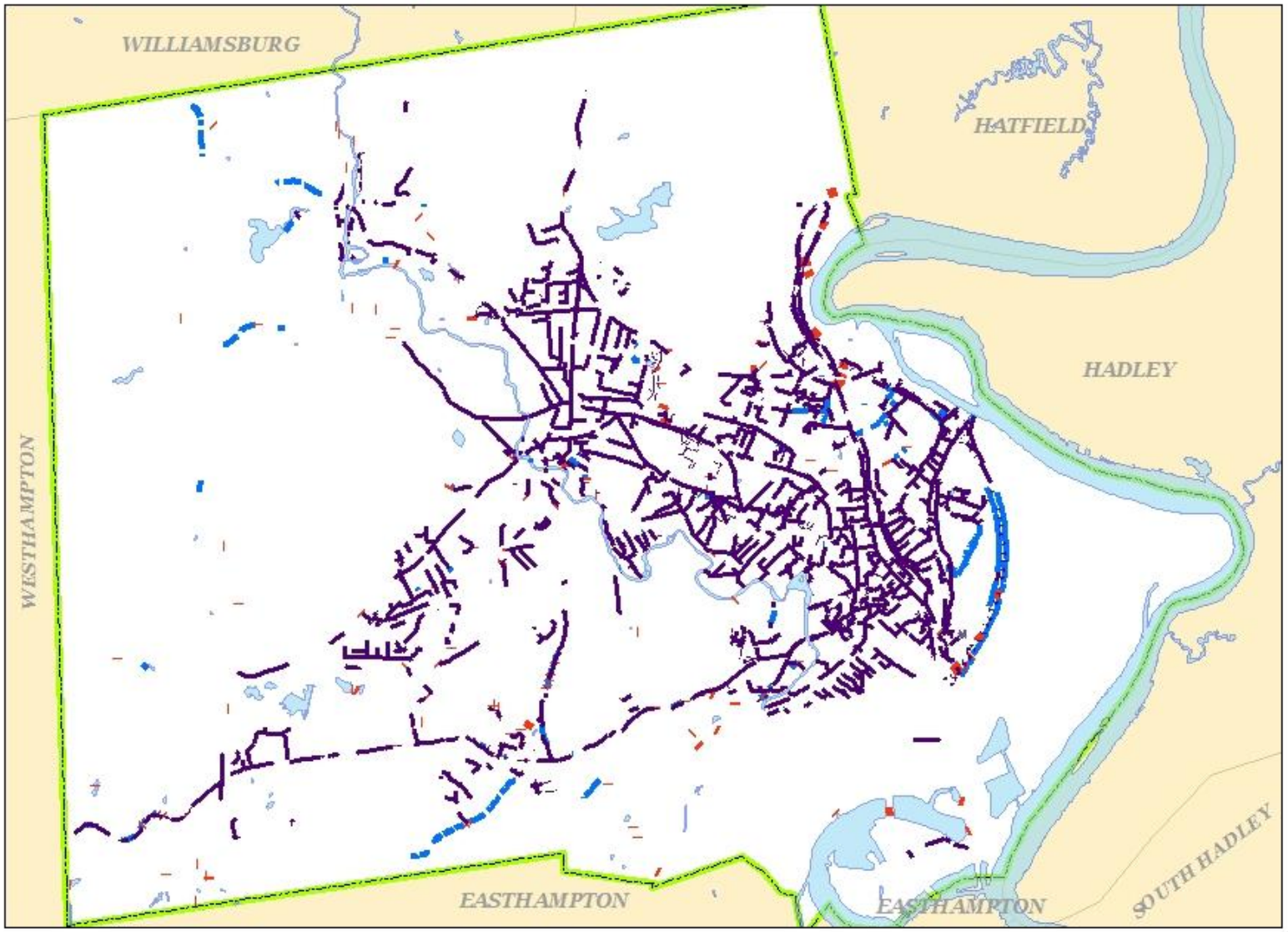
NORTHAMPTON



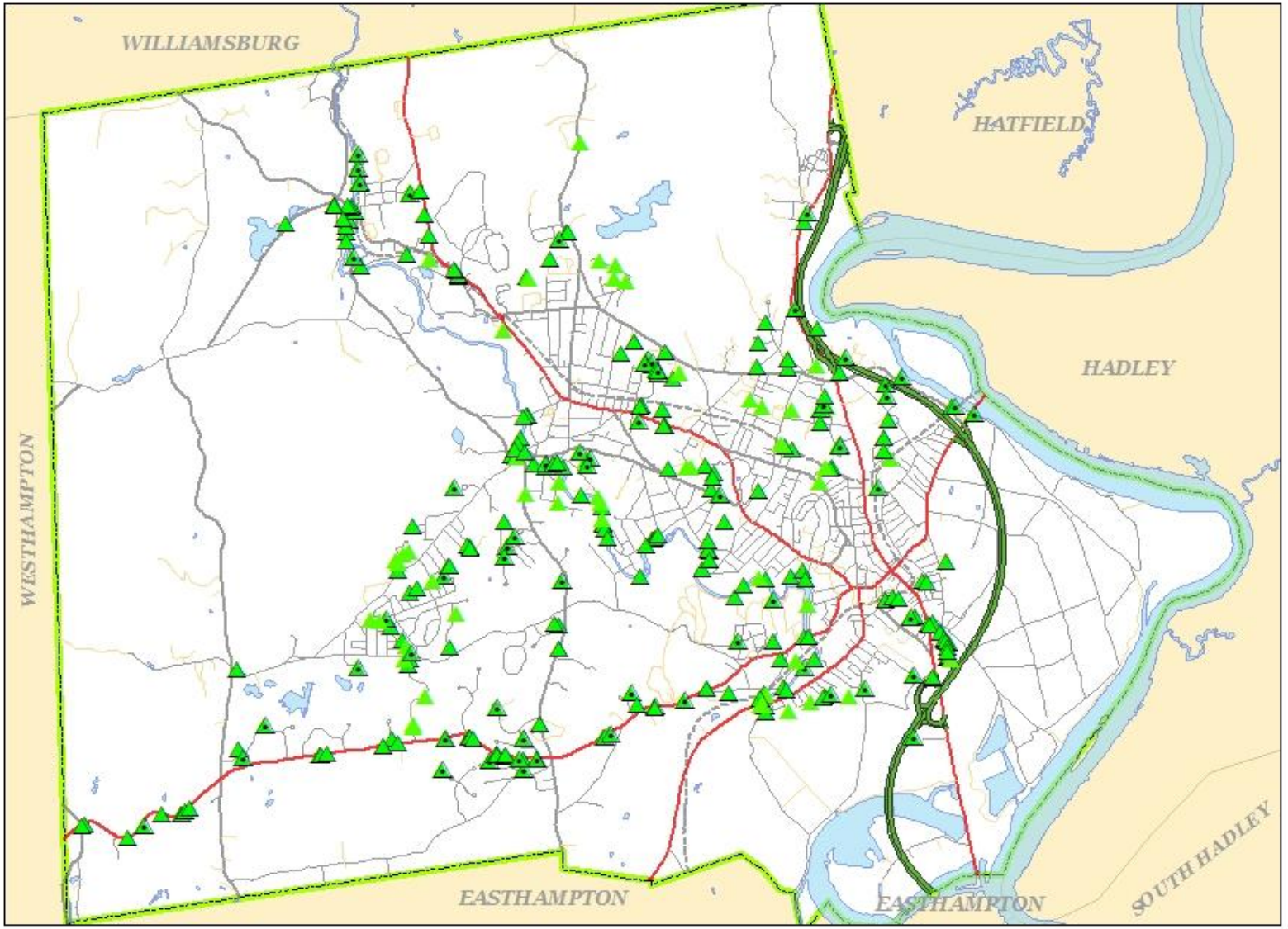
4,835 Catch Basins



114 Miles of Pipe, 190 Culverts & Drainage Channel



326 Drain Outfalls



Main Street Drainage

Under capacity stormwater drainage system causes surcharging of drain manhole during this rain event

North Street Flooding 2010

Under capacity stormwater drainage system causes ponding in the underpass after thunderstorm

Hatfield Street Drainage

Hatfield Street emergency drainage repair completed in 2011. (Note yellow gas pipeline).

