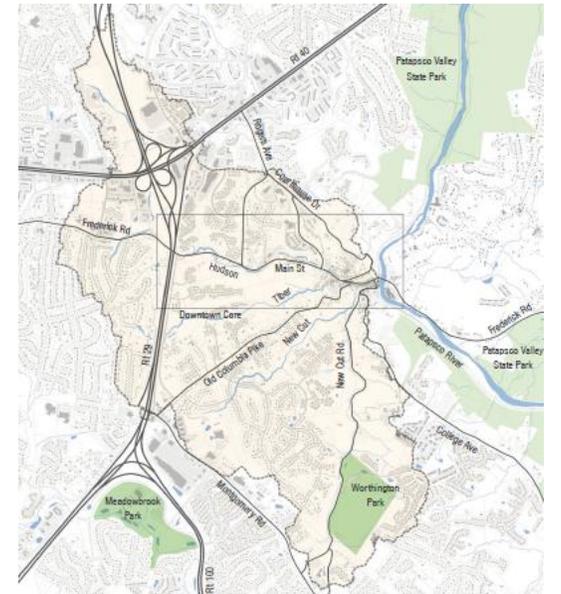




# Ellicott City Watershed Master Plan

Informational Meeting  
George Howard Building,  
Banneker Room



September 12, 2018



---

**Welcome – Allan H. Kittleman**

---

---

**Welcome – Jon Weinstein**

---

# Agenda

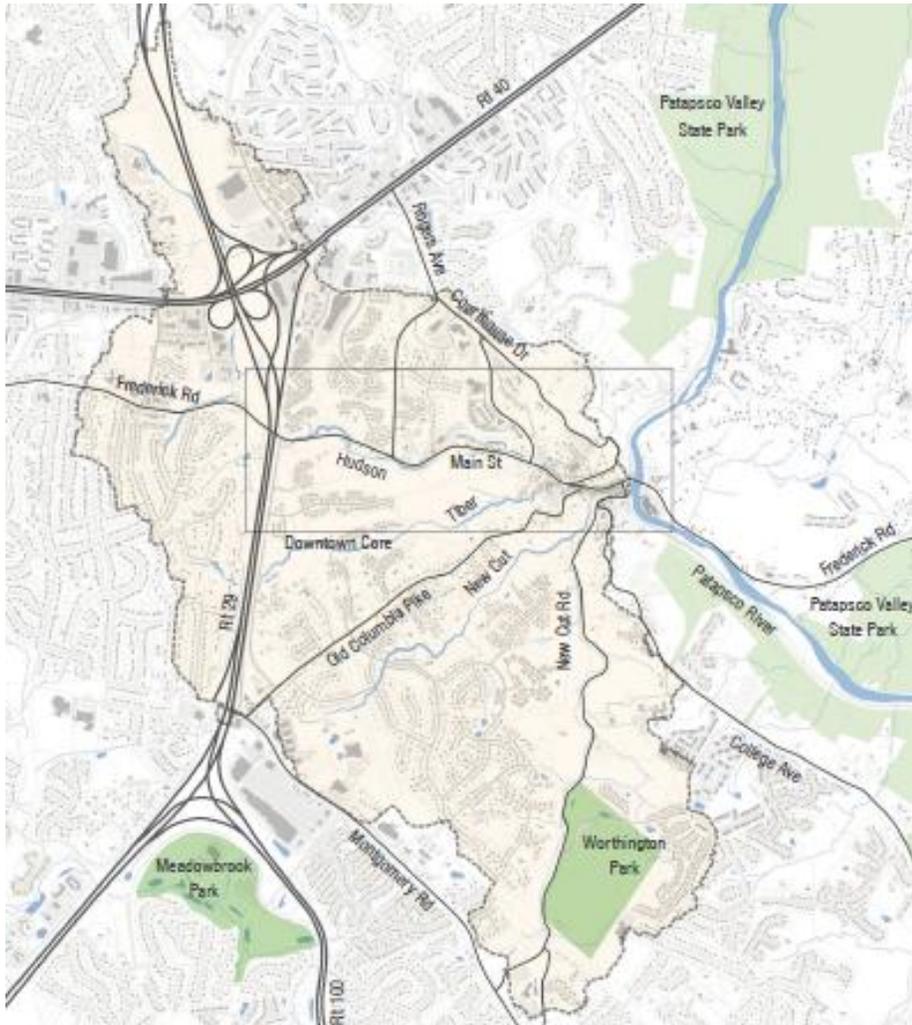
- **Welcome**
- **Recap on the Master Plan Process & Objectives**
- **Review of the New Five-Year Flood Mitigation Plan**
- **Overview of the Next Steps for the Master Plan**
- **Q&A**
- **Adjourn**

---

# Master Plan Process & Objectives (RECAP)

---

# Why a master plan? Purpose - Recap



## Purpose in May 2017:

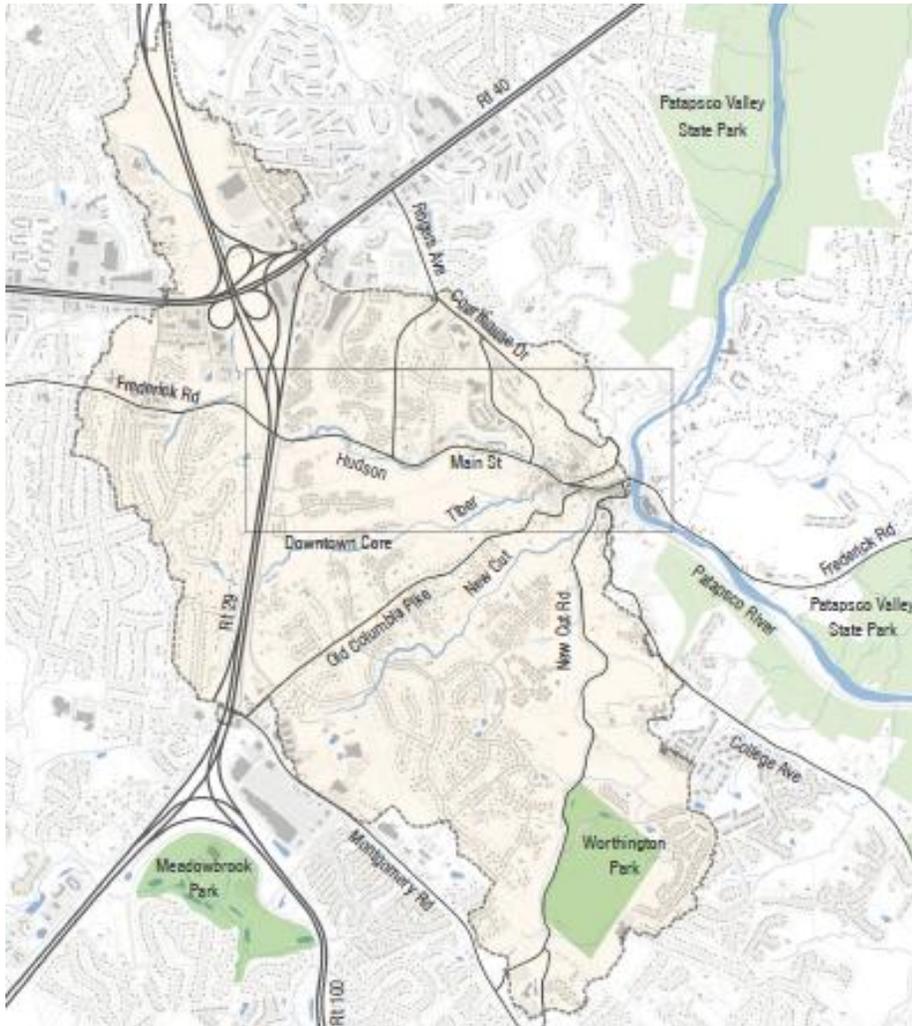
- Define a comprehensive, community-driven vision for rebuilding the impacted area
- Meet multiple objectives with resilient infrastructure projects and urban design
- Incorporate planning for the watershed with downtown master planning

# Master Plan Process - Recap

- **Master Plan kicked off in May 2017, building upon several prior efforts, notably:**
  - Flood Workgroup report
  - Input from five public meetings in fall 2016 (rECovery meetings)
  - Community Advisory Group's report
  - Comprehensive Hydrology & Hydraulic (H&H) study of watershed



# H&H Projects – Considerations - Recap



## An important baseline for the master plan

- Model used to test major changes to downtown

## Considerations

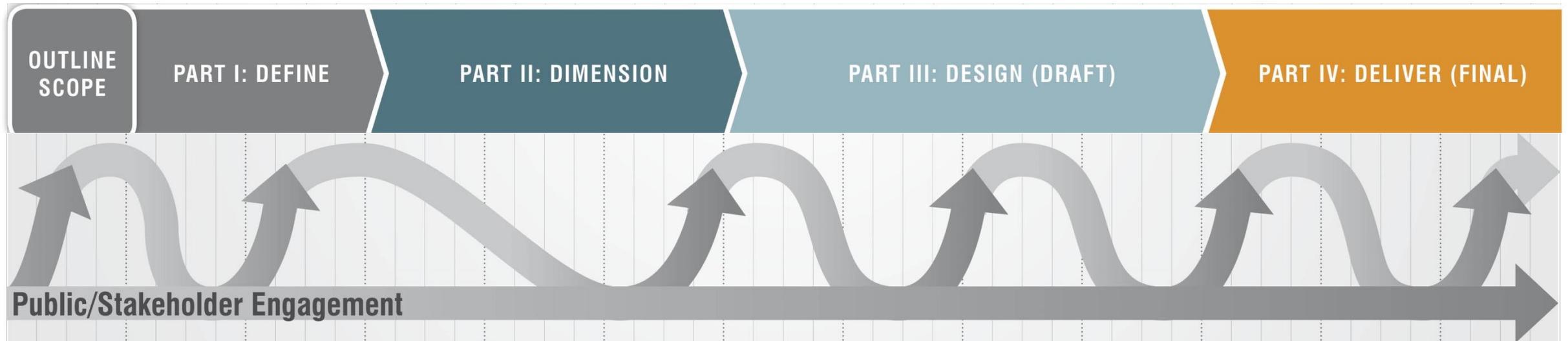
- Constructability of projects a question (on-the-ground investigations underway)
- Cost (\$80M estimated for 18 projects, could be higher)
- Complexity of planning and permitting 18 discrete projects (and time)
- Limited ability to achieve master plan goals (open space, placemaking, etc.)
- Lower Main still remains challenging

# Master Plan Process - Recap

**Before May 27, 2018, the planning process had resulted in:**

- Five public meetings/workshops (May 2017-March 2018)
- Four Master Plan Advisory Team meetings/Dozens of stakeholder meetings
- Vision and objectives
- Flood mitigation and urban design concepts in draft form

**Process was headed into final draft phase when flood hit**



# Vision - Recap

Ellicott City and its watershed is a model, resilient community that thrives by protecting its people, commerce, history, culture and natural environment.



# Master Plan Objectives - Recap



## **Rebuilding: *Emphasize resilience and placemaking in rebuilding***

Resilient Infrastructure | Attractive Downtown | National Model | Walkable and Accessible Destination



## **Environmental: *Protect the environment***

Healthy Natural Resources | Embrace Rivers and Tributaries | Interventions Address Flood Mitigation and Increased Green Space



## **Preservation: *Preserve Ellicott City's heritage***

Distinctive Elements | Buildings, Terrain, River Valleys | Importance of Historic Preservation | Social, Physical and Cultural Resources | History, Environment, Creativity and Culture



