Building Stormwater Resiliency: Howard County

Presented by
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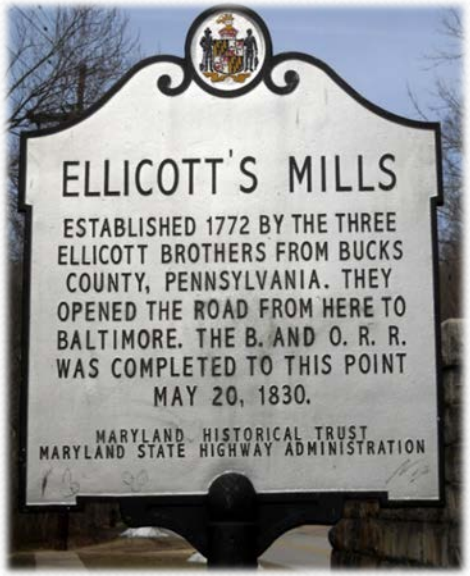


Agenda

- Acute Stormwater Quantity Issues – Major Flooding Events
- Chronic Stormwater Quantity Issues– Problems from “Regular” Rain Events
- How to address these issues for the future?

Ellicott City History of Floods

1868

1952

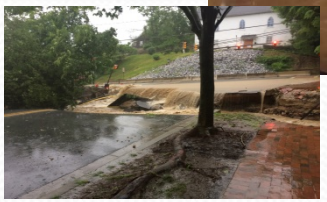
1972

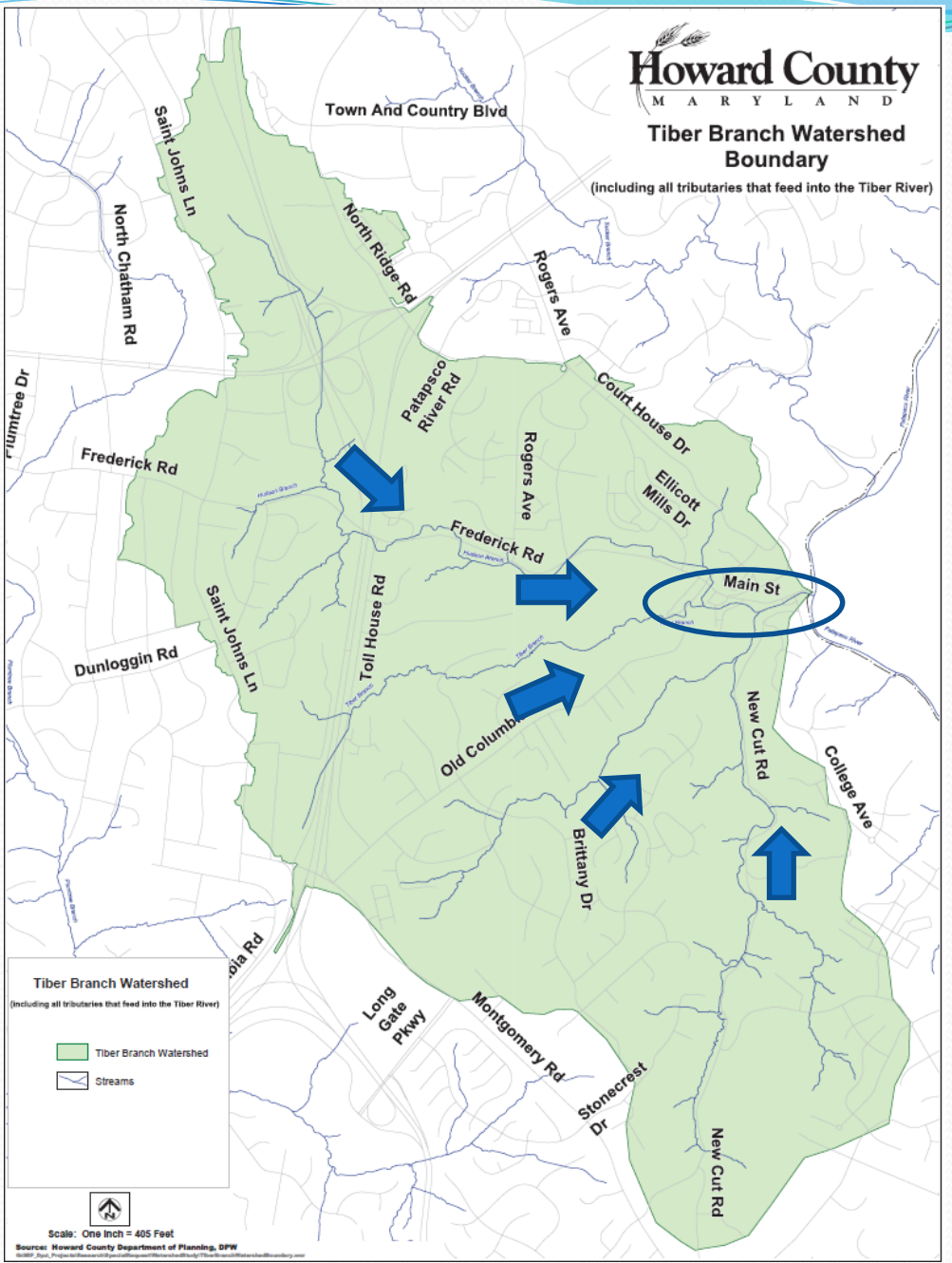
1975

2011

2016

2018

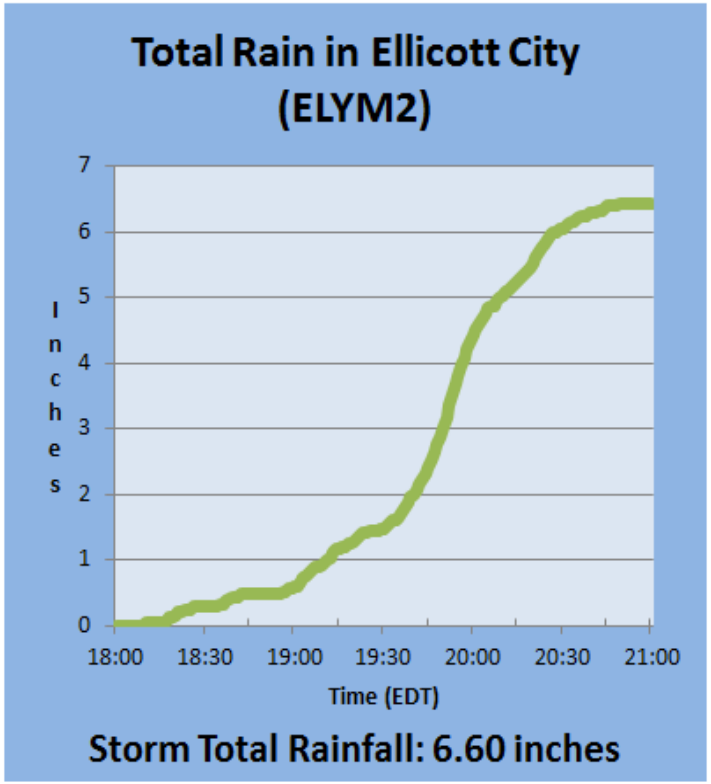




3.7 sq mi watershed

Historic Rainfall in Ellicott City, Maryland – July 30, 2016

Duration	Max Rainfall in Duration	Time of Occurrence
1 minute	0.20”	7:52pm-7:53pm
5 minutes	0.80”	7:50pm-7:55pm
10 minutes	1.44”	7:50pm-8:00pm
15 minutes	2.04”	7:46pm-8:01pm
20 minutes	2.44”	7:44pm-8:04pm
30 minutes	3.20”	7:36pm-8:06pm
60 minutes	4.56”	7:30pm-8:30pm
90 minutes	5.48”	7:00pm-8:30pm
2 hours	5.96”	6:50pm-8:50pm



Information obtained from the Ellicott City (ELYM2) rain gauge.
This gauge reports in 0.04” increments.

Ellicott City, MD – May 27, 2018

Duration	Max Rainfall in Duration	Time of Occurrence
1 minute	0.16”	4:15pm-4:16pm
5 minutes	0.56”	4:15pm-4:20pm
10 minutes	0.96”	4:11pm-4:21pm
15 minutes	1.44”	4:06pm-4:21pm
30 minutes	1.84” 1.84”	3:53pm-4:22pm 5:20pm-5:50pm
60 minutes	2.68” 2.84”	3:20pm-4:20pm 5:00pm-6:00pm
2 hours	5.00”	3:53pm-5:53pm
3 hours	6.56”	3:15pm-6:15pm

Information obtained from the Ellicott City (ELYM2) rain gauge. Data is preliminary and subject to correction. This gauge reports in 0.04” increments.

Note: - Catonsville ~ 10” of rain from same storm

July 2016

Hours Later

Caplans – Before and After 2016 & 2018

Ellicott Mills Drive - 2018

Addressing Major Flooding

- Infrastructure repairs (walls, roads, sidewalks, utilities)
  - Permanent repairs from 2016 held up in 2018
- Design of large flood mitigation projects
  - Dry Flood Mitigation structures and Conveyance projects including a tunnel
  - *Reduce* impacts to public from future large storms
- Corps of Engineers Floodproofing Study
  - County can't stop the rain. Public needs to protect their homes and businesses. County flood mitigation grants.
