



**Princess Anne Plaza
Civic League Meeting
November 10, 2015**

Storm Water Improvements

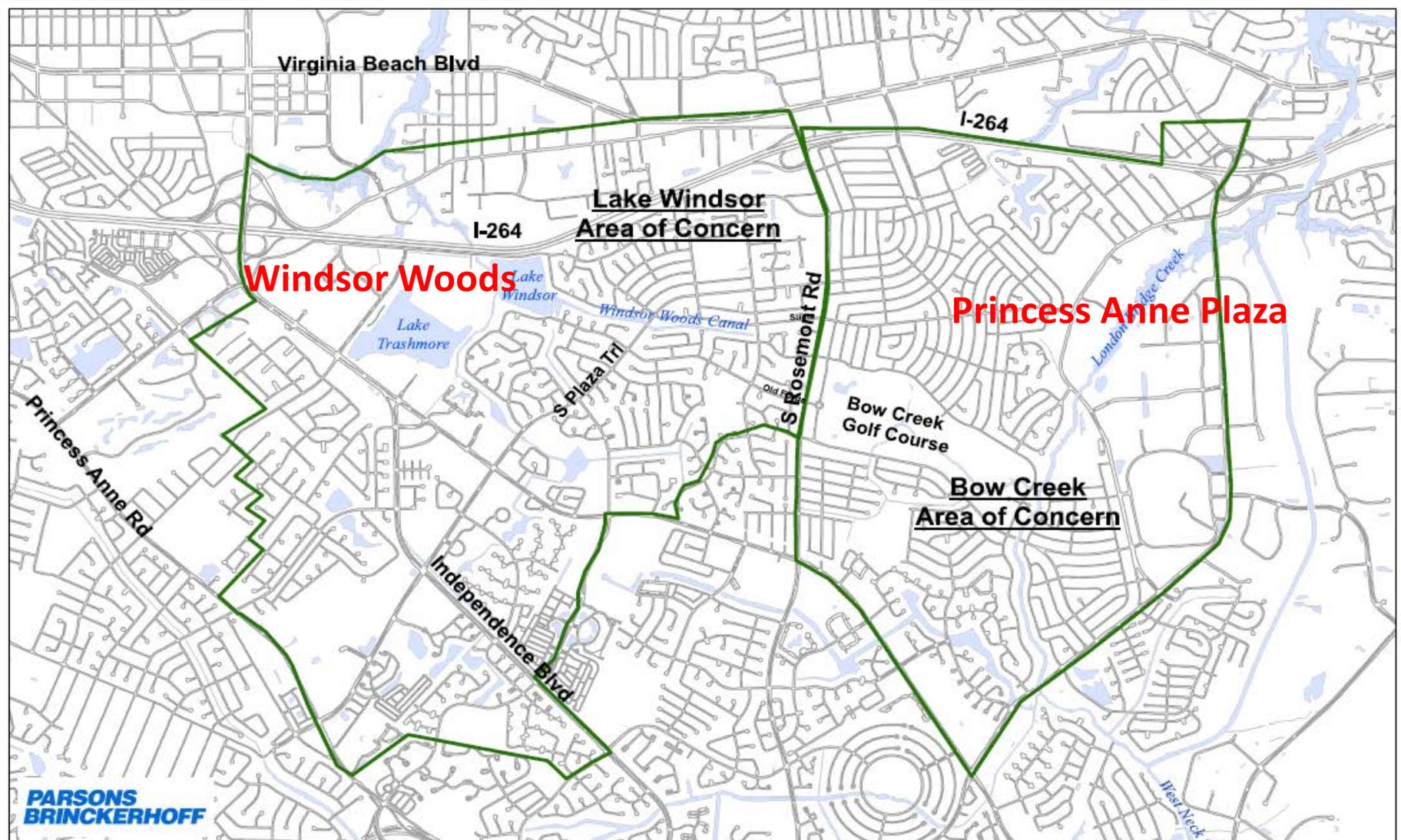
Princess Anne Plaza Civic League Meeting

