



STAUNTON FLOOD STUDY

City of Staunton

May 27, 2021

AGENDA

- Introduction
- Goals
- Managing Expectation
- Existing Conditions
- Possible Solutions

GOALS OF STUDY

- Understand and Model Existing Tunnel
- Define the Magnitude of the Flooding Risk
- Provide Constructable Projects that could Reduce Flooding Risk

LOW IMPACT DESIGN

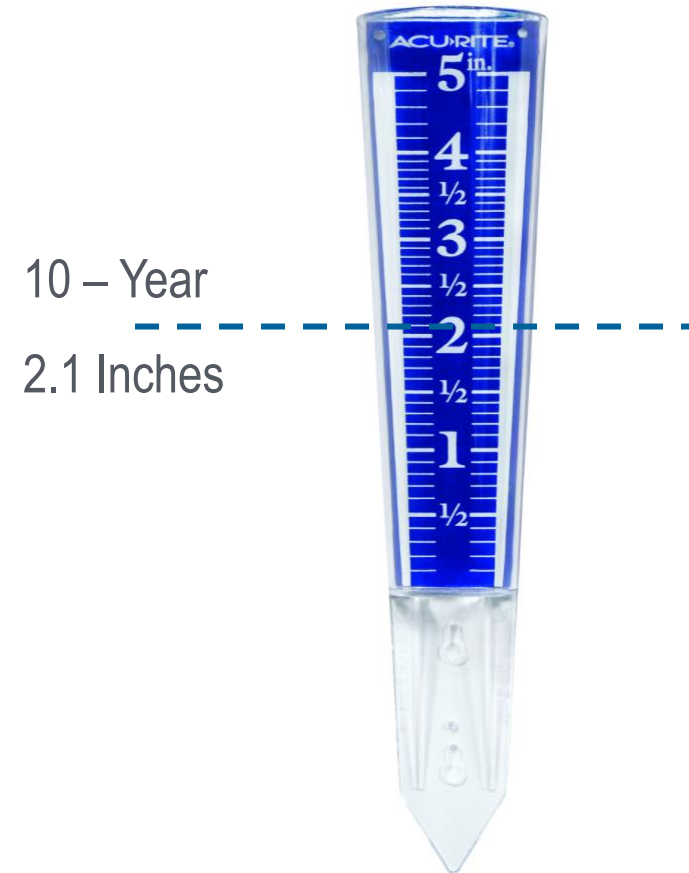


MANAGE FLOODING EVENTS



STORM EVENTS

10 – Year storm event is the standard to design road drainage, pipes, and inlets.