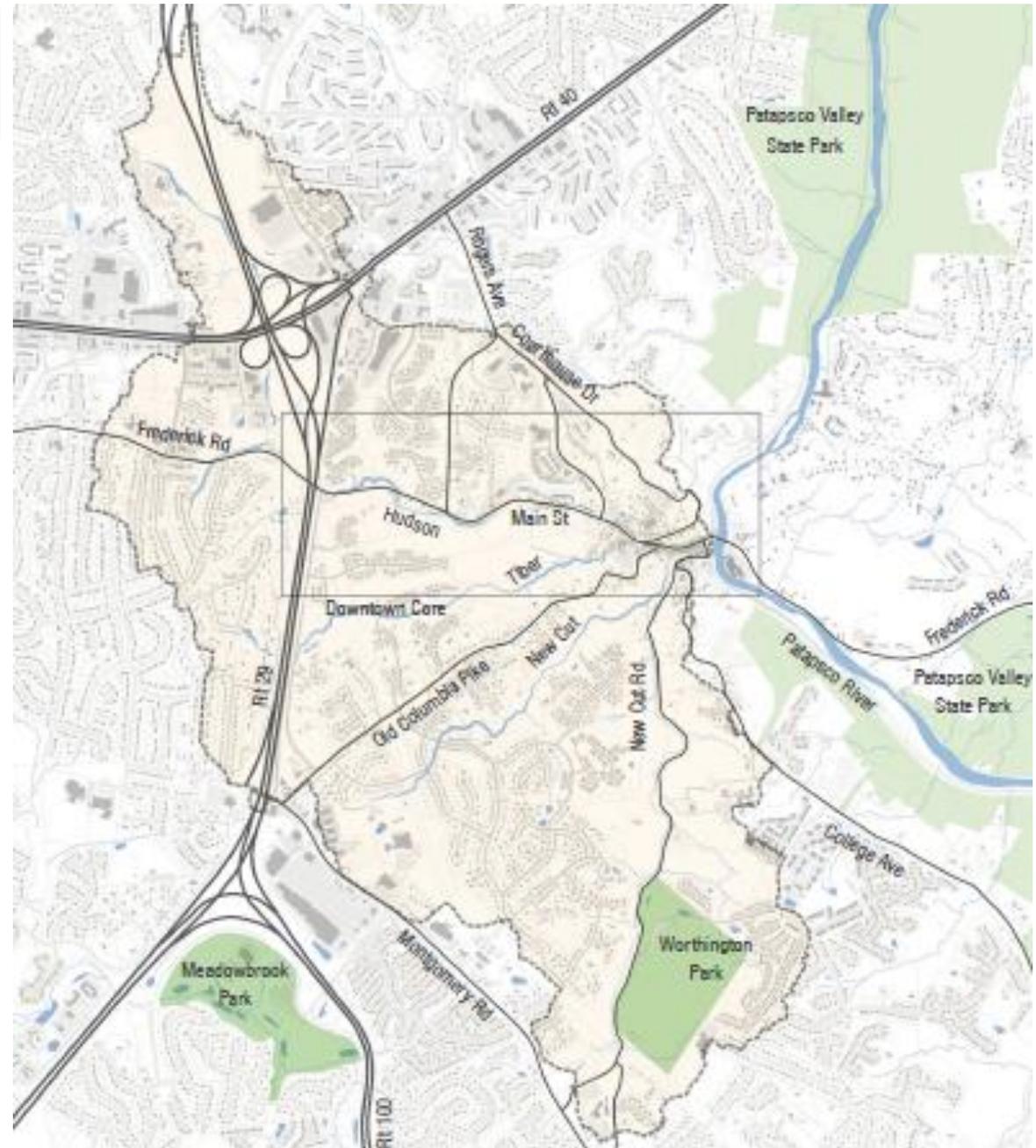
## **Economy: *Revitalize the downtown economy***

Balanced Economic Growth and Commercial Success | Investment – Existing and New Businesses | Thriving Small Businesses | Targeted Economic Development to Strengthen Main Street and West End | Leverage Baltimore County and Oella

# Study Area - Recap

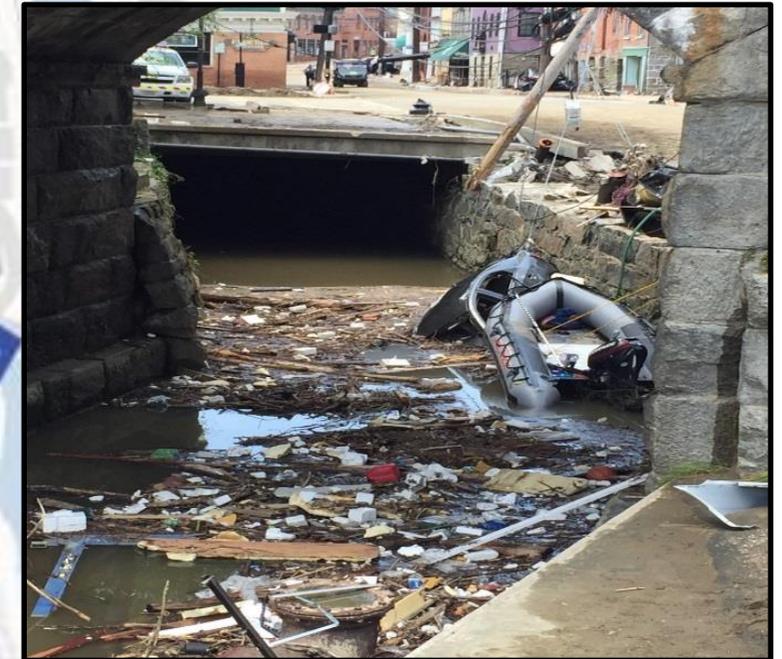
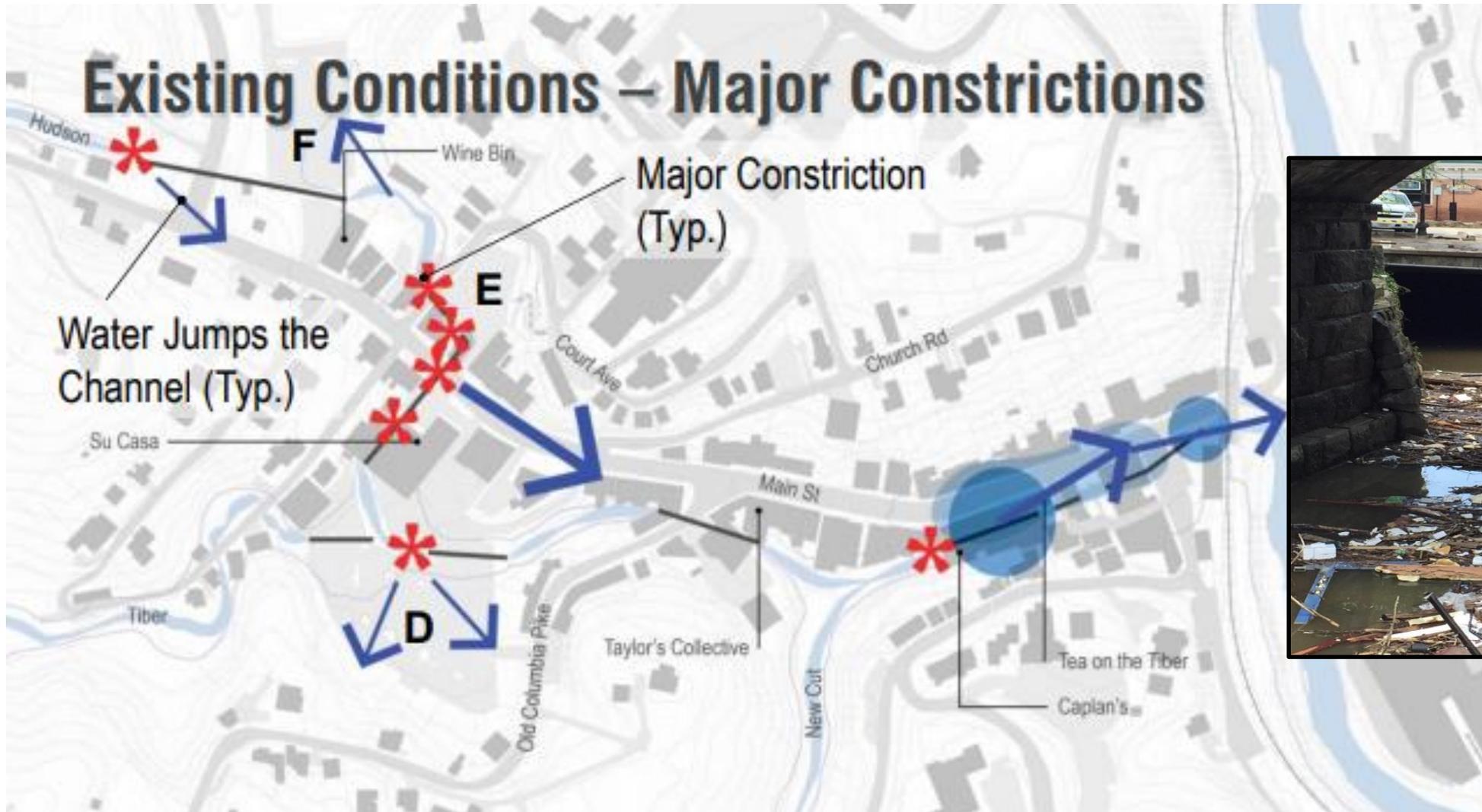
## Review of existing conditions

- Most of watershed built out
- Limited physical space to make improvements
- Most development in watershed took place prior to 100-year management requirements (59% 1990 or earlier); or modern SWM (76% 2000 or earlier)
- Within the flood-impacted area, flood water conveyance network is undersized and challenged by constriction points



# Flood Mitigation Approach - Recap

Address conveyance network downtown

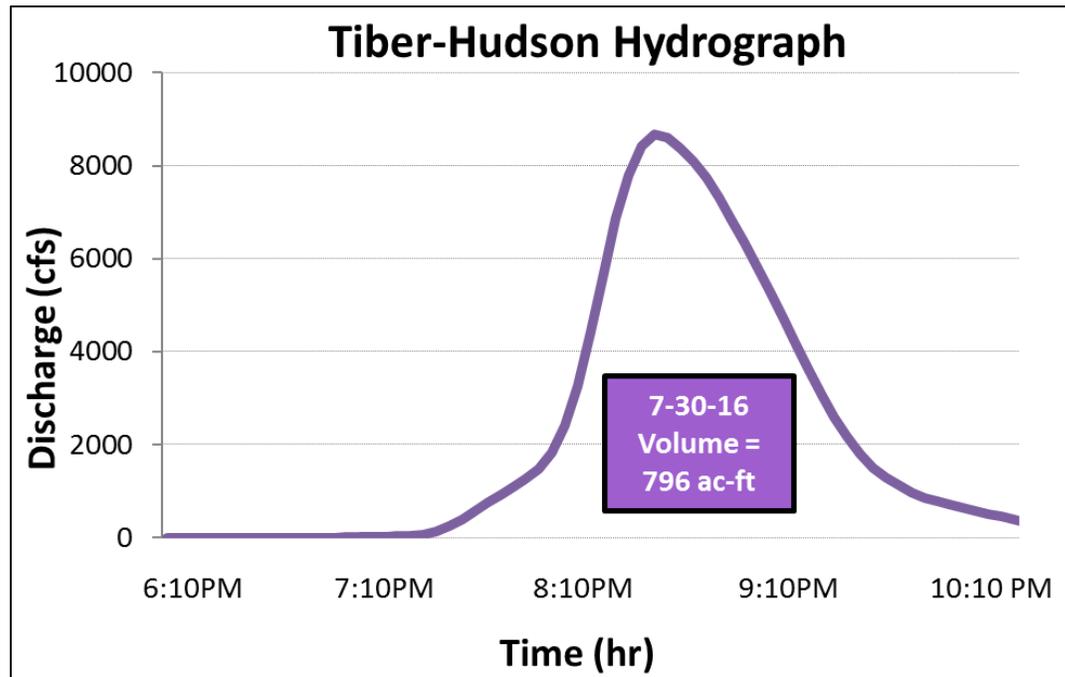


View from railroad bridge looking north

# Scope of Challenge - Recap

## Amount of water 7/30/16

- Volume expressed in “acre-feet”
- 1 foot of water over 1 acre area = 1 acre-foot
- Lot F = roughly 1 acre

