

**Testimony for The Pew Charitable Trusts Presented by Laura Lightbody, Director Flood-Prepared Communities Initiative**  
**House Committee on Appropriations**  
**Subcommittee on Transportation, and Housing and Urban Development, and Related Agencies**

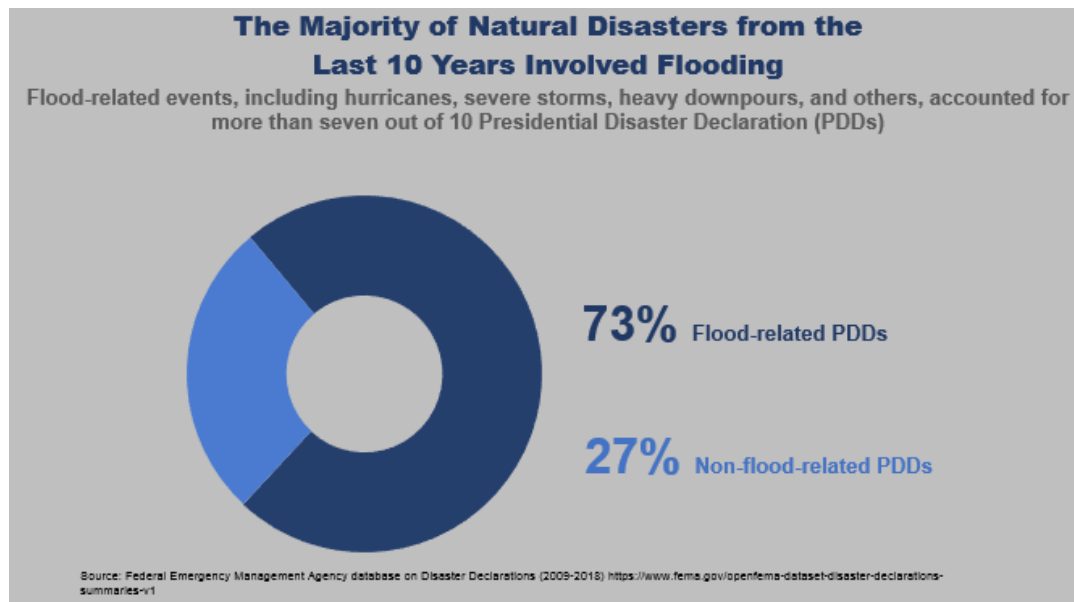
**March 13, 2019**

Chairman Price, Ranking Member Diaz-Balart, and Members of the Subcommittee, thank you for your invitation to discuss ways in which the Congress can support more resilient infrastructure. My name is Laura Lightbody, and I oversee The Pew Charitable Trusts' flood-prepared communities initiative aimed at reducing the impact of flood-related disasters on the U.S. economy, communities, and environment. Pew applies a rigorous, analytical approach to improving public policy that prioritizes investments in flood-ready infrastructure, mitigates the impact of disasters, modernizes flood insurance, and promotes nature-based solutions.

Flooding is the most costly natural disaster in the United States affecting all 50 states, inland and coastal. Since 2000, such events have caused over \$800 billion in overall losses associated with impacts such as business interruptions and physical damage to buildings, agricultural assets, and public infrastructure.<sup>1</sup> The challenge before this subcommittee is how to make much needed investments in infrastructure while ensuring those assets are not washed away by the next major flood.

**Floods are the most common natural disaster**

Flooding is the most pervasive natural disaster. Between 2009 and 2018, hurricanes, heavy rain, and other flood-related events accounted for 73 percent of Presidential Disaster Declarations.



<sup>1</sup> National Oceanic and Atmospheric Administration, *Billion-Dollar Weather and Climate Disasters: Summary Stats*, National Centers for Environmental Information, (accessed February 5, 2019) available at <https://www.ncdc.noaa.gov/billions/summary-stats> (considering tropical cyclone to be flood-related disasters).

Such events threaten lives and cause significant economic and physical damage to the vitality of communities, including homes, businesses, and infrastructure, such as roads, bridges, schools, and hospitals. Last fall, Hurricane Florence ravaged communities and infrastructure in the Carolinas with a storm surge of up to 13 feet and over 30 inches of rain in places.<sup>2</sup> At least 28 wastewater treatment plants and nearly 40 hospitals in North Carolina were impacted. More than 1,200 road closures halted supplies and prevented cities, including Wilmington, from receiving emergency responders and aid. And several school systems were closed for weeks, causing ripple effects throughout the community as parents grappled with balancing work and child care.

