

BMP WATERSHED SUMMIT 2024

Wildwood Municipal Building

October 16, 2024

Dan Gummersheimer- Director of Public Works

CITY OF BRENTWOOD

- Suburb of St. Louis, MO with a population of around 8,233 residents.
- City is a 4th Class City that was incorporated in 1919.
- Overall area is around two square miles.
- \$660 million in taxable revenue due to city's location & developments.
- Brentwood is a full-service community with a unique blend of quality residential neighborhoods and one of the most thriving business districts in the St. Louis metropolitan area. The city is located within minutes of downtown St. Louis. Brentwood is known as the "City of Warmth" because of its small-town charm and friendly atmosphere.

WHY DO THIS PROJECT

- Area was blighted due to constant flooding.
- Last area within Brentwood to be improved- other areas very successful revenue generators.
- Brentwood was in a unique financial position to do this project at this time.
- Brentwood knew that no other agency/municipality was going to do this project for Brentwood (USACE, Metropolitan Sewer District, FEMA/SEMA, Consortium of Adjacent Municipalities).

OBJECTIVES: HOW TO ADDRESS ONGOING FLOODING ISSUES?

- Solve 100-year recurring public health & safety problem.
- Remove Manchester Road from 100-year floodplain.
- Reduce 100-year floodplain from 60 acres to 27 acres (reclaim about 22 acres).
- 27 acres remaining in floodplain will adequately handle anticipated storm water volume.
- Most of the property removed in the floodplain (including 10 residential properties) is along Manchester corridor.
- Opportunity for sustainable urban creek area and unique redevelopment in St. Louis region.

BRENTWOOD BOUND CONSTRUCTION STRATEGIES

1. Flood mitigation projects
 - Water quality improvements
2. Manchester Road improvements
3. Deer Creek Connector / Brentwood Park improvements
4. Redevelopment area (following improvements)

HOW TO ADDRESS ONGOING FLOODING



Brentwood Bound



HISTORICAL FLOODING EVENTS

Flooding in Brentwood

June 1957 (4.74" in 15 hours)
April 1970
April 1973
July 1978
April 1979 (4.90" in 20 hours)
September 1980
June 1981
July 1982
September 1986
July 1991
August 1993
September 1993

May 1995
June 1996
February 1999
June 2000
June 2003
May 2004
July 2004
May 2005
May 2008
June 2011
December 2015
August 2016

Recent Rain Events

September 2008
7.8" in 9 hours, 0.2%
Tropical Depression Ike

June 26, 2011
3.5" in 35 hours, 1%

December 26-28, 2015
9", 60 hours, 2%

April 26-May 4, 2017
9", 192 hours, 4%



PREVIOUS EFFECTS OF FLOOD EVENTS



2008



2015



2016

BRENTWOOD BOUND AREA



Plate 1 - Study Area Boundary

Manchester Road Flood Mitigation Chapter 353 Blighting Analysis
City of Brentwood, Missouri



March 2018

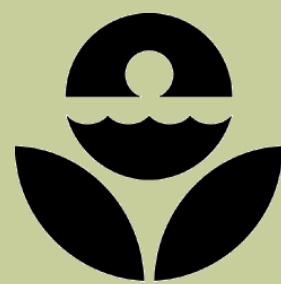
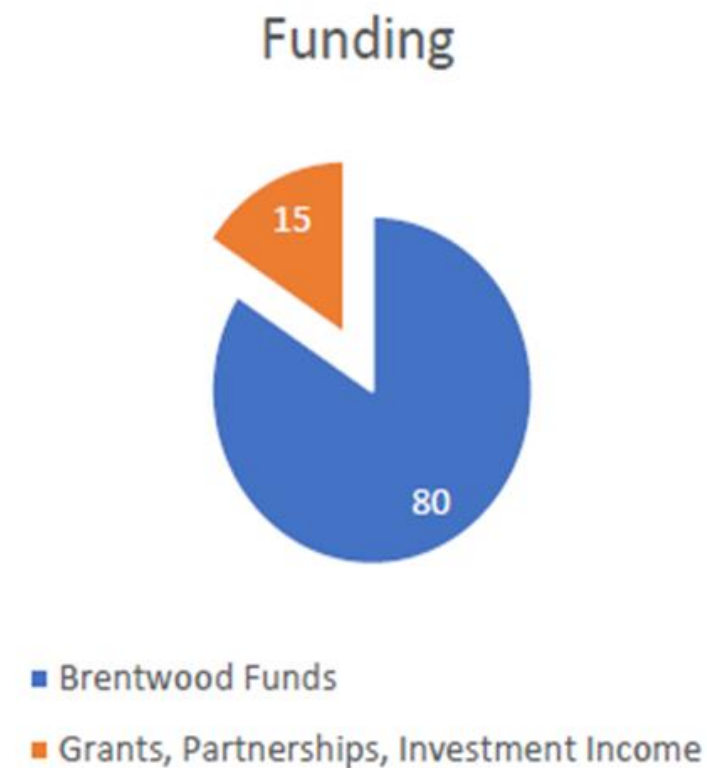
SCHEDULE