LAKE TAMS



10 – YEAR STORM EVENT

10 – Year
2.1 Inches



10 – YEAR STORM EVENT



7 Lake Tams

10 – Year
2.1 Inches



25 – YEAR STORM EVENT

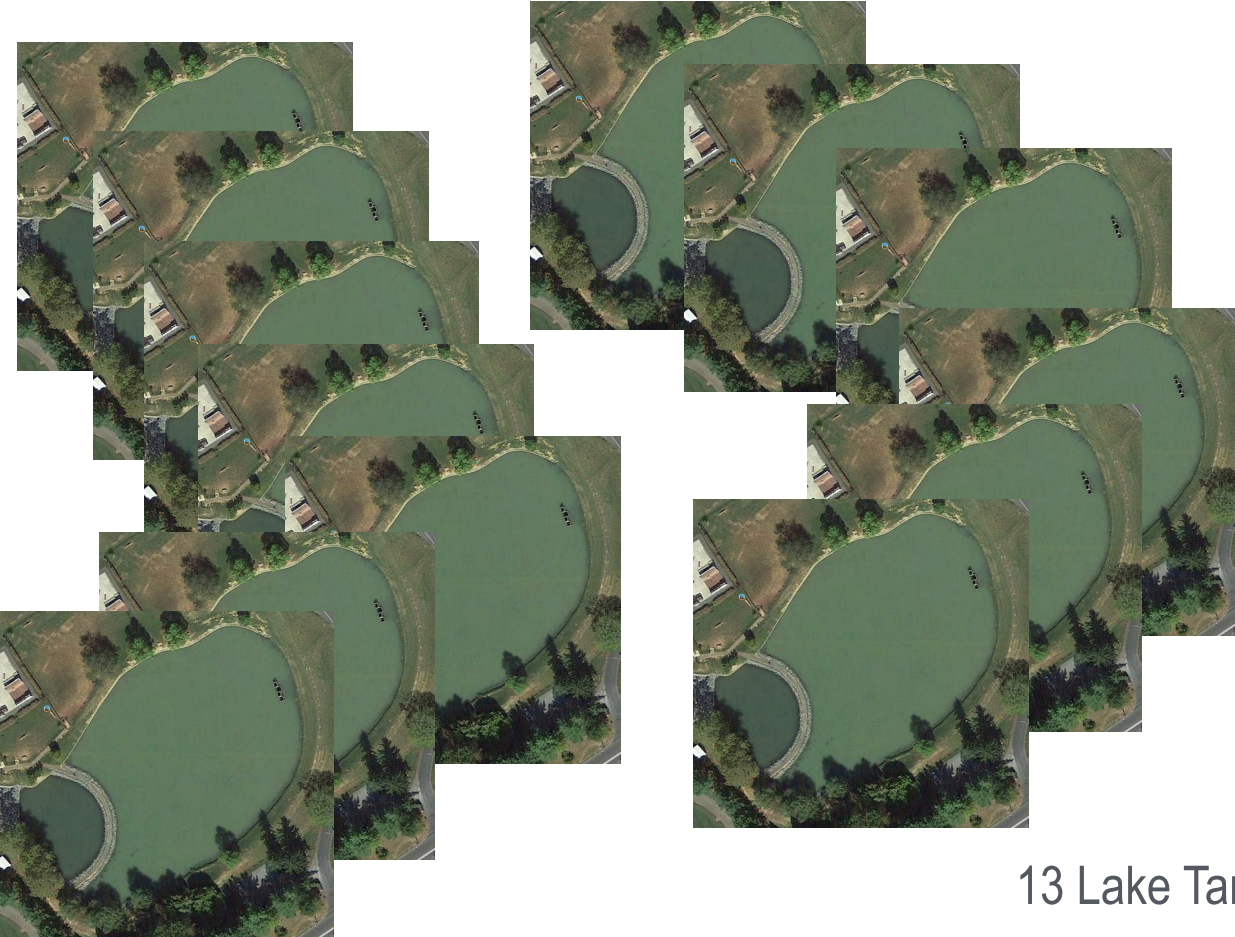


9 Lake Tams

25 – Year
2.5 Inches



50 – YEAR STORM EVENT

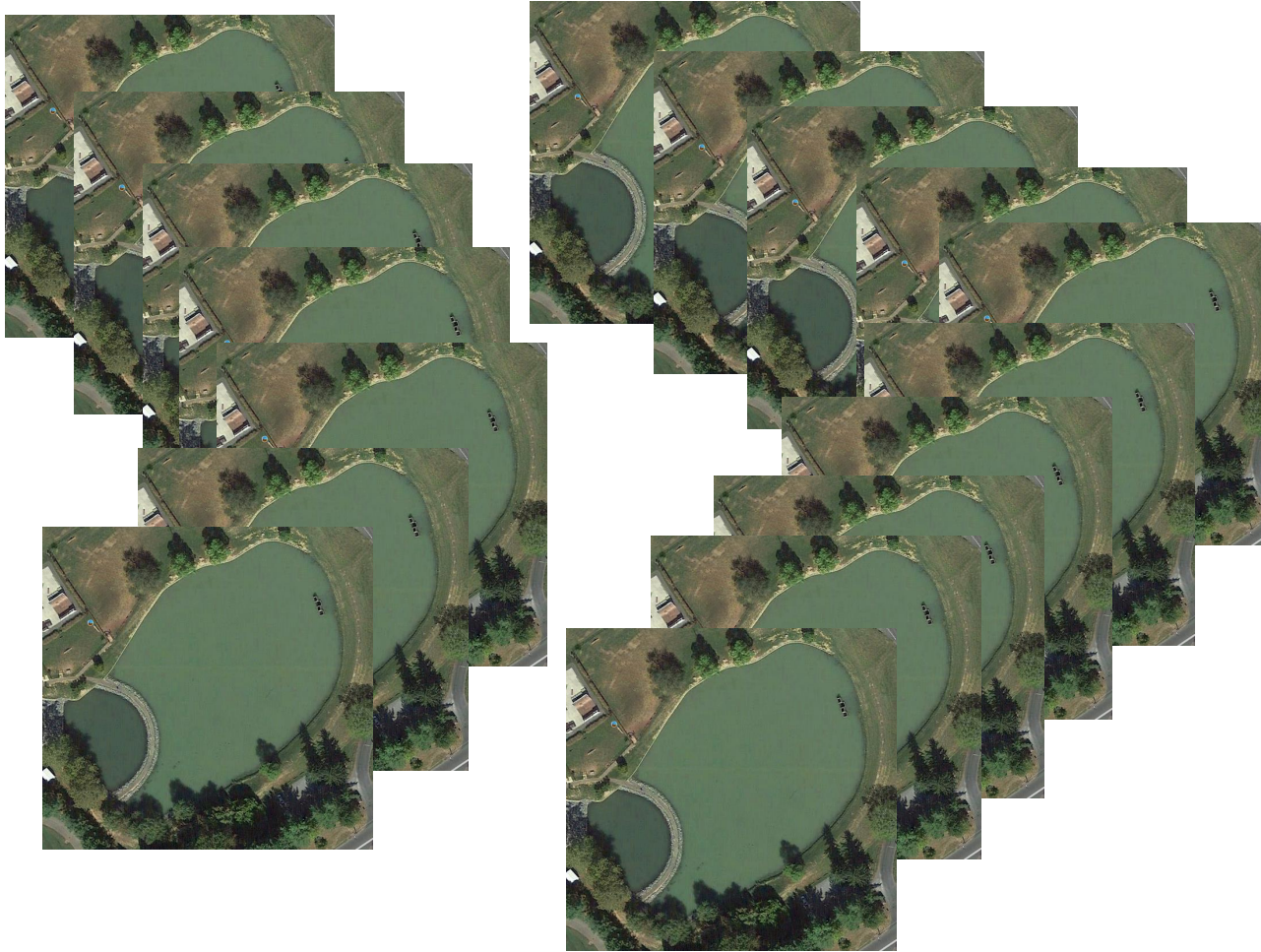