### **The federal government is the main source of disaster relief**

The federal government provides most of the funding for disaster relief, but that wasn't always the case. Federal disaster assistance began modestly and for well over a century was managed on a case-by-case basis largely as a supplement to local resources. Today, federal disaster assistance is governed by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, and when a major disaster is declared, much of the cost of managing response and recovery shifts from state and local entities to the federal government. A 2015 review of state budgeting for disasters concluded that natural disasters and emergencies have not had a significant effect on state finances, "...because states relied on the federal government to provide most of the funding for recovery."<sup>3</sup>

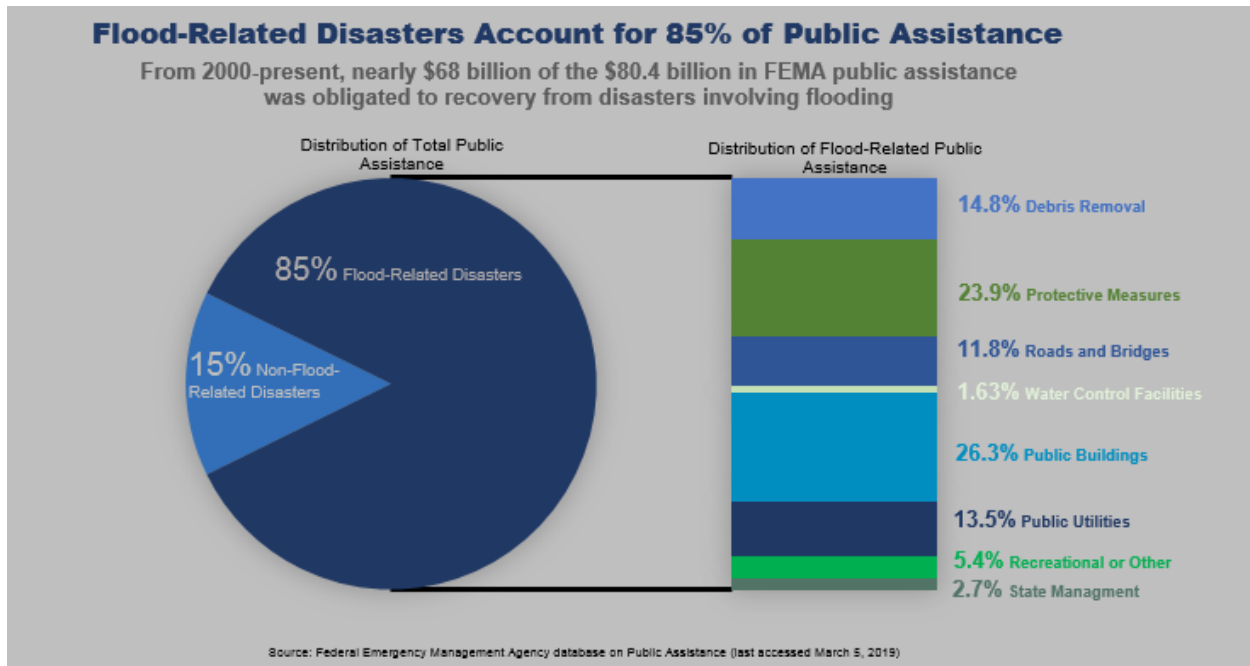
Without consistent accounting of costs across federal agencies it is hard to know exactly how much the federal government is spending in response to disasters, but a look at several of the main agencies providing support – the Federal Emergency Management Agency (FEMA), the Department of Transportation (DOT) and the Department of Housing and Urban Development (HUD) – is revealing.

FEMA's Public Assistance (PA) program, for example, uses authorities in the Stafford Act to deploy funding to assist states and localities following a federal disaster to repair, replace, or restore publicly-owned facilities, and to individuals on a limited basis. Spending through the PA program illustrates just how much disaster assistance goes towards flood losses – 85 percent, or \$68 billion, since 2000.

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<sup>2</sup> NOAA National Weather Service, *Historic Hurricane Florence, September 12-15-2015* <https://www.weather.gov/mhx/Florence2018> (last accessed 3/8/2018).

