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Flowing Together: Walking Tour and StoryMap City of Lambertville Technical Memorandum

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Prepared for: North Jersey Transportation Planning Authority (NJTPA)

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Table of Contents

I. Introduction	4
About Lambertville	4
Project Overview	4
II. Flowing Together Story Map	5
Project Objectives	5
Project Scope	6
III. StoryMap and AR Tour Development	6
Task 1: Research and Data Collection	6
Task 2: Public and Stakeholder Engagement	7
Task 3: Content Creation and Integration	8
Task 4: StoryMap Design and Development	11
Task 5: AR Tour-Project Integration	12
Task 6: Publication, Storage, Delivery Logistics	12
IV. Next Steps: Strategies for Promoting and Expanding the Walking Tour	13
Promoting the Tour and StoryMap	13
Continued Engagement	14
Appendices	16
Appendix A: Technical Memorandum 1	17
Appendix B: Flowing Together Swan Creek Walking Tour Story Map	41

I. Introduction

Together North Jersey provided technical assistance through the Vibrant Places Program to the City of Lambertville, New Jersey to develop a walking tour and StoryMap that tells the story of the Lambertville community, their life in a flood plain and resiliency in the light of climate change. This Technical Memorandum outlines the planning, process, and execution of the Swan Creek Walking Tour, part of the City of Lambertville’s Flowing Together: Building Community Resilience at the Confluence of Collective Knowledge, Creativity, and Action Project.

About Lambertville

Lambertville is a historic city in Hunterdon County, New Jersey, situated on the east side of the Delaware River, with a population of 4,139 residents with an annual growth rate of 0.6% as of 2020. The city’s growth and prosperity have been shaped by its waterways, including the Delaware and Raritan Canal constructed in the 1830s. As such, Lambertville has experienced significant flooding throughout its history. Lambertville is about 1.23 square miles in size (783 acres), 32.7% of which are considered impervious due to the city’s roads, buildings, and households. Certain parts of Lambertville near the water bodies are classified as Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas, specifically Zone A or Zone AE flood areas, requiring mandatory flood insurance for property owners. These areas face a 1 percent annual flood risk and a 25 percent chance of flooding during a 30-year mortgage period. Over the past two centuries, Lambertville has encountered 15 major flood events.

Currently, the demographic makeup of Lambertville is majority White population (82%). Other racial and ethnic groups include Hispanic/Latinx (15%), Asian (2.5%), Black and other (less than 1%), and two or more races (less than 1%). Lambertville residents’ average median household income is \$94,522, with an average household size of 2 people and median age of 53 years.

Project Overview

Through the Together North Jersey (TNJ) Vibrant Places Program, the Voorhees Transportation Center (VTC) worked with the City of Lambertville in developing a StoryMap and augmented reality (AR) Swan Creek Walking Tour. This tour is a part of the larger project, Flowing Together: Building Community Resilience at the Confluence of Collective Knowledge, Creativity, and Action, which aims to raise awareness of local ecological connections and to activate community involvement in the process of resilience building, particularly with regard to flooding. The goal of the walking tour is to tell the story of flooding and resiliency in Lambertville through the presentation of data and information at locations throughout the City. The team developed resiliency-focused, multi-media content, including photographic renderings, videos, interviews, and other multimedia experiences. This content can be experienced by participants in two ways: via AR mobile phone integration along the Lambertville route or online as a StoryMap for those unable to travel to Lambertville. Content on the StoryMap and in the Flowing Together AR walking tour includes visualizations and enhancements to depict the impacts of climate change and flooding events on the City of Lambertville, with both a historical and future-oriented perspective.

II. Flowing Together Story Map

Project Objectives

The Swan Creek Walking Tour, part of the Flowing Together Project, is an educational resource and documentation for Lambertville residents and visitors to learn more about the history of Lambertville’s flooding history and the risks and responsibilities associated with living beside the Delaware River and the creeks flowing into it. This project aims to:

- Raise awareness of local ecological connections and history
- To activate community involvement in the resilience-building process- regarding flooding
- Amplify community voices and experiences in Lambertville

Residents were engaged throughout the process and had input in telling their stories while interacting with subject matter experts and publicly available data throughout the creation of the ArcGIS StoryMap. This tour focuses on six key sites following the Swan Creek tributary. These sites have been identified by the City of Lambertville as sites with historical, environmental, social, and economic significance to the story of resilience in Lambertville and the struggle with climate change. The walking tour covers approximately 0.5 miles where the Delaware Canal end of Swan Creek and then following Swan Creek along Swan Street to Curley Lane.

The six key sites in Lambertville Flowing Together Tour are:

1. Entrance to the Delaware Canal
2. Pittore Justice Center / ACME building
3. Pump Stations & S Union St. Bridge
4. Historic firehouse / S Main St bridge
5. Quarry St / Ida Landslide
6. Curley Lane / Blue Acres Site



Project Scope

VTC, in agreement with the City of Lambertville, produced a scope of work outlining five major project tasks for the six key sites of the tour over a six-month period from December 2022 to June 2023.

The five tasks included: 1) Research and Data Collection, 2) Public and Stakeholder Engagement, 3) Content Creation and Integration, 4) StoryMap Design and Development, 5) AR Tour-Project Integration, and 6) Publication, Storage, and Delivery Logistics. Each task encompassed its methodology and sub-deliverables to ensure project milestones were met. Bi-weekly meetings were held throughout the project’s development to gather feedback, report findings and coordinate project planning and execution. The project team included the City of Lambertville, the NJTPA, the New Jersey Department of Community Affairs, VTC, and Rutgers Game Research and Immersive Design (RU-GRID). The Lambertville Historical Society also participated in the project by supplying relevant historical photos and information. The following sections of the memo outline the objectives and methodology of each task.

III. StoryMap and AR Tour Development

The Voorhees Transportation Center’s (VTC) technical assistance to Lambertville centered on the development of the Flowing Together- Swan Creek Walking Tour ArcGIS StoryMap. ArcGIS StoryMaps is ESRI’s place-based storytelling tool where authors can create and publish stories that can include maps, text, images, videos, embedded items, and other media. StoryMaps are web-based and can be viewed on desktops as well as mobile devices. Audiences do not need a background in GIS software to engage with StoryMaps, and these maps can be shared across social media to reach a wide audience.

Task 1: Research and Data Collection

As a first step in developing the StoryMap, VTC researched and reviewed best practices and case studies related to climate change, flood-related public engagement projects, AR walking tours, and StoryMaps. Desktop research and site visits were conducted to gather data on use history, existing conditions, and proposed plans for each site. VT developed cohesive site profiles and media recommendations for the tour. The City of Lambertville Resiliency Walking Tour and StoryMap: Technical Memorandum 1 (Attachment A) was the deliverable for Task 1 which summarized the research findings and content recommendations for each project site. In their findings, VTC staff:

- Identified historical sources and datasets related to flooding incidents
- Gathered relevant historical documents, photographs, and maps
- Collected data on flooding events, dates, locations, and impacts

Each site was developed based on a theme inspired by the research gathered for each site. The sites and their respective themes are as follows:

- 1. Entrance to the Delaware Canal-** A Historical Perspective: This site sets the stage for the rest of the tour, as it tells the story about the beginnings of Lambertville and how its unique geography shaped it to the city it is today.
- 2. Pittore Justice Center** – Lambertville Flood History: This site tells the history of flooding in Lambertville and highlights nine major flooding events that have impacted the city since its inception.
- 3. Union Street Bridge** – Life in The Floodplain: This site highlights community members’ stories and experiences with recurring floods in Lambertville.

4. Hibernia Firehouse – Community Recovery: This site highlights the significance of first responders and community resilience following inclement weather events in 2021.

5. Quarry Street Landslide- Green Infrastructure Solutions: This site highlights the city’s and other community members’ natural resource management and education efforts and their economic and ecological benefits to mitigate stormwater aftermath.

6. Curley Lane Blue Acres Site- Blue Acres and Future Visions: This site marks the end of the tour and highlights the City of Lambertville’s plans to repurpose the two Blue Acres Sites at Curley Lane while commemorating the story of families displaced due to stormwater damage.

Task 2: Public and Stakeholder Engagement

Public and stakeholder engagement was a key objective of the project that took place throughout the project's research and content creation. The aim was to collect stories on flood experiences from residents. The City of Lambertville shared Hurricane Ida Flood Survey responses with VTC to inform the project’s preliminary findings. Historical images were gathered from the Lambertville Historical Society in coordination with the city and were used to develop the graphics for sites 1 and 2. In addition, residents were interviewed about their flood stories and shared images of Lambertville and their homes. VTC developed recordings and graphics for sites 3, 4 and 6 using the images and interviews gathered by the city. Additional images collected by local artists and photographers were incorporated into StoryMap’s banner and web page layout.

- Public Engagement Methods:
- Collecting images, videos, and reports from Lambertville residents
 - Coordinating interviews with residents, first responders, and flood-response volunteers

This project's content creation and storytelling process would not have been possible without Lambertville residents' artistic contributions and testimonies throughout all stages of its development, as facilitated by the City of Lambertville. Interviews included the following community members:

- Vivien Bevich (interviewed 3/31/23)
- Gary Cohen (interviewed 3/18/23)
- Jay Garrison (interviewed 3/27/23)
- Anyi Guzman (interviewed 3/8/23)
- Mike Menche (interviewed 3/28/23)
- Michelle Rago (interviewed 3/21/23)
- Phil Rosso and Stephanie Cepparulo (interviewed 3/26/23)
- Lindsay Sherwin (interviewed 4/5/23)
- Jen Sirak (interviewed 3/29/23)
- Jenn Williford (interviewed 3/17/23)

Task 3: Content Creation and Integration

To create an immersive and captivating StoryMap, the project team took several steps to develop engaging content. Collaborating with the mayor of Lambertville, the team drafted narrative text to guide the participant through the StoryMap and its multimedia content. The team also created graphics using a combination of text, images, and multimedia elements utilizing Adobe Express, Photoshop, Illustrator, Rhino, Lumion, and Canva, ensuring that these graphics were both visually appealing and informative. The TNJ team collaborated with the Lambertville team to create a style guide for visual cohesion. Additionally, the team meticulously edited and weaved together interview audio into shorter segments using Garageband, seamlessly integrating the voices of individuals into the narrative to tell a complete story for each clip. To provide a comprehensive experience, collected data and historical information were thoughtfully incorporated into the graphics of each site, enriching the overall context and depth of Lambertville’s story. The content was also carefully cited to ensure accurate credit to data sources.