13 Lake Tams

50 – Year
2.9 Inches



100 – YEAR STORM EVENT



100 – Year
3.2 Inches



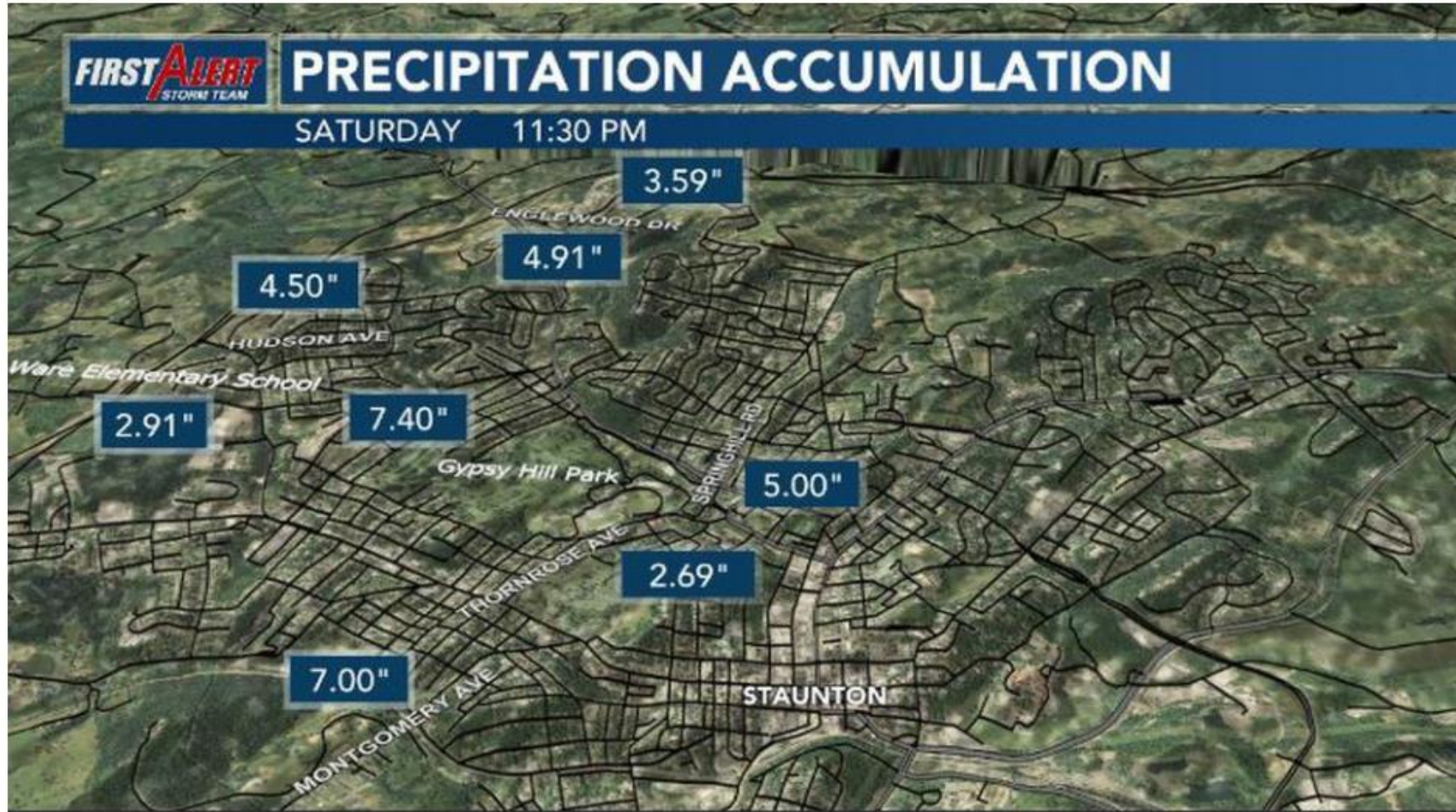
17 Lake Tams

500 – YEAR STORM EVENT

500 – Year
4.1 Inches



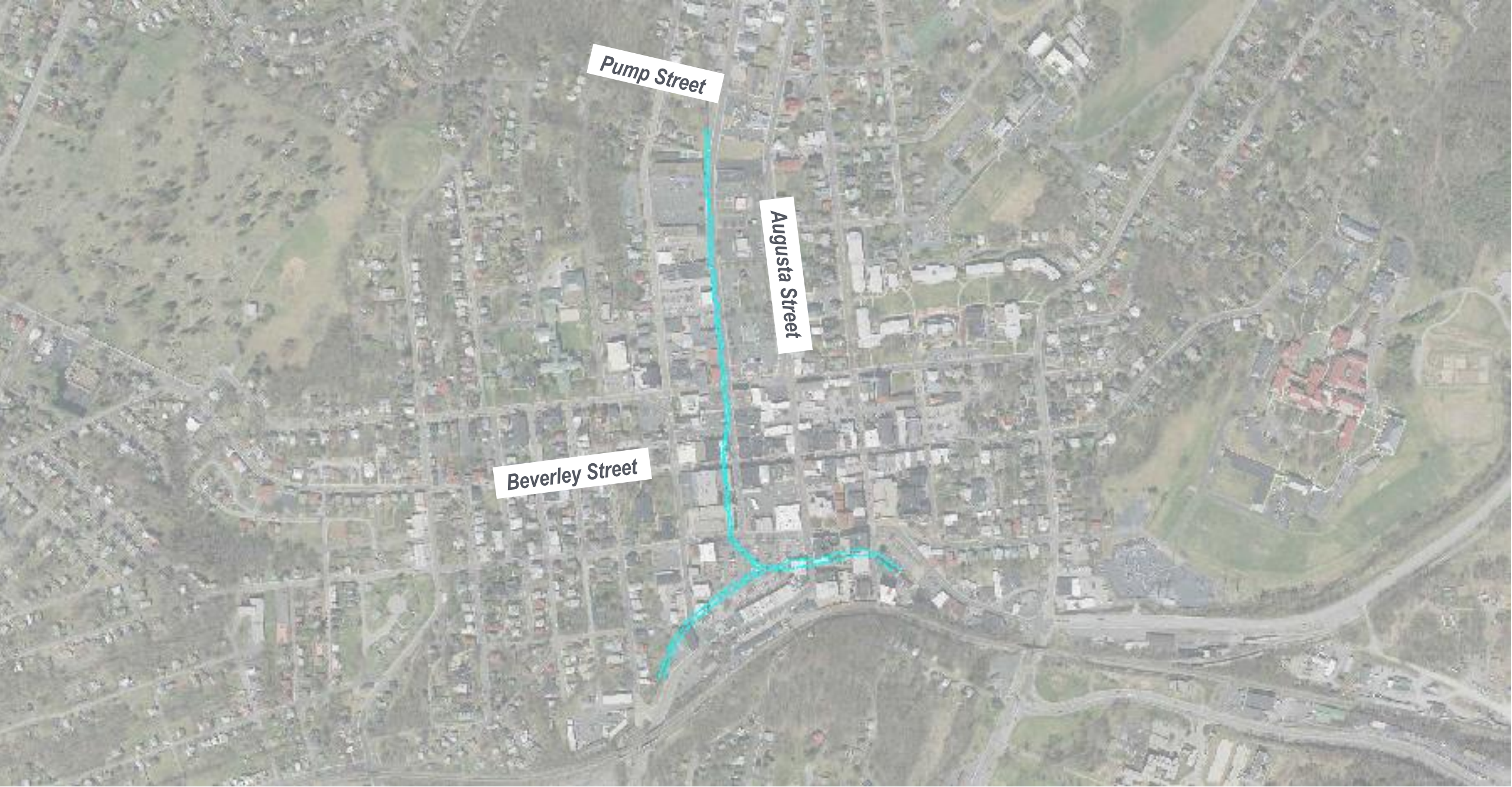
AUGUST 8TH STORM EVENT



August 8, 2020 (WHSV)