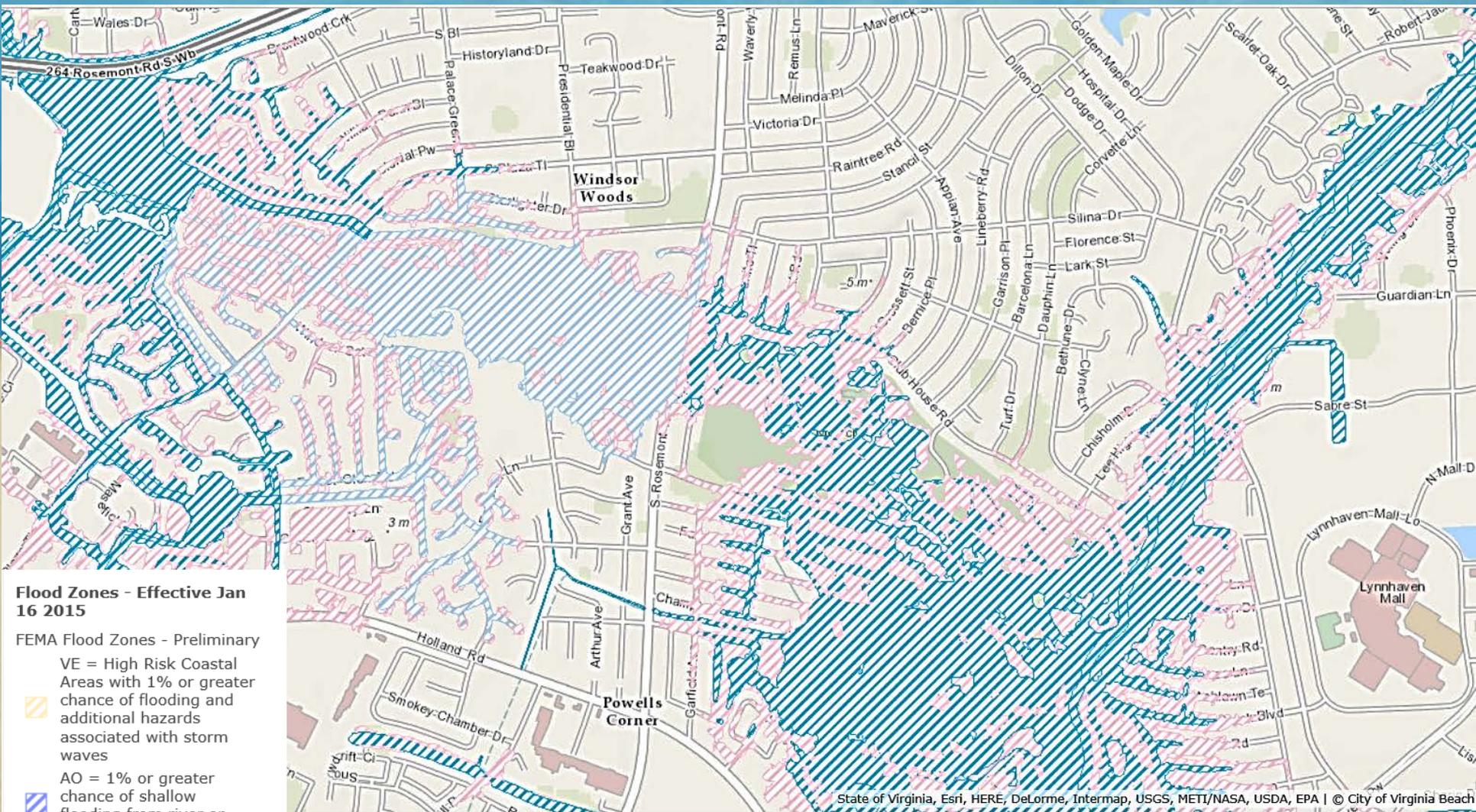
Agenda

- Drainage Areas and Flood Plain Maps
- Completed Projects
- Current Projects
- Potential Improvements Being Evaluated



Princess Anne Plaza Drainage Areas





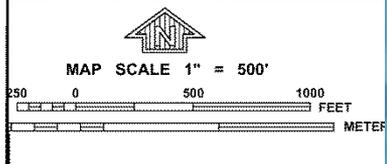
Flood Zones - Effective Jan 16 2015

FEMA Flood Zones - Preliminary

- VE = High Risk Coastal Areas with 1% or greater chance of flooding and additional hazards associated with storm waves
- AO = 1% or greater chance of shallow flooding from river or streams, avg 1-3'
- AH = 1% annual chance of shallow flooding usually from a pond, avg 1-3'
- A = 1% annual chance of flooding
- AE = Base floodplain see FIRM map for elevations
- X = Moderate to Low Risk Areas

Flood Zone Areas





PANEL 0103G

FIRM
 FLOOD INSURANCE RATE MAP

CITY OF
 VIRGINIA BEACH,
 VIRGINIA
 INDEPENDENT CITY

PANEL 103 OF 300
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COMMUNITY NUMBER PANEL SUFFIX
 VIRGINIA BEACH CITY OF 31501 0103 0

Notes to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
 5155310103G

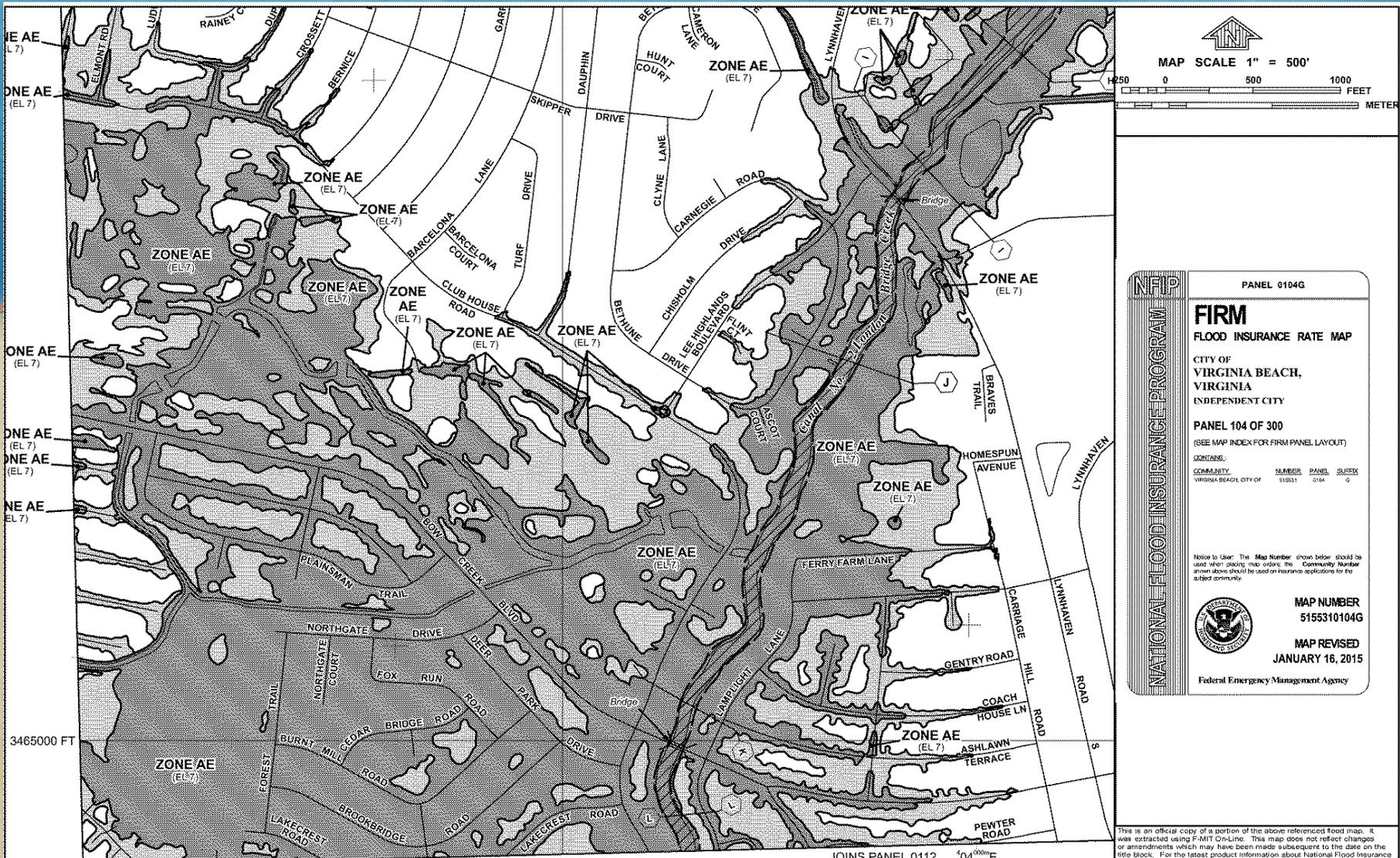
MAP REVISED
 JANUARY 16, 2015

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps, check the FEMA Flood Map Store at www.msc.fema.gov

Windsor Woods Flood Insurance Rate Map





Princess Anne Plaza Flood Insurance Rate Map



List of Completed Projects

- CIP 2-909 Canal Number 2 Improvements (1990)
Cost \$55 million
- CIP 2-115 Rosemont Road – Windsor Woods Drainage (1996)
Cost \$1.2 million
- CIP 7-114 Princess Anne Plaza Drainage Phase 2 (1998)
Cost \$5.9 million
- CIP 7-004 Storm Water Infrastructure Rehabilitation (2008)
Cost \$5 million
- CIP 3-405 Bow Creek Rec Center (2015) Storm Drainage Work
Cost \$600K