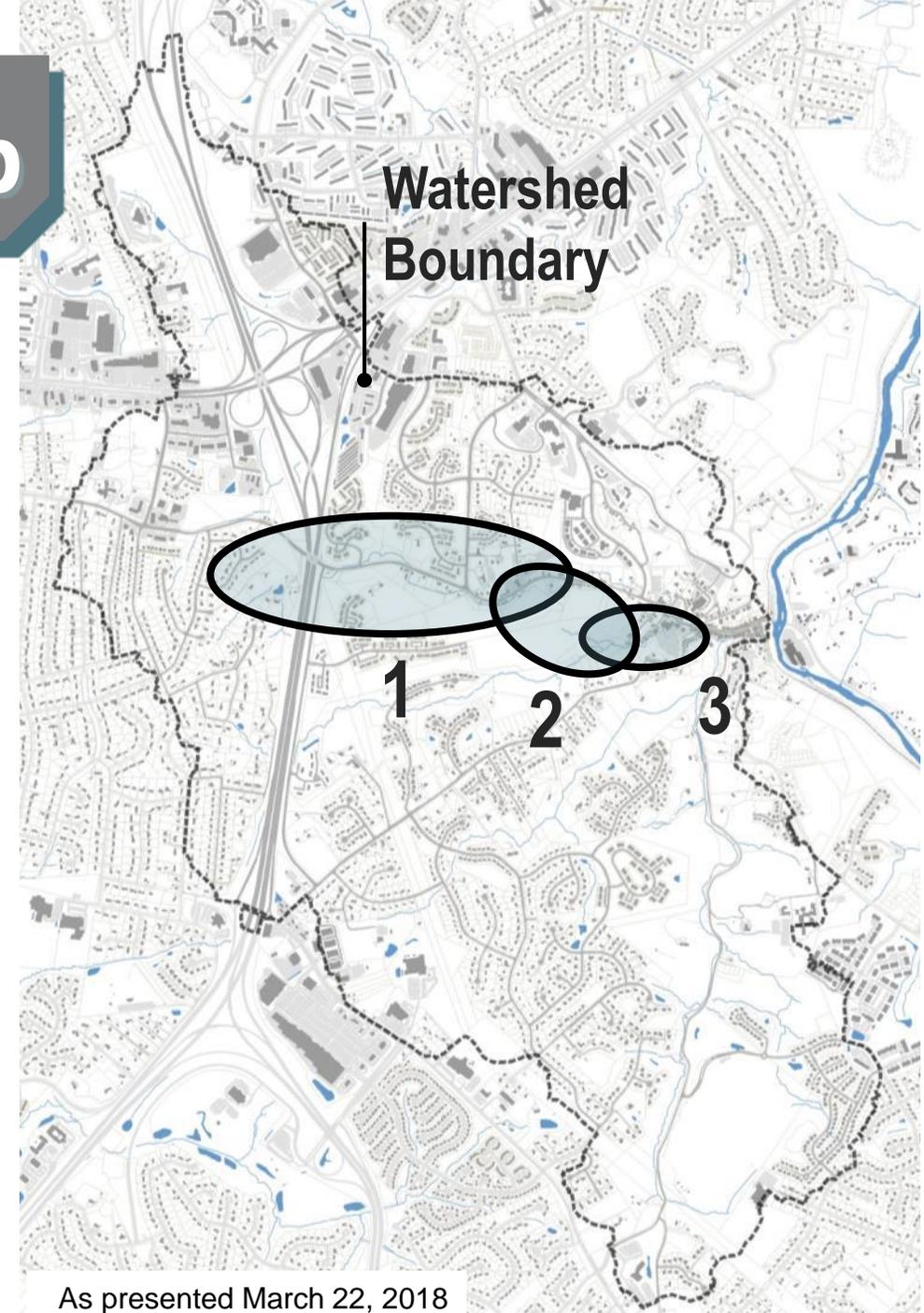


*July 30, 2016 produced nearly 800 acre-feet of water. Stacked foot-per-foot, that's the equivalent of an 80-story building on Lot F!*

# Conveyance Strategy - Recap

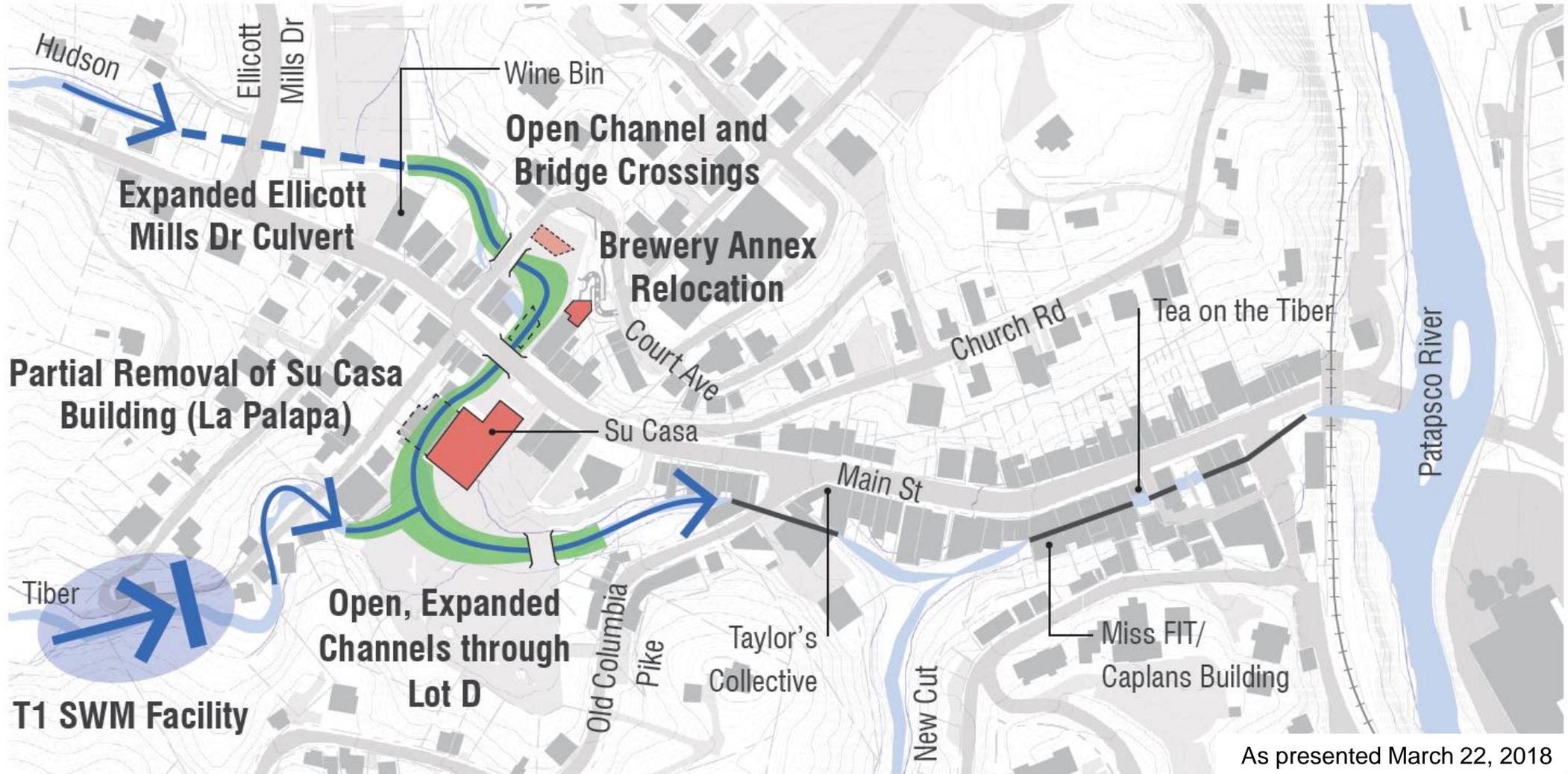
**Objective:** Keep water in channel and keep it from flowing down Main Street; work up from Patapsco

1. West End – *Limited Opportunities to Improve Conveyance; Focus - Floodproofing*
2. Upper Main - **Opportunity**
3. Lower Main – *Opportunities but Constructability Issues; Focus - Floodproofing*



# Upper Main Conveyance - Recap

A.k.a. "Hudson Bend"



As presented March 22, 2018

# Business & Building Impacts - Recap

A.k.a. "Hudson Bend"

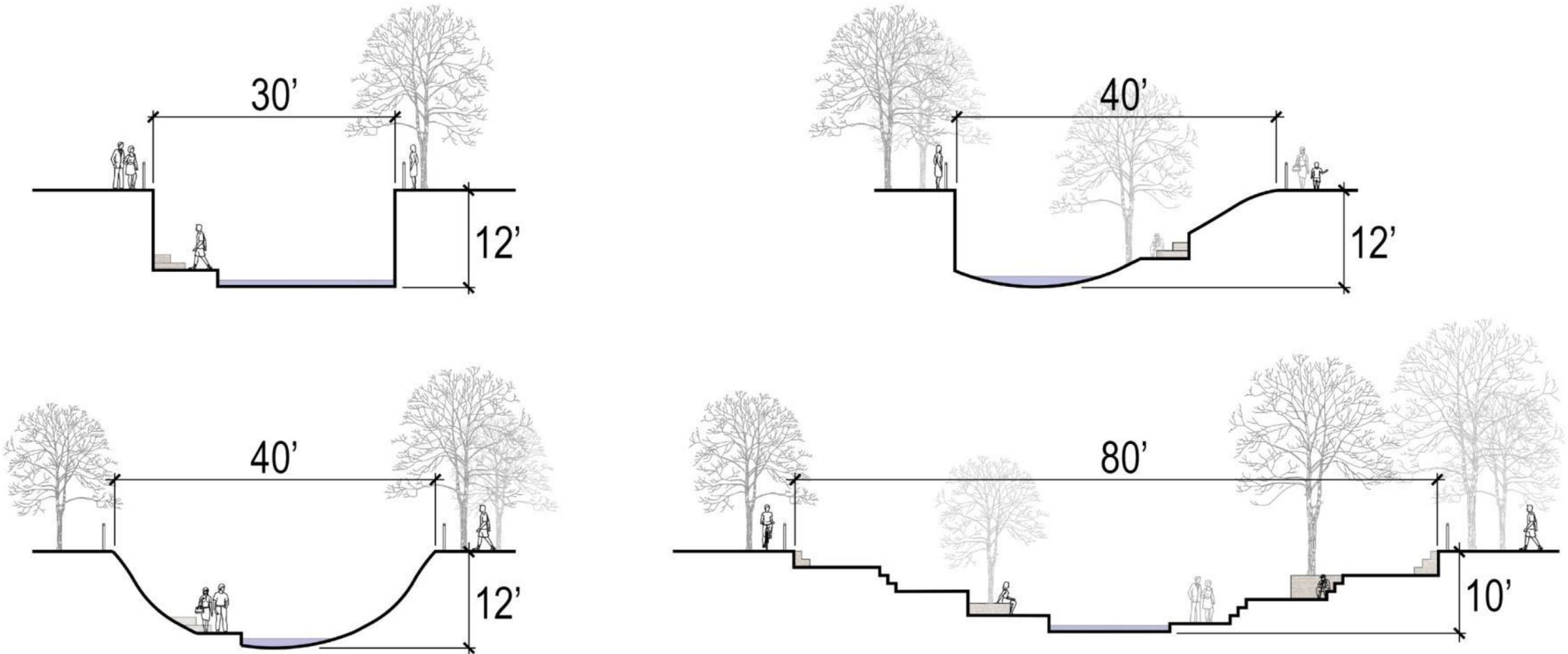


As presented March 22, 2018

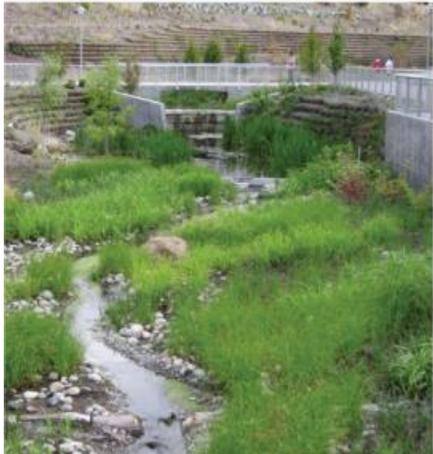
# “Hudson Bend” Amenity Space - Recap



# “Hudson Bend” – Cross Sections - Recap



# Gathering Space at Open Channel - Recap

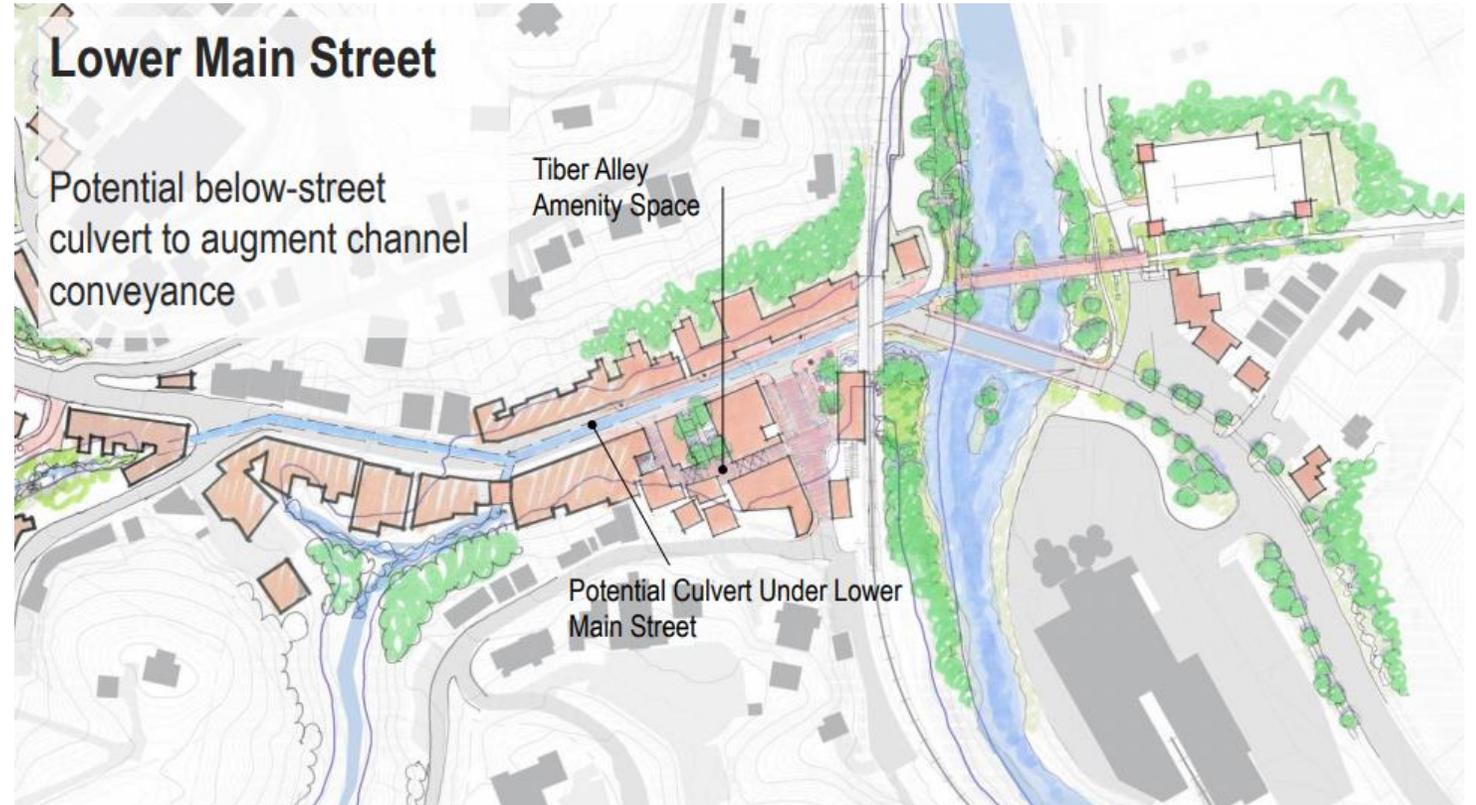


As presented March 22, 2018

# Lower Main Culverts - Considerations - Recap

## Many logistical considerations

- Highly disruptive (requires shutting down street for years to construct)
- Requires tying into buildings to shore them up prior to construction