A summary of the content for each site is presented below:

1. Entrance to the Delaware Canal- A Historical Perspective

Site one is linked with the entrance to the Delaware Canal. The text that accompanies this site includes information about the City’s history and background, emphasizing the connection to the nearby waterways. The media for this stie includes before/after photos of historic places throughout the Swan Creek neighborhood, including the Delaware Canal entrance, Lambertville Station, ACME Market, Hibernia Firehouse, and Quarry Street.



Lambertville Station 1906 and 2023. Source: The City of Lambertville and Lambertville Historical Society.

2. Pittore Justice Center – Lambertville Flood History

Site two is linked to the Pittore Justice Center. The text of the site discusses the building’s history and its physically low elevation, causing the building to be damaged by flooding events. The media of this site includes a timeline of major flooding events in the city’s history, and a description of future flood predictions.



Lambertville Flooding Events Timeline From Stroy Map

3. Union Street Bridge – Life in The Floodplain

The third site is at the Union Street Bridge, where major damage occurred during flooding events including Hurricane Irene in 2011. The media at this site includes audio from interviews with the Lambertville community and images of flood damage.



Community Interview Audio and Graphics

4. Hibernia Firehouse – Community Recovery

Site four is the Hibernia Firehouse, telling the story of community response and recovery. The text describes the work of first responders and community organizations as well as environmental recovery. The media at this site includes audio clips from interviews with members of the Lambertville community and images of the days after Hurricane Ida.



Lambertville Community Recovery Graphics

5. Quarry Street Landslide- Green Infrastructure Solutions

Site five is located at Quarry Street, the site of a landslide during Hurricane Ida. The text describes the landslide as well as the response of the City, a grassroots community planting of native plants to expand green infrastructure and promote stormwater recapture. The media at this site includes infographics about the native species planted at the site and a gif showing the growth over 80 years’ time.



Green Infrastructure Graphics

6. Curley Lane Blue Acres Site- Blue Acres and Future Visions

Site six, the final stop on the tour, is the Blue Acres Site at Curley Lane. The text describes the story of this site, which was the location of three homes that have been in the Rosso family for more than 100 years. Two of the homes were lost during Hurricane Ida, and the properties were acquired through New Jersey’s Blue Acres program. The media at this site includes clips from an interview with two members of the Rosso family, as well as images of the damage and renderings of future uses of the site.



Blue Acres Visioning Graphics

Task 4: StoryMap Design and Development

Creating a successful StoryMap involved various stages to ensure a cohesive narrative structure and an optimal user experience. The first step involved determining the narrative structure, carefully planning the flow of information and interactions within the StoryMap. Selecting the appropriate ArcGIS StoryMap templates and themes followed, ensuring the visual presentation aligned with the intended message. The information and content collected for Task 3 was organized and transformed into compelling visualizations and maps to present data effectively. Internal reviews and stakeholder feedback were sought, allowing for valuable insights and suggestions for improvement. Taking this feedback into account, necessary revisions and enhancements were made to the content and design of the StoryMap. Finally, testing was conducted to ensure the functionality and compatibility of the StoryMap across various devices, guaranteeing a seamless experience for all users.

Task 5: AR Tour-Project Integration

VTC collaborated with RU-GRID to transform the two-dimensional StoryMap content into an AR walking tour. An AR tour is an experience that integrates technology into place-based experience so that participants can interact with a place using digital tools. In other words, those experiencing the walking tour in-person can use their smartphones to access media that presents more information about the site. For the Swan Creek Walking Tour, the AR experience was developed using QR codes so that it is easily accessible for those with smartphones. Each site will have a sign with a QR code; when the QR code is scanned using a smartphone, the user will be shown specific media for each site.

VTC continued to coordinate media collection between the City of Lambertville and RU-GRID to gather additional materials necessary for the AR tour component and to create the immersive elements of the experience. Various media formats, such as 360 images, 360 videos, and 2D renderings of future solutions, were thoughtfully incorporated throughout the physical sites in town, offering visitors a comprehensive and engaging journey. The text narrative from the StoryMap was redeveloped to fit the needs of the in-person experience. The text was transformed into audio read by Lambertville’s mayor, explaining key points of the site and providing directions to the next stop on the tour. Participants could access the AR experience through their phones by scanning QR codes on signs near the six key sites the tour follows.



Task 6: Publication, Storage, Delivery Logistics

After the StoryMap was completed, the project team took the final steps to prepare it for publication and ensure its accessibility to the intended audience. The team worked with the City to finalize the StoryMap, ensuring that all elements, including text, images, and multimedia, were reviewed and refined. The StoryMap is currently hosted on Rutgers VTC’s ArcGIS account with shared permissions and editing rights given to the City of Lambertville. The team worked with the City to ensure that considerations were made regarding the platform’s user-friendly interface, scalability, and compatibility with various devices.

IV. Next Steps: Strategies for Promoting and Expanding the Walking Tour

While the StoryMap can be an excellent storytelling tool to engage residents and visitors on local flood history, the StoryMap does not stand alone as the only strategy that the town could undertake to raise awareness about flood resiliency – it needs to find its way to an audience! As part of this technical assistance effort, VTC conducted research to identify next steps in promoting the StoryMap that can expand the reach of its messaging.

Promoting the Tour and StoryMap

Strategies for marketing the walking tour consists of utilizing social media platforms (Facebook, Instagram, Twitter), sharing printed marketing materials, email marketing, and word of mouth.

Utilize Social Media Platforms

Posting on Facebook pages and groups is a great way to reach residents. Pages such as The New Hope & Lambertville Community Page, Lambertville Happenings Group, and Lambertville-New Hope- Local Business would be great resources for marketing the walking tour.



Sharing captivating videos or photos on social media of the tour will encourage residents to check out the walking tour. Local businesses, especially those located within proximity of the tour sites, could be asked to share or promote the tour on their social media pages. Asking residents to share their walking tour experience on their personal social media accounts is also a good idea. In addition to sharing content from the in-person experience, the link to the StoryMap can also be shared.

Additional places to post captivating photos or videos, can be on the town’s website: <https://lambertvillenj.org/>

Share printed marketing materials

To share printed marketing materials, the city can should consider hanging QR coded flyers that link to the StoryMap in local businesses, libraries, community centers, or bulletin boards such as the Lambertville Library, Under the Moon Cafe, Cafe Full Moon, the Community Church of Lambertville, and the Hunterdon County Senior Center. Additionally, they could leave small postcards in residents’ mailboxes or give out flyers at local town events or farmers markets.

Email marketing

The City of Lambertville should also consider emailing local community groups and asking them to share information with residents at upcoming community events. Marketing materials such as social media graphics or flyers should be included in outreach emails. Emailing local schools about taking the walking tour would also be great to help educate younger residents on the history of Lambertville before their time.

Word of mouth

Along with handing out a flyer, having conversations with residents about the tour will motivate others to check it out. Opposed to paper advertisements, hearing from others about their experience builds credibility and trust when it comes to gaining more walking tour visits.

Continued Engagement

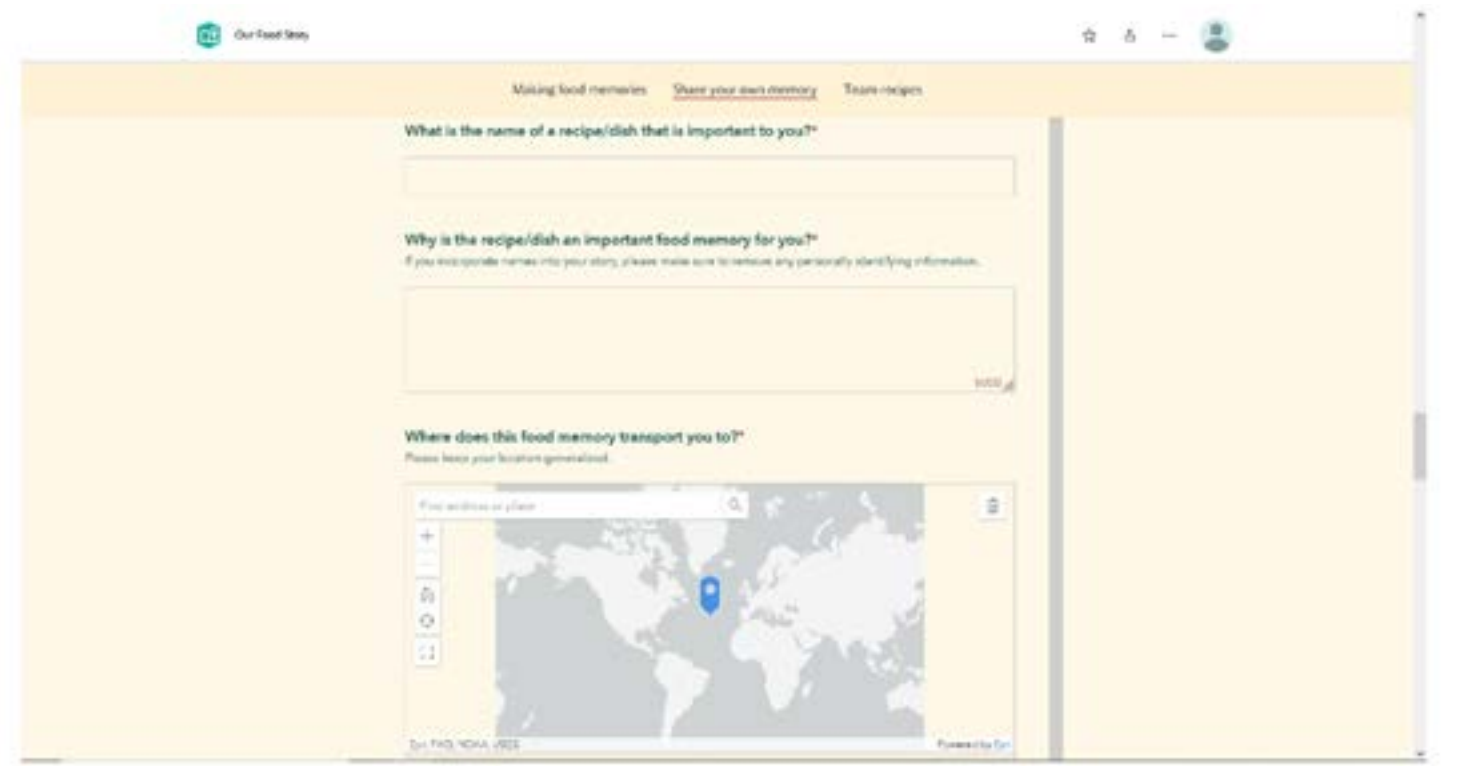
Expand the StoryMap

VTC will set up StoryMap Collections for the City of Lambertville, which can store additional content for engagement to supplement the Flowing Together StoryMap. Additionally, the collection will contain extended content that did not make it to the StoryMap. As part of the StoryMap Collections, VTC recommends for Lambertville to continue collecting resident stories about Life In the Floodplain, as collective storytelling can serve as a powerful tool that promotes inclusivity, cultural preservation, collaboration, and drive change.