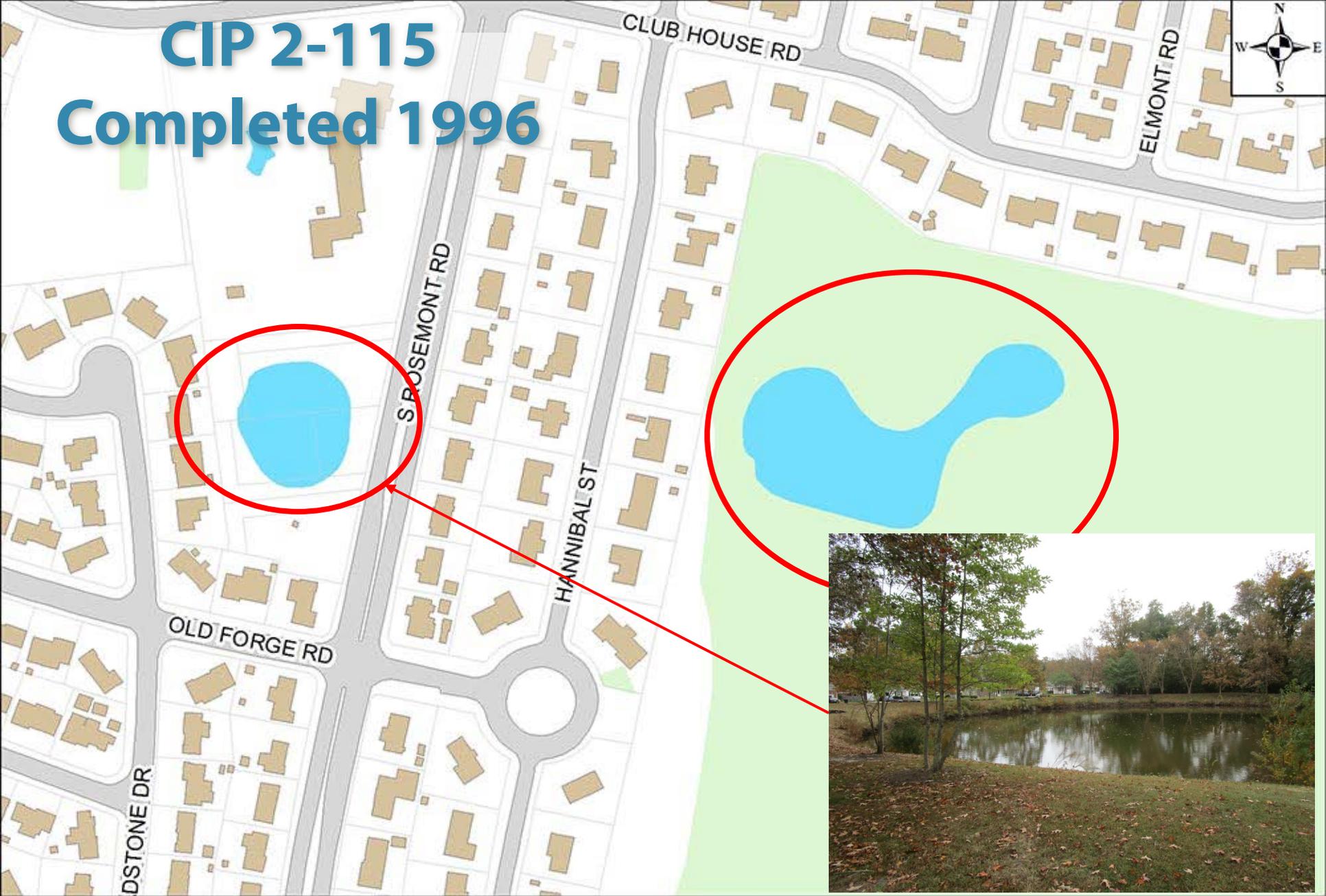
CIP 2-909 Completed 1990



Canal #2 Improvements – Cost \$55 million



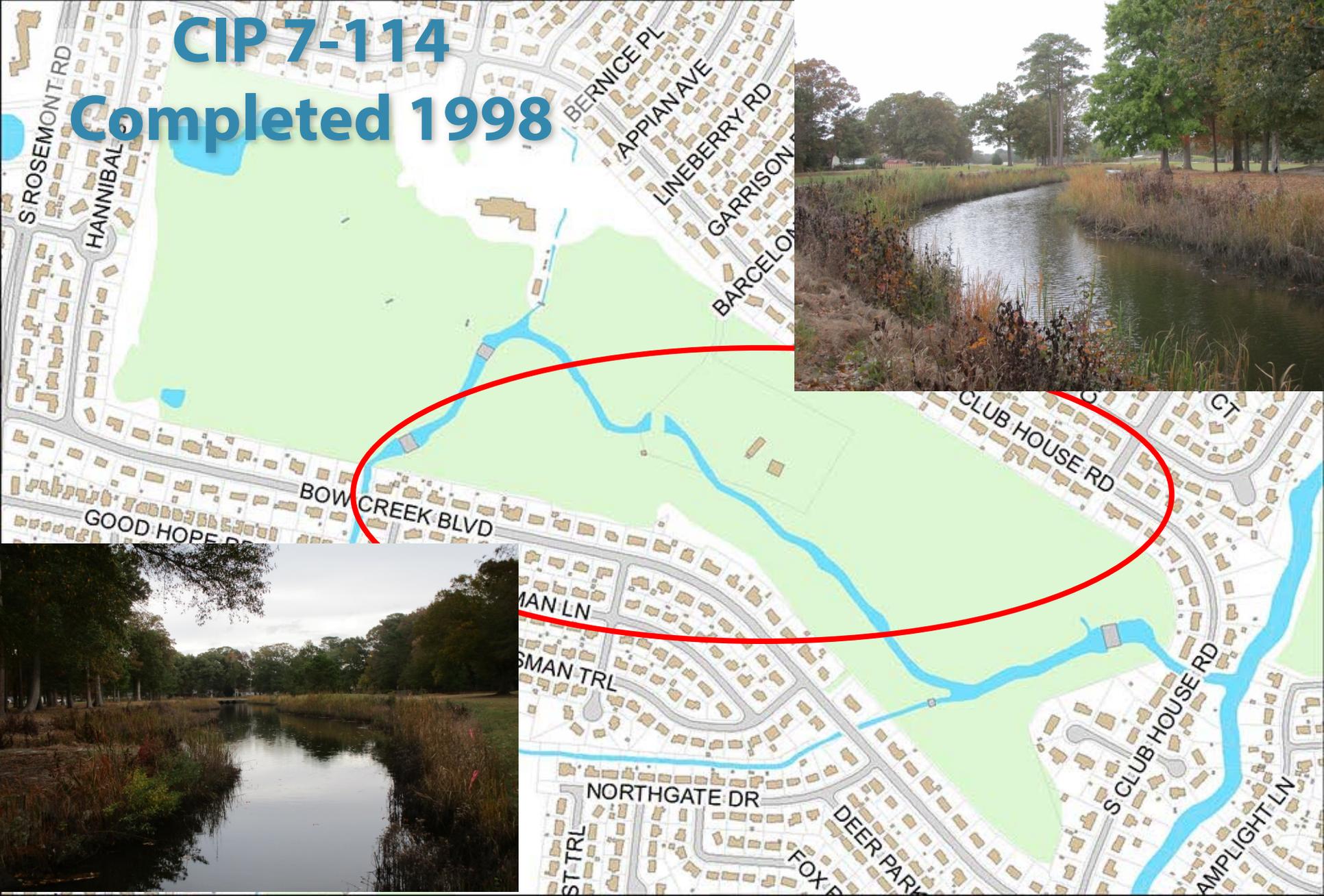
CIP 2-115 Completed 1996



Rosemont Road – Windsor Woods Drainage – Cost \$1.2 million



CIP 7-114 Completed 1998



Princess Anne Plaza Drainage Phase II – Cost \$5.9 million



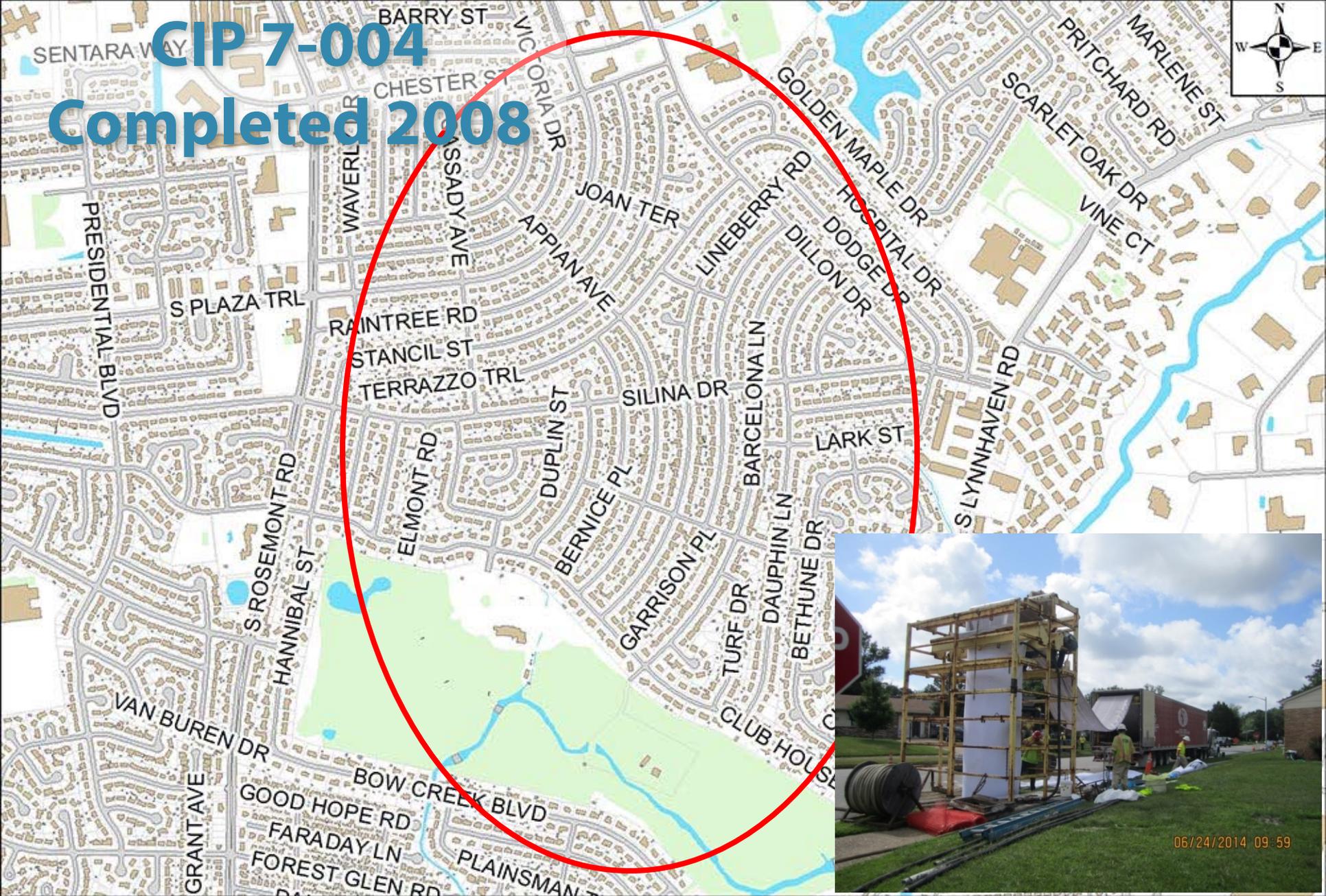
CIP 7-114 Completed 1998



Princess Anne Plaza Drainage Phase II – Cost \$5.9 million



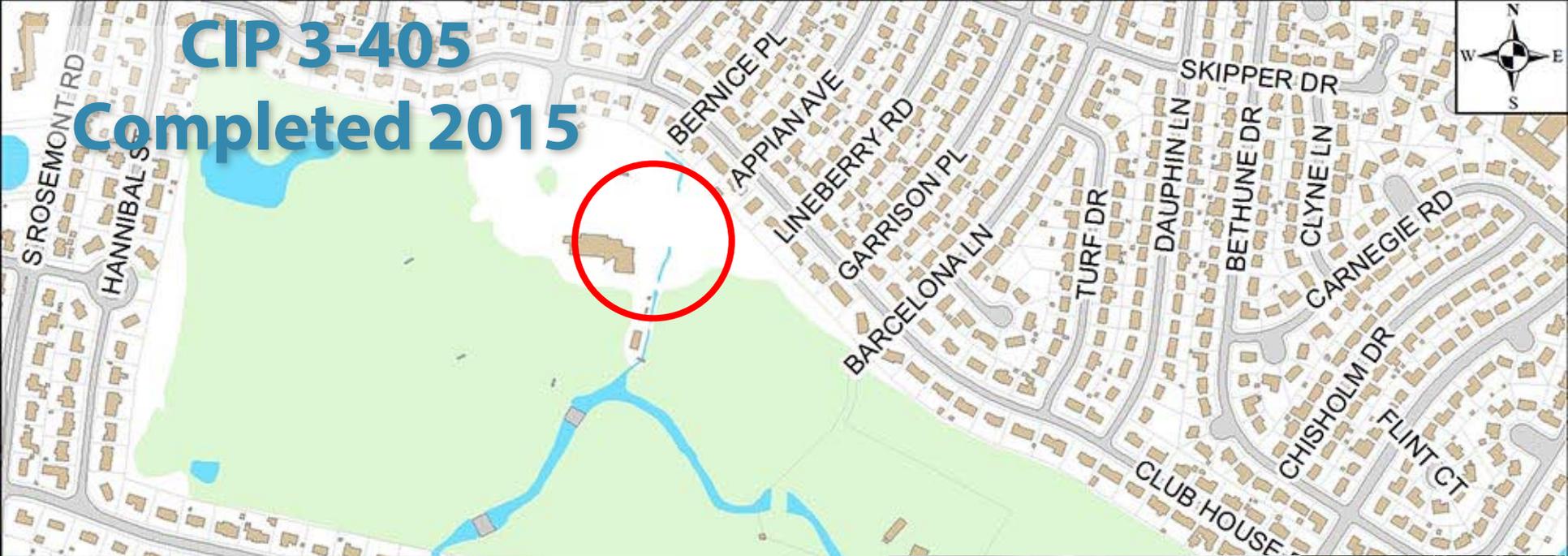
CIP 7-004 Completed 2008