500+ - Year
4.8 Inches

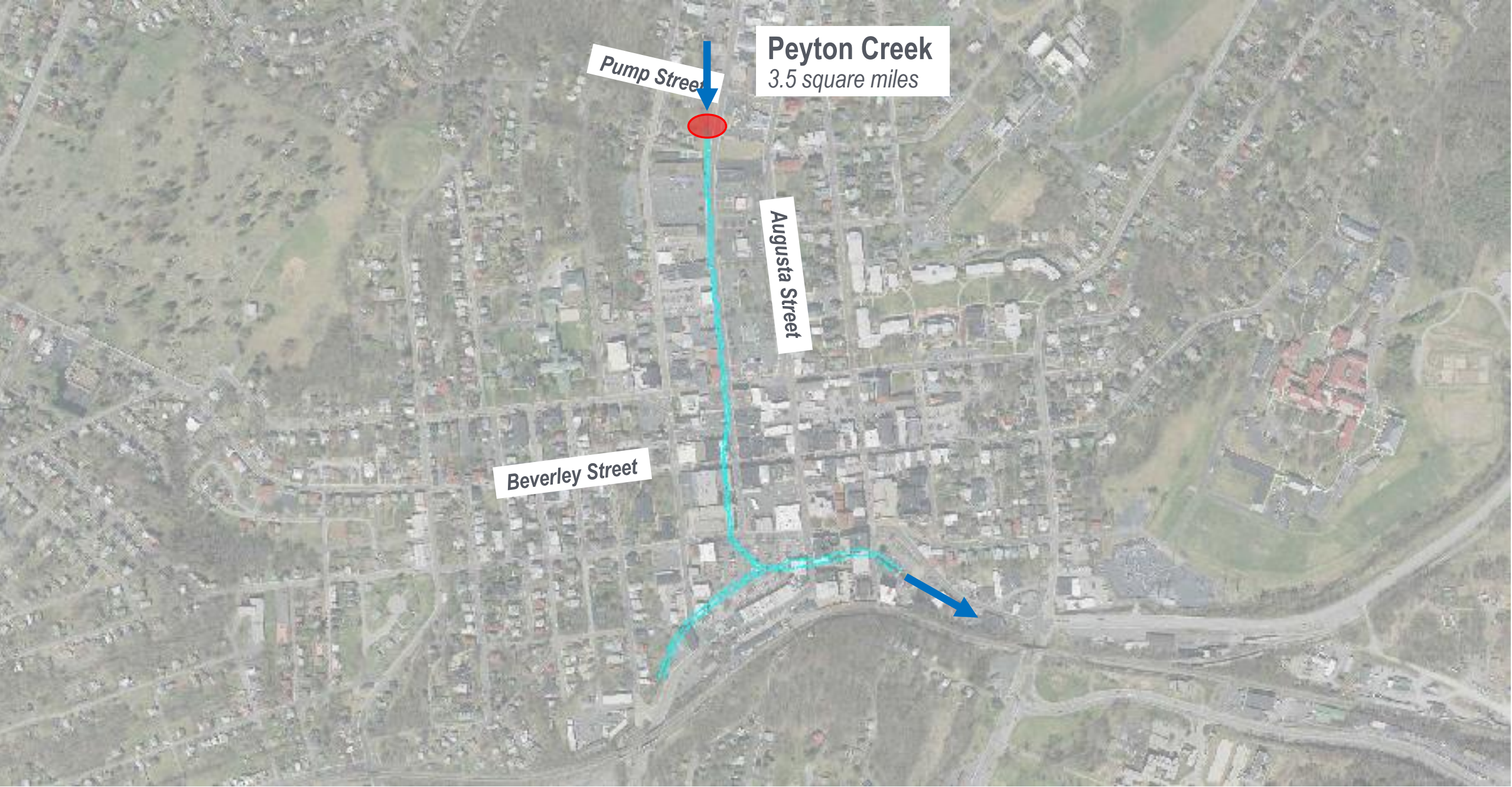




Pump Street

Augusta Street

Beverley Street



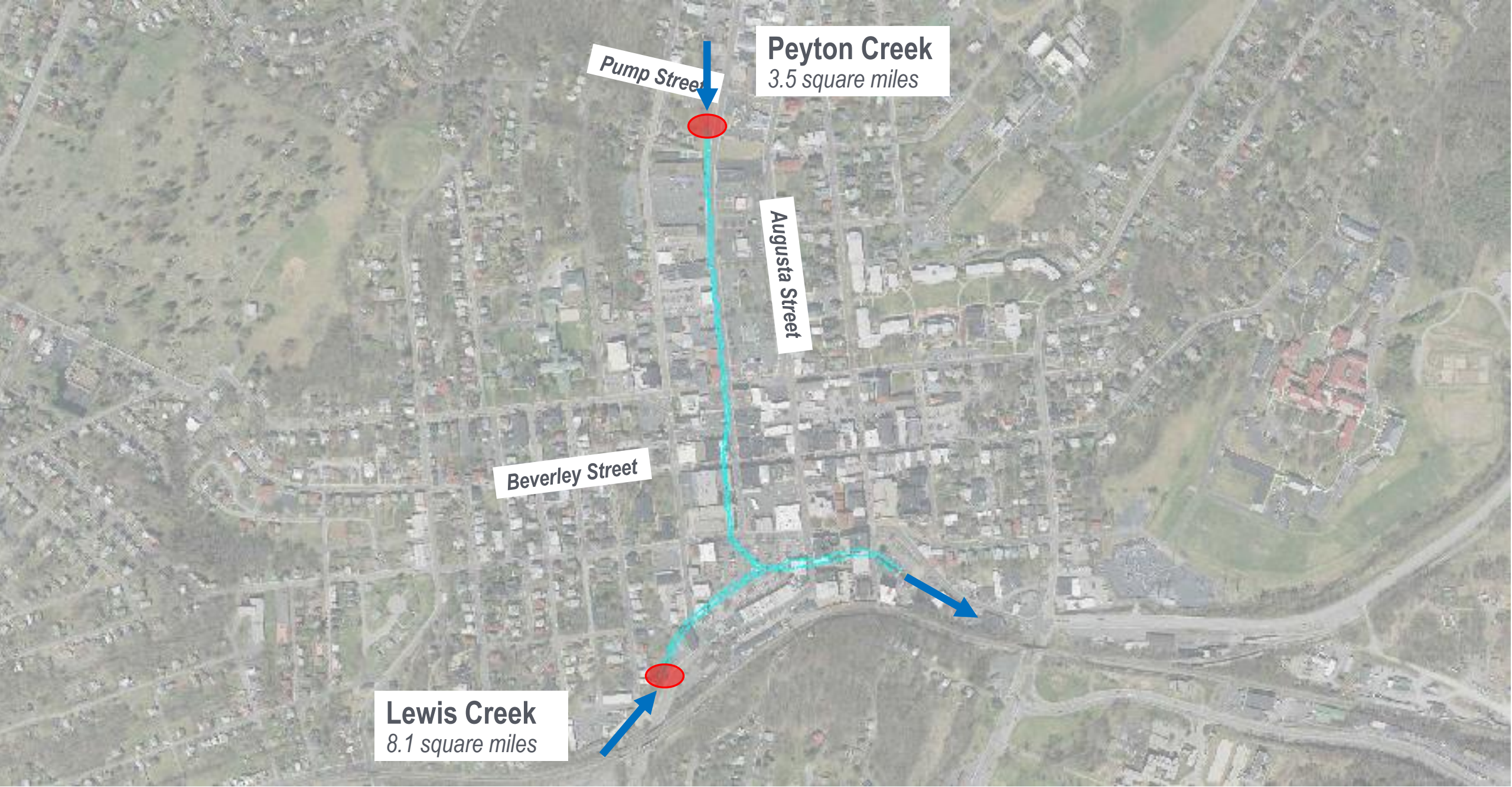
Peyton Creek
3.5 square miles

Pump Street

Augusta Street

Beverley Street





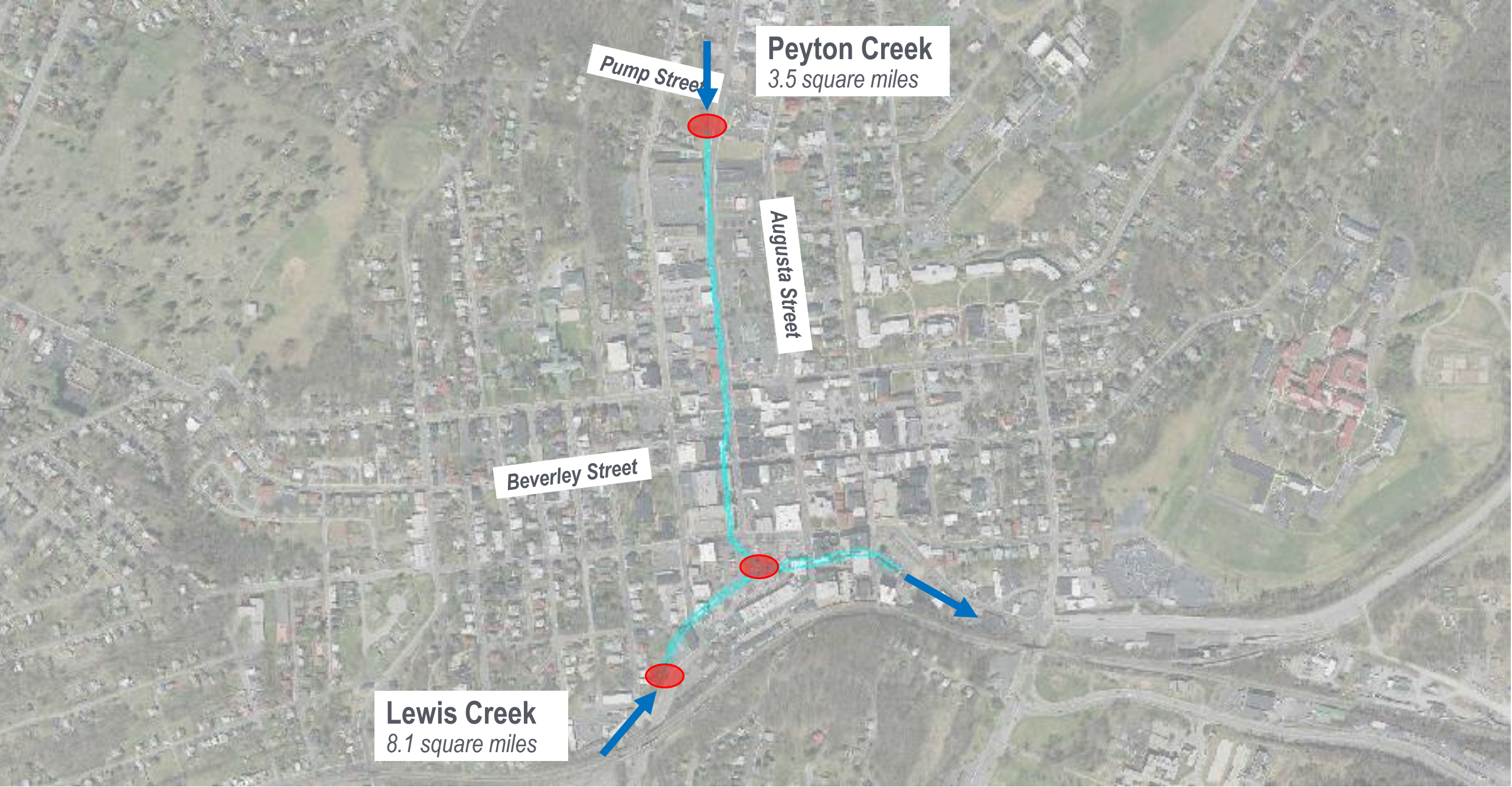
Pump Street

Peyton Creek