StoryMap Examples:Collection: Brooklyn Park 2025 by City of Brooklyn Park, MN. This is an example of a collection, which contains more than one StoryMap and stores external links (<https://storymaps.arcgis.com/collections/dd5c57ada179489a9a399a3b5e0963be>).



Survey: Our Food Story: Making and re-making memories, one dish at a time by ESRI’s StoryMaps Team (March 2022). This is an example of audience engagement by allowing readers to share their own story (<https://storymaps.arcgis.com/stories/8890de7ad92f4582b853da23c8fe86ac>).



Expand the Tour

VTC recommends expanding the tour to share more community experiences and examples of green infrastructure in the city. In its current form, the StoryMap focuses just on the Swan Creek area, but there may be other sites in the city that resonate with members of the community. The stories collected through audience engagement may provide inspiration for expanding the tour.

Appendices

Appendix A: Technical Memorandum 1



City of Lambertville Resiliency Walking Tour and StoryMap

Technical Memorandum 1

Background and Context Research

January 25, 2023

Prepared by: Alan M. Voorhees Transportation Center, Rutgers University

Prepared for: North Jersey Transportation Planning Authority (NJTPA)

Introduction

Together North Jersey is providing technical assistance through the Vibrant Places Program to the City of Lambertville, NJ to develop a walking tour and StoryMap for Flowing Together: Building Community Resilience at the Confluence of Collective Knowledge, Creativity, and Action. This Technical Memorandum presents findings from context research conducted by the Alan M. Voorhees Transportation Center (the VTC) in fulfillment of Task 1: Background and Context Research.

The context research consists of background research to inform the profiles of the walking tour sites and compiled suggestions for media to incorporate at each site. In addition, the team conducted a review of best practices and case studies of ArcGIS StoryMaps with relevant topics or tools to document the history of flooding, storytelling, and resilience.

Lambertville and its History of Flooding

Lambertville, New Jersey sits on the Delaware River and is home to 4,139 residents. The river serves as key feature of the city’s history, along with the Delaware and Raritan Canal, built in the 1830s. While the waterways allowed the city to grow and flourish, Lambertville also has a history with major flooding events. The city is comprised of 783 acres, 32.7% of which is impervious; most of its impervious character is due to its many roads and buildings or households. Portions of Lambertville along its water bodies are designated Special Flood Hazard Areas according to FEMA’s National Flood Hazard data. These areas are designated as either Zone A or Zone AE flood areas. Flood zones A and zones AE have mandatory flood insurance purchase requirements for home and business owners. These areas also have a 1 percent chance of flooding per year and a 25 percent chance of flooding at least once during a 30-year mortgage.

The city has recorded 15 major flood events over the past 200 years. A time lime of these historic events and flood height crests for the neighboring Delaware River are provided below:

- **January 1841-** the first major flood recorded, all the river bridges from Easton to Trenton were swept away except for half the Lambertville-New Hope bridge which had to be restored in 1842ⁱ. The flood crest measured 17.9 ft.
- **March 1846-** The Flood of 1846 was moderate, crest measuring 15.5ftⁱⁱ
- **March 1902-** A series of snowstorms followed by heavy rains caused flooding on the Lehigh and Delaware Rivers that measured 18.3 feet, the highest flood recorded in Lambertville since the Flood of 1841ⁱⁱⁱ.
- **October 1903-** The Flood of 1903- according to The Trentonian local newspaper, some cities witnessed water levels up to 28 feet.^{iv} The Lambertville-New Hope bridge was again destroyed, leading to its redesign- to a steel bridge in 1904.
- **March 1936-** Two successive rainstorms combined with snowmelt flooded the Eastern Seaboard from Virginia to Maine. Measured 17.89 feet.

- **May 1942-** Flood crest measured 13 ft
- **August 20, 1955-** Hurricane Diane landed five days after Hurricane Connie. Hurricane Diane produced several inches of rain with locally heavier amounts of 10 to 20 inches, with a crest of 24 ft^v. This resulted in the Flood of 1955^{vi}, Point Pleasant bridge was destroyed and was not rebuilt.
- **May 1984-** Minor flood category, crest measured 13 ft^{vii}
- **January 1996-** Moderate flood category, crest measured 15 ft^{viii}
- **September 2004-** Hurricane Ivan^{ix} The remnants of Hurricane Ivan, combined with a cold front, produced an average rainfall amount of 2-4 inches in NY, 3-7 inches in PA, 1-3.5 inches in NJ, and 2 inches in WV.
- **April 2005-** Major flood, flood crest measured about 20 ft. The Delaware River rose to higher levels due to snow melt and unusually high amounts of rain^x.
- **June 2006-** While citizens were in the midst of recovery efforts from the two previous storms, yet another significant magnitude flood event occurred in late June of 2006; wet conditions were the result of a month of above-average rainfall combined with a low tropical stalling over the Delaware River basin for a week^{xi}
- **March 2011-** Minor flood, crest reached 13 ft.
- **September 2011-** The remnants of a tropical storm (TS) Lee moved up the Appalachian Mountains and interacted with a quasi-stationary east-west frontal boundary. Ten to 15 inches fell at numerous locations in Central PA and NY
- **August 2021-** Hurricane Ida hits Lambertville, cited as one of the worst flash floods in its history; Delaware River crest reached about 14 ft^{xii}.

Ida Recovery and Response

Following Hurricane Ida, the City of Lambertville conducted a survey to gather community input on storm flood response throughout the city. The findings give a sense of the community's behavior around one of their most recent major floods and could help inform future recommendations. The following were some of the findings of the survey:

- Most residents who didn't have flood insurance before Ida acquired flood insurance after.
- 25% of residents reported having to move out of their property during Hurricane Ida because of flood damages
- 94% of residents reported not being told to evacuate
 - Those who received instructions mentioned Nancy Finan, the electric company, first responders, and the police.
- Residents reported property floodings ranging from 2 inches to 15 feet of water
- Overall, residents seemed grateful and happy with the community response and support but criticized the local government and FEMA for lack of efficient response.
- Residents are taking active taking steps to build resiliency by installing and using sump pumps, generators, and home improvements like changing floor/window materials and mindful garden planting.

On March 2022, \$228.3 million was granted to the Community Development Block Grant Disaster Recovery Fund for recovery spending. Subsequently, in September of the same year the City of Lambertville awarded the bid for the Tropical Storm Ida Restoration Projects for Swan Creek, Ely Creek & York Street to Kyle Conti Construction, LLC for the amount of \$1,696,961. ^{xiii} Additional funds (\$660,717) were secured and awarded to Earle Asphalt Company and to CMS Construction Inc. for road repairs and stabilization of the Swan Creek Tributary along Quarry Street. The cost of the project was shared with neighboring West Amwell Township

Walking Tour Sites

The Swan Creek Walking Tour, part of the *Flowing Together* Project, will serve as an educational resource available for Lambertville residents to learn more about the risks and responsibilities associated with living beside the Delaware River and the creeks that flow into it. This project aims to raise awareness of local ecological connections and history to activate community involvement in the process of resilience building, particularly regarding flooding. Residents will be engaged throughout the process and will have input in telling their story, whilst interacting with subject matter experts and available data throughout the creation of the ArcGIS StoryMap. This walking tour will focus on six key sites following the Swan Creek tributary. These sites have been identified by the City of Lambertville as sites with historical, environmental, social, and economic significance to the story of resilience in Lambertville considering climate change.

Proposed Swan Creek Walking Tour Path



This project will focus on six key sites in Lambertville:

1. Entrance to Canal
2. Pittore Justice Center / ACME building
3. Pump Stations & S Union St. Bridge
4. Historic firehouse / S Main St bridge
5. Quarry St / Ida Landslide
6. Curley Lane / Blue Acres Site

Start of tour meeting location: Municipal Parking lot by ACME Building ★

Existing Conditions

The total distance of the walking tour is about 0.5 miles in length. Given their spatial proximity, there is an overlap in the existing demographic and land use conditions of the sites explored throughout the tour. For data analysis purposes, sites were grouped into two groups by proximity. Both groups were also geographically divided by Route 29, one of the major roads that run through Lambertville. The demographic data for this report was extracted from the 2020 Census and covered a 0.5-mile radius from the centroid of each group.

Summary of key statistics for Sites 1-4

- All four sites are about 800 ft or less from each other, and all measurements are within a 0.5-mile radius of 25 S Union St.
- Census tracts: 34019011800, 42017104400, 34019011900
- Zip Codes: 18938, 08530
- Demographic data:
 - **Estimated about 2,079 people live within a 0.5-mile radius of the site as of 2020.**^{xiv}

- 67.5% increase since 2000 (1,241)
- 69.02% increase since 2010 (1,230)
- Racial characteristics of the people living in this area in 2020:
 - 82.11% are White
 - 1.49% are African American
 - 12.51% are Hispanic
 - 1.83% are Asian
 - 0.43% are American Indian or Alaskan Native
 - 8.47% are of "some other race"
 - 5.8% are of two or more races.²
 - **Between 2010 and 2020, the White population changed by 53.78%, the African American population by 63.16%, and Asian population by 171.43%. The number of Hispanics changed by 106.35%**
 - 35.56% of the population is over the age of 65
 - 52.98% are of working age (18-64)
 - 12.46% are under 18
 - 4.47% are under 5 years old
- The median household income for the study area ranged from \$64,219 to \$123,409, compared to the state of New Jersey with a median of \$85,245.
- There is no data on the foreign-born population in this area.
- **About 424 families reside in the study area.**
- 38.78% of the homes in the area are Single-family attached homes, and 28.79% are Single family detached homes.