<sup>3</sup> Government Accountability Office, *Budgeting for Disasters: Approaches to Budgeting for Disasters in Selected States*, March 2015 <https://www.gao.gov/products/GAO-15-424>; Government Accountability Office *Budgeting for Emergencies: State Practices and Federal Implications*, September 1999 <https://www.gao.gov/products/GAO/AIMD-99-250>.



As the Subcommittee considers these statistics, please note that these numbers, though they reflect expenditures on disasters that have already been declared, are likely to rise. The timeline for many recovery and rebuild projects can be slow, and more funds will be obligated for these past disasters in the months and years ahead.

Likewise, as this Subcommittee knows, large sums have been needed to address post-disaster and other emergency repairs to the nation’s roadways. Looking at appropriations made for just the Federal Highway Administration’s (FHWA) Emergency Relief program since 2000, the total runs to over \$15 billion. Even with those large sums, the program has a large financial backlog of qualified projects: \$2.5 billion in unfunded requests and only \$831 million available to fund those requests.<sup>4</sup>

The post-disaster dollars that flow through HUD’s Community Development Block Grant Disaster Recovery (CDBG-DR) program are equally large. For this program, supplemental appropriations directed to recovery were over \$64 billion from the year 2000 to the present, excluding amounts directed to the 9/11 recovery effort. In February 2018, Congress also appropriated \$15.9 billion for areas that had suffered recent disasters, but those dollars were directed specifically toward mitigation work.

**Insufficient Investments in Pre-Disaster Mitigation**

Mitigation can take on many forms uniquely suited to serve community needs: elevation or acquisition of flood-prone homes, enhanced stormwater management systems, subdivision rules or road-building practices to limit the extent of impervious surfaces, raising of structures and assets, including roadbeds or bridges above anticipated flood levels, elevating utilities associated with critical facilities such as hospitals or water treatment plants, restoring or conserving wetlands to absorb floodwaters, and most significantly, not putting buildings and people in harm’s way in the first place.

<sup>4</sup> Congressional Research Service, *Emergency Relief for Disaster-Damaged Roads and Public Transportation Systems* (August 29, 2018).

Research by the National Institute of Building Sciences finds that every \$1 invested in disaster mitigation saves society \$6.<sup>5</sup> The report covers 23 years of grant funding by FEMA, the Economic Development Agency, and HUD. It found significant savings in terms of safety, property protection, and continuity when communities are struck by riverine or coastal flooding, hurricanes, earthquakes, or wildfires. In the case of riverine flood, the savings are a \$7-to-\$1 benefit for proactive mitigation steps such as acquiring or demolishing flood-prone buildings.

Unfortunately, the nation has historically underinvested in mitigation. According to a 2016 GAO report, of the \$277.6 billion that the federal government spent on disaster assistance from 2005 to 2014, a tiny fraction of that went to mitigation.<sup>6</sup>

It's not just the federal government that underinvests, the same is true of states, localities, and even individuals. Studies show that few property owners prepare for natural disasters. Only an estimated 10 percent of flood- and earthquake-prone households have taken mitigation measures.<sup>7</sup> While data on how and to what extent states invest in mitigation is limited, it is fair to say it is minimal and mostly tied to cost shares for federal programs.<sup>8</sup> Regardless of whether a state is proactive or not, they still receive federal assistance post disaster.

### **Years of underinvesting compounded by more assets at risk**

As cities and communities have expanded over time, the natural landscape has been replaced by impervious surfaces like roads and parking lots, homes and buildings. This increases the likelihood of flooding which can lead to more lives lost, higher costs incurred, and more structures destroyed.

More than 60,000 miles of U.S. roads and bridges are in coastal floodplains, threatening supply chains and local economies. In coastal counties, the population increased by 40 percent between 1970 to 2010<sup>9</sup> and along rivers, about 41 million residents face high flood risks.<sup>10</sup>

### **Recommendations**

While there is no silver bullet to reducing these risks, The Pew Charitable Trusts recommends Congress consider the following actions and investments that can be taken now to ensure federal investments are

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<sup>5</sup> Multihazard Mitigation Council, *Natural Hazard Mitigation Saves: 2017 Interim Report*, National Institute of Building Science (December 2017).

<sup>6</sup> Government Accountability Office, *Federal Disaster Assistance: Federal Departments and Agencies Obligated at Least \$277.6 Billion During Fiscal Years 2005 Through 2014* (2016), <http://www.gao.gov/assets/680/679977.pdf>.