3.5 square miles

Augusta Street

Beverley Street

Lewis Creek
8.1 square miles



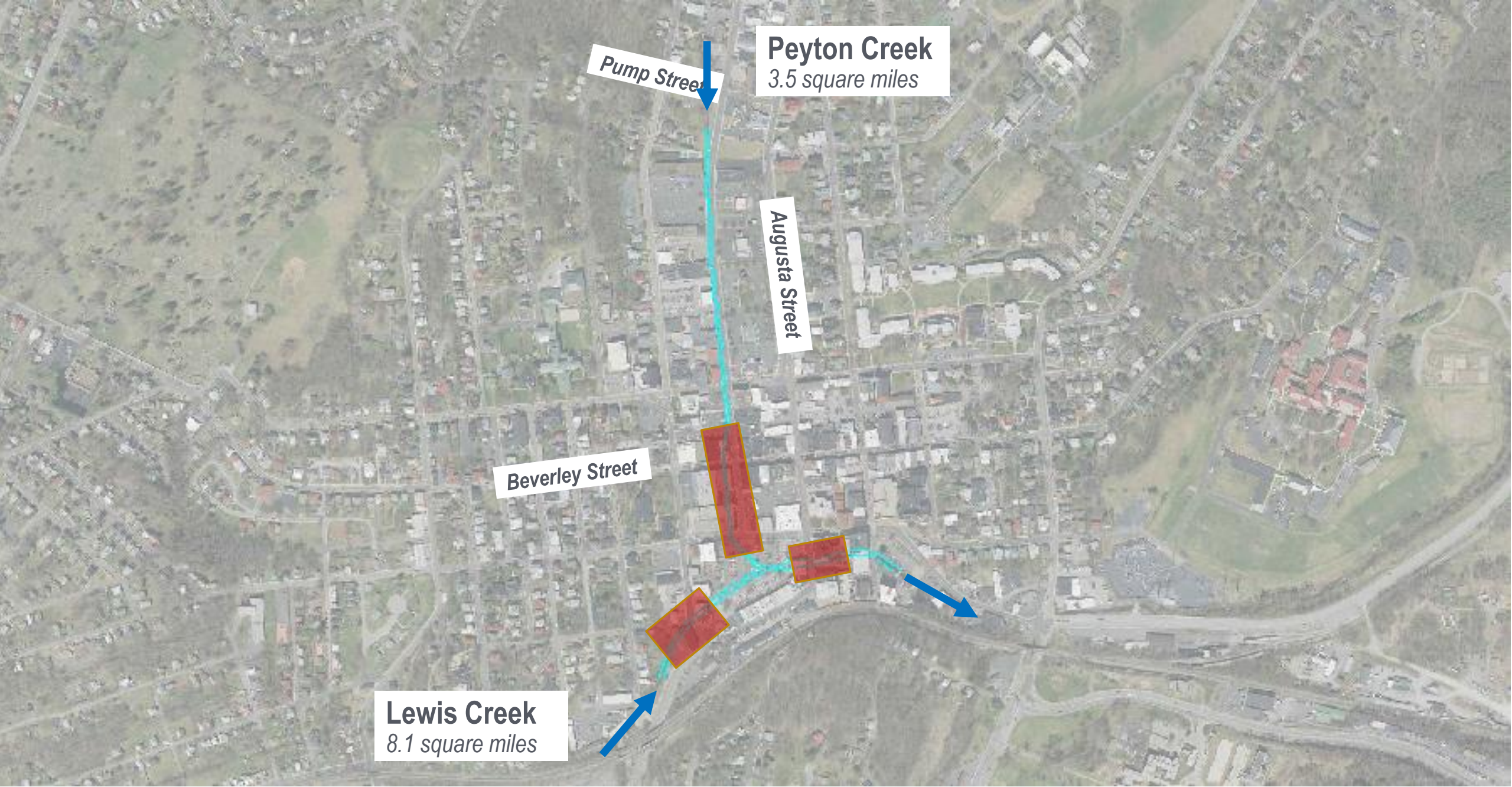
Pump Street

Peyton Creek
3.5 square miles

Augusta Street

Beverley Street

Lewis Creek
8.1 square miles



Pump Street

Peyton Creek
3.5 square miles

Augusta Street

