

The Economic Impact of the 2016 Ellicott City Flood

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Executive Summary

This study assesses the economic contribution of Downtown Ellicott City/Main Street Corridor businesses to the Howard County economy and estimates the displaced business and economic activity occurring in the County as a result of the July 30th Ellicott City flash flood event. Key findings of this analysis include:

Pre-Flood Impact of Downtown Ellicott City/Main Street Corridor Businesses

- Prior to the flood, the 141 businesses located in Downtown Ellicott City/Main Street Corridor, directly contributed \$124.2 million in business activity to the County and employed 955 workers earning an estimated \$53.1 million in Labor Income;
- When multiplier effects are included Downtown Ellicott City/Main Street Corridor businesses generated a total impact of \$196.8 million in business activity in the County and supported 1,396 jobs earning \$79.5 million in labor income;
- These businesses directly generated an estimated \$6.2 million in combined State and local government revenues, with \$2.0 million in County government revenues, and when multiplier effect are included, generated an estimated \$10.2 million in combined State and local government revenues, with \$3.7 million in County government revenues;

Business/Economic Impact of the July 30th Ellicott City Flash Flood

- As a result of flood induced reductions in business activity, the July 30th Ellicott City flash flood event could directly reduce economic activity in the County by \$42.4 million and reduce labor income earned by \$18.1 million and County government revenues could fall by \$700,000; and
- When multiplier effects are included, County economic activity could be reduced by \$67.2 million, with a resulting loss of 151 jobs and labor income reductions of \$27.2 million with County government revenue losses of as much as \$1.3 million as a result of the flood.

A secondary goal of this analysis was to prepare and present data on the overall flood related impacts on the County, including information on: property damages; response and recovery costs; and the potential costs and payback period for the required long term flood mitigation efforts for Ellicott City. Because of the ongoing nature of the County's flood response and recovery efforts, much of this data is not yet available; however, the JFI found that:

- Preliminary estimates of the County costs incurred to address immediate flood related response total \$12 million for the response and recovery efforts to date and \$2 million in channel wall repairs on County-owned property along the Tiber-Hudson stream; and
- A conservative estimate of County business tax and residential property tax revenues from Downtown Ellicott City/Main Street Corridor business activity and residents totals \$2.3 million. Based on discussions with the County Office of Emergency Management, future flood mitigation efforts for the Ellicott City area could range into the "tens of millions of dollars." Based on data on business taxes and residential property taxes paid by the businesses and residents, a high level payback estimate is 4.3 years per \$10 million (\$10 million /\$2.3 million).

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Introduction

Ellicott City was founded in 1772 when John, Andrew and Joseph Ellicott of Bucks County, Pennsylvania, chose the picturesque wilderness upstream from Elk Ridge Landing to establish a flour mill. The first courthouse was built in 1841 and when Howard County was formed out of Anne Arundel County in 1851, Ellicott City was designated as the County seat. Ellicott City serves as the historical center of social and cultural activity in the County. On July 30th, 2016, a storm cell dumped six inches of rain in during a two hour period in Ellicott City, in what has been termed a once in one thousand year flooding event. The Ellicott City flash flood caused two deaths, generated 120 swift water rescues, and caused significant property damage.¹ President Obama approved federal disaster aid for Ellicott City on Friday, September 14th, 2016, providing federal resources to assist impacted businesses and residents and implement long term mitigation projects to improve the City's resilience.²

The Howard County Economic Development Authority (HCEDA) retained University of Baltimore's Jacob France Institute (JFI) to estimate the economic impacts associated with downtown Ellicott City's businesses and the flood induced displacement of this business activity. This analysis consists of three parts:

1. An analysis of the economic contribution of Downtown Ellicott City businesses to the County economy;
2. An analysis of the estimated displaced business activity cause by the flood related-shutdown of Downtown Ellicott City businesses; and
3. A discussion of other flood related impacts and the fiscal implications of the rebuilding and flood mitigation options currently under consideration.