Summary of key statistics for Sites 5 and 6

- Both sites are about 300 ft from each other, and all measurements are within a 0.5 mile radius of 2 Curley Lane.
- Census tracts: 34019011800, 42017104400, 34019011900
- Zip Codes: 18938, 08530
- Demographic data
 - **Estimated about 1,387 people live within a 0.5-mile radius of the site as of 2020.^{xv}**
 - 57% decrease from 2000 (2,176)
 - 12.76% increase since 2010 (1,230)
 - Racial characteristics of the people living in this area in 2020:
 - 84.07% are White
 - 1.73% are African American
 - 11.03% are Hispanic
 - 1.3% are Asian
 - 0.43% are American Indian or Alaskan Native
 - 7.5% are of "some other race"
 - 4.97% are of two or more races.²

- **Between 2010 and 2020, the White population changed by 5.05%, the African American population by 26.32%, and the Asian population by 28.57%. The number of Hispanics changed by 21.43%.**
- 42.61% of the population is over the age of 65
- 47.36% are of working age (18-64)
- 10.03% are under 18
- 5.28% are under 5 years old
- The median household income for the study area was \$123,409 compared to NJ median of \$85,245.^{xvi}
- U.S. Census Bureau -2016-2020 indicates that 563 people or 14.78% of the population living in this area were "foreign-born."
- **About 286 families reside in the study area.**
- 53.37% of the homes in the area are Single-family attached homes.

Site Profiles

The site profiles include geographic information, use history, flooding risks, and, where possible, potential flooding interventions (such as green infrastructure solutions, flood plain/flood zone best practices, and Blue Acres site suggestions). These profiles also include recommendations for media content for the StoryMap and AR walking tour and will continue to evolve as the team works through Tasks 2 and 3.

Site 1: Entrance to Delaware Canal



About the Location

The VTC team proposes for the tour to begin at the entrance of the canal, accessible through the municipal parking lot on 31 S Union St by the Pittore Justice Center. Site 1 (Entrance to the Canal) will be on the Delaware and Raritan Canal State Park Trail facing the Delaware Canal and the Swan Creek exit point to the Delaware River. Both water and sewer pump stations sit at this location, which is also a gateway to the Delaware and Raritan Canal State Park. At this site, floodgates were proposed but never built. This site sees the canal spillway and the Swan Creek exit to the Delaware River.

Media Recommendation - Theme: *History of Lambertville*

This site will set the stage for the rest of the tour, as we will discuss the history of the canal, railroad, waterways, and their significance to the formation of the town of Lambertville from an economic and geographic standpoint in the 17th, 18th, and 19th centuries. Topics to discuss on the site can include but are not limited to:

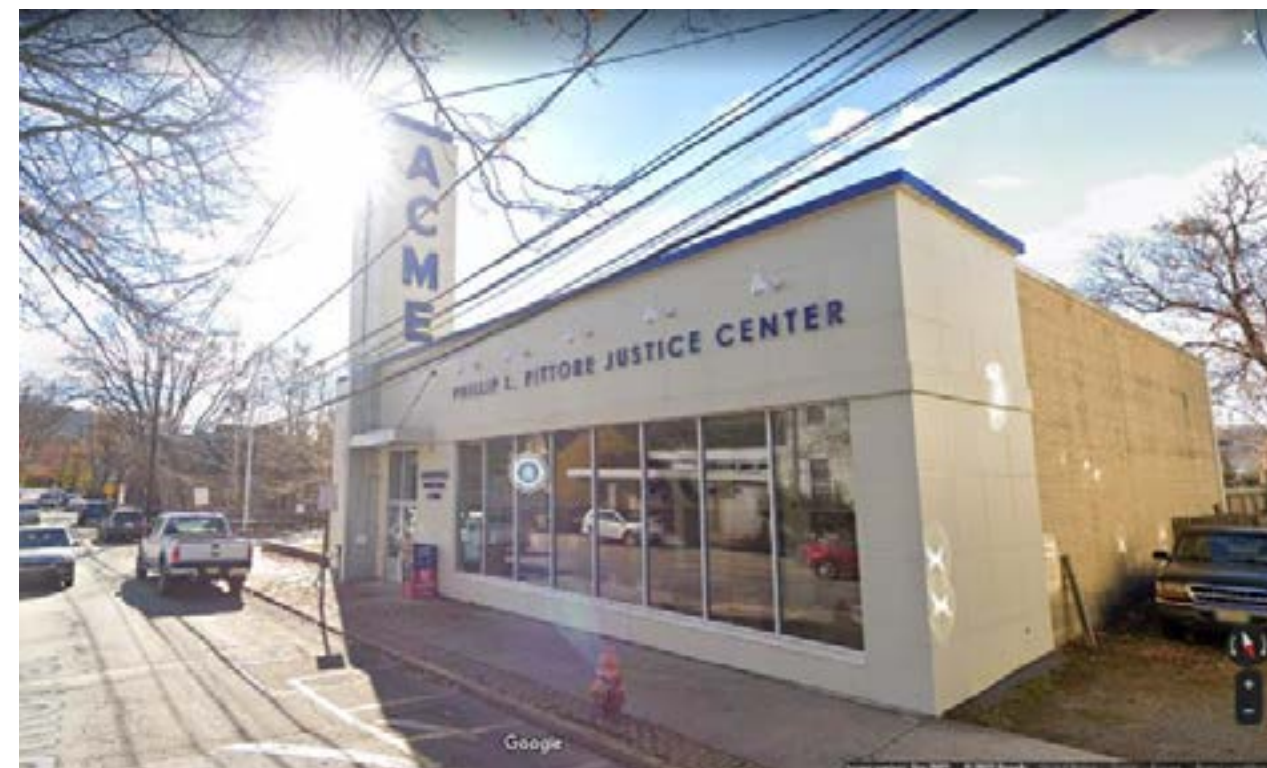
- Where water comes from and where does it go?
- How has water shaped the town?
- Why is the canal an important linchpin in NJ transportation history?

Paired with desktop research and community input from the City of Lambertville and the Lambertville Historical Society, the VTC team will gather historical images and videos that depict the impact the surrounding waterways had on the growth of the city. Each piece of digital media should be paired with a date, credits, and a brief narrative to be converted to ArcGIS StoryMap and WebXR content. The media at this site will include the following components:

- Historic and contemporary photos and videos



Site 2: ACME Theatre - Pittore Justice Center



About the Location

Following Site 1 is the Pittore Justice Center (Site 2), what was once a former ACME theatre and later market; is now a municipal building that doubles as a community screening room.^{xvii} This building has fallen victim to multiple floodings and losses over the years and during previous floodings, such as Hurricane Ida; the town has posted memorials on the windows of the building. Additionally, it has been identified by the City as a good place for a high water marker sign. In the last administration, plans to move the Police Station to this site were met with strong resistance from residents.

Media Recommendation - Theme: *Major Flooding Events*

Site 2 will introduce the history of flooding in Lambertville and highlight major flooding events that have impacted the city since its inception. Topics to discuss on the site can include but are not limited to:

- What is a floodplain?
- Why does flooding occur in Lambertville?
- What were some of the major floods that have hit Lambertville?

Paired with desktop research and community input from the City of Lambertville, the VTC team will gather information on past flooding events in the area. Additionally, VTC will work to render a timeline for the historical flooding events of Lambertville. The proposed timeline will also include costs incurred by the city per flood event, where possible. The media at this site will include the following components:

- Rendering of Flooding Events Timeline
- Storm forecasting graphics



Site 3: South Union St Bridge and Pump Stations



About the Location

At Site 3, a portion of S. Union Street Bridge which was originally cement was replaced with steel guardrails after a boat crashed through the bridge during Hurricane Irene in 2011. Based on Ida survey data collected from the City, residents in the area experienced property damage due to Swan creek overflow.

Media Recommendation - Theme: Impacts and Infrastructure

Site will highlight a specific example of the structural damage caused by flash floods, which leads the way to a conversation about sustainable infrastructure. With the water and sewer pump stations located across the street from this site and en route to the rest of the tour, we will talk about the existing water distribution systems, proposed floodgates, and additional proposals for mitigation efforts. Topics to discuss on the site can include but are not limited to:

- What are some infrastructure solutions?
- Flood Safety

For this site, at the S. Union St Bridge, an image of the boat that crashed on the bridge will appear paired with audio. This will be a brief text-to-speech description recounting the event or audio of a community member giving testimony recounting the event. VTC will work with the City of Lambertville to plan a story circle, an event to gather community statements about the boat crash event. The story circle will be recorded, and its audio will be used as content throughout the StoryMap.

- Photo of the boat
- Audio recounting the crash- story circle



Site 4: Hibernia Firehouse Co.



About the Site

For years, the Lambertville Fire Department Hibernia Company provided fire protection and emergency response services to the Lambertville community. The Fire Department's mission was to prevent the loss of life and property. In addition to responding to fires, they also responded to medical emergencies, motor vehicle accidents, rescue calls, and incidents involving hazardous materials.^{xviii} The Firehouse is currently decommissioned and most recently housed Fisherman's Mark food pantry. Fisherman's Mark is a social services nonprofit that has served Lambertville residents for over 10 years. This site can serve as a symbol of community response and resiliency.

Media Recommendation - Theme: Emergency Response and Resiliency

This site will highlight the significance of first responders and community support following Hurricane Ida on August 26, 2021. Topics to discuss on the site can include but are not limited to:

- Emergency response and management
- Community Resilience

VTC will conduct desktop research and work with the City of Lambertville to gather images and videos of the view of Swan Creek from the S Main St bridge and interview first responders recounting their experiences. In addition, renderings of flood height, direction, and debris can be created to show Swan Creek conditions after Ida (previous interviews recount cars and household items being swept away into the creek during peak height).

- Video interview or audio recording of first responders and community members - pulled from story circle
- Animation or rendering of Swan Creek Conditions

Site 5: Quarry Street- Ida Landslide



About the Site

Site 5 demonstrates the connection between those uphill and those downhill during flooding events. At this site, a landslide from higher-level land and properties caused damage to the ground below. The hill on Quarry Lane can reach up to 239 ft (73m) above sea level compared to ground level which is 118 ft (36m) above sea level; heavy rains and over 100 ft of elevation created a landslide of significant speed during Hurricane Ida that took down many ash trees. Based on survey data collected from the City during Ida, residents in the area experienced property damage, tree failure, vehicle damage, and power outages.