<sup>7</sup> Howard Kunreuther & Erwann Michel-Kerjan; *Natural Disasters*, Copenhagen Consensus 2012, The Wharton School, University of Pennsylvania (April 12, 2012) [http://opim.wharton.upenn.edu/risk/library/CopenhagenConsensus2012\\_NaturalDisasters.pdf](http://opim.wharton.upenn.edu/risk/library/CopenhagenConsensus2012_NaturalDisasters.pdf).

<sup>8</sup> Pew Charitable Trusts, *Natural Disaster Mitigation Spending Not Comprehensively Tracked* (September 30, 2018) <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2018/09/natural-disaster-mitigation-spending--not-comprehensively-tracked>.

<sup>9</sup> NOAA Office for Coastal Management *Fast Facts: Economics and Demographics* <https://coast.noaa.gov/states/fast-facts/economics-and-demographics.html> (last accessed 3/8/2019).

<sup>10</sup> Olivia E.J. Wing, et al., *Estimates of Present and Future Risk in the Conterminous United States* 2018 *Environ. Res. Lett.* 13 034023, available at <https://iopscience.iop.org/article/10.1088/1748-9326/aaac65>.

made in a way that accounts for future risks, stewards taxpayers' dollars responsibly, and reduces the impact of flooding on communities:

### **Assess risk and plan with the future in mind**

As the Department of Transportation itself has noted,

“many of the structure’s being built today will still be in use fifty or, in some cases, one hundred years in the future. If a project is overbuilt, it may cost too much and prevent other, more useful investments. If it is underbuilt, it is subject to risks of premature damage or destruction that require premature repair or replacement and impose an additional cost of being out of service....”<sup>11</sup>

The challenge is to find the appropriate balance—the balance that carefully anticipates the risks that may be experienced not just in the near term, but over the design life of the roadway, the bridge, the utility, the hospital, or the home.

For the nation’s roads and bridges, there is already a system in place for designing, managing, maintaining, and improving transportation assets across the nation. The asset management planning structure set up by the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21) puts states in the lead to make long-range plans that address mobility and safety, and identify needs and performance gaps—including the roads, highways, and bridges that repeatedly require repairs due to emergency events.

In addition, DOT has developed important tools to help states and metropolitan planning agencies evaluate and incorporate into their planning approaches the future risks from floods and storms. Some agencies have already used DOT’s Vulnerability Assessment Scoring Tool (VAST) or similar tools to inform their plans and investments.

For a time, FHWA had made grant funding available for this important evaluation work, and Pew recommends that Congress dedicate a portion of its appropriation to restart these efforts to evaluate vulnerabilities to increasing flood risk.

### **Invest in mitigation**

Given the breadth and gravity of the problem, it can be difficult to determine where to invest strained resources that address the greatest need. Mitigation is a promising area in need of greater investment.

The 115<sup>th</sup> Congress recognized this in a couple of significant ways, which Pew applauds.

- Of the more than \$35 billion appropriated to HUD’s CDBG – DR program through two supplemental spending bills following the 2017 disasters, nearly \$16 billion was allocated specifically toward mitigation, representing one of the largest investments in mitigation funding

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<sup>11</sup> U.S. Department of Transportation, *Strategic Sustainability Performance Plan* (June 2012).

in history. Once allocated, this investment will help communities impacted by recent disasters mitigate against future floods and other extreme events.

- The Disaster Recovery Reform Act, signed into law in October 2018, gives the President authority to set-aside an amount equivalent of up to six percent of certain types of future disaster assistance for pre-disaster mitigation projects, creating a permanent funding source for states to access. Had this program been in place prior to the 2017 hurricane season, more than \$650 million could have been made available to communities.<sup>12</sup>

These actions represent significant investments towards reducing risk. However, both are made available only after a disaster has occurred. It is critical that communities begin to plan and prepare *before* devastating events to minimize impacts. DOT and HUD, which provide a significant amount of disaster relief funding to communities, have the untapped potential to not only guide resilient investments but encourage them before the next disaster strikes.

- **Include “disaster mitigation” into the merit criteria of BUILD grants**

Better Utilizing Investments to Leverage Development (BUILD) Transportation grants are popular among states and localities as a resource to help finance important surface transportation projects. Addressing current and projected vulnerabilities is broadly incorporated within the scope of “State of Good Repair” merit criteria, which on occasion has resulted in projects producing secondary benefits of addressing natural disaster risks. By specifically including disaster mitigation or resiliency requirements within the criteria used to select projects, applicants would be incentivized to ensure the long-term sustainability of their projects in the face of growing risks to extreme weather, helping strengthen the Nation’s transportation infrastructure.