Economic Impact of Downtown Ellicott City Businesses and the flood Displaced Business Activities

Ellicott City is the cultural and governmental center of Howard County. The City is the county seat and home to the County's governmental offices. While the Ellicott City CDP³ is large and comprised of an area ranging from the Baltimore County line in the north and east to Route 108 in the south, downtown Ellicott City serves as the center of this Census Designated Place. The Ellicott City CDP is the County's second largest center of employment after Columbia and accounts for 13 percent of the County's total employment base. While only a portion these jobs, an estimated 955 jobs, are located in the Downtown Ellicott City/Main Street Corridor, this area is an important concentration of County jobs, retail and entertainment activity and is one of the County's most visible and recognizable historical landmark communities. Because of the severity of the flooding and the social, economic and economic importance of Ellicott City, Howard County has requested this analysis and estimated of flood caused economic dislocation on the County.

¹ <https://www.washingtonpost.com/news/capital-weather-gang/wp/2016/08/01/this-is-how-an-off-the-charts-flood-ravaged-ellcott-city/>.

² <http://www.baltimoresun.com/news/maryland/howard/ellcott-city/ph-ho-cf-fema-flood-declaration-0922-20160916-story.html>.

³ Census Designated Places (CDPs) are the statistical counterparts of incorporated places, and are delineated to provide data for settled concentrations of population that are identifiable by name but are not legally incorporated under the laws of the state in which they are located.

Table 1: Howard County Employment by Place

Item	Total Jobs	% of Total
Total County Employment	165,655	100%
All Places (Cities, CDPs, etc.) ¹	<u>136,608</u>	<u>82%</u>
Columbia CDP	80,328	48%
Ellicott City CDP	21,861	13%
Estimated Downtown Ellicott City ¹	955	1%
Elkridge CDP	13,103	8%
North Laurel CDP	5,758	3%
Jessup CDP (Partial)	5,282	3%
Ilchester CDP	4,758	3%
Fulton CDP	2,947	2%
Savage CDP	1,425	1%
Scaggsville CDP	803	0.5%
Highland CDP	34	0.0%
All other employment	29,047	18%

(1) CDP = Census Designated Places.

(2) Estimated by JFI

Source: U.S. Bureau of the Census - LEHD and the JFI

In the aftermath of a major natural disaster, impacted areas must collect information on the severity and impacts of the disaster event. Data on disaster-related damages and costs are required in order to qualify for and receive federal and state assistance. These assessments typically focus on the property damages, response costs, and government spending needs associated with the immediate response and aftermath of disaster recovery. In the long term, data on the mitigation costs to address the underlying environmental and physical costs associated with reducing future risks from similar events are also critical. While these traditional damage assessments focus on the physical and financial costs of a natural disaster, information on the business and economic costs associated with natural disasters can also be critically important.

According to the International Economic Development Council's (IEDC) March 2015, *Leadership in Times of CRISIS: A Toolkit for Economic Recovery and Resiliency* report,

These assessments determine eligibility for state or federal disaster declarations, inform local decision-making processes, and evaluate the severity of impacts to specific sectors (e.g. critical infrastructure, impacts to structures, housing, local government functions). It is critical that EDOs and economic development professionals play an active role in these processes. While the conduct of these (relatively) routine assessments follow well-defined paths, there tend to be very few, consistent efforts to evaluate the disaster's impact on the business or economic sector.⁴

Similarly, according to *The Recovery and Resiliency Roadmap: A Toolkit for Economic Preparedness* report,

⁴ <http://restoreyoureconomy.org/wp-content/uploads/2015/03/IEDC-Leadership-in-Times-of-Crisis-Toolkit.pdf>, p. 96.