- CB 56 – One year moratorium on building in Tiber and Plumtree Watersheds; identify design manual changes.
  - Watershed specific Design Manual revisions

Addressing Major Flooding – Cont.

- Proactive maintenance
  - In-stream woody debris removal after “large” storms” (2”/24 hours or 30 mph sustained winds)
- Property acquisition
  - Remove people from harms way. Partial or complete building removal.
- Enhanced situational awareness
  - VMS signs, audible alerts, high ground hubs, additional gaging and NWS coordination
- Restart long term Master Plan efforts
- Considerations – cost, time, permitting, historic resources, public perception and expectations

Nuisance Flooding and Drainage Issues

- Current stormwater criteria – Environmental Site Design
  - Promotes groundwater recharge, water quality for small/frequent storms. Slows the flow.
  - "Small/frequent storms" tending towards high intensity/short duration events that overwhelm the ESD devices causing localized flooding
  - County can require greater quantity control for historically flooded areas. Is this a Catch-22?
  - Bring back 2-year and 10-year quantity control?
- Older areas built prior to SWM requirements
  - Basically stormwater conveyance – pipes and ditches that require maintenance
  - Goal was to move water, not detain it or soak it in

Nuisance Flooding and Drainage Issues

- Performing Drainage Assessments
  - Areas of know roadway drainage issues being studied for possible conveyance upgrades
  - Increase inlet capacity to match pipe capacity
  - Need to look at areas downstream of upgrades
  - Limited areas for new quantity control facilities. Trees versus SWM structures.
- How much land is left to develop?
  - Need more stringent SWM for redevelopment?
- Considerations – cost, time, vastness of existing stormwater system, public versus private ownership, public expectations, what do we design for?

So what do we do?

- Acknowledge that there is a problem
- Regional/Statewide approach
- Don't work/regulate in a vacuum
- Show me the money. Grants, loans, and other funding sources.
- How do we eat the stormwater resiliency elephant in the room? One bite at a time.

Thank You