Storm Water Infrastructure Rehabilitation— Cost \$5 million



CIP 3-405 Completed 2015



Bow Creek Rec Center Drainage – Cost \$600k



Current Activities

- Survey of Residents – Preliminary Study
- Windsor Woods Canal Improvements
- Windsor Oaks West Canal Improvements
- Princess Anne Plaza Channel (North Gate) Improvements

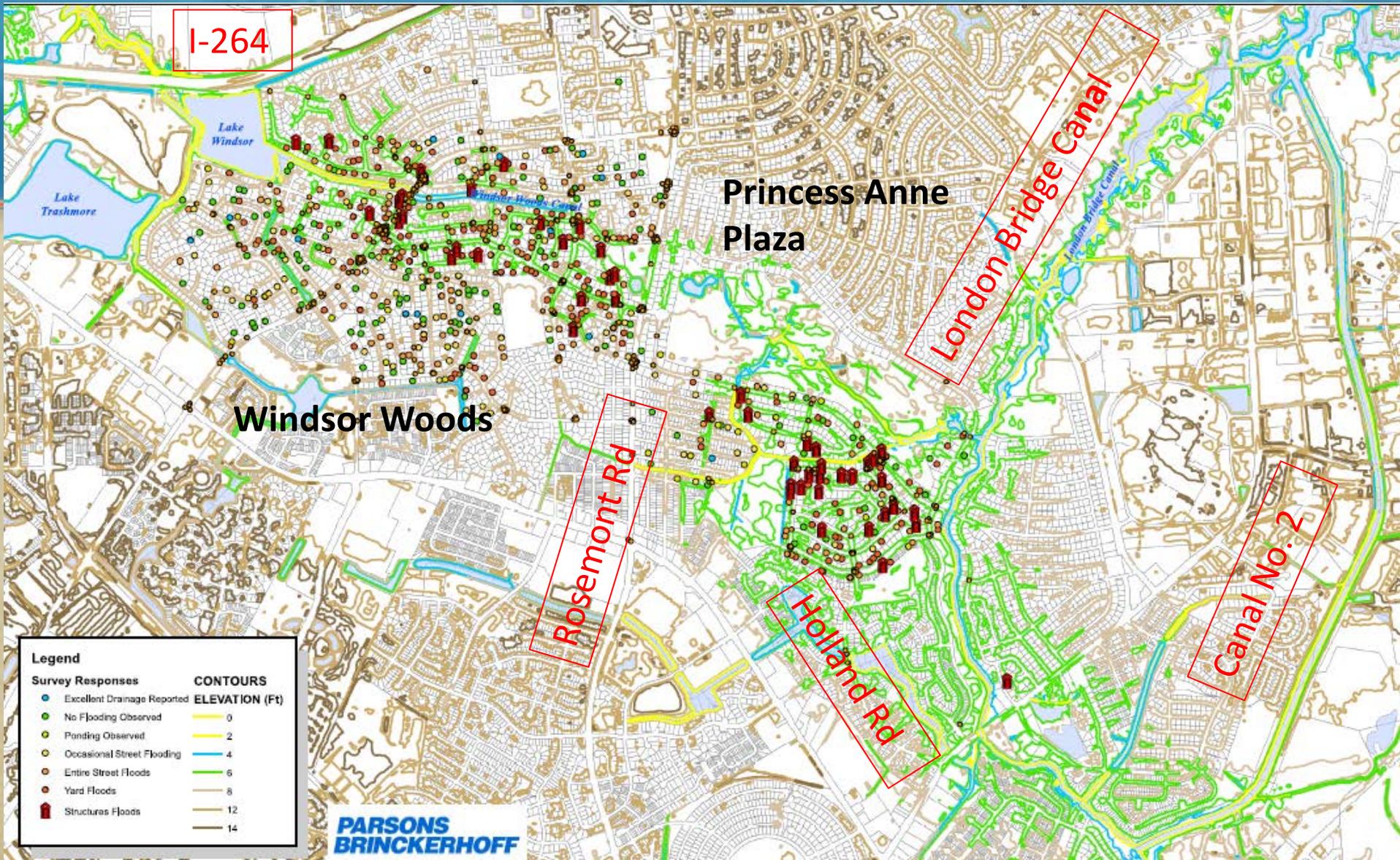


Survey of Residents Conducted 2014

Summary of Data

	#	% of total
Total Evaluations Received	538	100%
Structural Flooding	49	9.1%
Yard Flooding	195	36.2%
Entire Street Flooding	309	57.4%
Occasional Street Flooding	79	14.7%
Ponding	26	4.8%
No Problems with Drainage	110	20.4%
Excellent Drainage	13	2.4%

Survey of Residents Info Plotted on Map



Current Projects

Windsor Oaks
West Canal

Maintenance
Dredging

Windsor Woods Canal

Maintenance
Dredging

Princess Anne Plaza

Maintenance
Dredging

Maintenance Dredging and Channel Improvements

Design	1.5 Years
Construction	1.5 Years
Estimated Cost	\$3.0 Million
Estimated 12,000 Linear Feet of Work	