Economic impact studies conducted following a major disaster provide significantly more details on the immediate and long term repercussions of a disaster in terms of jobs, industry and business impacts and other economic indicators. This type of study enables the community to better understand the value of what has been damaged or destroyed in terms of the local economy and to learn about the communities' vulnerabilities. It provides a solid and basic understanding of how to improve the situation and helps engage the community in problem solving efforts. This provides a broader understanding of the most appropriate responses and recovery efforts to pursue as well how the community might want to consider mitigation efforts for future events. The economic damage of a disaster goes beyond accounting for physical damages or insured loss to such measures as the indirect costs of business interruption caused by power failure or market loss. This kind of understanding can help to shape initiatives to restore the local economy and prevent further catastrophes.⁵

As described in these reports, understanding the business and economic impacts of a natural disaster can be vitally important to gauging and responding to the event and resulting mitigation efforts. The goal of this analysis is to provide HCEDA and the County's government leadership with data on the business and economic costs associated with the July 30th Ellicott City flash flood event. As described in the IEDC report, this information can be used by public officials and the HCEDA in:

- Developing a clear picture of how industry and business has been impacted by the disaster;
- Receiving information on economic impacts to share with state and federal officials in order to justify the need for external recovery resources;
- Being informed in a way that influences decision-making in a time of crisis and taking critical actions for short- and long-term recovery;
- Understanding how current and future tax revenues have been negatively impacted by the event and how public services might be affected;
- Developing an outlook of how the local economy has been impacted by the event;
- Understanding how employment, wages, and tax revenues have been adversely affected;
- Providing support for identifying strategies, programs, and projects for short- and long-term recovery; and
- Educating community stakeholders on the current situation to provide insight and build consensus on how the community should move forward.⁶

In order to estimate the business and economic costs associated with the July 30th Ellicott City flash flood event, the JFI prepared this analysis of the overall estimated economic contribution of Downtown Ellicott City/Main Street Corridor business activity and estimated flood induced displacement of this business activity. This analysis focused on the subset of possible economic impact measures identified in the IEDC report related to business operations and employment, focusing on:

- Change in employment by industry;
- Loss of wages;
- Business interruption (e.g. change in gross product, output shifts);

⁵ <http://www.bceda.ca/sites/default/files/The%20Recovery%20and%20Resiliency%20Roadmap%20-%20A%20Toolkit%20for%20Economic%20Preparedness.pdf>, p. 53.

⁶ IEDC pp. 100-101.

- Loss of revenue for key industries within the impacted area; and
- Tax revenue loss (e.g., sales, property, employment, etc.).

The IEDC report identifies many other potential impact measures, such as property damage, business closures and relocation, environmental costs, and long term changes in housing and business activity.⁷ Because the flood response and recovery effort is ongoing, much of this data are not yet available. As a result, this effort focusses on two measures of economic activity:

1. What is the economic contribution of Downtown Ellicott City/Main Street Corridor businesses to the County; and
2. How has this activity been impacted by the flood.

This analysis provides the HCEDA and County government with information on the estimated economic importance of Downtown Ellicott City/Main Street Corridor businesses to the County and the projected, preliminary impact to the County of the business activity displaced by the flood. This information will assist the County in designing its flood response and mitigation strategy. It is important to note that this analysis is based on preliminary and estimated information on impacted businesses and employment activity. Because response and mitigation efforts are ongoing, a more complete accounting of the final economic and associated impacts will need to wait until response and recovery efforts are complete. This analysis, however, will provide the County with initial estimates of business and economic impacts that can assist in designing its long term recovery and mitigation strategy.

Pre-Flood Economic Contribution of the Downtown Ellicott City Employment Base

The first step in analyzing the economic impacts associated with the July 30th Ellicott City flash flood event is to determine the economic contribution of Downtown Ellicott City/Main Street Corridor businesses to the County prior to the flooding event. As described in the Methodology section below, the JFI worked with the HCEDA to develop an estimate of total business activity and employment in the impacted area and then estimated the economic contribution of this activity using the IMPLAN economic model for Howard County.