Prospect Street Culvert Collapse 2004

Emergency Repair required costing $29,000

Florence Street

Stormwater drainage pipe – emergency repair by Public Works personnel.

Elm/Riverside/Milton Streets Flooding

Under capacity stormwater drainage system causes brook to overflow and flood the roadway and properties during rain storm

Vicinity of Austin Circle

Example of location that may require new drainage infrastructure.

New EPA Stormwater Permit - Mandates

- EPA permit regulates City stormwater discharges to Brooks and Streams
- The new EPA permit drastically increases costs for stormwater systems
- Increase O&M for permit compliance = $525,000
- Permit expected FALL 2012

EPA MANDATE - Catch Basin Cleaning

New EPA permit will require all catch basins to be maintained at less than 50% full with sediment. Currently, only certain catch basins are routinely cleaned of sediment.

Catch Basin Cleaning with Vactor Truck

EPA MANDATE - Street Sweeping

New EPA permit will require sweeping 2 times per year in Spring and Fall. Currently, streets are swept once each year.

EPA MANDATE – OUTFALL SAMPLING
Vernon St– Outfall to the Mill River

New EPA permit will require outfall sampling of 25% of City 326 outfalls. This is about 80 outfalls that will require sampling in dry and wet weather.

EPA MANDATE – GREEN INFRASTRUCTURE

Drainage Green Retrofit on Conz Street – Water Quality Swale

EPA MANDATE – PUBLIC EDUCATION

Other EPA Permit Mandates:

- Illicit Discharge Detection and Elimination
- Nitrogen Reduction in discharges
- Municipal floor drain inspection/improvements

River and Brook Erosion Threats

- City is blessed with scenic brooks and rivers
- BUT – Stream bank erosion may threaten property and infrastructure
- No funding source for these threats
- City aggressively chases limited grant money but this is inadequate funding and lacks responsiveness required for needs

River Road Retaining Wall – Mill River

This retaining wall is failing and threatens River Road and sewer interceptor line.

Federal Street Retaining Wall – Mill River

This failing retaining wall threatens sewer interceptor line. Temporary repairs have been done.

Roberts Meadow Brook – Musante Beach Area

Stream bank erosion on Roberts Meadow Brook threatens the house in the photo as well as a bridge a little further downstream.

Flood Control & Stormwater Mandates

- Army Corps mandated engineering studies and maintenance and repair requirements for Mill River and Connecticut River Systems including Levees and Pump Stations (estimated cost of $2,200,000 over the next three years).
- EPA Stormwater Permit Mandates that includes increased operation and maintenance costs estimated at $525,000 per year.
- River and Brook erosion repair projects

For questions

Budget

Stormwater and Flood Control
Projected Revenue Requirements (FY 2012-2015)