- **Modernize Federal Highway Administration Emergency Relief Program Funding**

The Federal Highway Administration Emergency Relief (ER) program provides states and localities with funding to support emergency and repair efforts following catastrophes. However, the reactive approach of the program, as well as the modest appropriation, does not do enough to ensure roadways are open and accessible to Americans who depend on them daily.

With an annual appropriation of just \$100 million dating back to 1972, the value of ER funds has diminished over time requiring supplemental appropriations to meet demand for the program. Since 2000, the ER program has received nearly \$15 billion in additional supplemental funding. The Subcommittee should consider increasing the annual appropriation of the ER program to at least \$600 million, which would reflect the program’s original purchasing power.

- **Create a Federal Highway Administration Pre-Disaster Infrastructure Program.**

ER grant recipients are constrained in their ability to account for future risk in repair efforts. Establishing a pre-disaster mitigation program within FHWA would help minimize disaster costs to DOT by allowing states and communities to improve the resiliency of vulnerable and

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<sup>12</sup> Federal Emergency Management Agency, OpenFEMA – Public Assistance Data – Subgrantee Summary (last accessed 9/11/2018), available at <https://www.fema.gov/openfema-dataset-public-assistance-funded-projects-summaries-v1> (calculated 6% of designated categories of public assistance under the Disaster Recovery Reform Act).

repeatedly damaged assets. The Appropriations Committee could allocate a percentage of future ER supplemental dollars towards such a program. In doing so, pre-disaster funding would not present an additional cost to the federal government and the amount dedicated to the program would directly correlate with the magnitude and frequency of future disasters.

- **Incentivize mitigation through CDBG-DR**

Likewise, HUD's CDBG-DR could direct grantees to incorporate risk reduction and mitigation planning into their grant applications, in turn requiring that proposed projects account for future natural disasters.

### **Simply put, build and invest smarter**

A new poll released today by The Pew Charitable Trusts demonstrates that more than three quarters of Americans support a requirement that all future federal spending on infrastructure located in flood prone areas be better constructed to withstand the impacts of flooding. This overwhelming support across the political spectrum adds to the mounting evidence for the need to build and invest smarter.

However that is not what we are doing today. As disasters and associated costs have grown, the federal government has continued to bail out impacted communities time and again using 50-year old policy. Since 1977, federal agencies such as DOT and HUD have been required to avoid investing in flood-prone areas, or alternatively, to abide by basic flood mitigation practices as a way to reduce "exposure to potential flood losses by deterring unnecessary siting of activities in high hazard floodplain locations."<sup>13</sup>

Although it is well intended, that policy does not account for today's vulnerabilities or tomorrow's risks leading to wasted taxpayer dollars spent to build or rebuild infrastructure and structures located in harm's way.

The time is now for Congress to require that federal investments in flood-prone areas be more resilient to future risks, such as sea-level rise and flooding. Without this, tens of thousands of federally-funded assets such as water utilities, roads and bridges, hospitals, and schools remain vulnerable to the vicious cycle of flooding resulting in mounting costs to rebuild. We simply cannot afford to allow this pattern to continue.

A proactive approach to investing in the floodplain has been embraced by the Department of Defense and in some cases by HUD and FEMA. Hundreds of localities and numerous states across the nation also have stronger infrastructure flood standards than the Federal government.

Pew recommends that any federal disaster or emergency relief dollars come with a requirement to evaluate flood risk throughout the planned lifetime or duration of the investment, plan, or project in order to:

- (1) Reduce the risk of financial and property losses, including taxpayer losses resulting from floods;

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<sup>13</sup> FEMA, Interagency Task Force on Floodplain Management, *Further Advice on Executive Order 11988 Floodplain Management* <https://www.gsa.gov/real-estate/environmental-programs/gsa-nepa-implementation/laws-and-regulations/floodplain-management>

- (2) Take practicable steps toward assuring that federal resources will be allocated to structures and projects that will remain flood resistant throughout their intended design life;
- (3) Prevent, to the extent possible, the disruption of critical services during flood events, including but not limited to the closure of strategic transportation routes, inaccessibility of health care facilities, or loss of power or essential water and wastewater services; and
- (4) Minimize the impact of current and future floods on human safety, health, and welfare.