The JFI worked with HCEDA to develop and populate a database of Downtown Ellicott City/Main Street Corridor businesses. This effort identified 141 businesses with an associated 955 jobs⁸ in the impacted area. As presented in Table 2, the retail sector accounts for 34 percent of businesses and 25 percent of employment; the professional scientific & technical services sector accounts for 24 percent of both businesses and employment; and the accommodation & food services sector accounts for 13 percent of businesses and 28 percent of employment. While these three sectors account for 71 percent of businesses and 77 percent of employment, the Downtown Ellicott City/Main Street Corridor has a diversified economy with businesses across a wide spectrum of sectors.

⁷ IEDC, p. 105.

⁸ All employment figures are on a headcount basis. Throughout this report, totals may not add due to rounding. All financial figures are in 2016 dollars.

Table 2: Ellicott City Employment, By Sector

Item	Total Businesses	Total Jobs
Total	<u>141</u>	<u>955</u>
Natural Resources	0	0
Mining	0	0
Utilities	0	0
Construction	1	10
Manufacturing	2	3
Wholesale Trade	5	29
Retail Trade	48	240
Transportation & Warehousing	1	1
Information	1	13
Finance & Insurance	3	16
Real Estate	2	28
Professional Scientific & Technical Services	34	230
Management of Companies	1	1
Administrative & Waste Services	6	54
Educational Services	1	8
Health & Social Services	5	17
Arts, Entertainment & Recreation	4	7
Accommodation & Food Services	18	266
Other Services	9	32
Government and Non-NAICs	0	0

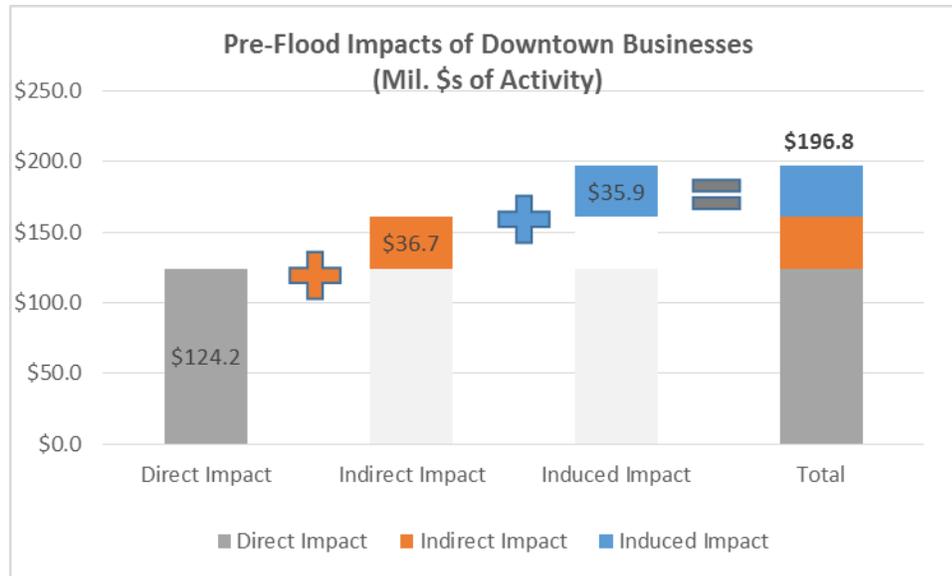
Source: HCEDA, DLLR and the JFI

Once the level of business activities and employment was identified, the JFI estimated the economic contribution of these businesses and jobs using the IMPLAN economic model. Prior to the flood, the 141 businesses located in the Downtown Ellicott City/Main Street Corridor, directly contributed \$124.2 million in business activity to the County and employed 955 workers earning an estimated \$53.1 million in Labor Income. This direct business activity is augmented with \$36.7 million in business activity and 210 jobs resulting from the *Indirect Impacts* associated with local business purchases and \$35.9 million in business activity and 231 jobs resulting from the *Induced Impacts* associated with the increase in local household incomes for a total impact of \$196.8 million and 1,396 jobs. Prior to the flood, Downtown Ellicott City/Main Street Corridor businesses directly generated an estimated \$6.2 million in combined State and local government revenues, with \$2.0 million in County government revenues, and when multiplier effect are included, generated an estimated \$10.2 million in combined State and local government revenues, with \$3.7 million in County government revenues.