	FY 2012	FY 2013	FY 2014	FY 2015
Existing Operation Budget Allocations				
Overtime (Storms)	$23,000	$23,000	$23,690	$24,401
Flood Control	$32,625	$32,625	$33,884	$35,194
Personnel (w/benefits)	$164,096	$164,459	$169,392	$174,474
Storm drains O&M	$54,050	$54,050	$55,672	$57,342
Total Allocated O&M	*$273,771*	*$274,134*	*$282,638*	*$291,411*
Increase in O&M Budget (due to new EPA permit)				
Monitoring	–	$51,500	$106,090	$109,273
Engineering Staff (w/benefits)	–	$46,350	$95,481	$98,346
Operations Staff (w/benefits)	–	$77,250	$159,135	$163,910
Catch basin cleaning vehicle	–	$9,517	$9,517	$9,517
Vactor truck	–	$75,138	$75,138	$75,138
Street sweeper	–	$37,569	$37,569	$37,569
Public education	–	$10,300	$21,218	$21,855
Energy costs	–	$10,300	$21,218	$21,855
Total incremental O&M		*$317,924*	*$525,366*	*$537,463*
Infrastructure Investments				
Conz Street Drainage Improvements	$64,426			
North St Drainage		$225,000		
Drainage infrastructure			$250,000	$250,000
Municipal green design/construction			$30,000	$30,000
Flood Control Pump Station Analysis			$100,000	$100,000
Total Infrastructure Investments	$64,426	*$225,000*	*$380,000*	*$380,000*
Total Operating Expenses	**$338,197**	**$817,058**	**$1,188,004**	**$1,208,874**
Debt Service				
General Bond:	$67,436	$68,746	$63,926	$62,176
Ridgewood Terrace/Crescent St				
Barrett St/Utility Study				
Anticipated Future Debt:				
Levee Repair(FY13 to FY15)		$61,100	$59,573	$58,045
Pump Station Mandate Repair (FY13 and FY14)		$13,750	$65,906	$102,938
River Road Retaining Wall (FY13 and FY14)		$160,800	$156,780	$152,760
Roberts Meadow Brook (FY13 and FY14)		$54,600	$53,235	$51,870
Levee Certification (FY13 and FY14)		$55,000	$53,625	$52,250
Total Debt Service	**$67,436**	**$413,996**	**$453,044**	**$480,039**
Total Revenue Requirement	**$405,632**	**$1,231,053**	**$1,641,048**	**$1,688,912**