- 2011-2016 - Flood Studies
- 2018 - COP's – \$40 MM
- 2018 - Brentwood Redevelopment Corp / 353
- 2018 - Design Started on Phase 1
- 2018-2022 - Property Acquisitions
- 4/2019 - EDST Vote – Passed by Over 3:1
- 8/2019 – Conditional Letter of Map Revision
- 11/2019 - 2019 COP's Based on EDST Passage
- 12/2019 - Phase 2 Design
- 12/2019 – 6/2023 – Construction
- 2023 – Letter of Map Revision

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Design Studies	Yellow				Yellow								
Funding							Orange						
Design							Blue				Blue		
Property Acquisition							Grey				Grey		
Construction									Green		Green		

BUDGET – GRANTS AND PARTNERSHIPS

- \$95 MM Project
 - Brentwood COP's - \$80 mm
 - Partnerships/ Grants/ Investment Income - \$15mm
 - Great Rivers Greenway
 - East-West Gateway
 - Muny Grants
 - Metropolitan Sewer District
 - Missouri Department of Transportation



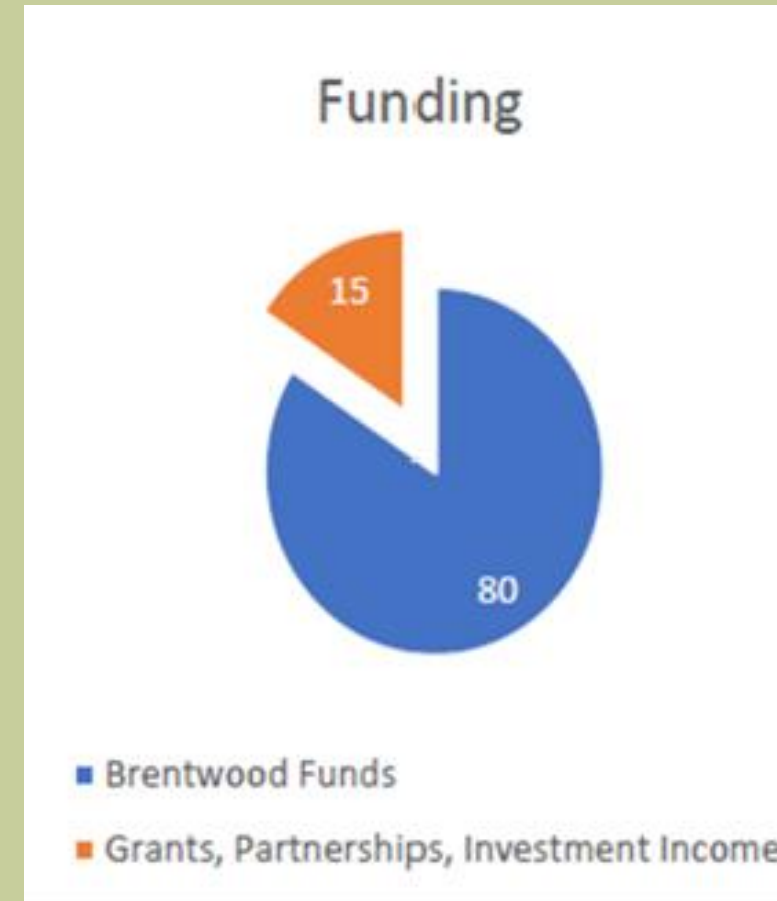
EPA

United States
Environmental Protection
Agency



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 - Missouri Department of Transportation
 - Missouri Department of Natural Resources
 - U.S. Environmental Protection Agency

