



The Historic Ellicott City Flood Workgroup

Report

12/01/2015

I. Introduction

Flooding is a major problem in the Patapsco River and Hudson/Tiber Watershed Tributaries, causing significant property damage and personal loss. There have been numerous incidents of flooding, including several recent major events.

The Howard County Flood Mitigation Plan identifies Historic Ellicott City as an area of flood vulnerability, stating: “The (Old) Ellicott City area will potentially be one of the most impacted during a 100-year flood event on the Patapsco River... Nearly all structures in the area may suffer flooding damage to their buildings and contents. Many are likely to be impacted significantly or severely. In addition to flooding from the Patapsco River, the (Old) Ellicott City area is also impacted by the Tiber Hudson Branch, Cat Rock Run, Autumn Hill Branch, and New Cut Branch. There are many businesses in the (Old) Ellicott City area, making both the buildings and their valuable contents vulnerable to flooding.”¹ The Howard County Executive funded approximately \$2,500,000 in Fiscal Year 2016 for a first phase (Phase I) of flood mitigation projects in the Historic Ellicott City area. In conjunction with that effort, the Howard County Executive created the Historic Ellicott City Flood Workgroup through **Executive Order 2015-06**. While the Workgroup will not oversee Phase I efforts, it is tasked with recommending flood mitigation solutions to be included in future efforts (Phase II). The Workgroup is specifically charged with:

1. Acting on initiatives to reduce flooding.
2. Evaluating priorities for mitigation/infrastructure improvements in the future.
3. Outreach to the community related to projects and initiatives.
4. Seeking community input and feedback.
5. Seeking opportunities for additional funding sources.
6. Providing community educational opportunities on reducing impact of future flooding.
7. Work towards possible reductions in Federal Emergency Management Agency (FEMA) insurance rates.

¹ *Flood Mitigation Plan - Howard County, Maryland*; September 6, 2010;
http://www.howardcountymd.gov/uploadedfiles/home/environment/environmental_services/finalhowardcountyfmp.pdf

The Workgroup consists of the following individuals:

- Kevin Bloom
- Frank Durantaye
- Debra Korb
- Lori Lilly
- Jason McMillan
- Ken McNaughton
- Dave Myers
- Ron Peters
- Bruno Reich
- Debbie Slack Katz (Chair)

The Workgroup is supported by the following Howard County Departments/Offices:

- Office of Community Sustainability
- Office of Emergency Management
- Department of Inspections, Licenses & Permits
- Department of Planning & Zoning
- Department of Public Works
- Howard County Council (District 1)

II. Workplan

The Flood Workgroup met on a monthly basis from June – September 2015. The Flood Workgroup then met on a bi-monthly basis from October – December 2015.

- **June 15, 2015 -**
 - Logistics – A discussion on:
 - When and where the group will meet.
 - Mission and member responsibilities.
 - Setting meeting procedures.
 - Deliverables – A discussion on requirements:
 - Outreach – At least one public hearing to receive community input.
 - Education – Campaign to educate community on flooding and how to help mitigate impacts.
 - Insurance – Work on reducing FEMA insurance rates. **The Workgroup did not explore FEMA insurance rates further based on the fact that the insurance rate had recently been reduced and that it would be difficult to reduce it farther.*
 - Continuation – Recommendation by October 1, 2016 on whether to continue work.
 - Public testimony targeted for 2016.

➤ **July 13, 2015**

- Current Work – Discussion of what County Government is currently doing to mitigate flooding. Potential Phase I projects were shared:

Proj #	Project Description	Amt	Unit	Estimate Unit Price	Total Estimated	Year 1	Years 2-5	Years 6-10
					Cost	FY16	FY17-20	FY21-25
1	Stream Wall Inspections and Prioritization	1	Ea	\$50,000	\$50,000	\$50,000	\$0	\$0
2	Stream Wall Design and Construction (assume 750 lf per year)	7500	LF	\$2,000	\$15,000,000	\$1,500,000	\$6,000,000	\$7,500,000
3	Comprehensive Floodproofing Study for Historic Ellicott City	1	Ea	\$75,000	\$75,000	\$75,000	\$0	\$0
4	Historic Ellicott City Floodproofing	50	Ea	\$10,000	\$500,000	\$250,000	\$250,000	\$0
5	READY – annual channel clean up (\$20k/year)	10	Year	\$20,000	\$200,000	\$20,000	\$80,000	\$100,000
6	Annual County Stream Channel Maintenance (larger projects)	10	Year	\$100,000	\$1,000,000	\$100,000	\$40000	\$500,000
7	S&S Site 1 – Re-form channel under Tiber Park Bridge	300	LF	\$300	\$90,000			\$90,000
8	S&S Site 4 – Replace cinder block wall next to apartment complex	400	LF	\$2,000	\$800,000	\$0	\$800,000	\$0
9	S&S Site 5 – Repair erosion above culvert and do planting	1	Ea	\$50,000	\$50,000	\$50,000	\$0	\$0
10	S&S Site 6 – Replace sandbag wall	200	LF	\$2,000	\$400,000	\$400,000	\$0	\$0
	TOTAL ESTIMATED COSTS				\$18,165,000	\$2,445,000	\$7,530,000	\$8,190,000

- Historical Overview – Discussion of what have been the past impacts of flooding and what could happen in the future.
- Education – Discussion of what has already been done to address flooding. **All technical reports prepared over the last 20-years were reviewed.*
- Next Steps – Discussion of how the workgroup will work moving forward

➤ **August 17, 2015**

- The Workgroup took a tour of the watershed to visualize flooding impacts and better understand potential mitigation efforts:

Stop	Location	Topic Speaker	Themes / Discussion
1 (5:05-5:20)	Courthouse gully	Lori Lilly	<ul style="list-style-type: none"> • Unmanaged impervious cover, effects on stream channel, relation to flooding
2 (5:25-5:40)	EC staircase	Jim Caldwell / Mark DeLuca	<ul style="list-style-type: none"> • Stormwater management in downtown EC • Project design / function
3 (5:45-6:05)	8454 Frederick Rd (Nathan Sowers)	Mark DeLuca / Lori Lilly	<ul style="list-style-type: none"> • Channel walls • Private vs public improvements • Routine maintenance • Constrictions
4 (6:10-6:25)	EC Historic Colored School	Mark DeLuca / Lori Lilly	<ul style="list-style-type: none"> • Impacts from Lee • S & S Study • Stream restoration • Channel walls
5 (6:30-6:45)	Rusty Rim pond	Center for Watershed Protection	<ul style="list-style-type: none"> • Outdated stormwater management facilities • Proposed project site
6 (6:50-7:00)	CR Daniels / Lotte Plaza	Jim Caldwell	<ul style="list-style-type: none"> • Unmanaged, large lot impervious cover • Private commercial property • County incentive programs for stormwater management
7 (7:05-7:15)	End at EOC	Ryan Miller	<ul style="list-style-type: none"> • Emergency operation center • Response and communication during Lee/emergency events

➤ **September 14, 2015**

- Discussion on the relation of Phase I flood mitigation efforts (“short-term” goals) vs. the Workgroup’s Phase II flood mitigation efforts (“long-term” goals).

➤ **October 19, 2015**

- This meeting isolated the focus of the report. Each Workgroup member presented 5-10 points they want to see covered in the report. The Workgroup worked through those proposals to establish the focus of the report.

➤ **October 26, 2015**

- The Workgroup confirmed the objective of the report due to the County Executive and County Council. A framework for the report was developed to capture all the items needed to fulfill the executive order establishing the Workgroup.

➤ **November 16, 2015**

- Workgroup members worked on the content of each section of the report. The workgroup then reviewed all the sections as a whole, refined the content, and concluded the meeting with a preliminary draft of the report.

➤ **November 23, 2015**

- The Workgroup finalized the flood mitigation report.

III. Recommendations

The Historic Ellicott City Flooding Workgroup is making the following recommendations to the Howard County Executive and County Council with the goal of protecting the Ellicott City Historic District by enhancing public safety and minimizing damage to properties.