Media Recommendation - Theme: Environmental Impacts

This site will highlight the natural resource management efforts being undertaken by the City and other community members, and how such efforts could mitigate stormwater aftermath. Topics to discuss on the site can include but are not limited to:

- Stormwater management methods
- Stormwater recapture and its value

VTC will quantify and create visualizations of the potential impacts of environmental mitigation efforts previously taken on-site. Using tree planting species data from the City of Lambertville, VTC will render graphics showing future tree growth conditions paired with their economic and ecological benefits.

- Tree benefits inventory
- Animation or multiple images- depicting tree/ vegetation growth (intervals: 5-10-20 years)
- Visualization of environmental impact stats

Site 6: Curley Lane- Blue Acres Site



About the Site

This area is not in a designated flood zone but is less than 100ft from a regulatory floodway, Swan Creek. During Hurricane Ida, two houses (2 Curley Lane and 4 Curley Lane) fell into Swan Creek. As a result, the vacant lots were sold to NJDEP as part of their Blue Acres voluntary buyout program. The remaining house in this immediate area, 6 Curley Lane, is currently being bought through Blue Acres as well. Under these conditions, the City can repurpose this area into natural flood storage or an open space that will measure about 0.3 acres in size.

Media Recommendation - Theme: Looking Forward

This site will mark the end of the tour as we highlight the City of Lambertville's plans to repurpose Blue Acres Sites while commemorating the story of families displaced due to stormwater damage. Topics to discuss on the site can include but are not limited to:

- What are Blue Acres Sites?
- What would you like to see in this space?

VTC will work with the City of Lambertville and families participating in the Blue Acres program to capture their stories through interviews and historical images. VTC will also create a rendering to show the potential park that could be created on this repurposed site.

- Video interviews of families
- Historical images of homes
- Rendering of park

StoryMaps Case Examples

StoryMaps Background

ArcGIS StoryMaps is ESRI's place-based storytelling tool. Users can create and publish their stories, which can include maps, text, images, videos, embedded items, and other media. StoryMaps are web-based and can be viewed on desktops as well as mobile devices. Audiences do not need a background in GIS software to engage with StoryMaps, and they can be shared across social media to reach a wide audience.

StoryMaps includes tools that are used to enhance storytelling, such as interactive maps and other immersive and multimedia blocks. These tools include:

- Sidecar, a scrolling, slide-based block that allows users to view or scroll-through narrative while viewing an image or graphic. Sidecars allow "map actions," which choreograph maps within a sidecar slide and clickable links.
- Map tour, a map with plotted points. Media and narrative can be added to points.
- Swipe, a tool that allows you to compare two images or maps side by side.
- Timeline, which can show up to 20 events accompanied by a description and image.
- Embed, allowing the incorporation of other web content into the narrative. This could include 360° images, 3D models, or Google Street View images.

StoryMaps Examples

The following StoryMaps serve as case studies for this project based on their content of application of a StoryMap tool:

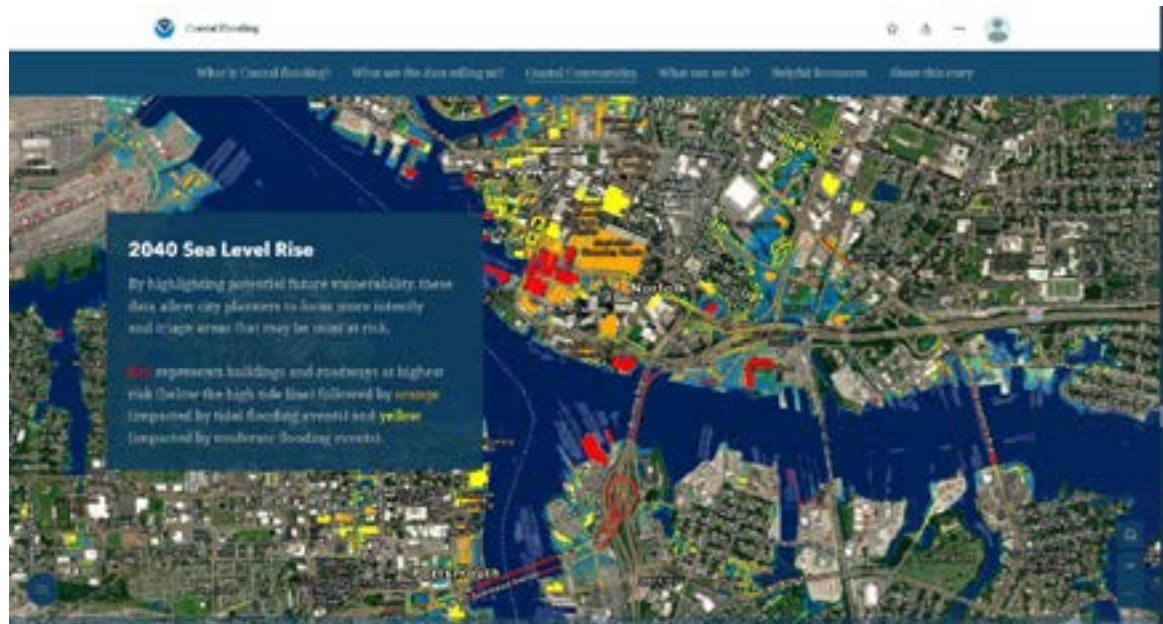
- *Brooklyn Park 2025* by City of Brooklyn Park, MN
<https://storymaps.arcgis.com/collections/dd5c57ada179489a9a399a3b5e0963be>
- *Coastal Flooding* by NOAA/NOS, Old Dominion University, ESRI (March 2022)
<https://storymaps.arcgis.com/stories/4faf6d052c8f41b3b9b99c506642bca5>
- *City of Atlanta Green Infrastructure Program* by City of Atlanta Department of Watershed Management (n.d.)
<https://storymaps.arcgis.com/stories/c41bc3f84d8e4e70bc1672ffcd830f1f>
- *Embedding 3D objects in ArcGIS Storymaps* by Tom Baker (April 2022)
<https://storymaps.arcgis.com/stories/c1fc9a37b3164c329f1993ebe1e9a2b2>
- *From Naptown to Indy* by Allen Carroll (n.d.)
<https://storymaps.arcgis.com/stories/fe79c0d72625474ba5d2cb7cc4f65036>
- *Grandma Charleses's Cinnamon Rolls* by Michelle and Craig Thomas (n.d.)
<https://storymaps.arcgis.com/collections/15788592cf844121a71a6a7dfc4cfc17?item=5>
- *Planning a trip to see Scotland's castles* by Hannah Wilber (2021)
<https://storymaps.arcgis.com/stories/9f8e965375834c708274222105794328>
- *Our Food Story: Making and re-making memories, one dish at a time* by ESRI's StoryMaps Team (March 2022)
<https://storymaps.arcgis.com/stories/8890de7ad92f4582b853da23c8fe86ac>
- *The Voices of the Grand Canyon* by The Grand Canyon Trust (n.d.)

<https://storymaps.arcgis.com/stories/b22a6a09bb2344ff845d9efd3e4152f7>

Coastal Flooding by NOAA/NOS, Old Dominion University, ESRI (March 2022)

This StoryMap covers the topic of flooding, and demonstrate how various tools can be used to tell the story of flooding. The tools used in this map include the side car tool, which shows narrative alongside images and a map with changing content, and the swipe widget, which shows flooding on the map. In addition, the StoryMap concludes with a “call to action” section to promote viewers to engage with the topic further.

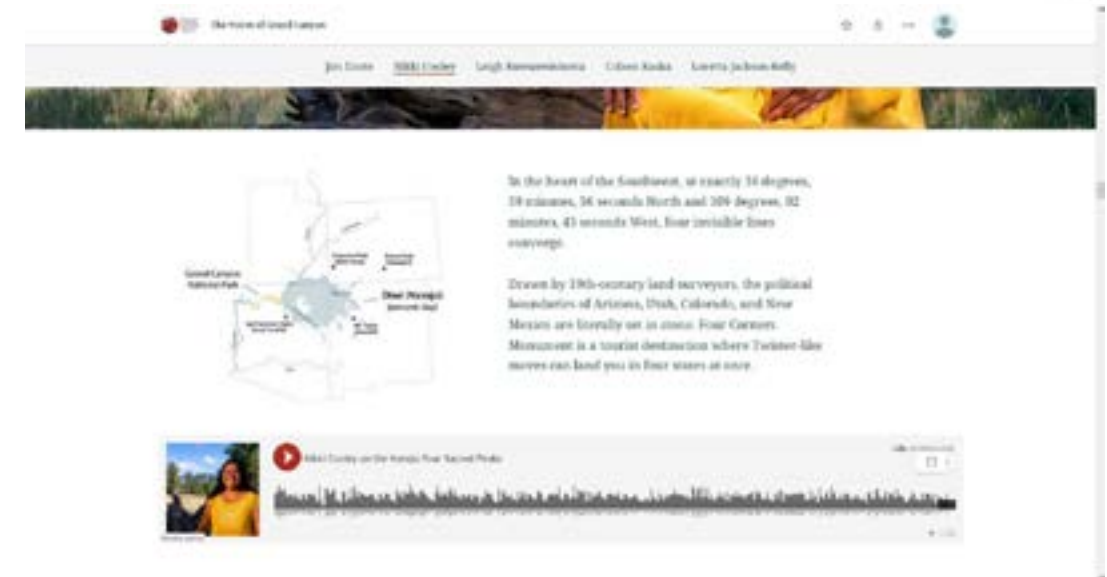
<https://storymaps.arcgis.com/stories/4faf6d052c8f41b3b9b99c506642bca5>



The Voices of the Grand Canyon by The Grand Canyon Trust (n.d.)

This StoryMap demonstrates how the tool can be used for storytelling. The StoryMap uses embedded voice recordings and videos throughout to include multiple perspectives and first-hand accounts. The embedded content is from multiple sources, such as Soundcloud and Youtube.