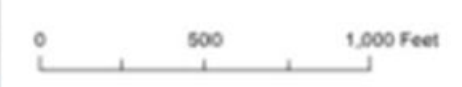


PROPERTY ACQUISITIONS

Brentwood Bound – Property Acquisition



- Legend**
- Acquisition**
- City Owned/Agreement Executed
 - Easement Acquired/Counteroffer Approved
 - MSD Owned
 - Necessary for Construction
 - Temporary & Permanent Easements
 - No Longer Pursuing
 - Project Area Boundary
 - Streams



Parcel Acquisition
City of Brentwood, MO
Deer Creek Flood Mitigation

12/31/2021

FLOOD MITIGATION PROJECT



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FLOOD MITIGATION IMPROVEMENTS

- Construction of two retention basins (Mary Ave & east end)
- Over 6,500 feet of creek improvements including widening, retaining walls, storm sewers, and the like
- Amended soils
- Perennial groundcover
- Prairie seeding & ornamental grasses
- Bioretention & aquatic plants
- Trees & shrubs
- Permeable pavers in parking lot & grass pavers

FLOOD MITIGATION AREA – PRIOR TO STORMS



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FLOOD MITIGATION AREA - DURING STORMS



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FLOOD MITIGATION AREA - AFTER STORMS



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BRIDGE AREA - PRIOR TO STORMS



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BRIDGE AREA - DURING STORMS



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BRIDGE AREA - AFTER STORMS



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WATER QUALITY IMPROVEMENTS BRENTWOOD PARK LAKE

- The Brentwood Park Lake receives flow from land that is currently outletting directly to Deer Creek
- This lake provides water quality benefits through increased retention time and plant nutrient uptake
- The lake reduces about 32.2 pounds of nitrogen and 6.4 pounds of phosphorus from entering Deer Creek annually
- The lake treats 80% of total suspended solids



WATER QUALITY IMPROVEMENTS WESTERN CONFLUENCE WETLAND

- Redirected two storm drainpipes that were discharging directly into Deer Creek into wetland
- The total drainage area being redirected to wetland is approximately 7 acres
- Wetland designed to have varying topography to form shallow semi-permanent pools for optimal plant and wildlife habitat
- The lake reduces about 27.7 pounds of nitrogen, 3.5 pounds of phosphorus and 176.2 MPN of bacteria from entering Deer Creek annually



WATER QUALITY IMPROVEMENTS GRG CONNECTOR

- The parking lot features 18,975 square feet of permeable pavers, with 27,965 square feet of contributing drainage area and 1.2 feet of stone storage depth
- The system is designed to encourage infiltration and maximize the BMP effects of the permeable pavement
- A bioretention basin has been proposed at the southwestern end of this area, downstream of the parking lot to store, filter and direct stormwater runoff into the stormwater collection system