A. Structural

The Flood Workgroup has identified short and long range structural improvements to the stormwater management systems in the Ellicott City drainage area to mitigate and possibly eliminate property damage. Some of these ideas are in response to the changing character of recent floods and could be accomplished in the near future. Others are long range ideas that could enhance the urban design of Ellicott City, create tourist attractions and capture the imagination of the wider population. Other ideas are possible long range projects to handle maximum water quantities with no damage to property. Many small projects such as repairing of the channel walls on private property may be accomplished by cooperatives, grants, or other programs to allow them to be completed faster or at lower cost. Other projects may be accomplished by public funding or public/private ventures. The following recommendations should be considered for future mitigation efforts:

1. Continue funding Phase I and fund Phase II mitigation projects.
2. Repair existing stormwater system including:
 - a. Channel walls
 - b. Structures supporting buildings spanning the channels
3. Increase capacity of the existing stormwater system including:
 - a. Increase number and/or size of underground stormwater pipes
 - b. Create spillways
 - c. Create underground storage such as below Parking Lots F and D
 - d. Increase size of existing stormwater management ponds and add new ponds

4. Implement flood proofing projects on private property
5. Create new funding/implementation models including:
 - a. A technical assistance program on the local level modeled after FEMA
 - b. State and federal grants
 - c. Tax incentives
 - d. Cooperative programs
6. Create projects that combine increased stormwater capacity and urban design such as:
 - a. Widen and deepen beds and develop recreation areas
 - b. Create step ponds
 - c. Partner with Baltimore Gas and Electric (BGE) on flood mitigation projects in its corridor.
 - d. Creation of a park/city attraction that doubles as stormwater storage
 - e. Creation of a rock quarry that doubles as a stormwater storage
7. Create an access point in the lower downtown watershed for maintenance, monitoring and post storm surveys.

B. Maintenance/Monitoring

The purpose of this section is to emphasize the importance of channel maintenance and monitoring in flood control. The following recommendations should be considered for future mitigation efforts:

1. **Maintenance:** The County should implement an ongoing plan to minimize the amount of debris that accumulates within the stream channels of the Tiber and Hudson tributaries, as well as the drainage channels that empty into the Tiber and Hudson. This would include all naturally occurring debris from rain, wind, snow or ice storms and any other debris that ends up in the channels.
2. **Monitoring:** The county should monitor the Tiber and Hudson channels along with the tributaries that empty into the Tiber and Hudson on a scheduled basis of four times per year. This would include monitoring for any blockages, side wall failures or potential side wall failures that could cause future problems. In addition to the scheduled inspections the stream channels should be inspected after every significant storm event for any accumulated debris. A significant storm event can be defined by heavy snowfall over 6 inches, heavy rain over 2 inches in an 8 hour period, wind gusts of over 30mph and any accumulating freezing rain. In addition to the county monitoring, it would be

beneficial for local residents whose property adjoins the stream channels to also monitor for debris and report any concerns to the Department of Public Works. The portion of the Patapsco River from the Route 144 bridge to Oella should also be monitored for any fallen trees or logs that could cause blockages at the bridge. The inspections, debris removal and any blockages should be photographed and GPS coordinates recorded for future reference. Real time monitoring of waters levels and flow rates in the Tiber and Hudson along with adjoining streams would be beneficial for analysis and archiving. The flow station on the Hudson located at the Ellicott City Colored School should have an audible and visual alarm added. In addition to this alarm station, a second alarm station should be added where the Tiber and Hudson merge behind the Visitors Center. A third station behind the old bakery on Main Street would provide valuable comparative data on the less developed watershed of the Autumn Hill Branch and New Cut Road. The use of drone technology to help with the monitoring may be an option in the future.

C. Education

In a world where climate changes are somewhat unpredictable and building developments can change the flow of stormwater in Historic Ellicott City, Howard County should reach out to developers, commercial interests, business owners and residents with the latest information about techniques to control and mitigate floodwater. The following recommendations should be considered for future mitigation efforts:

- 1.** Maintain the current web page for all information related to Historic Ellicott City flooding. This would include flood mitigation preparedness techniques, technical resources, grant programs and videos about past floods and flood preparedness.
- 2.** Reach out to longtime Historic Ellicott City homeowners to share their knowledge of past flood events and educate new property owners and tenants about flood risk.
- 3.** Support the Flood Workgroup in its effort to hold at least one public hearing in 2016.
- 4.** Consider holding a Water Day in Historic Ellicott City. Invitations could be extended for representatives and presentations from the National Incident Management System, as practiced by the Emergency Management Division in South Carolina; the Maryland Emergency Management Agency; the Federal Emergency Management Agency; the Red Cross; and Southwest Airlines. The event would include a host of water-related items to attract public attention and would be held in conjunction with other relevant

groups in Howard County (e.g. the Watershed Stewards Academy and the University of Maryland Extension).