Table 3: Estimated Economic Impact of Downtown Ellicott City Employers on Howard County

Item	Direct	Indirect	Induced	Total
Output (\$s)	\$124,196,032	\$36,681,826	\$35,944,501	\$196,822,360
Employment (Jobs)	955	210	231	1,396
Labor Income (\$s)	\$53,063,314	\$14,522,418	\$11,892,946	\$79,478,677
State and Local Government Revenues (\$s)	<u>\$6,236,574</u>	<u>\$1,571,248</u>	<u>\$2,376,990</u>	<u>\$10,184,812</u>
State Government Revenues (\$s)	\$4,262,878	\$898,748	\$1,306,261	\$6,467,888
Local Government Revenues (\$s)	\$1,973,695	\$672,500	\$1,070,729	\$3,716,924

Source: The JFI and IMPLAN



Post-Flood - Estimated Economic Impact of Flood Displaced Business Activity

The July 30th flash flood impacted nearly all businesses in downtown Ellicott City. While a small number of businesses, mostly those in the western portion of the City, were able to open after only a few days, most business were closed for more than a month and many are still closed. Several businesses were able to reopen on Wednesday August 23rd, three weeks after the flood,⁹ with the scheduled opening of Main Street to pedestrians expected to occur in October. As of the time of publication of this report; however, only a fraction of downtown businesses have reopened and most are still in the process of assessing and addressing flood caused damages.

In order to estimate the business and economic activity displaced by the July 30th Ellicott City flash flood event, the JFI worked with the HCEDA to estimate the level of business activity “lost” to the County’s economy as a result of the flood induced closures as businesses recover and rebuild after the flood. Based on discussions with HCEDA, the assumptions on displaced business activity were as follows, it was assumed that:

- 20 percent of businesses will be closed for one month;
- 30 percent of businesses will be closed for three months; and
- 50 percent of businesses will be closed for six months.

This analysis is based on the assumption that all businesses are able to recover and re-open after the flood and did not assume any level of long-term business closures or displacement of business activity. Given the severity of the flooding event and resulting damages, it is possible that the duration of business displacement could be greater or not all businesses will be able to recovery and reopen, and as a result, actual impacts could be greater. Still, this analysis provides a useful estimate of the potential business and economic costs to the County. The core findings of this analysis are as follows:

- The flood induced reductions in business activities could directly reduce economic activity in the County by an estimated \$42.4 million and reduce labor income earned by \$18.1 million;
- County government revenues could fall by \$700,000; and
- When multiplier effects are included, County economic activity could be reduced by \$67.2 million, with a resulting loss of 151 jobs and labor income reductions of \$27.2 million, with County government revenue losses of as much as \$1.3 million.

Table 4: Estimated Economic Impact of flood-based Displacement of Downtown Ellicott City Business Activity on Howard County¹