---

# May 27, 2018 Flood

---

# May 27, 2018

## 7.5" in 5 hours

## Majority in 3 hours



# Video Camera Footage – May 27, 2018

Montage of video cameras located along Main Street showing how the May 27, 2018 flood evolved throughout Ellicott City. <https://youtu.be/GUqhTv3fQM0>

---

# Five-Year Flood Mitigation Strategy

---

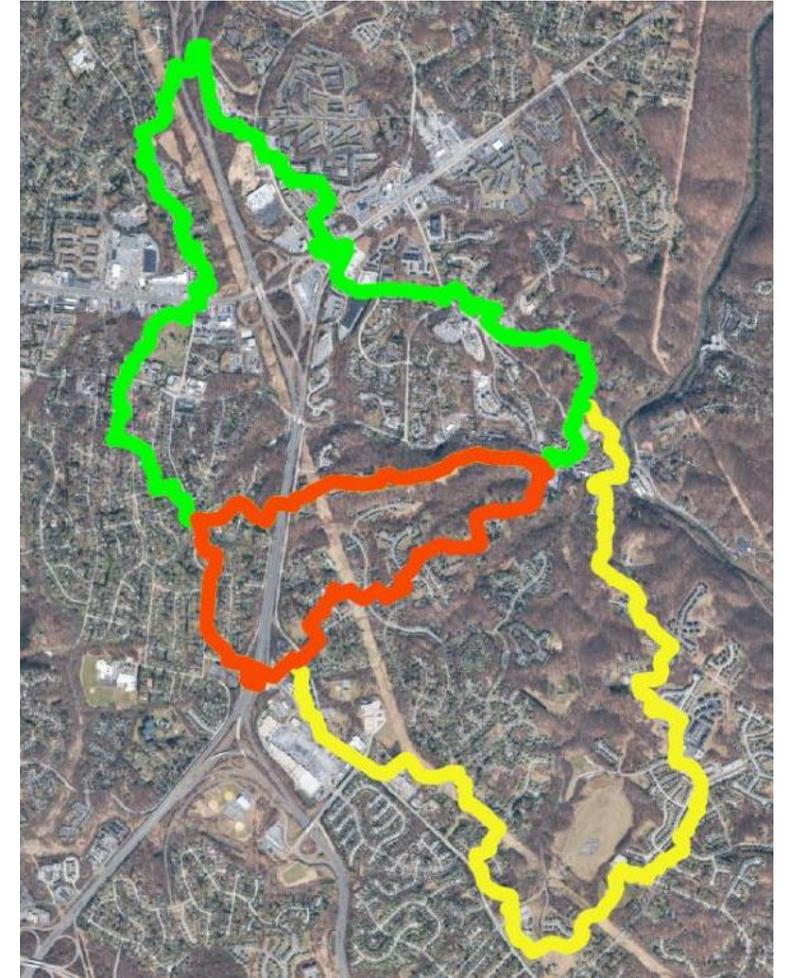
# Hydrology & Hydraulic Analysis

## McCormick Taylor Studied Entire Tiber-Hudson Watershed – 3.7 sq. mi.

- Hudson Branch – 1.55 sq. mi.
- Tiber Branch – 0.54 sq. mi.
- New Cut Branch (includes Autumn Hill) – 1.55 sq. mi.

## Modeled Multiple Storm Scenarios

- 100-year (1%) 24-hour baseline
- 10-year
- Recreated July 30, 2016 event  
(using NWS data, USGS channel measurements, storm reports and YouTube videos)



Watersheds Areas:

Green-Hudson; Red-Tiber; Yellow-New Cut

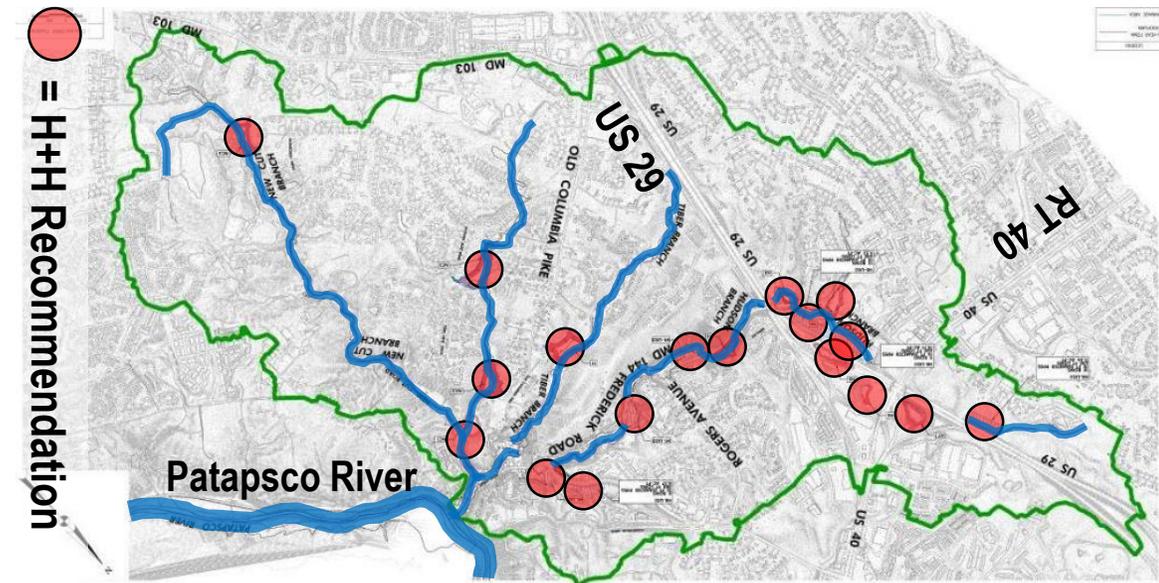
# Infrastructure Improvements in Process

## 18 Projects Identified in Hydrologic & Hydraulic Analysis, Approximate Cost \$80M+

- ~425 acre-feet of storage combined, above-ground (\$30M), below-ground (\$50M)
- Initial recommended phase (\$18.5M); Design/Engineering underway

## Floodwater Retention/Conveyance Improvements in process after 2016 storm include:

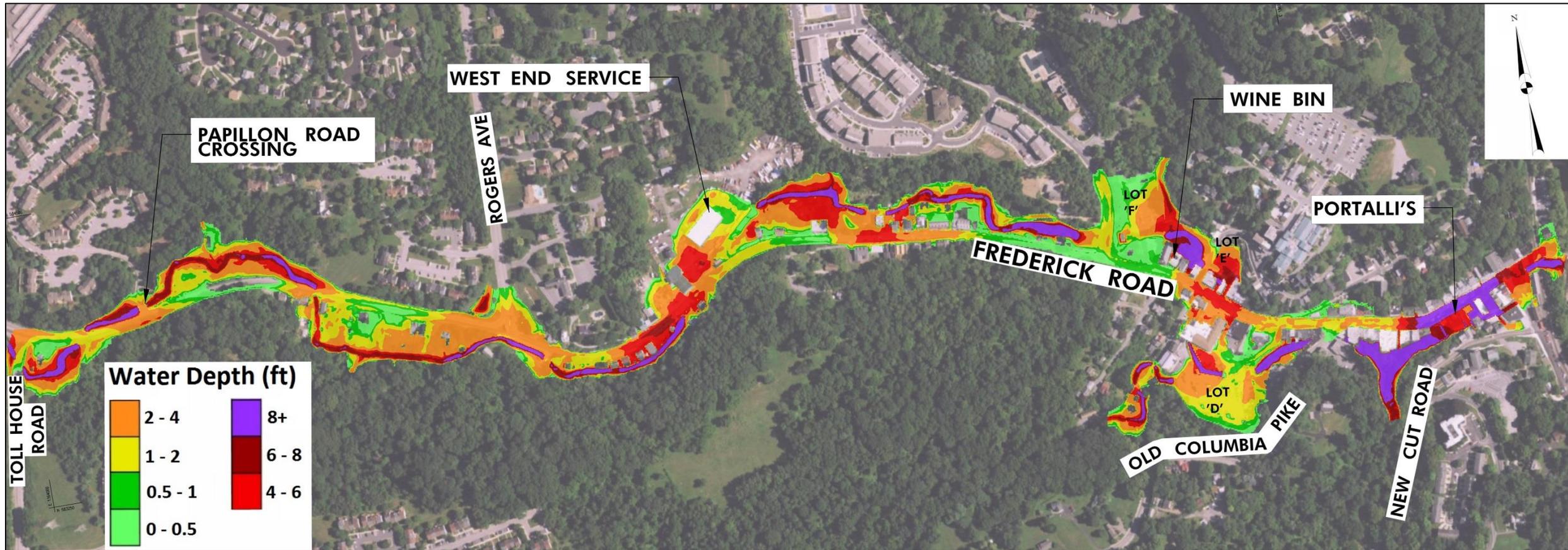
- **Hudson 7 Retention Facility**  
13 acre-ft of storage at US 29/40 Interchange
- **Quaker Mill Retention Facility**  
10 acre-ft of storage along Rogers Avenue
- **8600 Main Street Culvert Expansion**  
Significantly increasing the capacity of culvert
- **Tiber 1 (T1) Stormwater Retention Facility**  
70 acre-ft of storage in open space adjacent to Old Columbia Pike



# Hydraulic Modeling

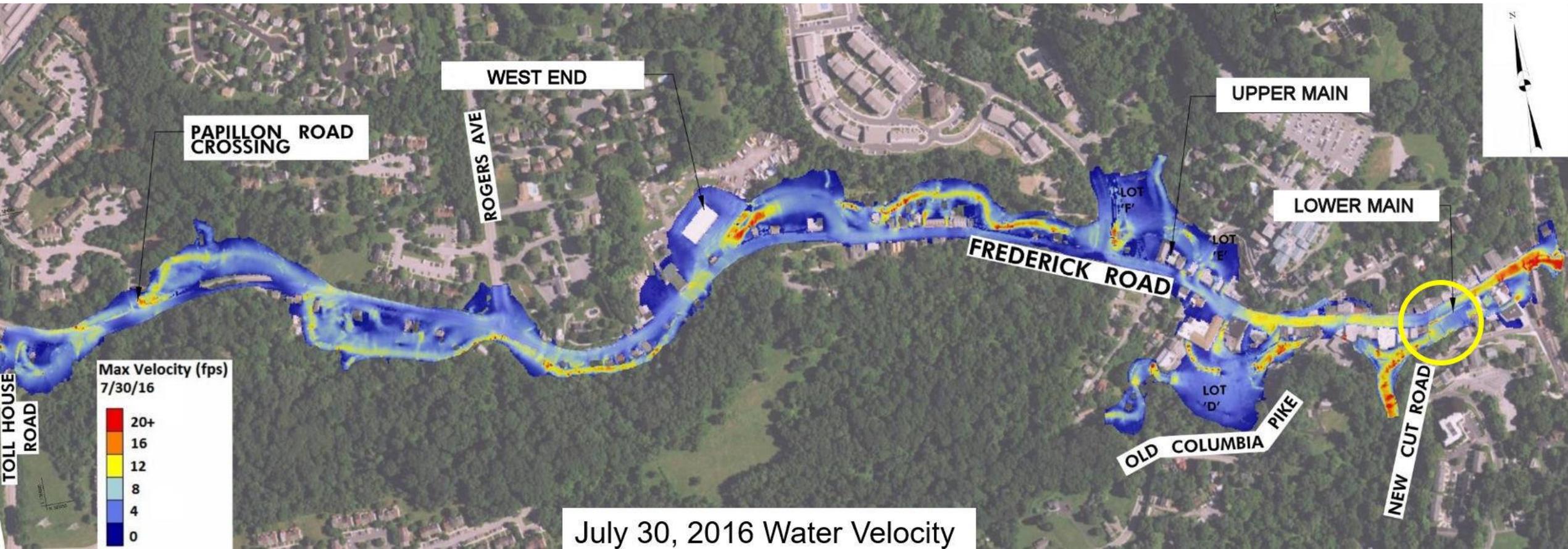
- Supporting Master Planning Effort
- Post May 2018 Storm Event Refocus
- Elements of Model Iterations
- Results and current alternatives