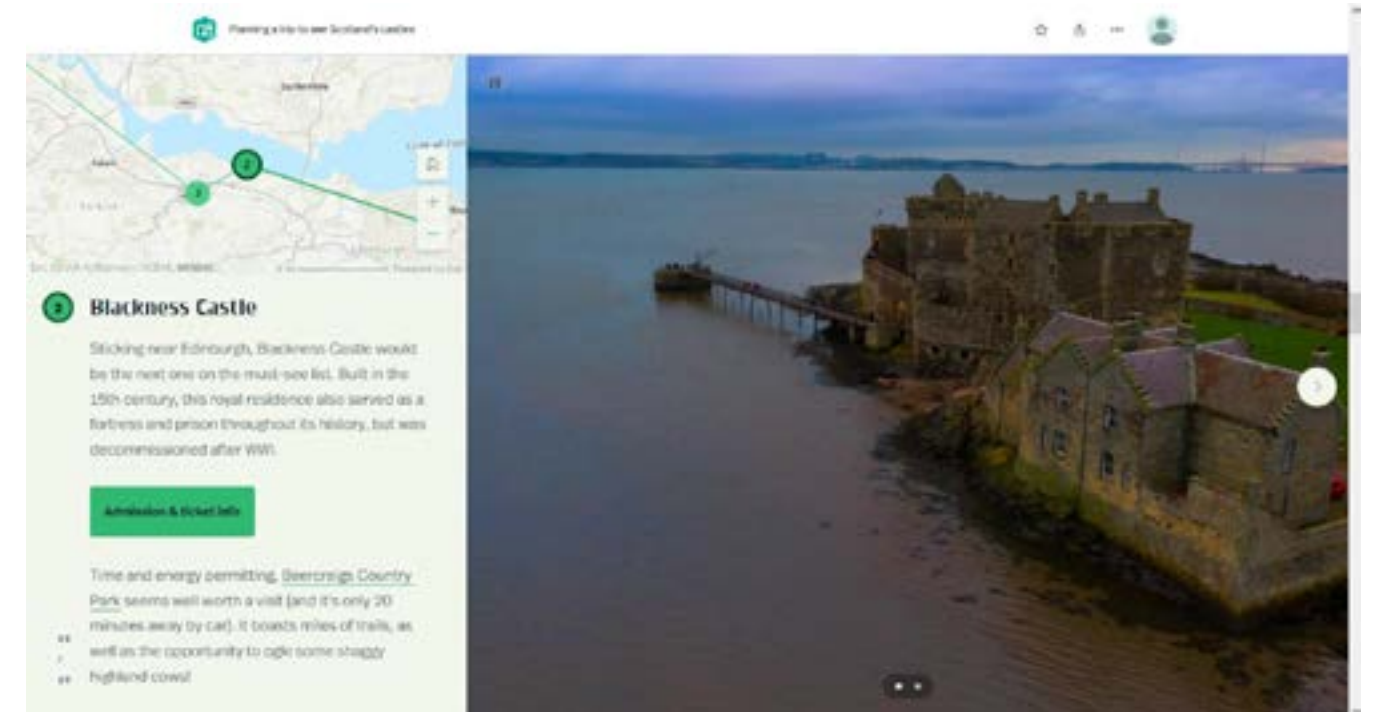
<https://storymaps.arcgis.com/stories/b22a6a09bb2344ff845d9efd3e4152f7>



Planning a trip to see Scotland's castles by Hannah Wilber (2021)

This StoryMap shows how to create a guided tour using the platform. There are tools such as progress lines and pop-ups to display content throughout the tour.

<https://storymaps.arcgis.com/stories/9f8e965375834c708274222105794328>



City of Atlanta Green Infrastructure Program by City of Atlanta Department of Watershed Management (n.d.)

This StoryMap discusses topics such as green infrastructure and shows how multiple pieces of content on the same screen, such as maps, media, and text.

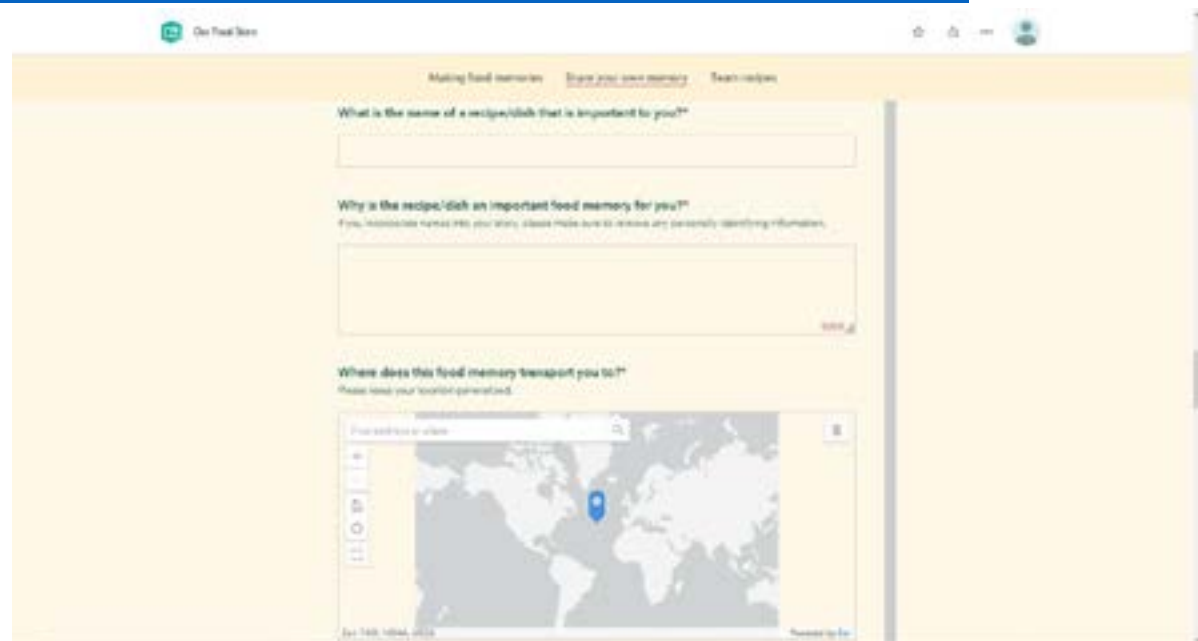
<https://storymaps.arcgis.com/stories/c41bc3f84d8e4e70bc1672ffcd830f1f>



Our Food Story: Making and re-making memories, one dish at a time by ESRI's StoryMaps Team (March 2022)

This StoryMap encourages audience engagement by allowing readers to share their own story through text and image submissions. This can be used for public engagement and involvement.

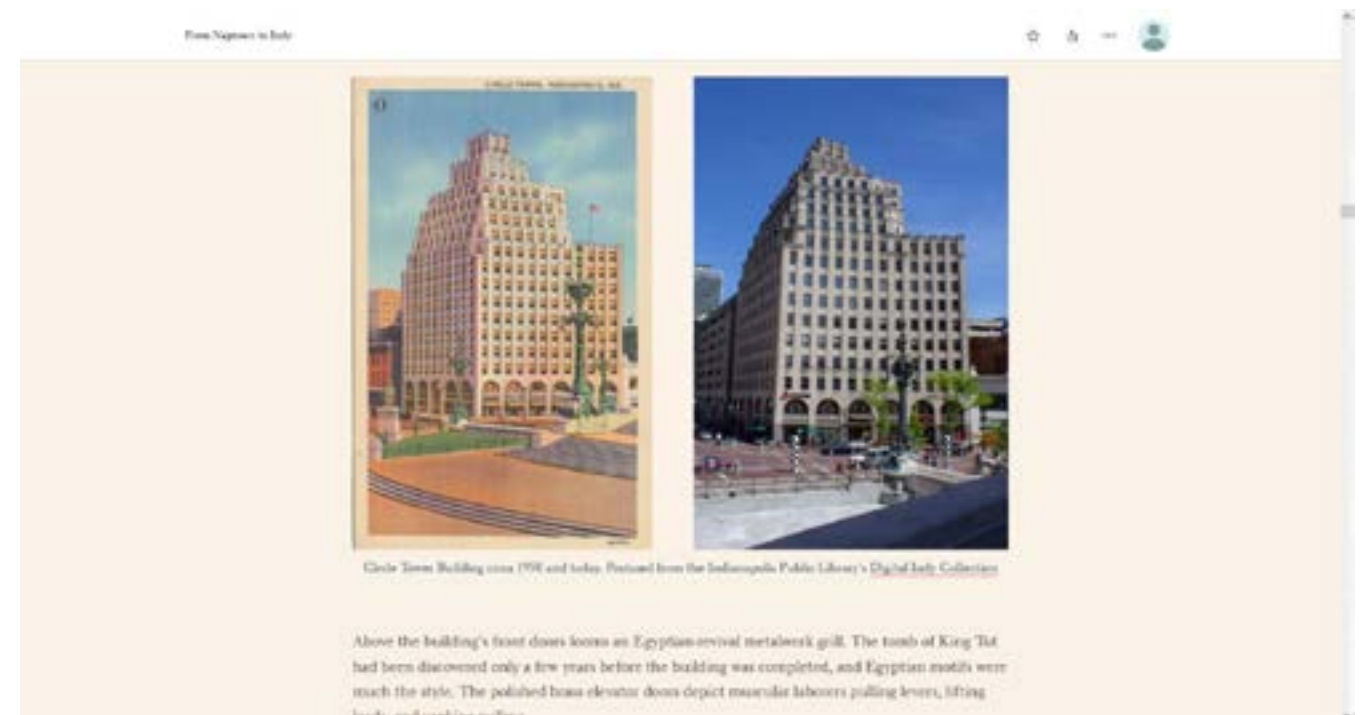
<https://storymaps.arcgis.com/stories/8890de7ad92f4582b853da23c8fe86ac>



From Naptown to Indy by Allen Carroll (n.d.)

This StoryMap shows how it can be used for touring a city. It uses of historic and contemporary images, at times shown side by side for comparisons, to incorporate storytelling and context for the tour. In addition, the sidecar tool is used to show the changing landscape over time.