Holland Rd at Barberry Rd Before



Holland Rd at Barberry Rd After

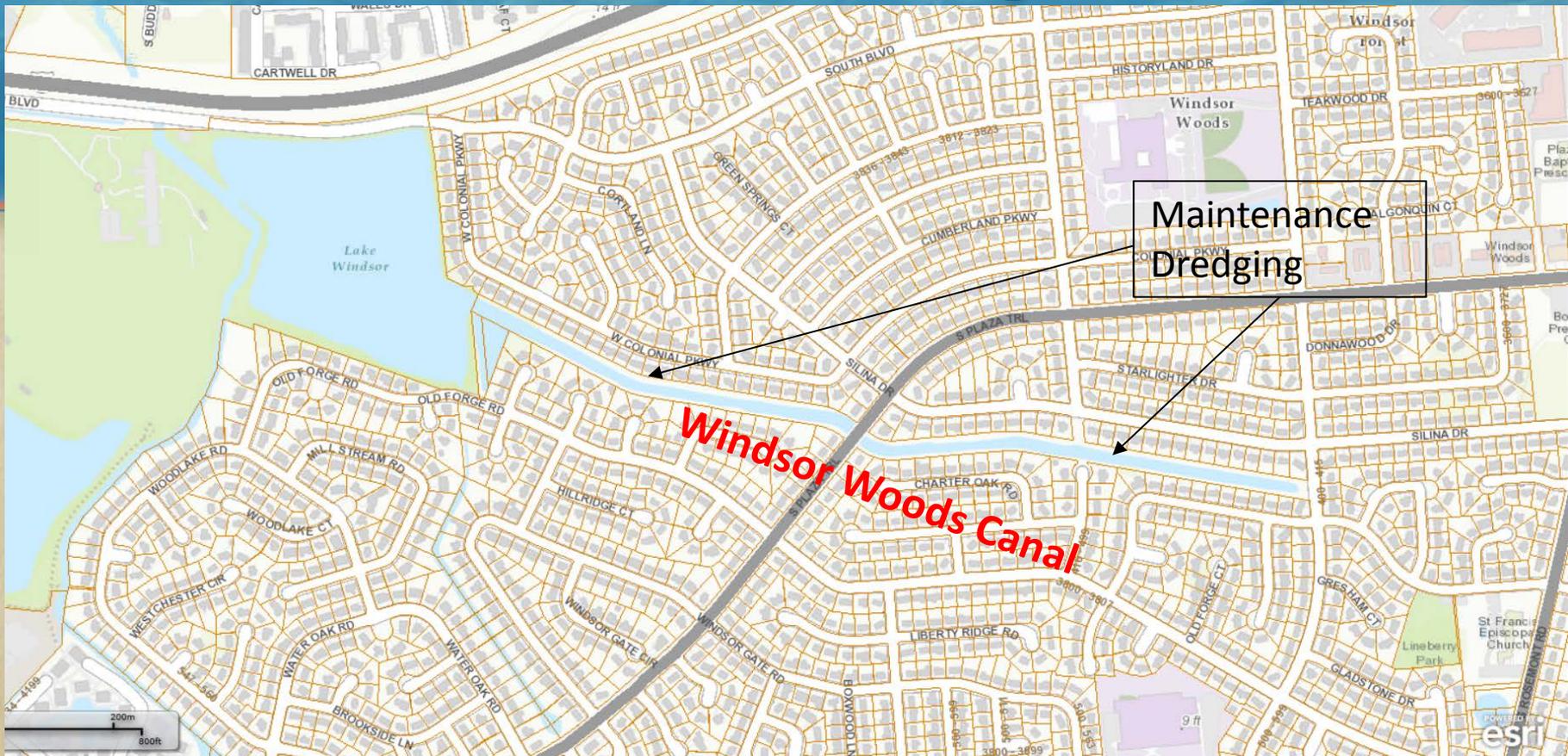
Lishelle Place Before



Lishelle Place After



Windsor Woods Canal Improvements

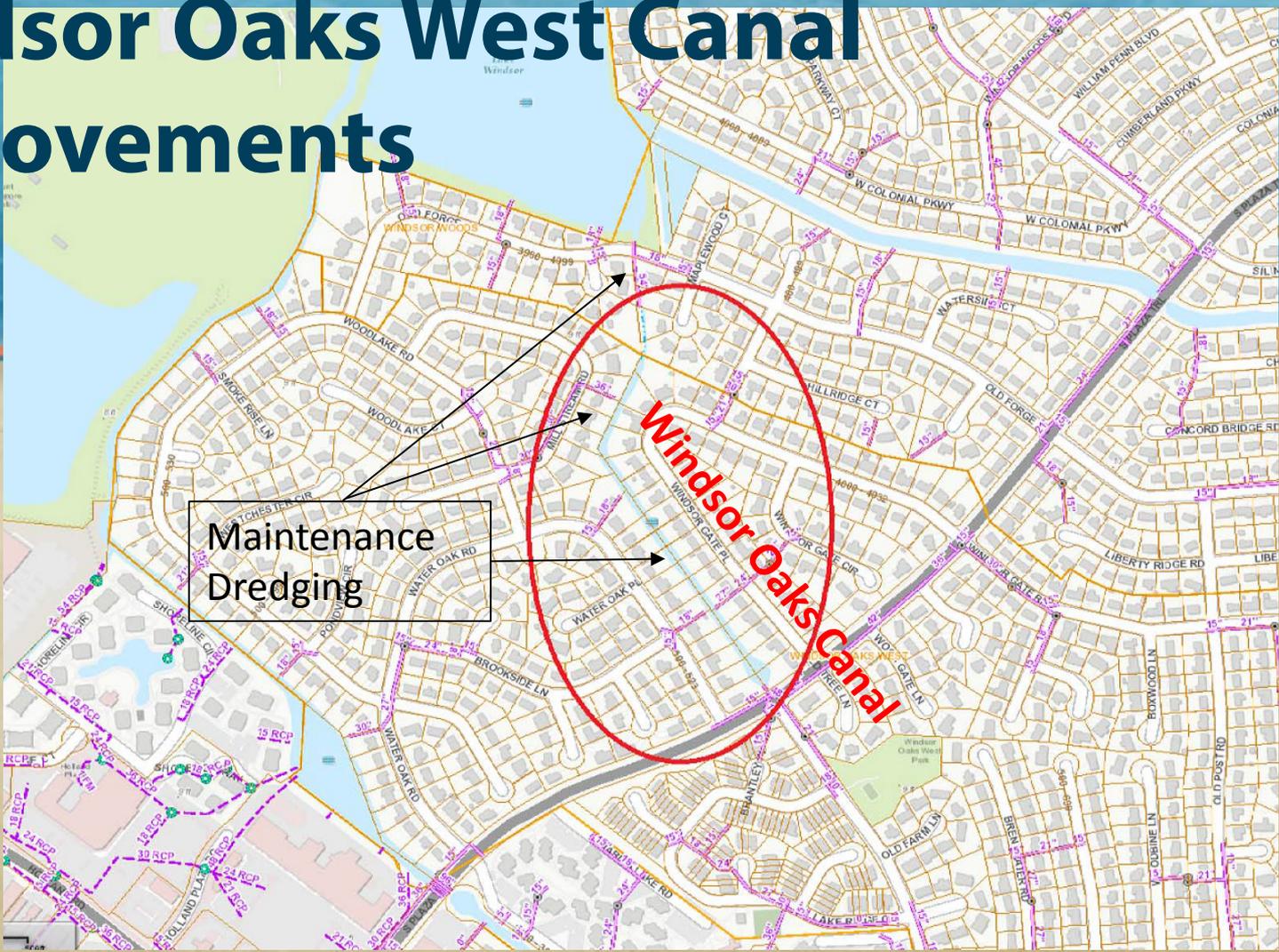


Maintenance Dredging and Channel Improvements

Design	1.5 Years
Construction	1.5 Years
Estimated Cost	\$1.0 Million
Estimated	4,400 Linear Feet of Work