5. Initiate community-level planning for emergency preparedness. This would include information about sand bags, monitoring and disseminating information from stream gages, dedicated communications and recovery efforts.
6. Promote awareness of stormwater quantity and quality. Stencil storm drains in Historic Ellicott City with “Drains to Patapsco River” and “Nothing down the drain but rain.” Encourage the use of rain gardens, rain barrels and bio-retention areas. Investigate involving the Boy Scouts and local High Schools.
7. Partner with relevant volunteer groups such as the Patapsco Heritage Greenway, Ellicott City Partnership, etc.

D. Programmatic/Capacity

In order to mitigate flooding in Ellicott City, the Flood Workgroup feels that consistent and dedicated resources need to be applied to the flooding issue until measurable improvements are seen. Until the recent appointment of the Flood Workgroup, a venue for discussion did not exist. The Flood Workgroup has since vetted many potential solutions and paths forward in its meetings and determined that comprehensive solutions will require resources beyond those that currently exist with regards to funding, staff and programs. The Flood Workgroup therefore recommends that flood mitigation capacity be increased through the following mechanisms:

1. **Dedicated Staff.** The County should have dedicated staff to oversee and coordinate flood mitigation efforts. This staff person would have the ability to effectively work across departments to achieve specified objectives. The staff person would be responsible for submitting grants, coordinating with other departments on grant submittals, communicating progress to the community, providing or coordinating provision of technical resources to the community, and generally ensuring and spearheading forward momentum on flood mitigation efforts.
2. **Provision of Flood Mitigation Programs.** The Flood Workgroup recommends that existing programs be supported or enhanced and new programs be developed and implemented. The Flood Workgroup recommends that 1) Restoring the Environment and Developing Youth (READY), Patapsco Heritage Greenway, and other groups

continue to be supported; 2) Tax incentives are offered to homeowner associations, businesses, and other groups to implement infrastructure remediation; 3) public / private partnerships are sought for funding infrastructure improvements and increasing awareness of flood issues; and 4) a new program be created to identify and implement floodproofing projects with incentives provided as needed.

E. Other

The Historic Ellicott City Flood Workgroup suggests that Howard County consider the following items, which do not conveniently fit under any of the previous headings in this report. The following recommendations should be considered for future mitigation efforts:

1. In the Lower Patapsco watershed, the Tiber-Hudson subwatershed had 27.7% impervious cover in 2006, which made it the second most impervious of the eleven subwatersheds.² While on-site flood plain controls are currently in effect for development in the watershed, in-lieu fees for offsite improvements should also be considered. The fees could be used for the design, construction, or modification of flood management projects throughout the watershed. Efforts should be made to return developed space to the natural environment where possible. Efforts should be made to protect and preserve the existing green and forested areas in the watershed. Where development must take place, it should be under the requirement of making no adverse impact on the environment. The Flood Workgroup is available to review and comment on any new development site plans.
2. The County should work for equitable solutions with homeowners whose properties have been adversely affected by increased flood exposure over a period of new development and possible climate change. When considering purchasing properties in high risk flood zones the County Government should negotiate fairly and equitably with all homeowners in that area.
3. The County should make clear how its funds are divided between managing the *quantity* of stormwater and the *quality* of stormwater that enters the Patapsco River.

² 2005 Lower Patapsco Watershed Restoration Action Strategy; <http://www.howardcountymd.gov/DisplayPrimary.aspx?id=375>

IV. Conclusion

Damaging floods have been recorded in Historic Ellicott City ever since the town was founded in 1772. Recent events such as Tropical Storm Lee in 2011 have reminded us that more needs to be done to mitigate the danger to life and property. Following the Ellicott City Flood Study and Concept Mitigation Report of 3 April 2014 Phase I steps were outlined for fiscal year 2016 and following years.

Climate change could make future flooding more frequent and larger in scope. Development in the watershed has contributed to the flooding danger and this needs to be considered if proposals for new development occur. We hope this report will help prevent loss of life and damage to property in the place where we live, work and recreate, Historic Ellicott City.