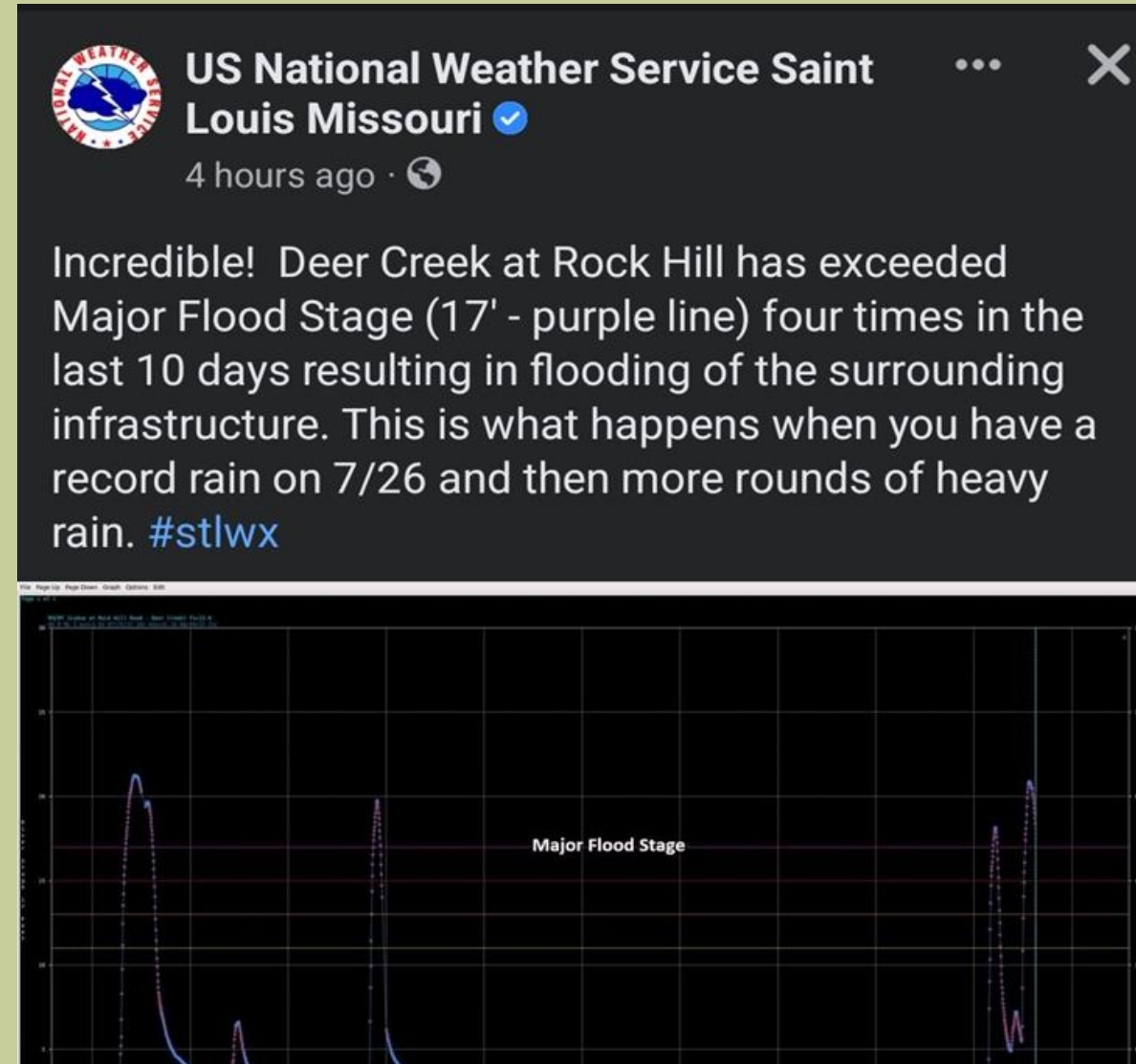
NATIONAL WEATHER SERVICE REGIONAL STATISTICS: JULY 26 – 28, 2022

- 25% of St. Louis' normal annual rainfall fell in 12 hours.
- St. Louis exceeded its normal rainfall amount for July and August combined in just 6 hours.
 - 7.31" is the normal amount of rain in July and August combined
- Lambert International Airport received 7.68" of rain in 6 hours.
 - This has a 1 in 1,000 chance of occurring in any given year.
- NWS: This rainfall event was the most prolific one the St. Louis metropolitan area has seen since records began in 1874.