Windsor Oaks West Canal Improvements

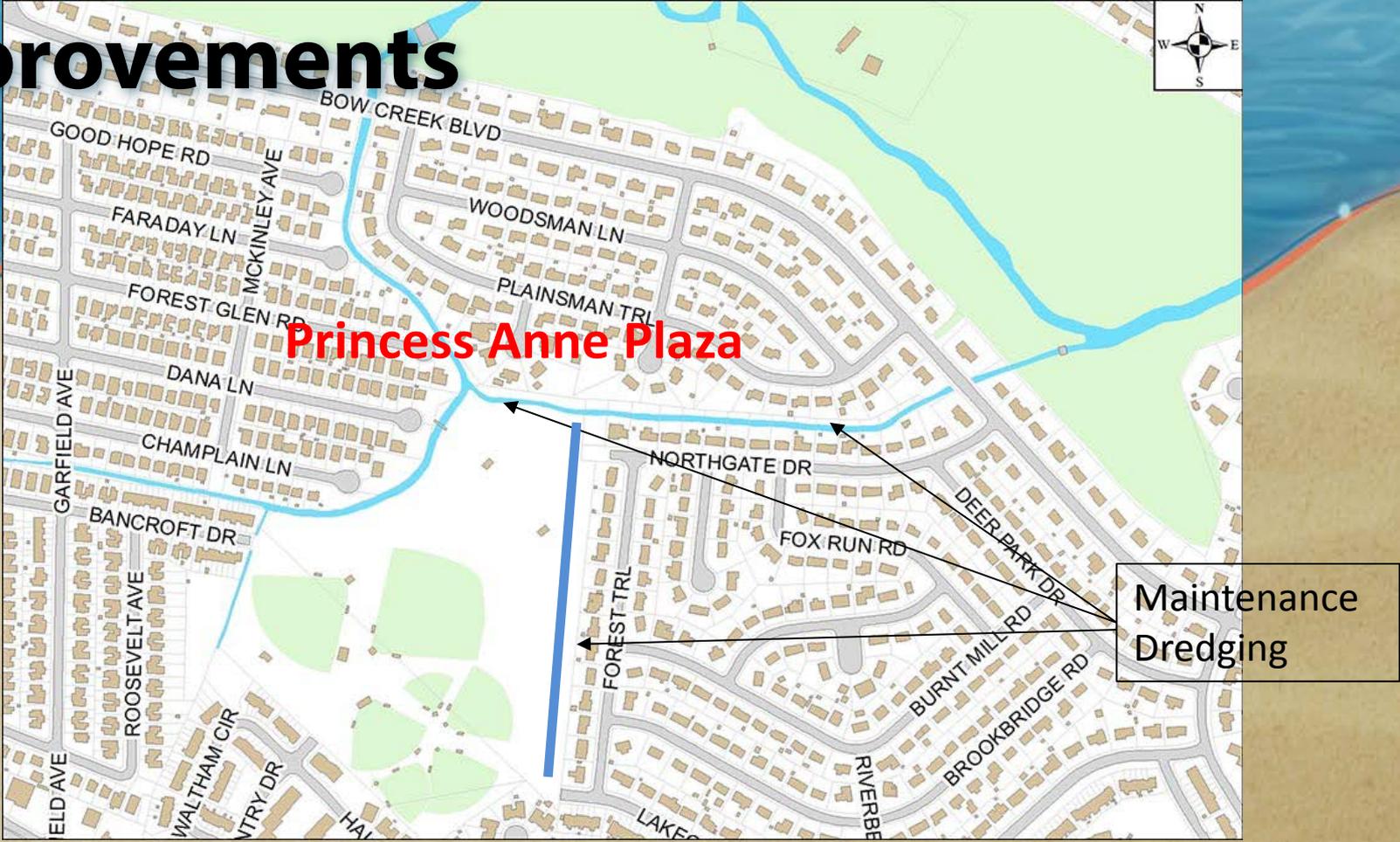


Maintenance Dredging and Channel Improvements

- Design 1.5 Years
- Construction 1 Year
- Estimated Cost \$1.0 Million
- Estimated 1,700 Linear Feet of Work



Princess Anne Plaza Chanel Improvements



Maintenance Dredging and Channel Improvements

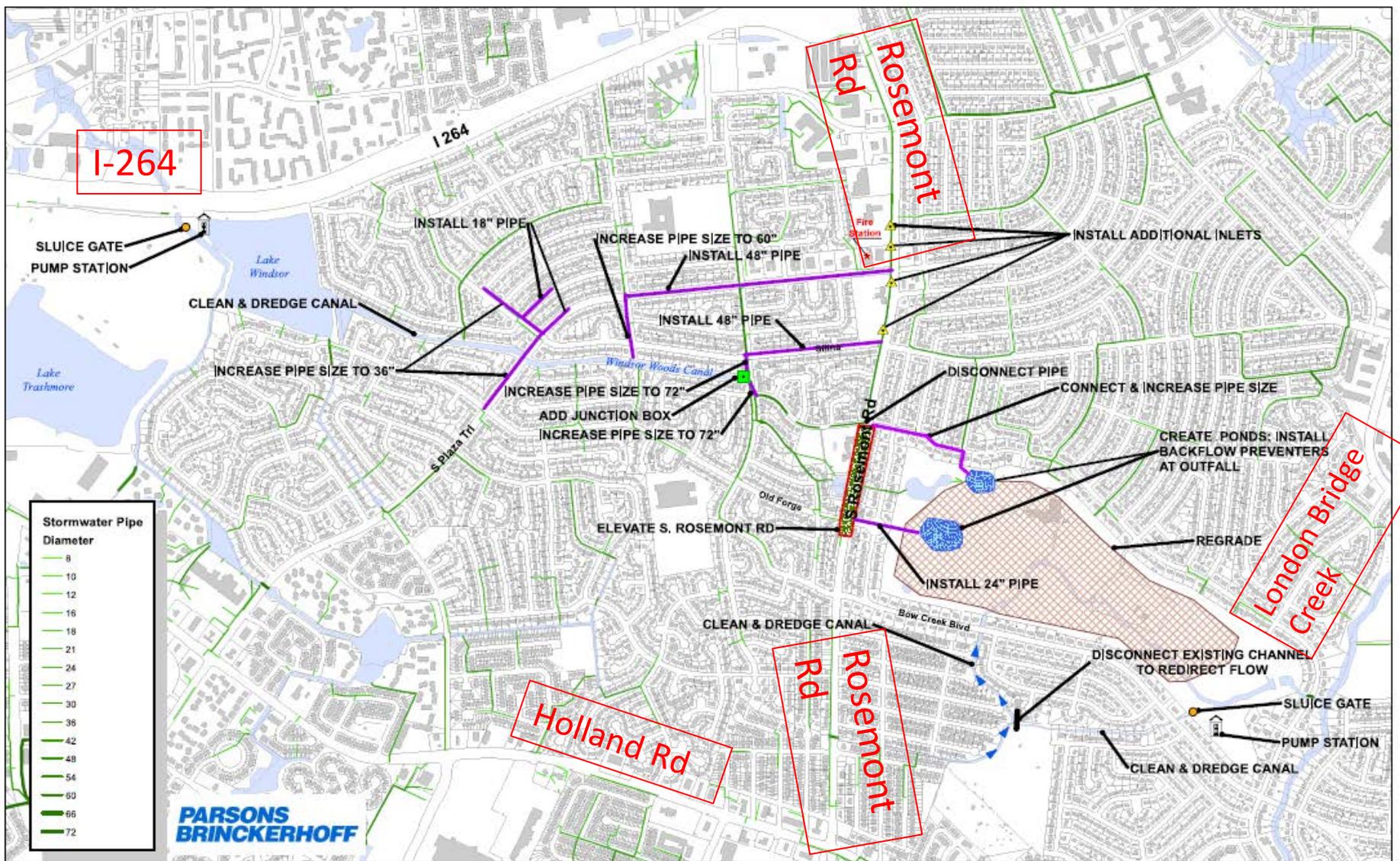
Design	1.5 Years
Construction	1.5 Years
Estimated Cost	\$1.0 Million
Estimated 6,000 Linear Feet of Work	