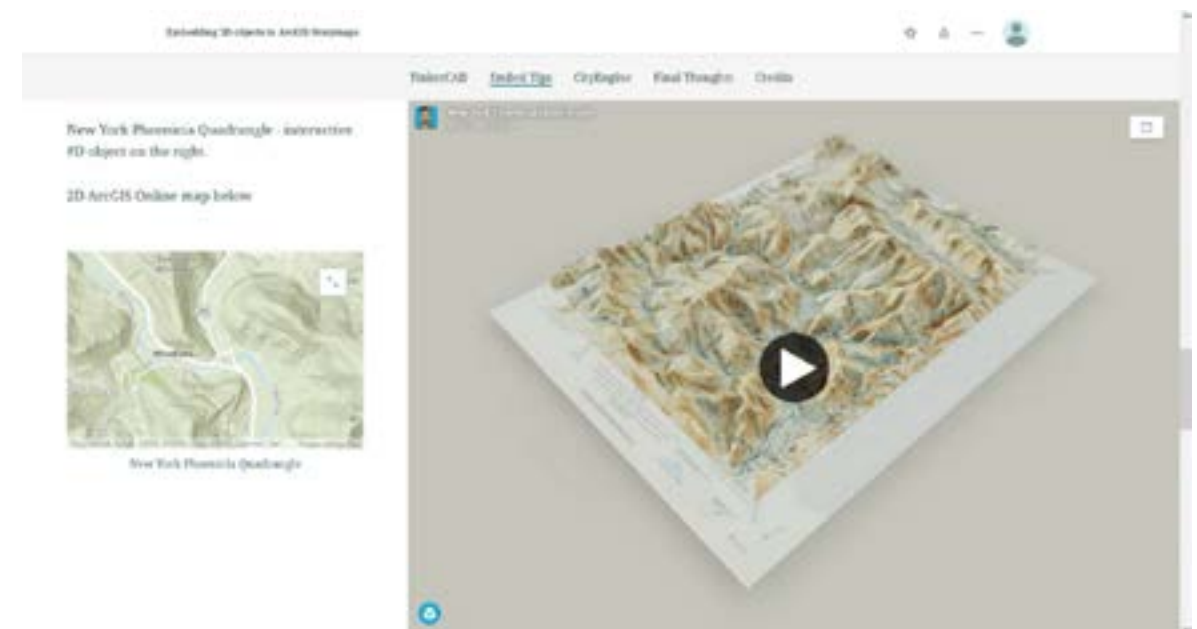
<https://storymaps.arcgis.com/stories/fe79c0d72625474ba5d2cb7cc4f65036>



Embedding 3D objects in ArcGIS Storymaps by Tom Baker (April 2022)

This example demonstrated including interactive 3D models in Storymap using the embed tool. In addition to models, the tool can also be used to include 360° images.

<https://storymaps.arcgis.com/stories/c1fc9a37b3164c329f1993ebe1e9a2b2>



Collection: *Brooklyn Park 2025* by City of Brooklyn Park, MN

This is an example of a collection, which contains more than one StoryMap. It demonstrates the possibility for Lambertville to continue to use ArcGIS StoryMaps as a tool to share more information about flooding beyond the walking tour.

<https://storymaps.arcgis.com/collections/dd5c57ada179489a9a399a3b5e0963be>



Additional Examples from ESRI

Map Tour

- <https://storymaps.arcgis.com/collections/dd4c2e6d5c2a40dd98e881f6ba616605>

Sidecar

- <https://storymaps.arcgis.com/collections/f630a462b29847fa948336a2ada4b02f>

Audio

- <https://storymaps.arcgis.com/collections/da562cb5f9d04db1b64fc7ceeb73661a>

Image gallery

- <https://storymaps.arcgis.com/collections/2626ceb37ac94630a3eb7f757132e920>

ⁱ <https://why.org/segments/for-200-years-bridges-have-made-new-hope-and-lambertville-more-like-two-sides-of-same-town/>

ⁱⁱ <https://www.lhry.org/lambertville-transportation-chronology>

ⁱⁱⁱ <https://www.lhry.org/lambertville-transportation-chronology>

^{iv} <https://www.trentondaily.com/trentoniana-photo-series-flood-of-1903/>

^v https://www.weather.gov/media/marfc/Tropical_Floods/DEL/NewHope.pdf

^{vi} <https://lambertvillehistoricalsociety.org/a-dialogue-about-history-the-flood-of-1955>

^{vii} <https://www.weather.gov/media/marfc/FloodClimo/DEL/NewHope.pdf>

^{viii} <https://www.weather.gov/media/marfc/FloodClimo/DEL/NewHope.pdf>

^{ix} <https://www.obxconnection.com/outer-banks-forum/forum-thread.aspx?Thread=5352>

^x <https://www.ltrr.arizona.edu/~katie/kt/FLOODS-USGS/NSF-AHIS/World-Env-Water-Res-Congress-Proc-2007/40927-4364.pdf>

^{xi} <https://www.ltrr.arizona.edu/~katie/kt/FLOODS-USGS/NSF-AHIS/World-Env-Water-Res-Congress-Proc-2007/40927-4364.pdf>

^{xii} <https://water.weather.gov/ahps2/hydrograph.php?wfo=phi&gage=nhpp1>

^{xiii} <https://lambertvillenj.org/meetings/meeting-documents/mayor-council-meeting/2022/2022-agendas-mayor-council/1202-09-01-2022-mayor-council-agenda/file>

^{xiv} <https://rutgers.policymap.com/newmaps#/>

^{xv} <https://rutgers.policymap.com/newmaps#/>

^{xvi} 2016-2020 by the Census' American Community Survey

^{xvii} https://www.nj.com/hunterdon-county-democrat/2013/07/lambertville_judge_serves_in_j.html

^{xviii} <https://www.countyoffice.org/lambertville-fire-department-hibernia-company-2-lambertville-nj-35a/>

^{ix} <https://en-gb.topographic-map.com/map-b8knh/New-Jersey/?center=40.36554%2C-74.93914&zoom=15&base=>

^{ix} <https://www.tapinto.net/towns/flemington-slash-raritan/sections/south-county-news/articles/lambertville-working-projects-to-get-city-back-to-pre-ida-days>

^x <https://www.tapinto.net/towns/flemington-slash-raritan/sections/south-county-news/articles/lambertville-sees-almost-10-inches-of-rain-local-businesses-devastated>

^{xi} <https://buckscountyherald.com/stories/lambertville-remembers-one-year-anniversary-of-hurricane-ida,19634>

^{xii} <https://www.nj.com/news/2022/08/car-lost-during-hurricane-ida-was-just-found-submerged-in-the-delaware-river.html>

^{xiii} <https://patch.com/pennsylvania/newhope-lambertville/all-lambertville-waterways-breached-banks-flooding-updates>

^{xiv} <https://storymaps.arcgis.com/stories/cea22a609a1d4cccb8d54c650b595bc4>

Appendix B: Flowing Together Swan Creek Walking Tour Story Map

FLOWING TOGETHER

Swan Creek Walking Tour

Lambertville, New Jersey

March 8, 2023

INTRODUCTION



The waters that flow through Lambertville—the Delaware River, the D&R Canal, several creeks—have helped shape the City’s history, influence our present, and will certainly impact our future.

Before the 1700s, the Lenni Lenape lived along the river and creeks, which teemed with fish and game. During the Colonial era, Coryell’s Ferry—as it was then called—served as the principal river crossing between New York City and Philadelphia. Throughout the 18th and 19th centuries, scores of houses were built along Swan Creek. In 1810, Lambertville was incorporated, and in the early 1830s the D&R canal was built and with it flowed enough industry and opportunity to transform a once small village into the city it is today.

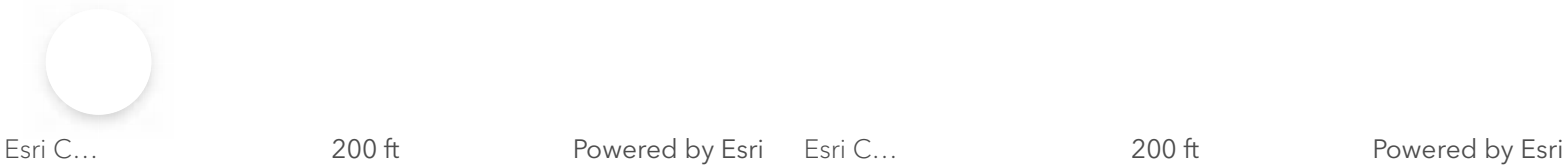
However, along with prosperity came floodwaters. Between 1841 and 2006, Lambertville suffered seven major riverine floods. The Flood of 1955 was the most serious; it crested at 24.1 feet and caused widespread, catastrophic damage. More recently, the effects of climate change have brought new dangers. The steep hills on the eastern edge of Lambertville have channeled rapid and heavy rainfalls into the neighborhoods below, flooding areas well outside of denoted floodplain maps. On September 1, 2021, the remnants of Hurricane Ida dumped nearly ten inches of water on Lambertville in a three hour period, overwhelming creeks, streets, homes, and the stormwater system. Through all these terrible events, the community’s response to floods tells a story of resolve and resilience. This StoryMap, Flowing Together, is just one of the City’s many responses to a long history of flooding in Lambertville. As we continue to rebuild following Ida’s destruction, future flooding events are a pressing concern, moving resilience planning to the forefront of local government work and community attention.

FEMA Flood Zones in Lambertville

Certain parts of Lambertville near the water bodies are classified as FEMA Special Flood Hazard Areas, specifically Zone A or Zone AE flood areas, requiring mandatory flood insurance for property owners. These areas face a 1 percent annual flood risk