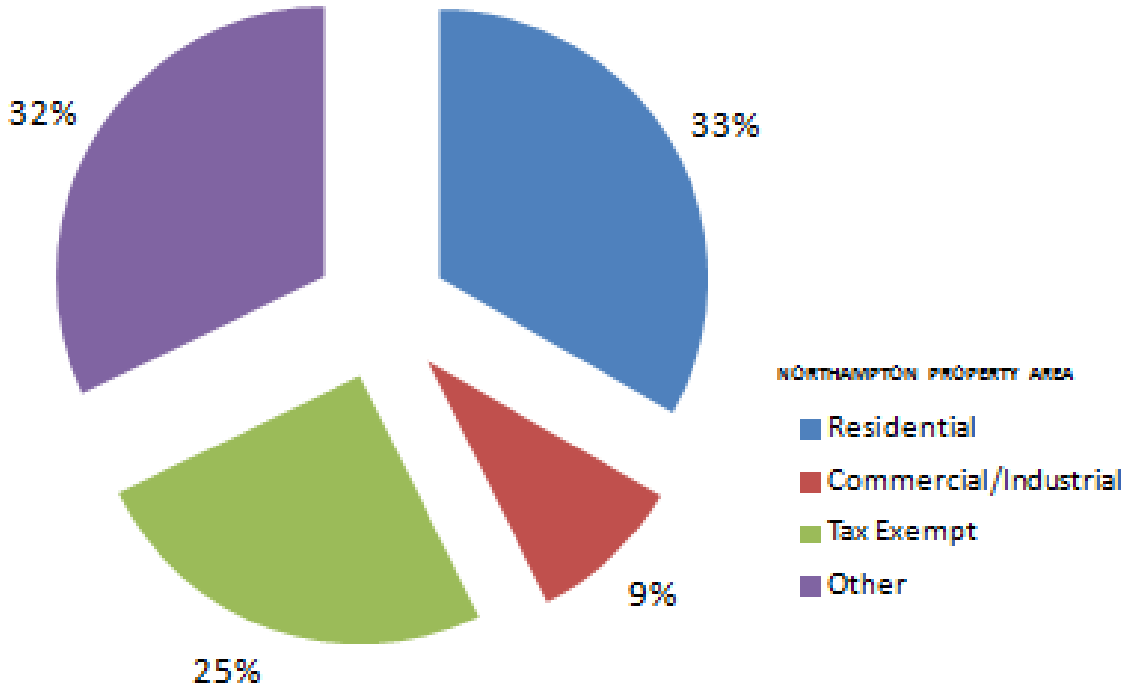
Ways to Meet Funding Needs

1. **General Fund – (Current Funding Method)**
2. **Use Override(s)**
3. **Create a new Stormwater and Flood Control Fee**
4. **Combination of General Fund and Fee**

1) General Fund

- The existing source of funding for Stormwater and Flood Control
- Flood Control/Stormwater programs compete with other City departments and services for limited funds
- Funding may not be stable and adequate
- Funding is not equitable: The General Fund is based on property taxes which bear little relationship to stormwater runoff
- Non-profit institutions do not contribute to property taxes

25 % of the Area in Northampton is Tax Exempt



2) General Fund & Override

- To supplement the General Fund – Prop 2 ½ override(s) might fund stormwater & flood control programs
- Program funding needs fluctuate based on capital projects. Multiple override votes may be needed to sustain programs.
- Unpredictable funding source for stormwater and flood control programs

3) Stormwater & Flood Control Fee

- Create a new dedicated, stable revenue source to fund stormwater and flood control system programs
- Would require determining a fee structure
- Tax-exempt properties are included
- Has been implemented in over 1,300 communities across the country since the 1970s
- Encouraged by DEP and EPA and allowed by law (MGL Chapter 83, Section 16 & MGL Chapter 40, Section 1A)
- Would require approval by the City Council

4) Hybrid of Fee & General Fund

- Pay program costs partly through fees and partly by General Fund
- For example use General Fund for operations costs and Utility for more variable capital projects
- General Fund may not provide a stable and adequate funding source

Questions?

How to Create A New Stormwater & Flood Control Fee

Basic Steps:

1. Estimate program revenue requirements
2. Develop of a Rate Structure to provide funding
3. Develop of a Billing System