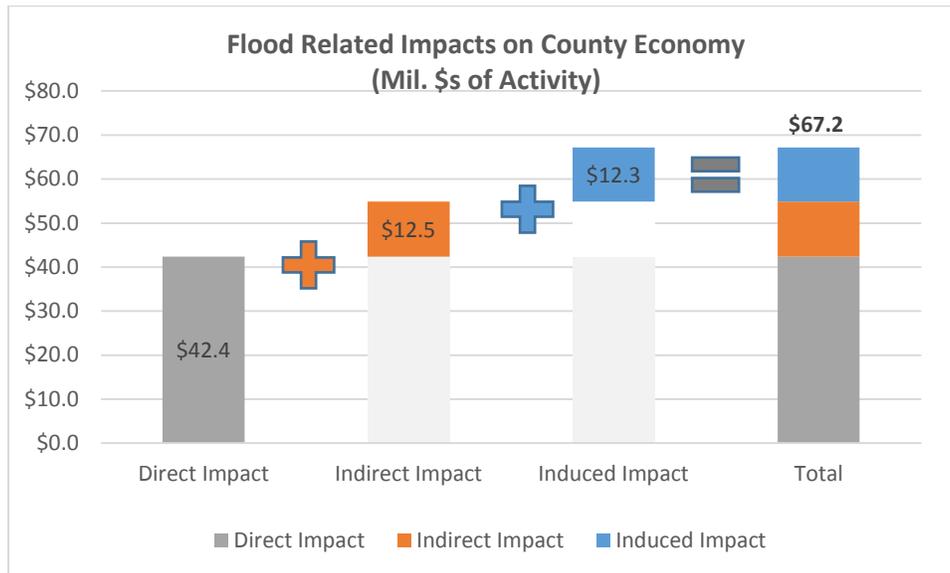
Item	Direct	Indirect	Induced	Total
Output (\$s)	\$42,400,000	\$12,500,000	\$12,300,000	\$67,200,000
Employment (Jobs)	n.m. ²	72	79	151
Labor Income (\$s)	\$18,100,000	\$5,000,000	\$4,100,000	\$27,200,000
State and Local Government Revenues (\$s)	\$2,100,000	\$500,000	\$800,000	\$3,500,000
State Government Revenues (\$s)	\$1,500,000	\$300,000	\$400,000	\$2,200,000
Local Government Revenues (\$s)	\$700,000	\$200,000	\$400,000	\$1,300,000

(1) Estimated loss of Howard County economic activity - based on business employment displacement estimates provided by the County - described in the text of the report.

(2) This analysis assumes that all businesses are able to re-open and suffer no long term employment impact - see text of the report for a description and analysis of this assumption.

Source: The JFI and IMPLAN

⁹ <http://www.bizjournals.com/baltimore/blog/real-estate/2016/08/portion-of-ellicott-city-main-street-to-reopen.html>.



Other Economic Impacts – The Importance of Ellicott City to the Howard County Economy

Ellicott City is one of Howard County’s best known, historical landmark communities. The Downtown Ellicott City/Main Street Corridor is possibly the County’s best known cultural and entertainment center and is visited by residents and tourists alike. Not only is it an employment center, ***Ellicott City is a key component of Howard County’s tourism sector.*** According to Anthony Cordo, the Executive Director of Howard County Tourism & Promotion, Ellicott City is one of Howard County’s main tourism attractions, and provides a core destination for both day trippers and overnight guests staying in the County for conventions, sporting events, festivals or concerts. Ellicott City offers an attractive dining, entertainment and retail mix that serves both residents and tourists.

Furthermore, Ellicott City, with its history, architecture and entertainment options also provides the “sense of place” that is increasingly favored by residents over newer, suburban style developments. This is especially true for Millennials, or younger workers between 25 and 34. A great deal has been written on the movement of both jobs and people, especially younger Millennials, into cities and reversing decades of urban decline. These trends were recently described in the City Observatory’s Young and Restless report, which analyzed trends in what it terms the “Young and Restless” or 25 to 34 year-olds with a bachelor’s degree or higher level of education who are increasingly moving back to the downtown areas of the nation’s major cities and fueling economic growth and urban revitalization. Millennial workers are increasingly favoring the live-work-play environments found in urban environments over the suburbs of their parents. Cities, counties and states are increasingly targeting the attraction and retention of these younger Millennial workers as a core part of their economic and workforce development strategies, and promoting the development of integrated live-work-play environments though land use policy changes is an increasingly important strategy. Ellicott City provides the mix of lifestyle and entertainment assets along with an image or “sense of place” that can assist the County in its goal to attract and retain Millennials and provide the quality of life assets vital to

maintaining the County's position as one of the Best Places in America to live, with Columbia, MD topping Money Magazine's Best Places to Live 2016.¹⁰