NATIONAL WEATHER SERVICE REGIONAL STATISTICS: AUGUST 3 – 4, 2022

- National Weather Service
 - The wettest 2-week period ever recorded in St. Louis
 - August 3 rainfall record broken
 - 15" of rain from July 24 – August 4
- Rock Hill Stream Gage exceeded "Major Flood Stage" four times in ten days.
 - Rock Hill Stream Gage is 1.7 miles upstream of the Brentwood Bound Project Area.
 - Historic Rain the previous week saturated the soils



FLOOD MITIGATION IMPROVEMENTS MINIMIZED FLOOD DAMAGES DURING CONSTRUCTION PHASE



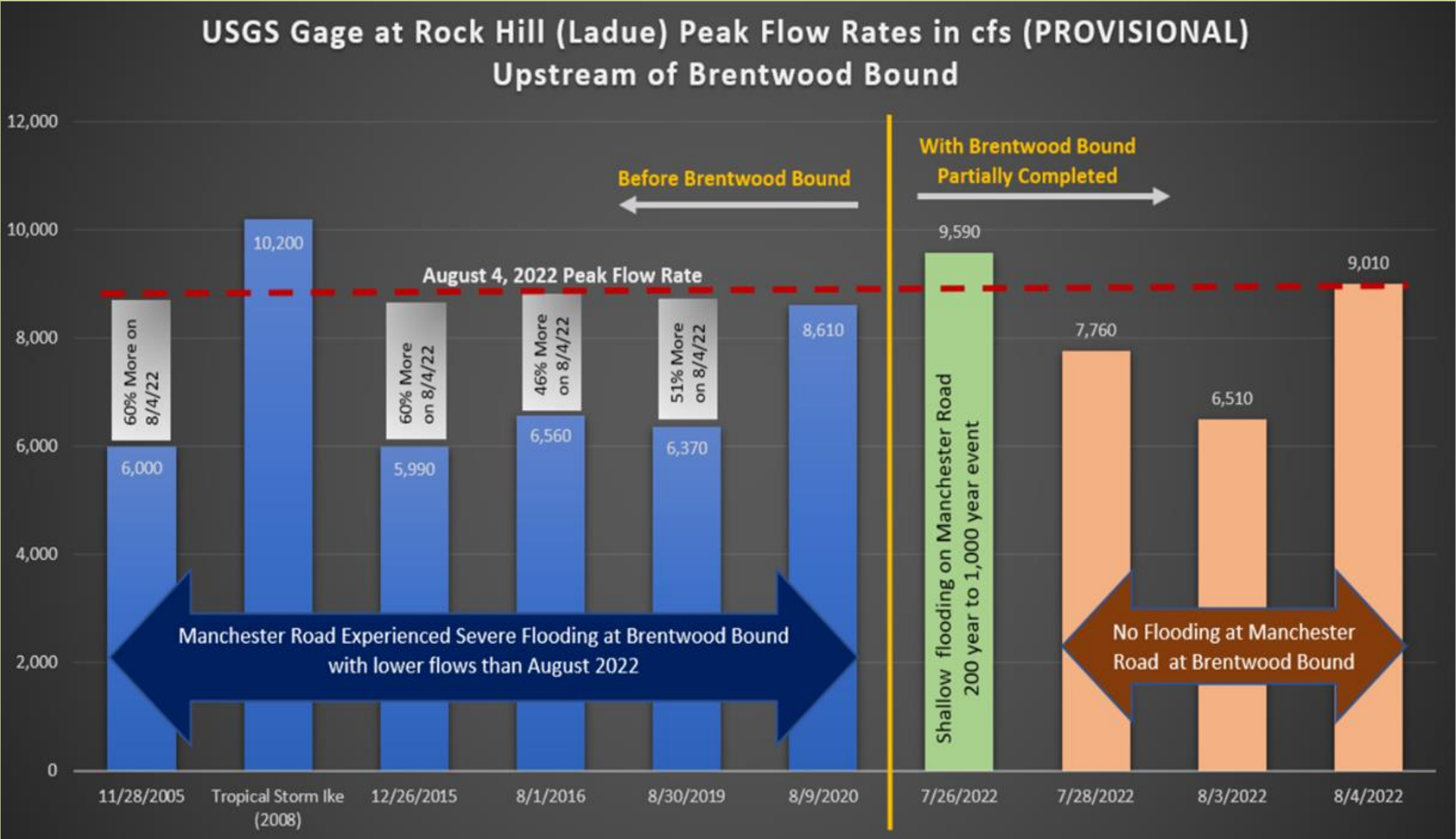
#1: The main water retention basin was only 75% complete at time of the flood