Beverley Street

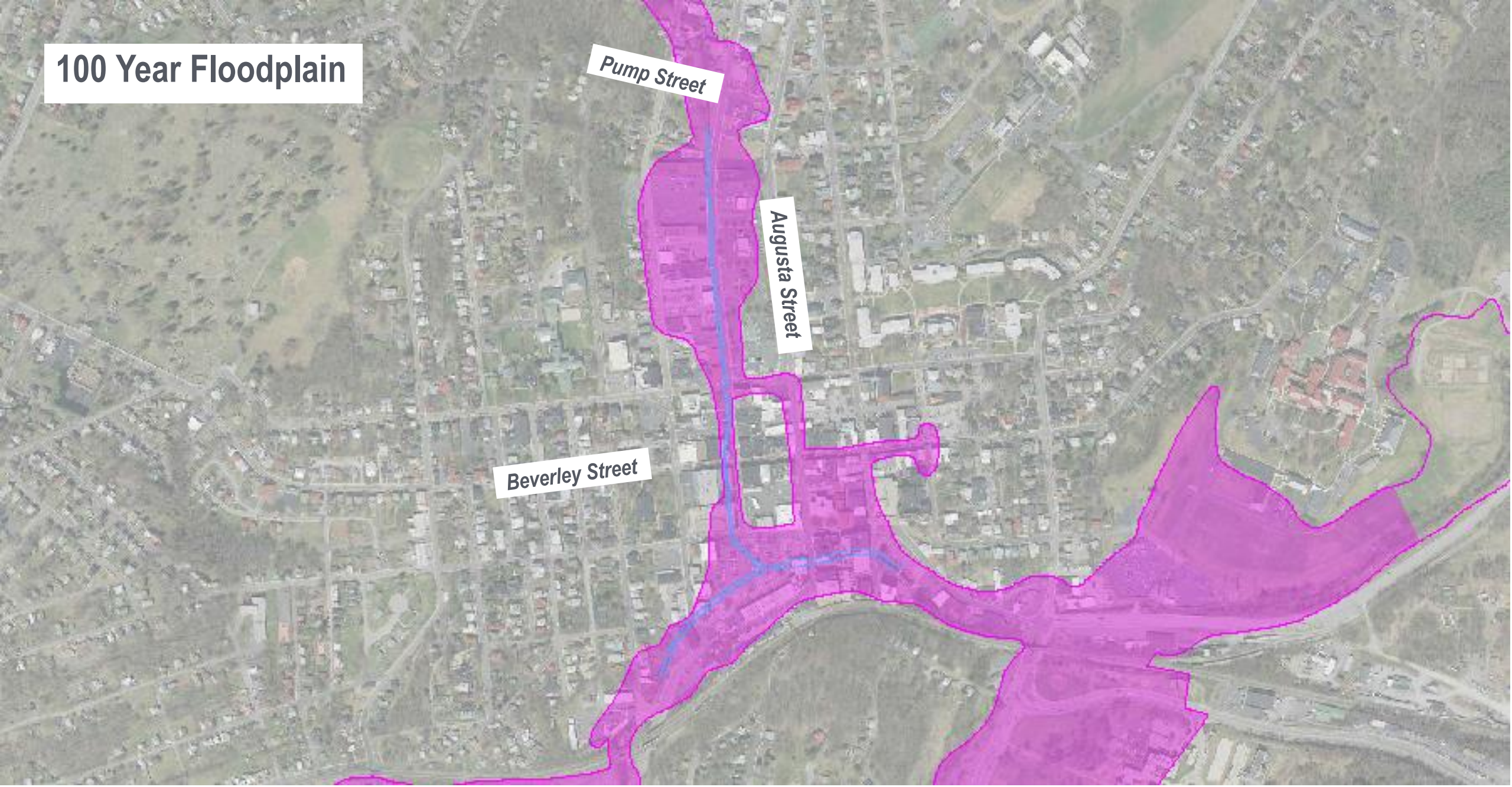
Lewis Creek
8.1 square miles

100 Year Floodplain

Pump Street

Augusta Street

Beverley Street



100 Year Floodplain

Pump Street



Augusta Street

Beverley Street



100 Year Floodplain

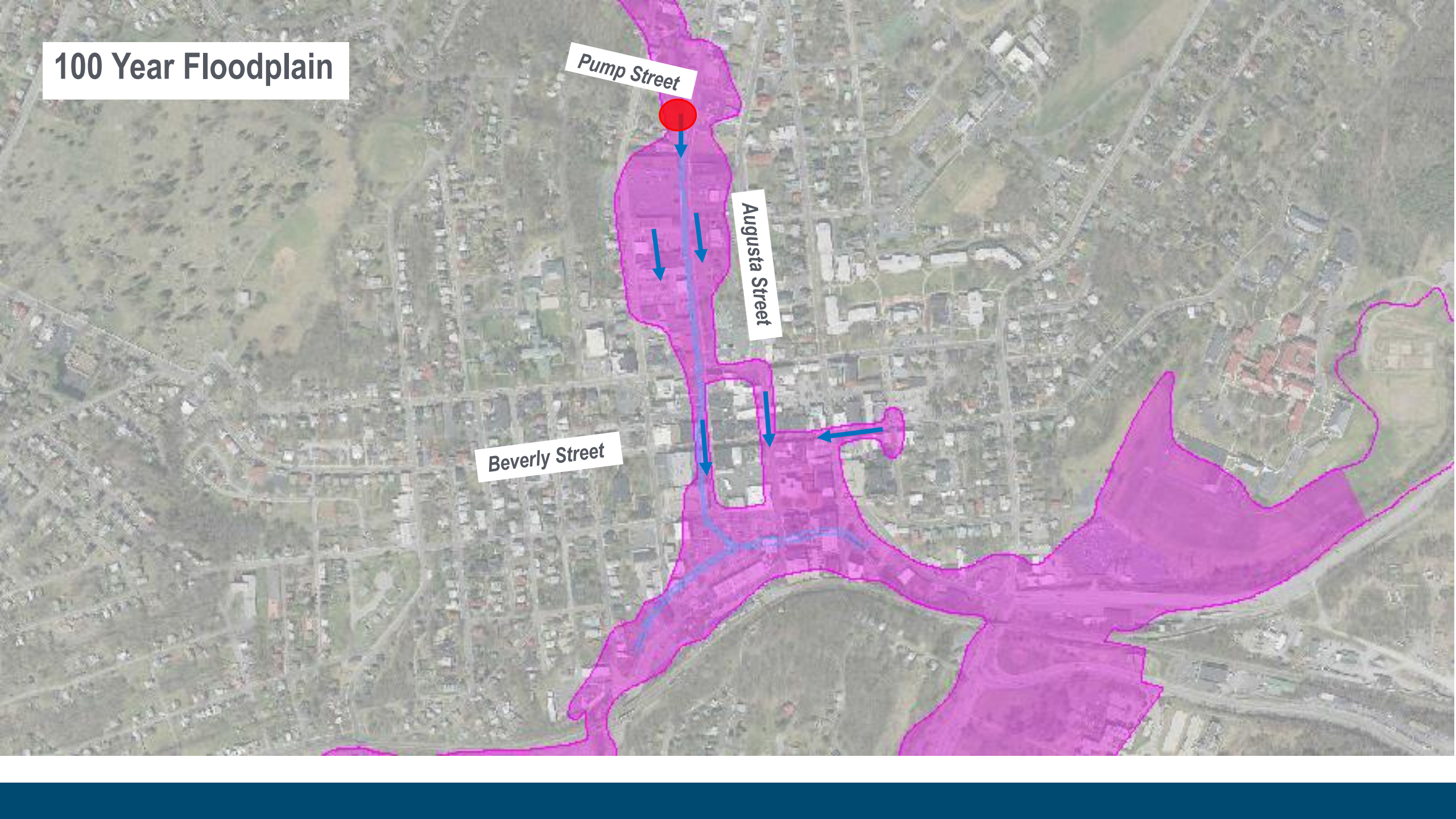
Pump Street