# Baseline for Master Plan Analysis



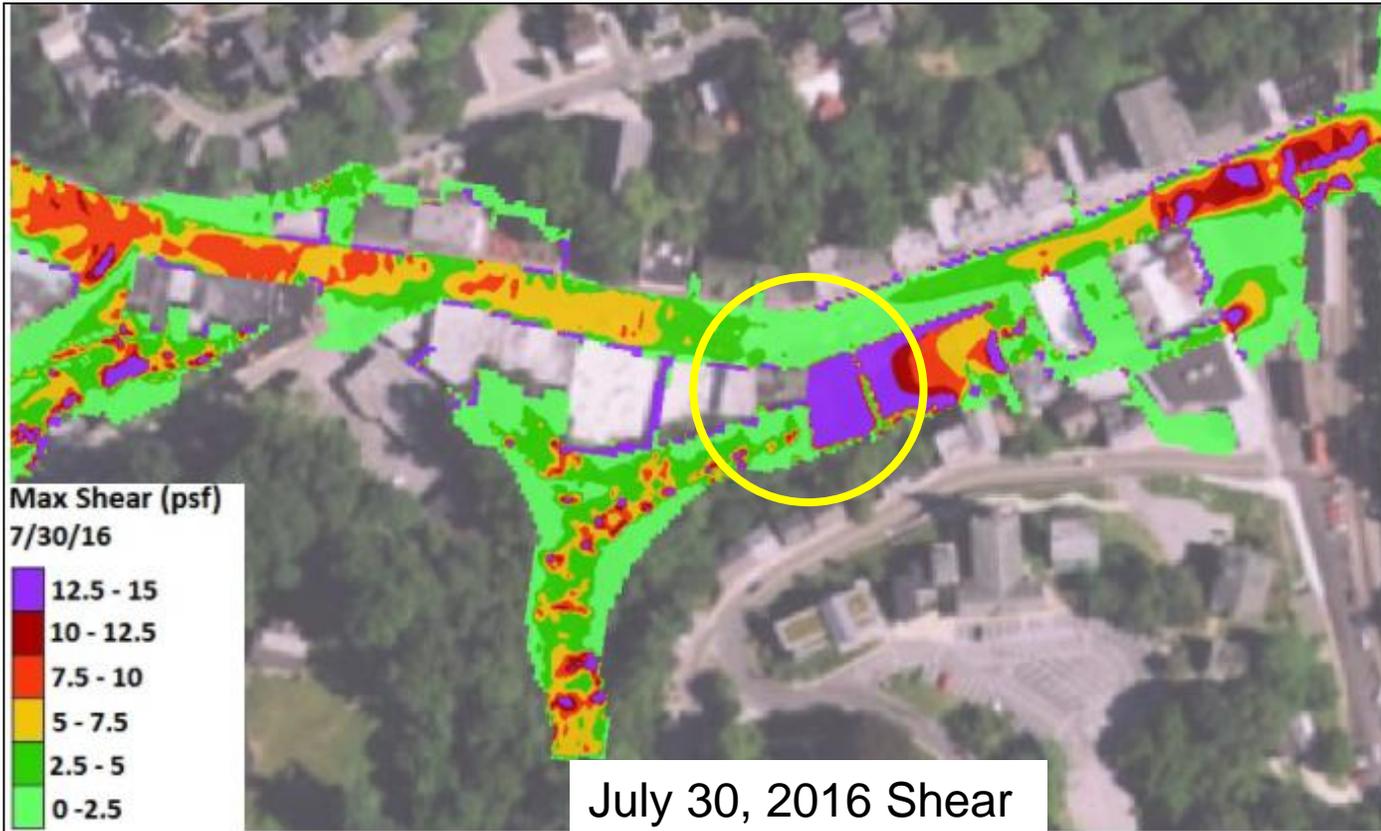
# July 30, 2016 Velocity Model

- Maximum flow velocity: Red = 20+ feet per second
- Note: High Velocity on mid-Main St and lower Main St, and from New Cut Rd



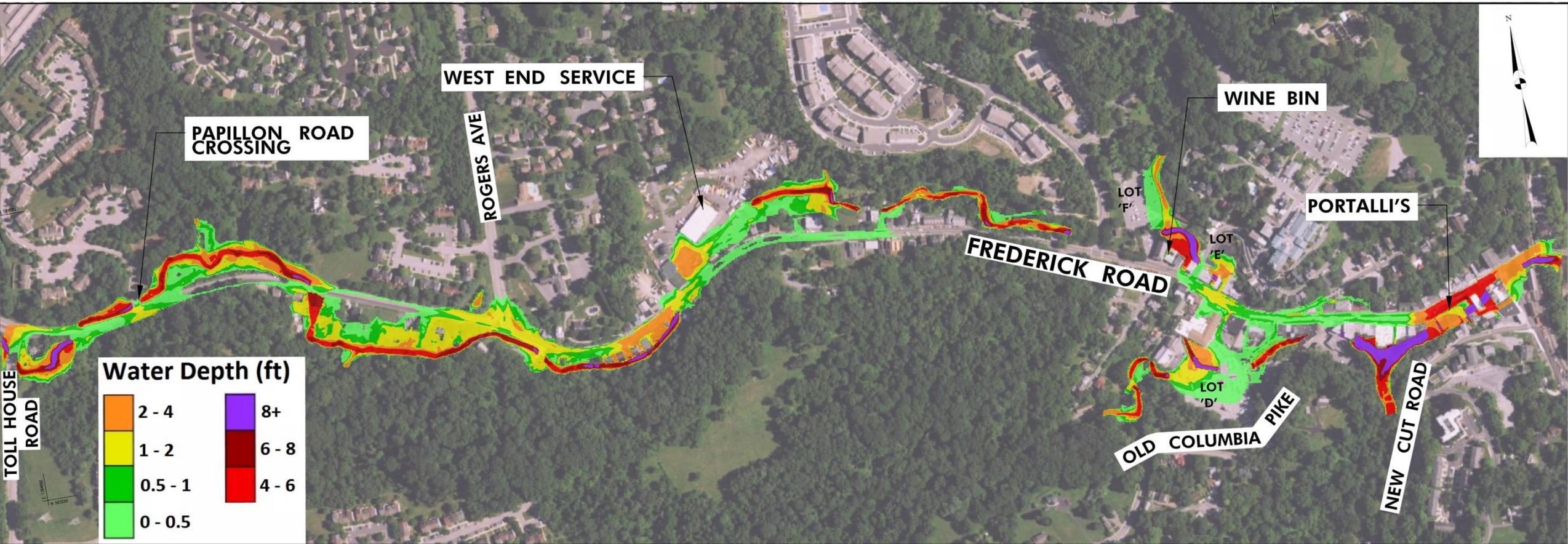
# July 30, 2016 Shear Stress Model

- Shear: Purple = 12.5-15 pounds per square foot
- Simulation of shear stresses in Lower Main St matches locations of significant damage to buildings



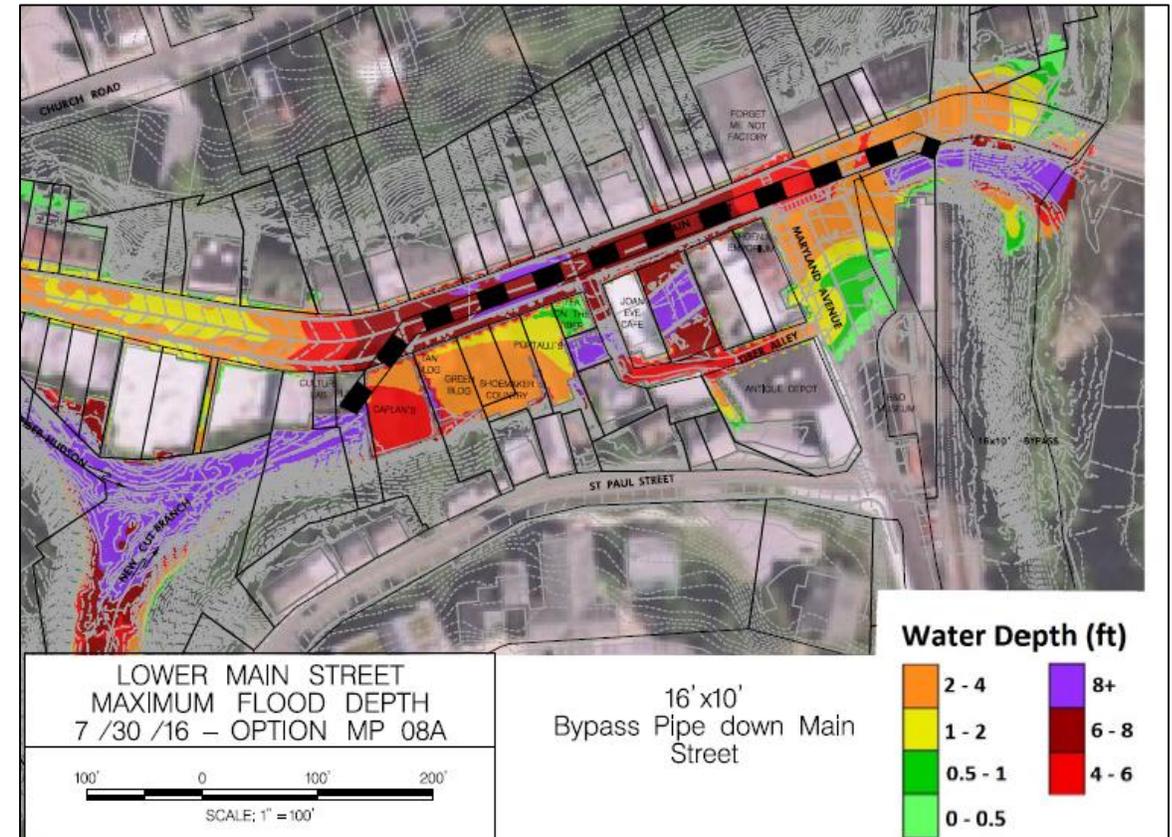
# July 30, 2016 Total H & H SWM + Conveyance

- Purple = 8+ feet (could be higher than 8')
- Yellow = 1-2';
- Darker green = 0.5-1';