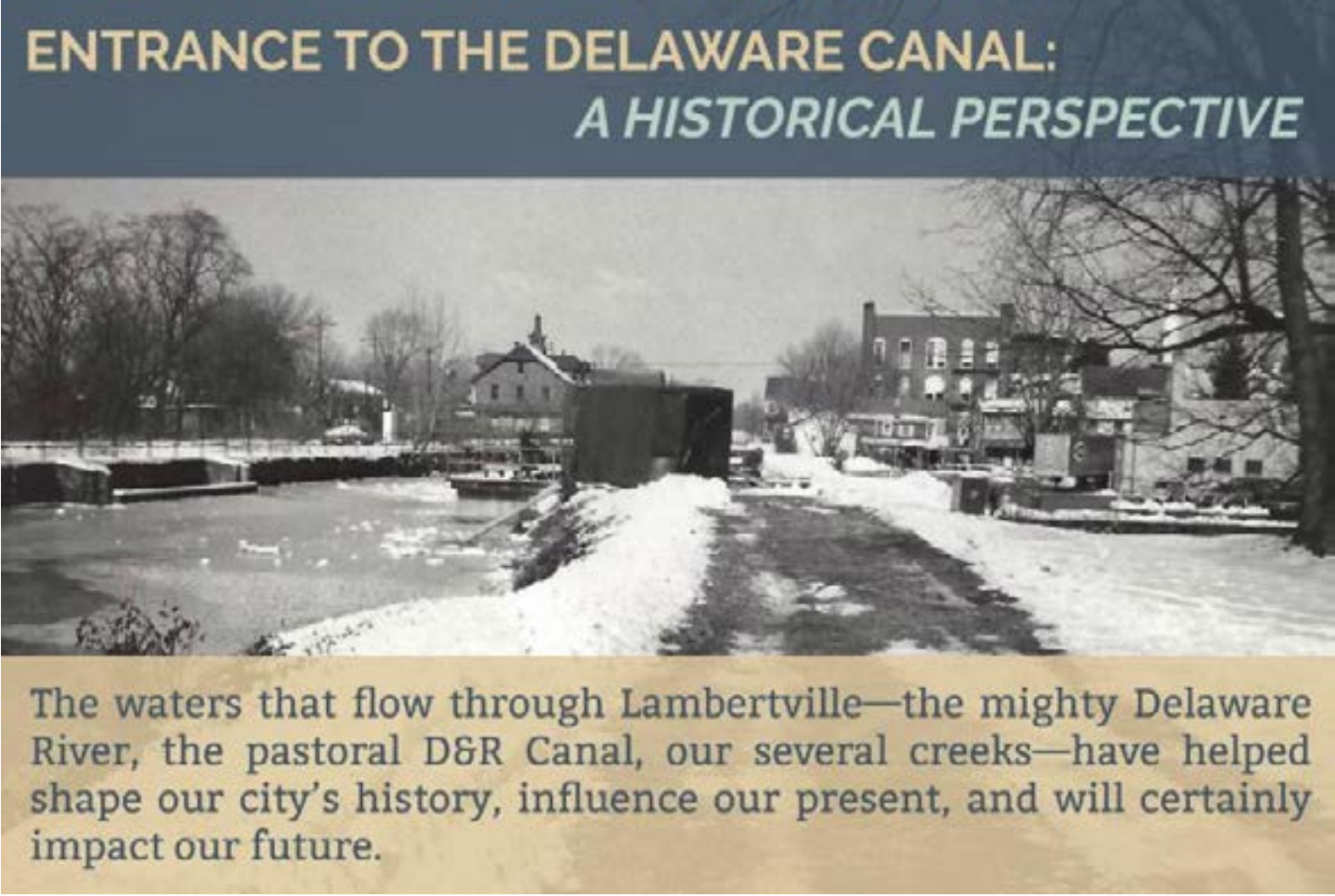
and a 25 percent chance of flooding during a 30-year mortgage period.

To view the FEMA flood zones, use the slider in the map below.



THE WALKING TOUR

1 Entrance to the Delaware Canal



Looking toward the river, try to imagine a small, flat-bottomed ferry carrying horses, people and goods from the eastern bank of the Delaware to the other side. From about 1732, this was Coryell’s Ferry. There was no canal —only a narrow creek tumbling to the river, a few humble dwellings and one or two commercial establishments.

Now, skip forward to the 1834 opening of the Delaware and Raritan Feeder Canal and see barges laden with Pennsylvania coal being pulled by mules, the cargo bound for Trenton, New York City, and beyond. The Belvedere-Delaware railroad came in 1851 and with it more people and significant opportunity. By 1872, Lambertville’s population had swelled to its peak of 4,637—600 more than present day.

Scroll to your left to see some “then and now” photos of well-known Lambertville landmarks through time.

2

The Pittore Justice Center

PHILLIP L. PITTORE JUSTICE CENTER:
LAMBERTVILLE FLOOD HISTORY

The City of Lambertville has recorded 15 flood events over the past 200 years. Flood events in Lambertville occur due to heavy precipitation, which causes either riverine or flash flooding.

Historically, most of Lambertville's floods have been due to overflows of the Delaware River which, on average, maintains a height of 2 feet throughout the year. More recently, in Hurricanes Irene and Ida the city experienced flash flooding from unprecedented rainfall.

Scroll right to follow the timeline of storm events and flood height crests for the Delaware River.



The Pittore Justice Center sits close to the Delaware and Raritan Canal. Once an ACME supermarket, the building now serves as the municipal court, meeting space, and a community screening room. At an elevation of 66.1 feet, it is one of the lowest buildings in the city and has fallen victim to multiple floodings and losses over the years. Given its location, size, and historic designation protections, flood mitigation for this building is one of the greatest engineering and financial challenges the city faces.

Featured here is a historical timeline of major flooding events that have impacted the city.

3

Union Street Bridge

UNION STREET BRIDGE: LIFE IN THE FLOODPLAIN



"The city has always been a low lying...area, so we do flood on a normal basis, usually every couple of years..."

▶

00:00 / 04:18

🔊

Listen to this audio clip to hear stories from members of the Lambertville community about the impact of Hurricane Ida.

The South Union Street Bridge crosses Swan Creek. During Hurricane Irene in 2011, the upstream balustrade was destroyed when, due to the rising waters in the creek, a boat crashed over the top of the bridge and landed in the street (the balustrade has yet to be restored). Across the street along the southern edge of the creek, is the Veolia pumping station, which pumps water from the canal in times of drought to the Swan Creek reservoir for treatment before making the mile trip back to the homes and businesses in the City. Behind it is another pump station, which pumps sewage to the LMUA treatment facility where wastewater is treated; the resulting effluent is released into the Delaware River.

Across from the pump station, a home has recently been elevated three feet

above the base flood elevation by its new owner. While not all property owners in the flood zone are able to undertake this level of mitigation due to structural or financial constraints, many residents along Swan Street have elevated their mechanicals and emptied their basements in preparation for the inevitable return of floodwaters.

Swan Street's natural topography and low-lying characteristics allow for the collection of precipitation overflow from various sources, including Swan Creek and the Delaware River, and rainwater from elevated areas, such as the hills on Quarry Street.

4

Hibernia Firehouse



First responders and social services agencies are key to the safety and well-being of any community. The Hibernia Fire House was built in 1875 and its volunteer company remained here until 2017 when the local fire companies consolidated and moved to the Union Firehouse on North Main Street. The firehouse then became the home to Fisherman’s Mark, a non-profit organization that provides social services and a food pantry to approximately 1,200 local clients. When Ida hit, floodwaters streamed over the bridge, filling the basement with four feet of water and destroying a large backstock of food. Fisherman’s Mark quickly relocated to an empty farm market building owned by the City in the north end of town and joined the relief efforts with the City’s department of social services, placing scores of families in temporary housing.

The City’s fire department, police department and local rescue squad answered nonstop emergency and evacuation calls during hurricane Ida and not a single life was lost due to their heroic efforts.

In 2022, the City oversaw more than \$2 million in stream restoration and mitigation efforts in Swan (and Ely) creeks, including the construction of an 80-foot block wall along the firehouse, a 60-foot concrete wall further upstream, hundreds of feet of vegetative gabion basket walls and many tons of riprap. On April 1, 2022, eighty community volunteers removed three tons of Ida-related debris from Swan Creek, including the remnants of an upright piano, the origin of which remains unknown.

5

Quarry Street Landslide

QUARRY STREET LANDSLIDE: GREEN INFRASTRUCTURE SOLUTIONS



“Maybe as a community we could do more preparedness...We should be thinking more, ‘It’s coming. How do we prepare?’.”
Vivien Bevich

During Hurricane Ida in 2021, a significant landslide occurred at this steep slope, bringing down large trees, crushing vehicles and narrowly missing homes. After clearing the debris, the City and community undertook natural resource management efforts to recover. Because the site is so steep it was largely inaccessible to machines; 25 yards of clean soil had to be carried by hand in five-gallon buckets to the top section.

Quarry Street residents planted 86 native shrubs, flowers, and trees to control erosion and recapture stormwater. The City is undertaking broad efforts to expand green infrastructure by educating residents of its many economic and ecological benefits. For the full list of plantings and their future benefits, as well as a rendering of their growth over time, scroll through the slides to the right.

6

Curley Lane Blue Acres Site

CURLEY LANE: *BLUE ACRES & FUTURE VISIONS*



“My grandfather bought this house around 1920. We’ve been here for...103 years...”



00:00 / 04:29



Listen to the audio clip to hear an interview with the Rosso Family.

Although not located in a designated flood zone, the homes at 2 Curley Lane and 4 Curley Lane were destroyed by the flooding of Swan Creek during Hurricane Ida and have since been removed. The three homes on this site, including the house that is still standing, have been in the same family for more than 100 years. Both the flood-damaged properties were acquired through the New Jersey Blue Acres Program, which restricts future development while encouraging mitigation and educational efforts at the site. The third home remains in the family and the present owners intend to stay.

Specific plans for this site have not yet been made, though one idea includes a naturalized park where visitors can enjoy the creek and sylvan views. As many as four residential properties in the city damaged during Ida may ultimately be

acquired through the program. Remarkably, a car parked here on Curley Lane was carried off by Ida floodwaters and, passing under five bridges, was finally found the following summer in the Delaware River.

Beyond the two homes lost at Curley Lane, the City recorded damage reports from 132 other homes that are not in the 100- or 500-year floodplain. The damage to these properties ranged from low levels of water in basements to severe damage requiring extensive rehabilitation. Because these properties are not in a designated floodplain, many of these homeowners did not carry flood insurance and more than a few have struggled with recovery costs.

LOOKING AHEAD

Communities across the United States must rely on the commitment and hard work of local municipal governments, first responders, engineers, planners, volunteers and local stakeholders to ensure continued viability as climate change continues to threaten our way of life. Financial resources for small towns and cities are often strained, and communities must compete for grant funding from nonprofits, state and federal agencies. During the last twenty years, Lambertville has received millions of dollars in grant funding to recover from, and mitigate against, natural hazards. But the next climatic event is a matter of when, not if, and there is still much work to do. Individual property owners are encouraged to carry insurance, prepare their homes, and create an emergency plan. The City will continue to educate its residents and business owners, train its first responders, and seek funding to employ a multitude of intersecting mitigation and resilience solutions.

ABOUT "FLOWING TOGETHER"

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For more information about Together North Jersey, visit <https://togethernorthjersey.com>

For more information about the NJTPA, visit <https://www.njtpa.org>

For more of Lambertville's history, please visit the Lambertville Historical Society: <https://lambertvillehistoricalsociety.org/history>

For more information about climate change in New Jersey, please find the following reports:

- <https://njclimateresourcecenter.rutgers.edu/resources/state-of-the-climate-new-jersey-2021/>

- <https://www.nj.gov/dep/climatechange/>



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