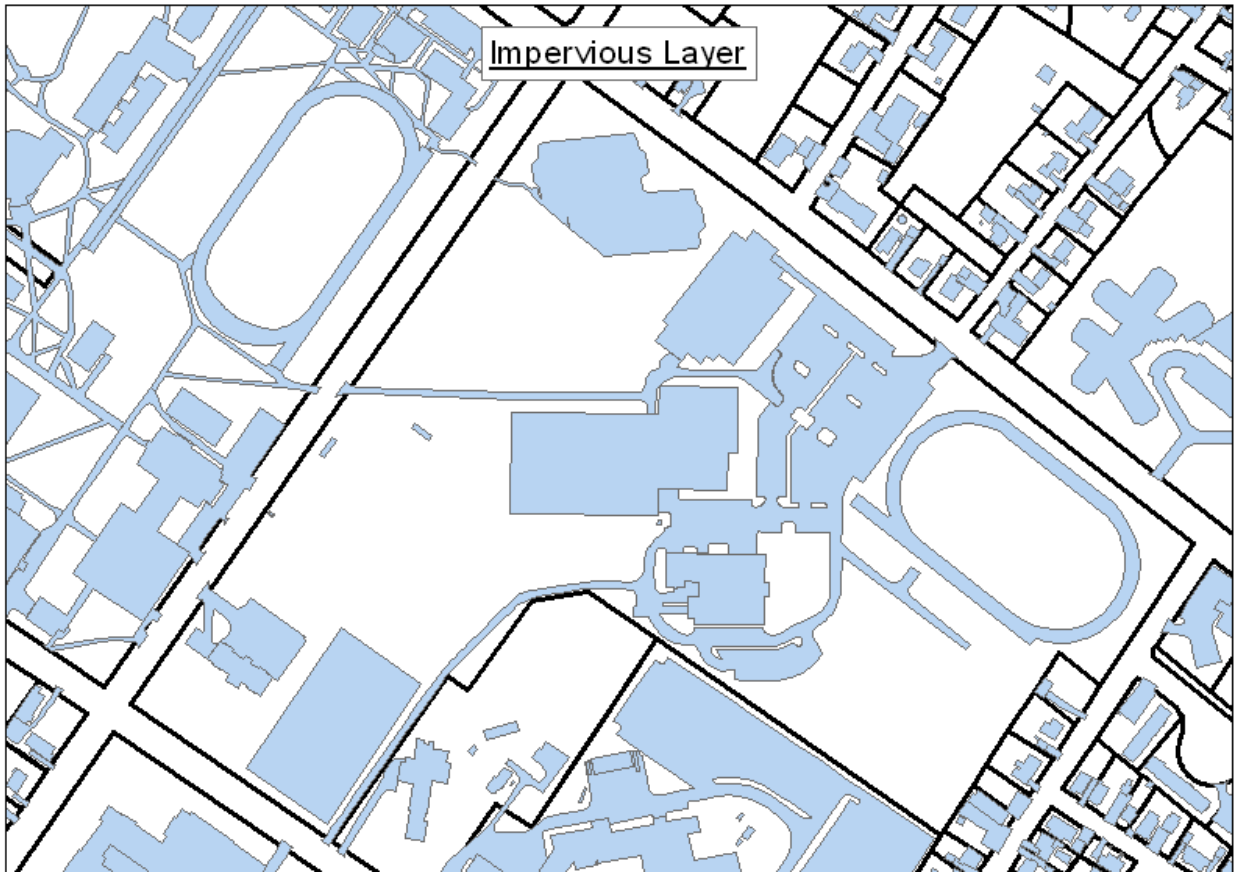
Fee Structure Options

- Flat fee
- Based on property value
- Based on property gross area, (number of square feet)
- Based on impervious area; increased runoff means more flow and pollutants
- Residential vs. Commercial factors
- Credits for agricultural land or drainage mitigation projects