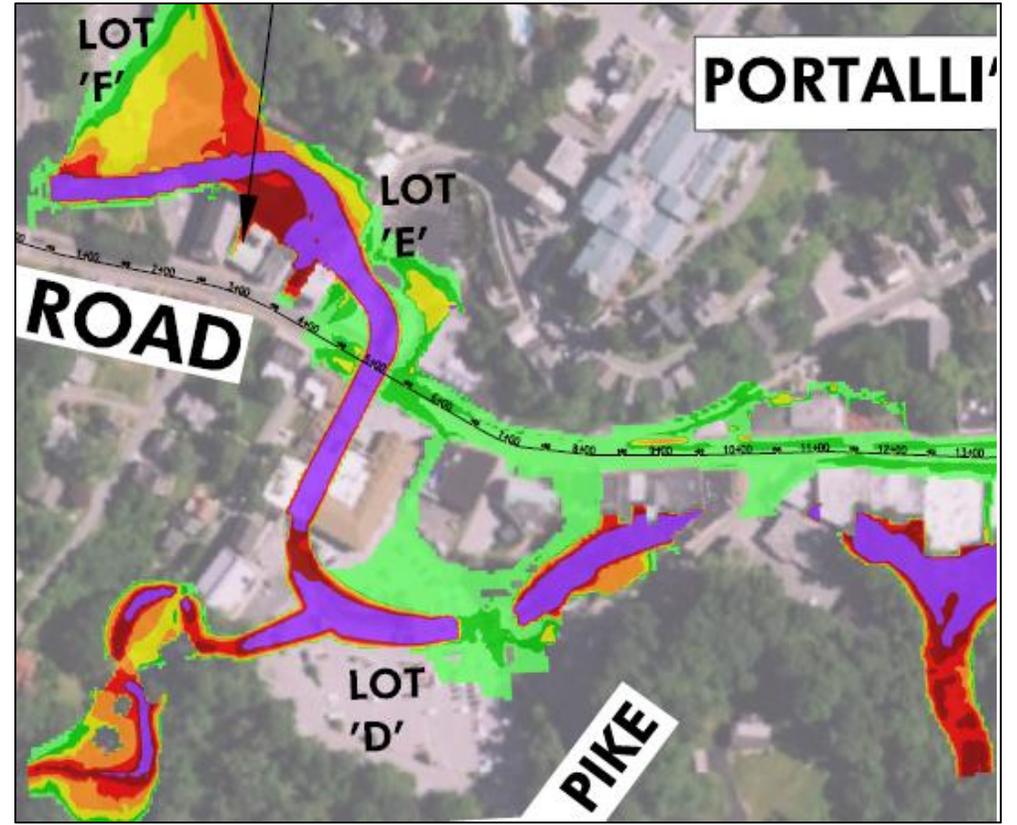
# Hydraulic Modeling for Master Plan

- Modeled Elements included:
  - Culvert options under Lower Main St



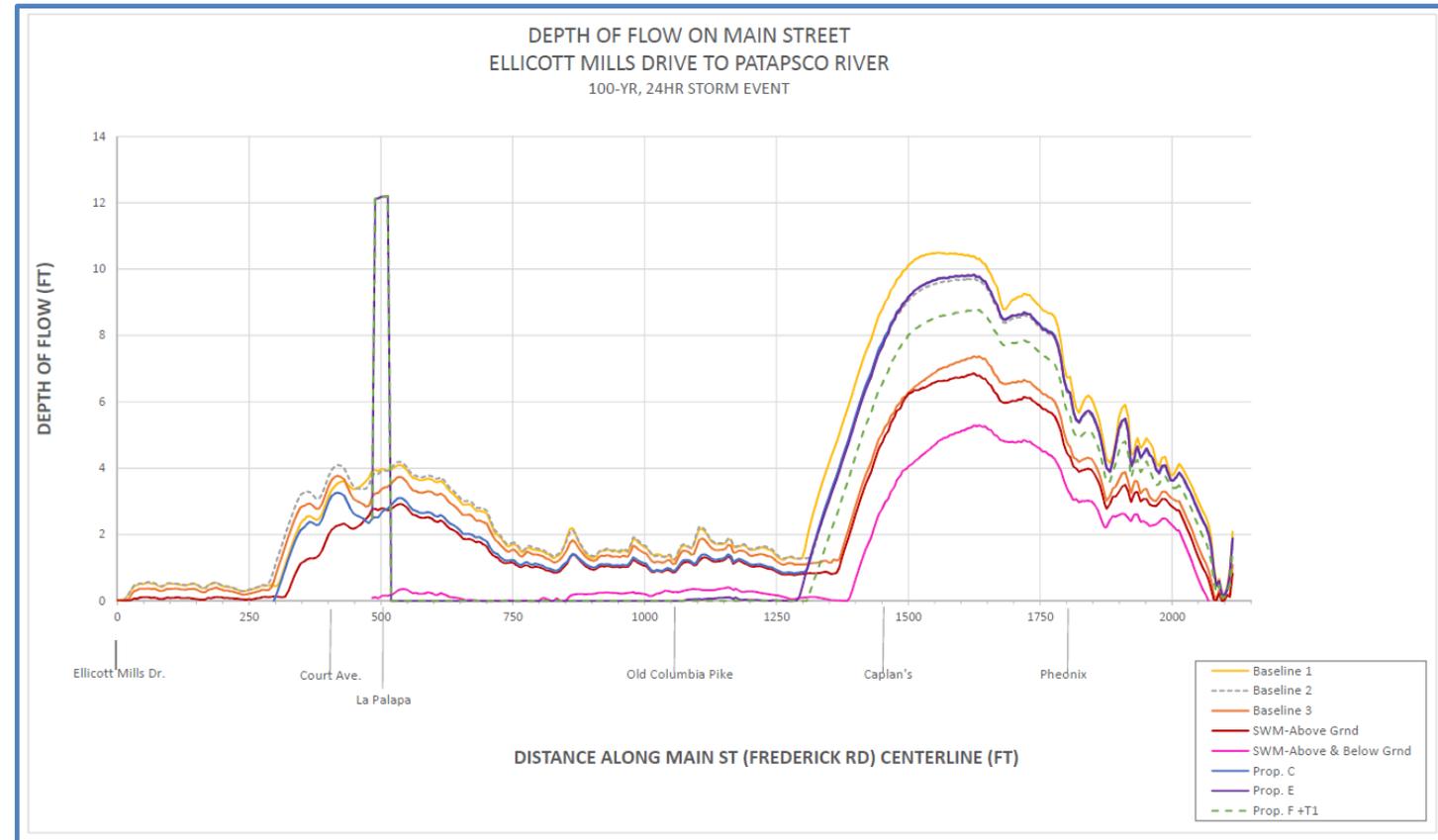
# Hydraulic Modeling for Master Plan

- Modeled Elements included:
  - Enlarged culvert crossing at Brewery; Widening and realignment of channel through Lot D ('Hudson Bend')



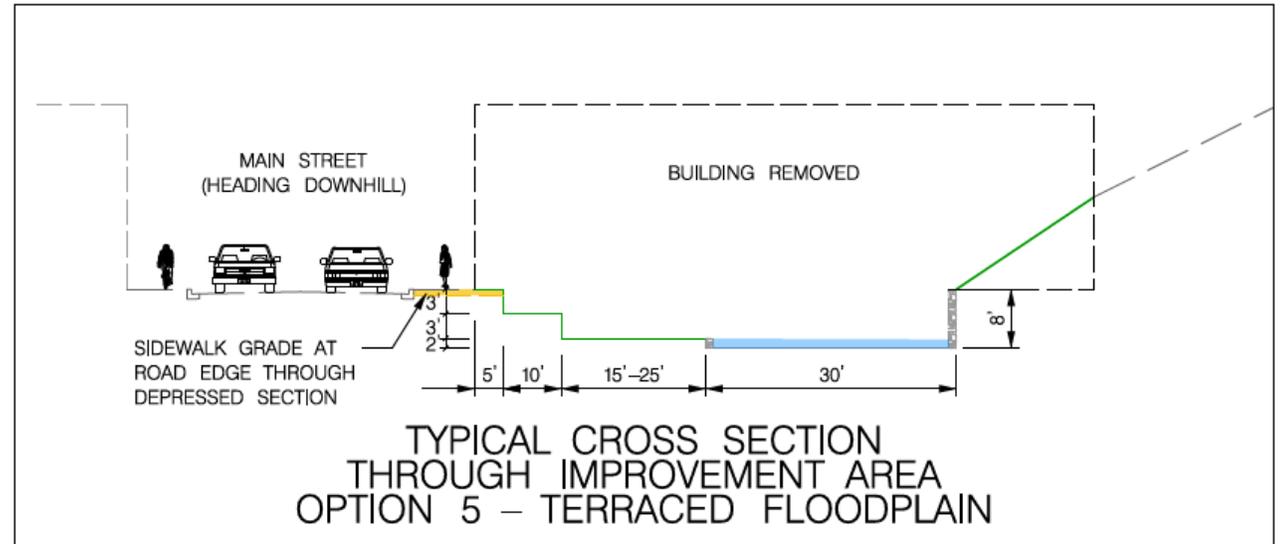
# Hydraulic Modeling for Master Plan

- Modeled Elements included:
  - Culvert options under Lower Main St
  - Enlarged culvert crossing at Brewery; Widening and realignment of channel through Lot D ('Hudson Bend')
- Combinations included:
  - Various stormwater management scenarios
  - 7/30/16 storm and 100 year storm
  - Flow depth, velocity, shear stress



# Hydraulic Modeling Post 5/27/18

- Additional Focus on Lower Main Floodplain:
  - New options per County direction
  - Additional channel and floodplain capacity from New Cut confluence to Patapsco
  - Building reconfiguration and removal
  - Increase capacity under Maryland Avenue
- Similar approach in West End:
  - Smoothing bends, increasing floodplain



# Hydraulic Modeling Post 5/27/18

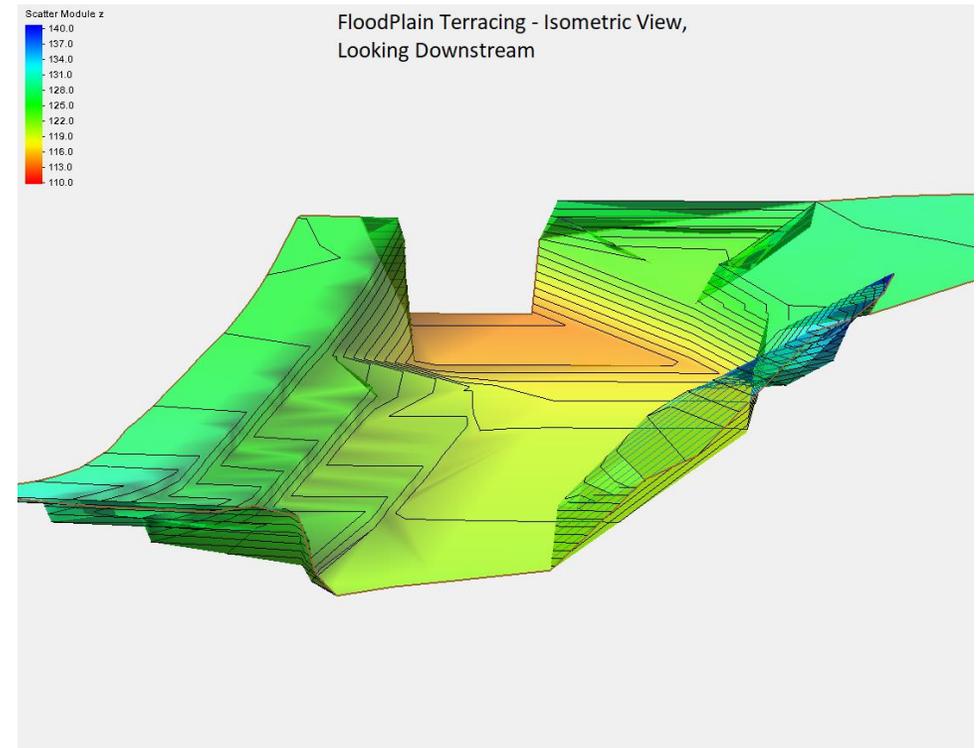
- Several Parameters
  - Building changes
  - Floodplain grading
  - Upstream SWM options
  - ‘Hudson Bend’
  - MD Ave Culverts
  - Tailwater (Patapsco) assumptions

Option #	Terraced Floodplain	Modified Floodplain	Quaker Mill	Lot D Channel Expansion	T-1 Pond	H-7 Pond	NC-3 Pond	Maryland Ave Culvert	Tailwater?	WE Floodplain & Conveyance	Additional Notes
1	x										Only removes 5 BLDGs in floodplain
2	x										FP Grading w/ piers
3	x										FP Facades Remain
4	x										Baseline FP Grading
5	x		x			x					Includes ECMDr Improvement
5A	x	x (TOT;GP in)	x			x					
6	x		x	x		x					
7	x		x	x		x	x				
8	x		x	x	x	x					
9	x		x	x	x	x	x				
10	x			x				x			Conveyance Option
11	x		x	x	x	x	x	x			C+SWM Option
12	x	x (TOT;GP in)		x				x			C+ MOD FP
13	x	x (TOT;GP in)	x	x	x	x	x	x			C+SWM+ MOD FP
14	x	x (TOT;GP in)	x	x	x	x	x	x	X		Addl w Multiple Patapsco Tailwater scenarios?
15	x	x (TOT;GP in)	x	x		x		X (2- 10'Dia)	X	X	
16	x	x (C.Lab in)	x	x		x		X (2- 10'Dia)	X	X	
16B	x	x (C.Lab in)	x	x		x		X (2- 10'Dia)	X	X	Adjusted terracing
16C	x	x (C.Lab;Purp)	x	x		x		X (2- 10'Dia)	X	X	
16D	x	x (C.Lab;Purp)	x	x	x	x		X (2- 10'Dia)	X	X	