Flood Impact, Response and Mitigation Costs

Ellicott City has suffered several floods, with severe floods in 1868, 1923, 1952, 1972 and 2006¹¹ and experienced flooding as recently as 2011, when with Tropical Storm Lee a "flash flood was unleashed on the town's streets, wreaking havoc in homes and businesses."¹² All of these flooding events caused significant social and economic costs. An initial secondary goal of this report was to collect available information on the full scale of the: 1) property, financial and economic damages; 2) total federal, state and local response costs; and 3) future flood mitigation efforts and costs; associated with the July 30th Ellicott City flash flood. However, after discussions with Ryan Miller and the Staff of the Howard County Office of Emergency Management, much of this data is not available at this time. Data on the flood related property, financial and economic damages will need to be collected from the impacted individuals, businesses and property owners based on insurance claims and the rebuilding costs incurred. As these efforts are ongoing, no final data is available on this time. Similarly, the County has begun the planning process to identify and design the long term flood mitigation policies, investments and efforts required to protect Ellicott City. As these efforts are also ongoing, no preliminary estimates are available at this time. Preliminary estimates of the County costs incurred to address immediate flood related response and initial recovery efforts were available and include:

- \$12 million in County costs for the response and recovery efforts to date; and
- \$2 million in channel wall repairs on County-owned property along the Tiber-Hudson stream to address 2 of the seven impacted flood walls. The other five walls are located on private property and no data on their costs was available at this time.

These preliminary cost estimates are expected to increase as additional recovery and mitigation costs, efforts and investments are identified and implemented. As a result, it is not possible at this time to identify the total costs associated with the Ellicott City flash flood and future flood mitigation efforts. However, in order to provide the County with some guidance on the future benefit cost ratios associated with future flood mitigation efforts, some general rules of thumb can be applied:

1. Based on the economic and fiscal impact analysis of Downtown Ellicott City/Main Street Corridor business activity, the businesses and jobs in the impacted area directly generate an estimated \$2.0 million in annual property tax, income tax, and related County government revenues;
2. Based on data from the County Department of Tax Assessments, residential property owners pay an additional \$330,000 in property tax revenues.¹³ No estimates of County income or other tax revenues from these residents is available at this time;

¹⁰ <http://time.com/money/4480692/columbia-maryland/>.

¹¹ <https://www.washingtonpost.com/news/capital-weather-gang/wp/2016/08/01/this-is-how-an-off-the-charts-flood-ravaged-ellcott-city/>.

¹² https://www.washingtonpost.com/local/ellcott-city-a-town-of-many-many-floods/2016/07/31/94f05032-575e-11e6-9767-f6c947fd0cb8_story.html.

¹³ Estimated by the JFI based on data provided on the assessed value of residential property.

3. A conservative estimate of County business tax and residential property tax revenues from Downtown Ellicott City/Main Street Corridor business activity and residents totals \$2.3 million. Once estimates of future flood mitigation costs are prepared, these costs can be divided by this \$2.3 million figure to derive the payback term for the County of these efforts;
4. Based on discussions with the County Office of Emergency Management, future flood mitigation efforts for the Ellicott City area could range into the “tens of millions of dollars.” Based on data on business taxes and residential property taxes paid by the businesses and residents, a high level payback estimate is 4.3 years per \$10 million (\$10 million / \$2.3 million); and
5. While the costs of flood mitigation and resulting payback periods presented in #4 above may seem high, according to the 2005 Multihazard Mitigation Council’s *Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities* report, every \$1 spent on mitigation saves society an average of \$4.¹⁴

As is typical in the immediate aftermath of a significant natural disaster, the total economic and fiscal costs of the July 30th Ellicott City flash flood event are not yet known. As a result, according to the IEDC report referenced above, the “initial [economic impact] assessment should be followed up by a more thorough economic impact study approximately six months to a year after the event. The additional study would allow for a more realistic analysis of damages, particularly since federal data and figures would take three to six months to be updated following a crisis.”¹⁵

¹⁴ <https://www.nibs.org/?page=mmc>.