### **Value the role of nature in reducing risk**

Another tool for flood mitigation is investing in natural infrastructure. Healthy wetlands, salt marshes, vegetated dunes, and free-flowing rivers can act as holding basins for floodwaters, decreasing the effects of flooding on people, homes, and businesses in adjacent communities while providing habitat for fish and wildlife. Along the coasts, such natural areas act as the first line of defense to reduce the effects of storm surge.

Research shows that using nature-based solutions to mitigate the threats posed by severe weather can be both economical and long-lasting:

- Coastal ecosystems mitigate an estimated \$23 billion each year in storm damages along the Atlantic and Southern coastlines alone.<sup>14</sup>
- According to the Gund Institute for Environment, wetlands and floodplains protected Middlebury, Vermont from as much as \$1.8 million in flood damages during Tropical Storm Irene in 2011 and saved the town an average of \$450,000 each year through flood mitigation.<sup>15</sup>
- Resources for the Future found that by not developing roughly 9,000 acres of land but instead preserving the area as state and local parks, the Meramec Greenway in St. Louis County, Missouri, benefits from \$7.7 million in avoided flood damages on average each year.<sup>16</sup>

Congress should require the consideration of nature-based solutions, as either an alternative or complement to hard structures or grey infrastructure. Nature-based infrastructure can provide flexible options for reducing flooding that becomes stronger over time. Unlike conventional grey infrastructure that typically deteriorates with age and can aggravate flooding, green infrastructure, such as wetlands and parks, can provide self-sustaining flood defenses that support ecosystem restoration while providing recreational space for communities.

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<sup>14</sup> Karen Thorne, et al., *U.S. Pacific Coastal Wetland Resilience and Vulnerability to Sea-Level Rise*, Science Advances, Vol 4, no 2 (Feb 2018) <http://advances.sciencemag.org/content/4/2/eaao3270.full>.

<sup>15</sup> Keri B. Watson, et al., *Quantifying Flood Mitigation Services: The Economic Value of Otter Creek Wetlands and Floodplains to Middlebury, VT*, Ecological Economics Vol 130 (October 2016) <https://www.sciencedirect.com/science/article/pii/S092180091630595X>.

<sup>16</sup> Carolyn Kousky and Margaret Walls, *Floodplain Conservation as a Flood Mitigation Strategy* Resources for the Future (July 2013) <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-13-22-REV.pdf>.



### **Putting it to practice: Raleigh, North Carolina**

There are two bridges in downtown Raleigh nearing the end of their design life that need to be replaced. The City's discussions about those replacement projects have served as a catalyst for additional improvements to the corridor area that is the most traveled gateway into the city and has been plagued by flooding for years.

The city initiated a comprehensive planning process in 2012 aimed at redeveloping and revitalizing the Capital Boulevard area. The study confirmed that a number of commercial and residential properties were located in the 100-year floodplain of Pigeon House Creek, which had been channelized, piped, and rerouted over many decades of attempts to contain and control it. The car dealership, bowling alley, hotels and other development along the corridor were highly hardened and impervious, thus further contributing to the flooding, erosion, and water quality problems in the area. The study created a new vision of the corridor – one that balances community and environmental needs in a way that promotes sustainable growth and redevelopment. That vision is coming to fruition.

Local, state and private funding is being coupled with federal support from DOT and FEMA to transform the area into a multi-modal corridor that features green spaces such as trails and connecting paths, as well as open spaces as a result of property acquisitions, stream restoration and enhanced stormwater systems.

According to the city of Raleigh's stormwater management office, "Decisions made in the 60's to pave over streams, add roads, and build houses in the floodplain have led to a lot of the problems today that we are working to undo. Now that we have a greater understanding of our future risks, the City is using every tool we have to make this not only a place where people want to be, but one that is resilient for our residents."

Raleigh's story is great, but for the most part, the city is an outlier. Communities around the country are eager to become less vulnerable to natural disaster but don't possess the tools, resources or guidance to do so. Our hope is that Congress can help and direct communities toward a more resilient future while reducing overall costs to recover from disasters.

On behalf of The Pew Charitable Trusts, thank you for the opportunity to present ideas on ways to reduce the impact of natural disasters on the U.S. taxpayer and communities around the country. We will continue to be a resource for the members of this subcommittee and look forward to working together.