Augusta Street



Beverly Street



100 Year Floodplain

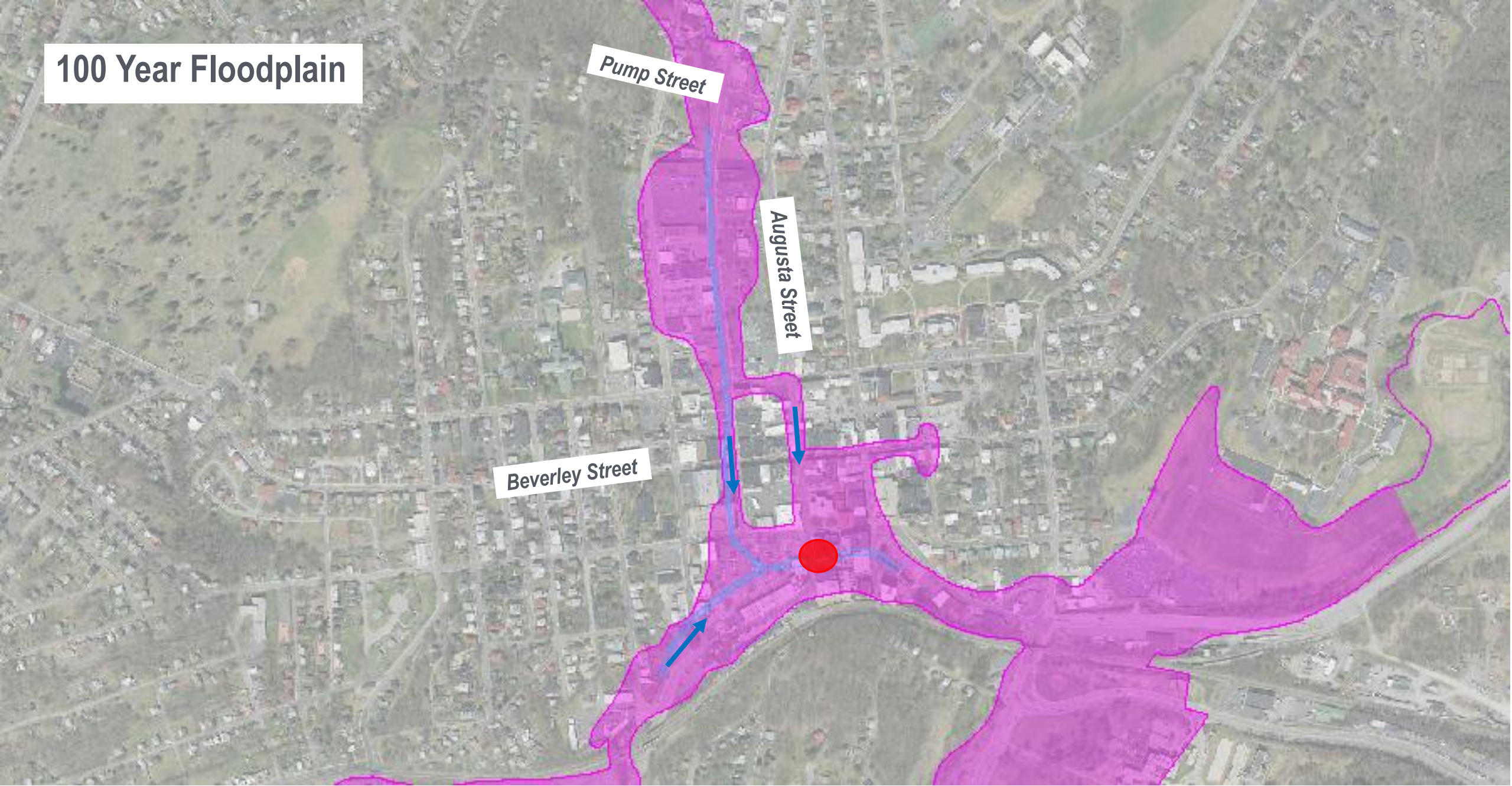
Pump Street

Augusta Street

Beverley Street



100 Year Floodplain



100 Year Floodplain

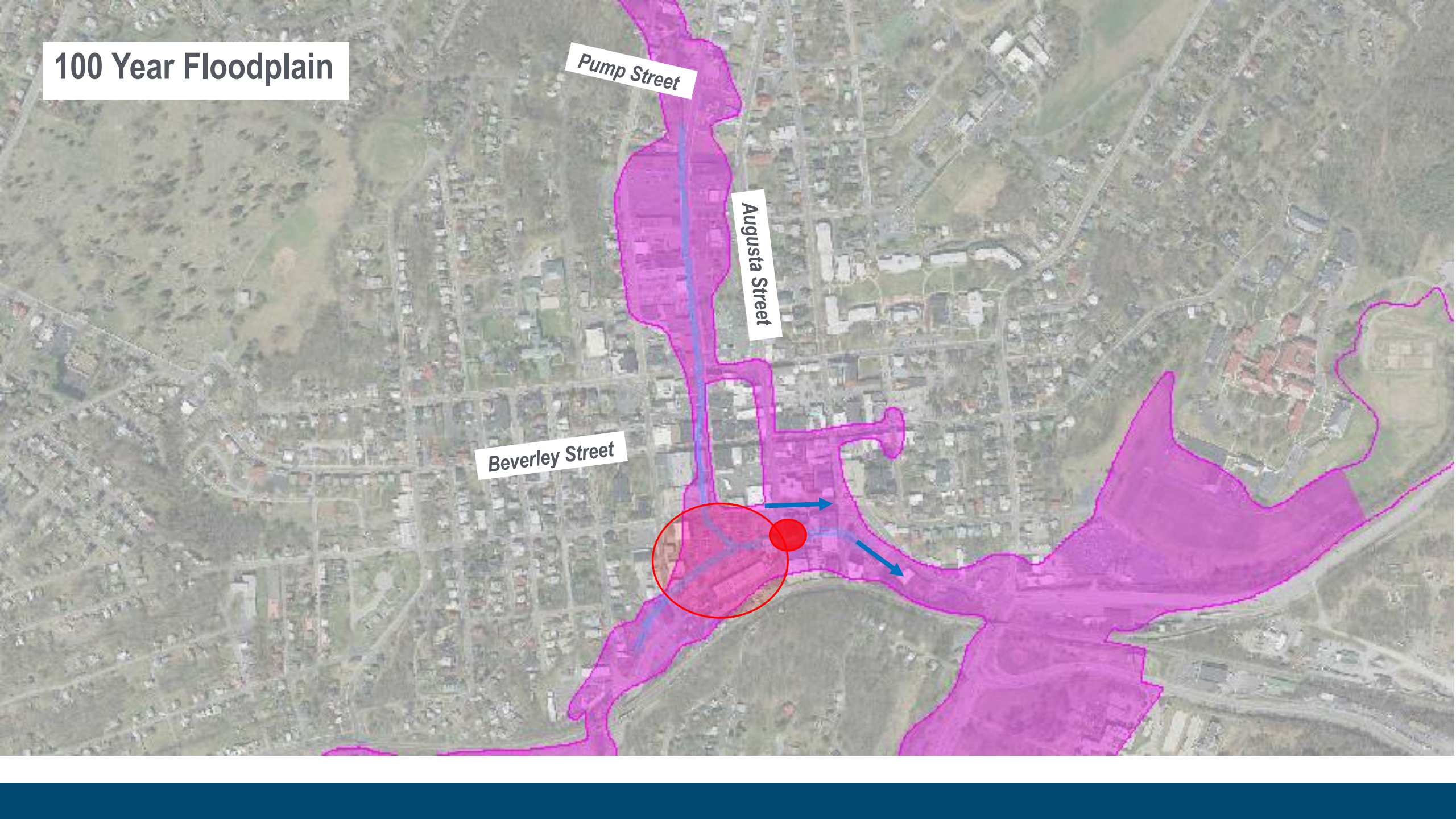
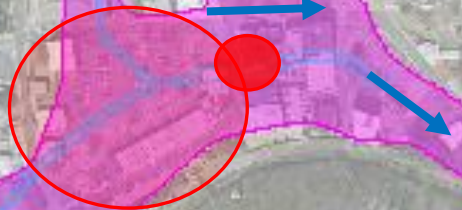


100 Year Floodplain