#2: The bridge, which is currently a choke point was not replaced at the time of the flood

#3: Construction of the secondary retention basin had not started at time of the flood

#4: Pavilion, Event Lawn and Destination Playground did not flood

FLOOD MITIGATION IMPROVEMENTS MINIMIZED FLOOD DAMAGES DURING CONSTRUCTION PHASE



60% more water flow was measured at Rock Hill Stream Gage and traveled through Brentwood Bound without flooding Manchester Road than in 2005 and 2015 storm events

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WATER QUALITY IMPROVEMENTS WETLAND ARBORETUM

- The City has purchased this six acres of wetland, a rare example of an urban wetland, south of Bi-State
- The purchase of this land will:
 - Ensure the property will never be developed
 - Increase biodiversity, improve soil health and reduce stormwater runoff
- The City is partnering with the Deer Creek Watershed alliance do finalize a design that will incorporate the recommendations of the Deer Creek Watershed Technical Advisory Group and Great River Greenway's design charrette



MANCHESTER ROAD IMPROVEMENTS

Enhance Manchester Road between Hanley and Bremerton

- MoDOT-funded enhancements
 - Mill and overlay pavement
 - Improve drainage along the corridor
 - Manchester Rd. bridge replacement near Hanley Rd.
 - Sidewalk and ADA improvements
 - Traffic signal upgrades
- Brentwood-funded enhancements
 - Pedestrian tunnel
 - Decorative street signage
 - Pedestrian lighting
 - Business access management
 - Manchester Rd. bridge enhancements near Hanley Rd.
 - Landscaping and green space
 - Accessible 6" curbs & 5' sidewalks on north side
 - Accessible 6" curbs & 10' shared use path on south side



BRENTWOOD PARK

- Brentwood Bound added approximately 32 acres of additional park land.
- Designed with the following goals:
 - Uncommon Spaces
 - Healthy Lifestyles
 - Connectivity
 - Economic Growth
 - Environmental Sustainability
- Initial park features included:
 - Lake
 - Amphitheater
 - Trails – including connection to Deer Creek Greenway
- Additional funding allowed:
 - Pavilion and Event Lawn
 - Destination Playground



BRENTWOOD PARK PAVILION & WEST COMMUNITY CREDIT UNION EVENT LAWN

- Front Door of Brentwood park
- Natural gathering place – along the Deer Creek Greenway
- 1,100 square foot multi-purpose space
- Opening glass wall system creates indoor/outdoor space
- Large open event space
- Outdoor terrace with fireplace
- Sustainable features
 - Solar Panels
 - High Efficiency Mechanical Equipment
 - Stormwater Management
 - Natural / Regional Materials



BRENTWOOD PARK DESTINATION PLAYGROUND

- Memorable destination – creative and family friendly
- Unique features:
 - 22-foot x 55-foot climbing feature
 - Zip line
 - Adventure Structure
- Pavilion with water play feature
- Overlook
- Natural water play area that resembles the Deer Creek Watershed
- Sustainable features
 - Water Recovery/ Harvesting
 - Native Plant Materials
 - Stormwater Management



DEER CREEK CONNECTOR / RUSSELL AVE. - AFTER IMPROVEMENTS

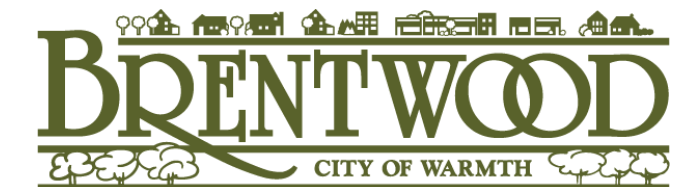


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NEWS 4 – GREAT DAY VIDEO (3 min)



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Redevelopment Concept



CONCEPT DEVELOPMENT DIAGRAM

81276_BRENTWOOD-MANC

FOR INFORMATIONAL PURPOSES ONLY

DRAFT

1" = 100'

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Contact Info

Dan Gummersheimer, P.E.

(314) 962-4800

dgummersheimer@brentwoodmo.org

www.brentwoodmo.org

Questions?

THANK YOU!