¹⁵ IEDC, p. 53.

Data Collection and Impact Analysis Methodology

The Howard County Economic Development Authority retained the Jacob France Institute of the Merrick School of Business at the University of Baltimore to analyze the economic implications of the July 30th, 2016 Ellicott City flash flood. This analysis used the IMPLAN input-output model for Howard County to analyze data on the contribution of downtown Ellicott City business activity and the business activity displaced by the July 30th, 2016 flash flood on the County's economy. A description of the data collection and economic impact methodology used in this analysis is as follows.

Business Database Generation

The core economic impact analysis of the economic contribution of the Downtown Ellicott City/Main Street Corridor businesses to the Howard County economy and of the flood related displacement of business activity is based on a database of Downtown Ellicott City/Main Street Corridor businesses developed by HCEDA and the JFI. HCEDA was able to provide lists of downtown businesses based on the inventory of Main Street Merchants from the Ellicott City Historic District Partnership as well as from property tax data. This data was used to create a master list of downtown employers. In order to prepare the economic impact analysis, data was needed on the industry and employment of these firms. HCEDA provided data from the State of Maryland on the employment and industry (NAICs code) of Ellicott City businesses. Employment and industry data were available for approximately half (66 of 141) of the downtown businesses. For the downtown businesses where data were unavailable, the business sector was identified based on internet and database searches of the company and employment was estimated based on sector averages. The business database results were validated based on discussions with HCEDA.

Economic Impact Methodology

Data on Downtown Ellicott City/Main Street Corridor business employment by sector was entered into the IMPLAN model for Howard County, Maryland in order to estimate the economic contribution made by these businesses to the County's economy. IMPLAN is one of the most widely used models in the nation, and can be used to analyze the impacts of companies, projects, or of entire industries. An input-output analysis examines the relationships among businesses and among businesses and final consumers. Input-output analysis is based on the use of multipliers, which describe the response of an economy to a change in demand or production. Multipliers measure the effects on an economy from a source of economic activity, in this case the business activity occurring in the Downtown Ellicott City/Main Street Corridor area.

The economic activity generated in a city, county, region or state is greater than the simple total of spending associated with the event or activity being studied. This is because as this money is earned it is, in turn, spent, earned and re-spent by other businesses and workers in the state economy through successive cycles of spending, earning and spending. However, the spending in each successive cycle is less than in the preceding cycle because a certain portion of spending "leaks" out of the economy in each round of spending. Leakages occur through purchases of goods or services from outside of the region and federal taxation. The IMPLAN multipliers used in this analysis capture the effects of these multiple rounds of spending. This analysis focuses on four measures of economic impact:

- **Output.** The total value of production or sales in all industries;
- **Employment.** The total number of full and part time jobs in all industries;
- **Labor Income.** The wages and salaries, including benefits, and other labor income earned by the workers holding the jobs created; and
- **State and Local Government Revenues.** The revenues accruing to the State of Maryland, county, City and municipal governments.

Four measures of the economic activity and impact of the jobs supported by Downtown Ellicott City/Main Street Corridor businesses are included in this report:

- **Direct effects.** The change in economic activity being analyzed—in this case the retail, entertainment/dining, professional services, and other business activities occurring in the Downtown Ellicott City/Main Street Corridor;
- **Indirect effects.** The changes in inter-industry purchases, for example the purchase of food to be prepared in a restaurant, in response to the change in demand from the directly affected industries;
- **Induced effects.** The changes in spending from households as income and population increase due to changes in production; and
- **Total effects.** The combined total of direct, indirect and induced effects.