# Hydraulic Modeling Post 5/27/18

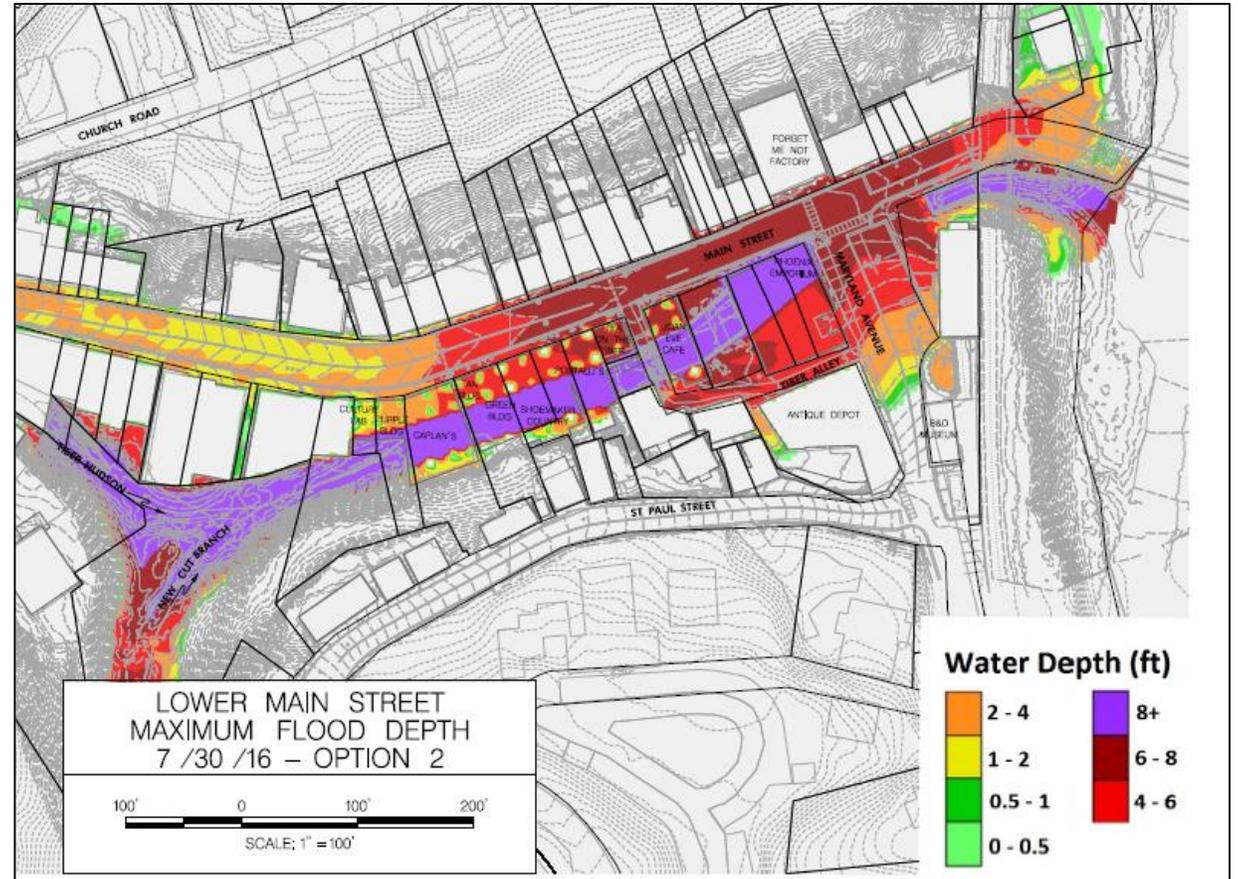


Iterative changes to building removal and floodplain grading



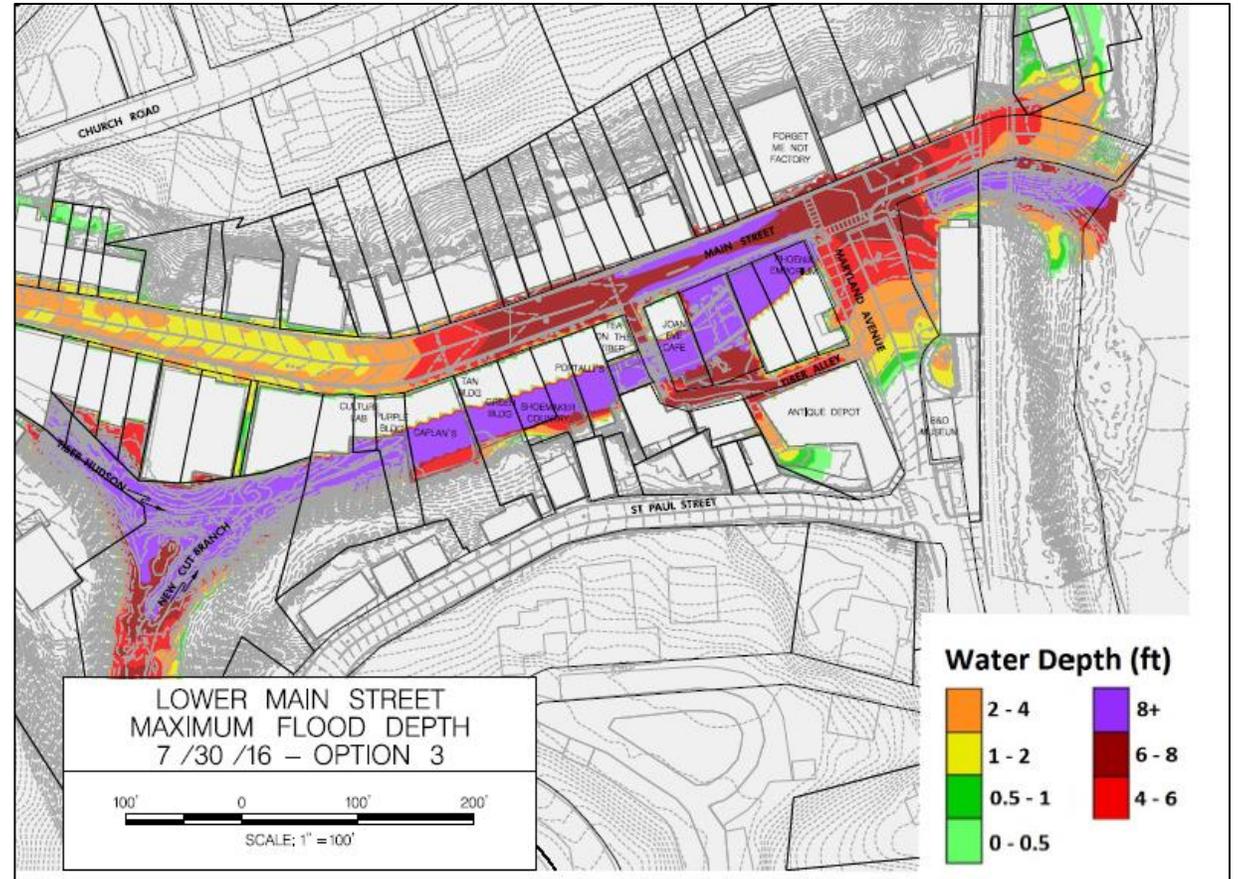
# Hydraulic Modeling Post 5/27/18

Open First Floor along south side of Main St (buildings on piers)



# Hydraulic Modeling Post 5/27/18

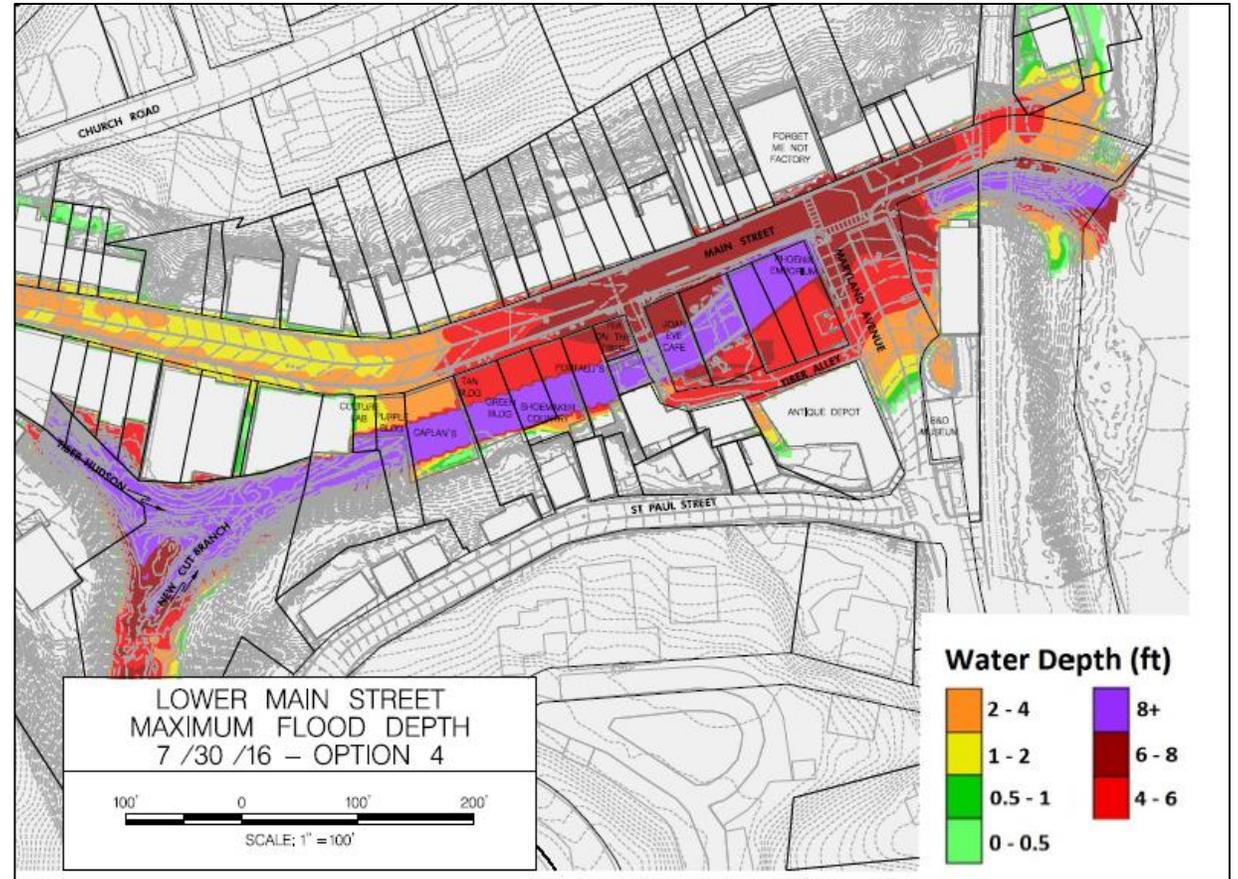
Remove buildings over channel,  
retain “facades” only



# Hydraulic Modeling Post 5/27/18

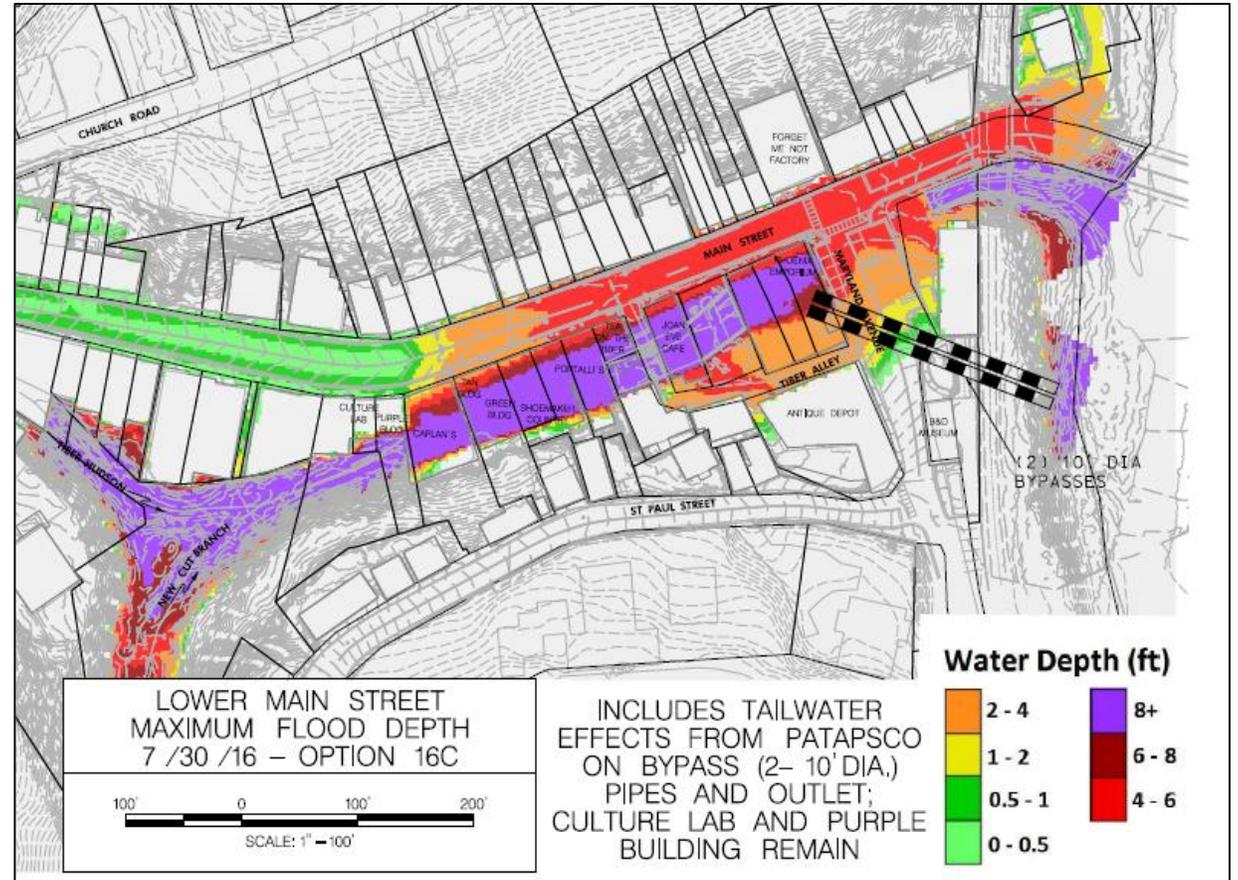
Remove buildings completely, south side of Main St