1. Rate Method – Impervious Area

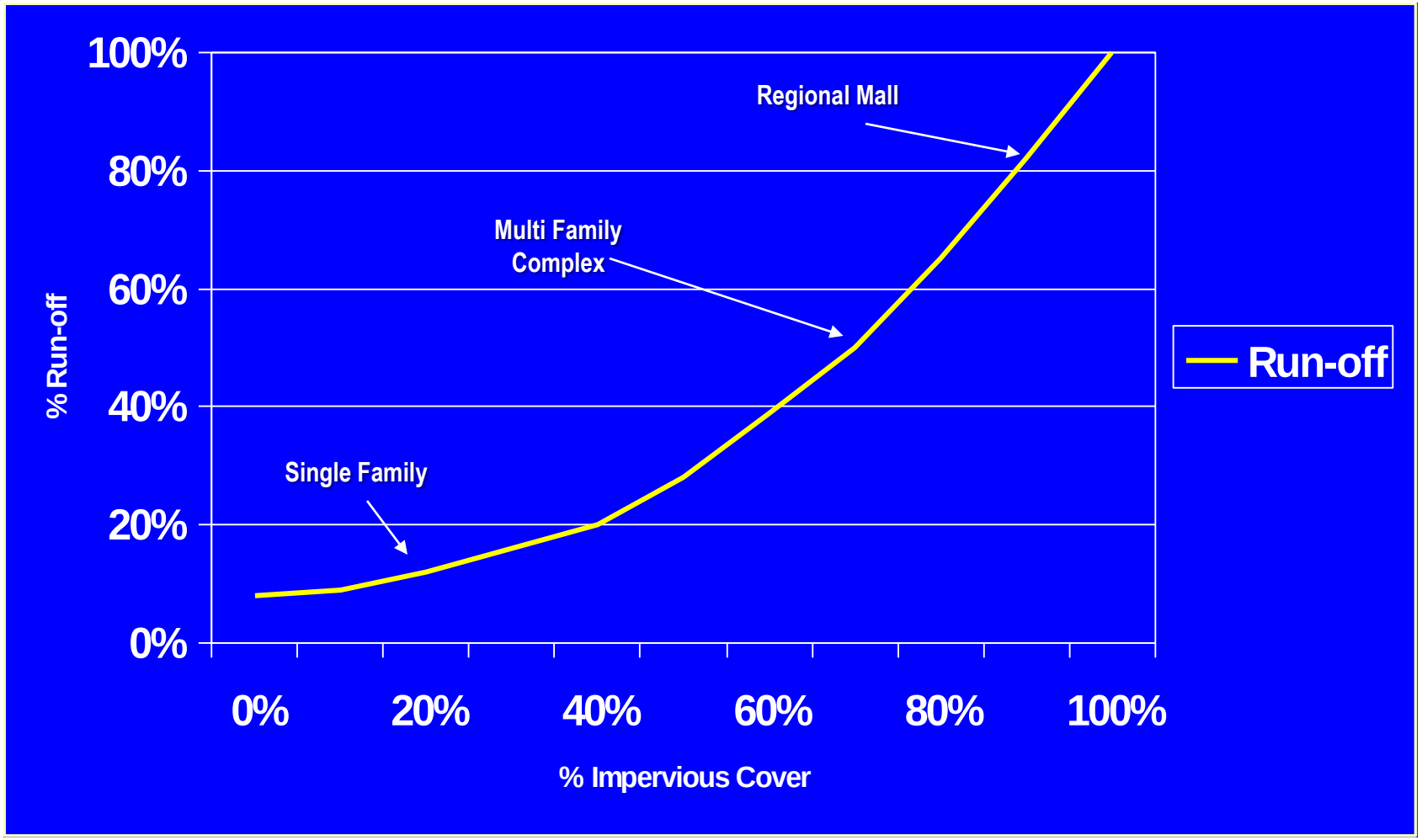
- Rate Based on Impervious area on a parcel
- Cost allocation based on property contribution to runoff
- Large roofs, parking lots, etc. pay more
- Undeveloped property is not billed
- Many towns use a flat fee for residential property, and calculate the actual impervious area for non-residential property
- CDM Report recommended this method

Total Parcel Area and Impervious Area are Mapped for Each Parcel



Total Parcel Area = 36.3 acres
Total Impervious Area = 12.4 acres
(highlighted in blue)

Rates Based on Impervious Surface Area: The more pavement and runoff - the higher the fee



2. Combination of Impervious Area and Total Property Area

- Equitable – All property owners would contribute to flood control/stormwater programs

- The calculation will take in to account both impervious area and the overall size of the parcel

- Determination of calculations/factors may require customer education

Stormwater Utility System Credits

- Possible Stormwater Impact Credits
  - On-site water management – beyond requirements
  - Rain gardens
  - Green roof-tops
  - Stream buffers/filters
  - Other systems that follow best management practices
  - Agricultural preservation
  - Conservation restrictions
  - CH61 Status lands, forestry, agriculture, recreation uses
  - Credit guidelines and credit values need to be determined

Need for Utility Task Force

- Use average flat fee for residential property?
- Calculate the fee for non-residential and commercial property?
- What about properties such as mixed-use, condominiums, mobile homes, and private roads?
- City property to be billed?
- Implement a utility credit system? Details?
- Many other details to be determined

Possible Task Force

- Potential task force members
  - City councilors
  - Board of Public Works members
  - Chamber of Commerce
  - Residents
  - Others?

THANK YOU!

We’d be happy to address any questions!