Potential Future Improvements

- Maintenance
- Internal improvements
 - Additional pipe systems
 - Additional ponds for storage
- Ultimately may need to address Sea Level Rise
 - Tide gates
 - Pump Stations

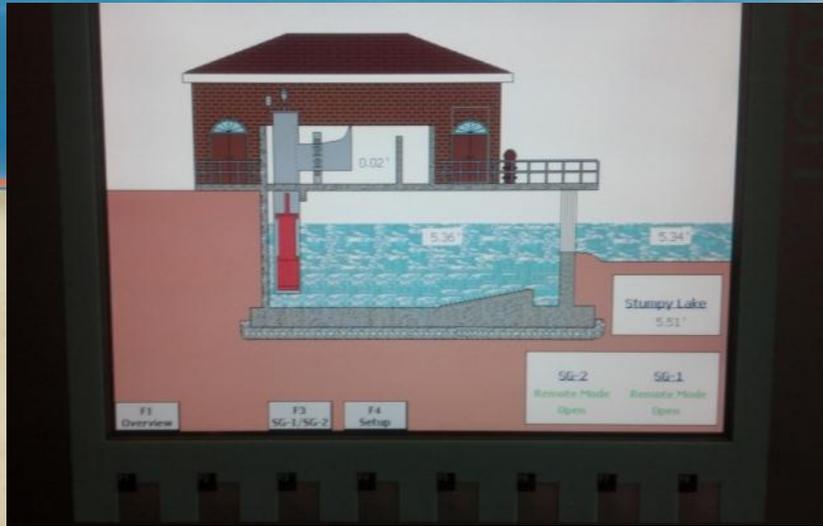


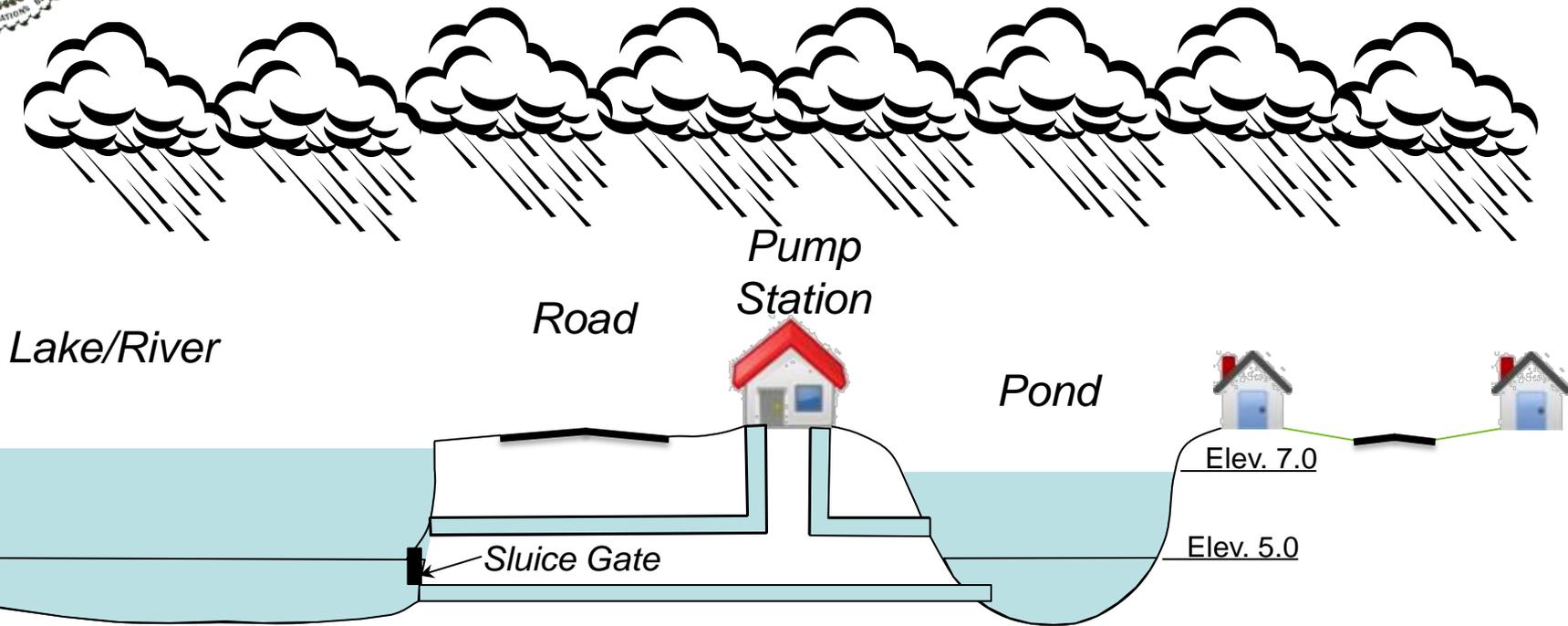


Potential Future Improvements



Example - Pump Station





Typical Pump Station

End