...dozens of additional iterations featuring different parameter combinations and alterations to arrive at current selected alternative



# Hydraulic Modeling Post 5/27/18

- Remove buildings, south side of Main and grade floodplain through that area
- Upstream SWM improvements
- Maryland Ave additional culverts
- Hudson Bend improvements
- Additional improvements to Ellicott Mills culvert, West End grading (not shown)



# Comprehensive Approach

- **Channel/floodplain expansion**  
(acquisition and removal)
  - Public open space expansion
  - Pedestrian network enhancement
- **Stormwater retention facilities/improved wetlands**
- **New and expanded culverts**
- **Encourage floodproofing**  
(as result Feb. 2018 of Army Corps of Engineers study)
- **Community partnerships**
  - Howard EcoWorks Soak it Up Campaign





Phoenix Emporium  
8049 Main St.  
Brick: c. 1851 Frame: c. 1870s

Discoveries  
8055 Main St.  
Block: c. 1920s-30s

Bean Hollow  
8059 Main St.  
Stone & Frame: c. 1930s

Great Panes  
8069 Main St.  
Brick & Stone: c. 1841

Tea on the Tiber  
8081 Main St.  
Stone: c. 1834



Portalli's  
8085 Main St.  
Brick: c. 1920s, c. 2000



Shoemaker's  
8095 Main St.  
Block: c. 2000



Johnson's Buildings  
8109 Main St. 8113 Main St.  
Frame: c. 1859 Frame: c. 1830s



Caplan's  
8125 Main St.  
Brick: 1926

**Lower Main St.**

# Ellicott City Flood Mitigation Plan

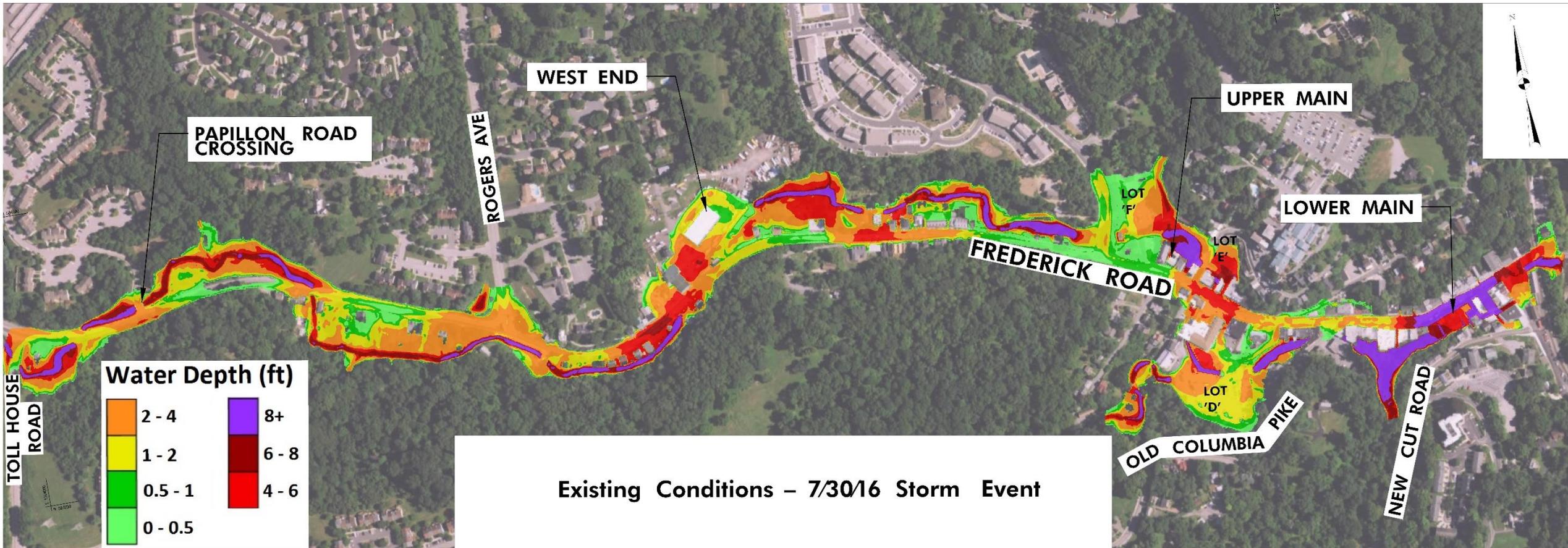
## Summary of the 5-Year Flood Mitigation Plan Capital Improvements:

- Ellicott City Property Acquisition/Removal
- Lower Main Open Space Construction
- Ellicott Mills Culvert Expansion
- Hudson 7 Retention Facility at US 29/Rt 40 Interchange
- Quaker Mill Retention Facility at Rogers Ave
- 8600 Main Street Culvert Expansion
- Two 10' Culverts from Maryland Ave to Patapsco River

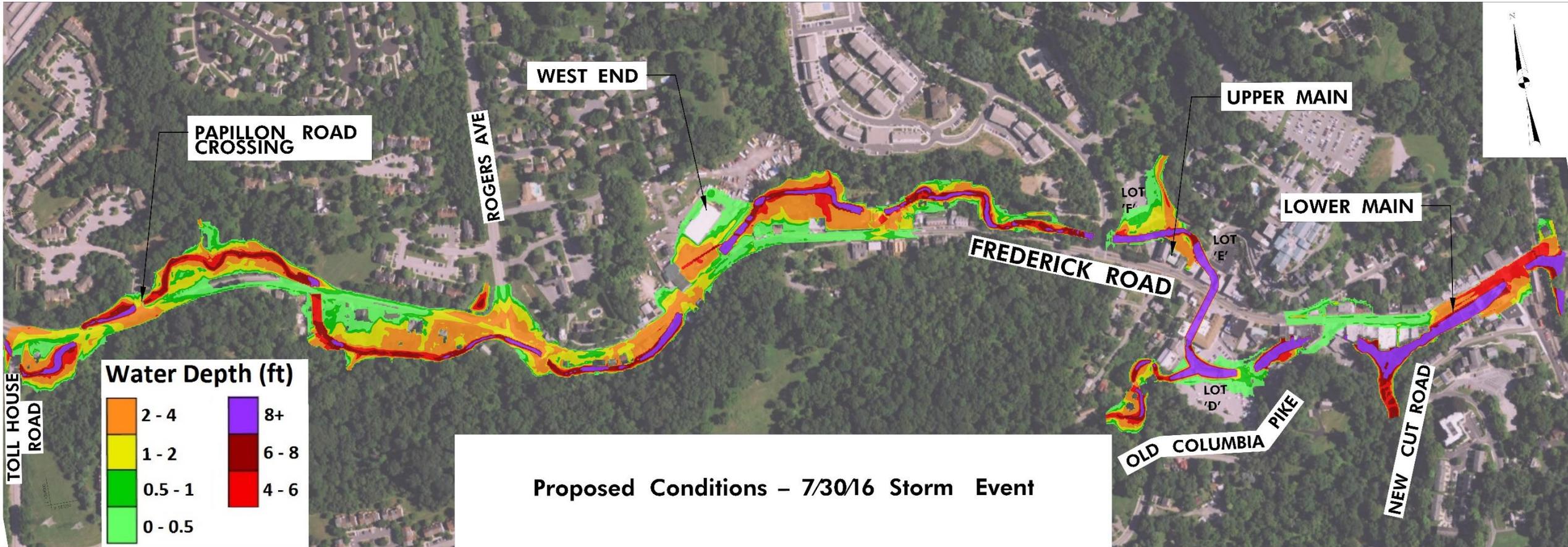
## This plan is the most effective of all those explored due to its ability to address:

- Protecting Lives- mitigates the immediate risk to life safety
- Urgency- a significant portion of the plan can be accomplished in a short duration
- Feasibility/Constructability- most of these projects have already received some level of engineering
- Cost-effectiveness- this plan by far produces the largest benefit per dollar

# July 30, 2016 Water Depth Model



# Recommended Mitigation Improvements Model



# Continuing Community Engagement

**Master Plan Process** – continuing this fall

**Ellicott City Historic Structures Review Committee**

- Key historical elements to preserve and re-use

**Historic Preservation Commission**

- Certificate of Approval

Projects with federal or state permitting or funding must include a

**Section 106 Review**

- Identify any impact or adverse effects of historic resources
- Work with state agencies, including Maryland Historic Trust

**County Council Public Hearing – September 17, 2018**



---

# Master Plan Approach

## *Next Steps*

---

# Master Plan Objectives



## **Life Safety: *Protect Lives***



## **Rebuilding: *Emphasize resilience and placemaking in rebuilding***

Resilient Infrastructure | Attractive Downtown | National Model | Walkable and Accessible Destination



## **Environmental: *Protect the environment***

Healthy Natural Resources | Embrace Rivers and Tributaries | Interventions Address Flood Mitigation and Increased Green Space



## **Preservation: *Preserve Ellicott City's heritage***

Distinctive Elements | Buildings, Terrain, River Valleys | Importance of Historic Preservation | Social, Physical and Cultural Resources | History, Environment, Creativity and Culture



## **Economy: *Revitalize the downtown economy***

Balanced Economic Growth and Commercial Success | Investment – Existing and New Businesses | Thriving Small Businesses | Targeted Economic Development to Strengthen Main Street and West End |

# New Approaches

Building upon the five-year flood mitigation plan, the master plan will take a fresh look at opportunities to meet multiple objectives with:

- Urban design and amenity enhancements
- Public park and open space
- Land uses in the core area
- Streetscape and roadway improvements
- Debris management (vehicles and dumpsters)

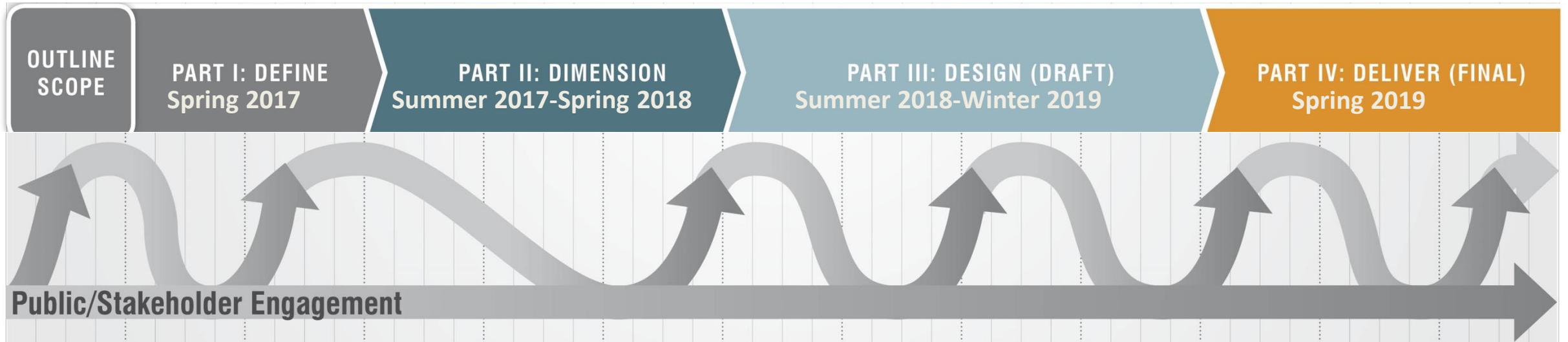


*An example of terracing in Hebden Bridge, UK*

Concepts will be prepared for the West End, Upper Main, Lower Main and Courthouse areas. We will keep Hudson Bend in play. The new master plan will reflect the five-year plan for retention projects in the watershed.

# Next Steps

- Master Plan Advisory Team meeting in mid-October
- Public Workshop in late-October
- Online engagement opportunity after the public workshop
- Preparation of a draft plan for public review in early 2019



---

# Questions & Answers

---

---

**More Information:**

*[www.howardcountymd.gov/ECMP](http://www.howardcountymd.gov/ECMP)*

---