Pump Street

Augusta Street

Beverley Street



Existing Conditions



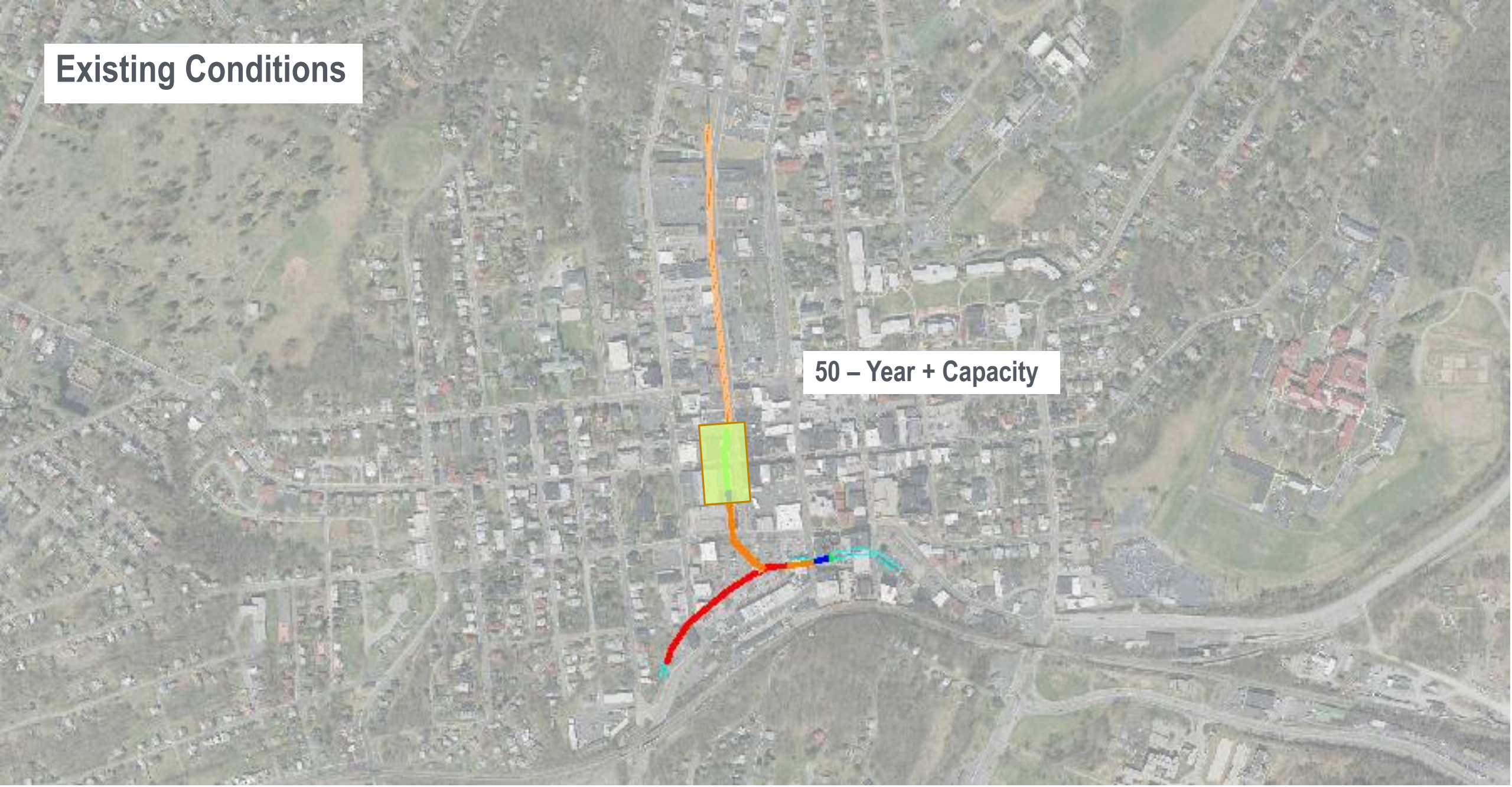
Existing Conditions



10 – Year Capacity
(Level of Service)



Existing Conditions



50 – Year + Capacity

Existing Conditions



10 – Year Capacity

Existing Conditions

< 10 – Year Capacity

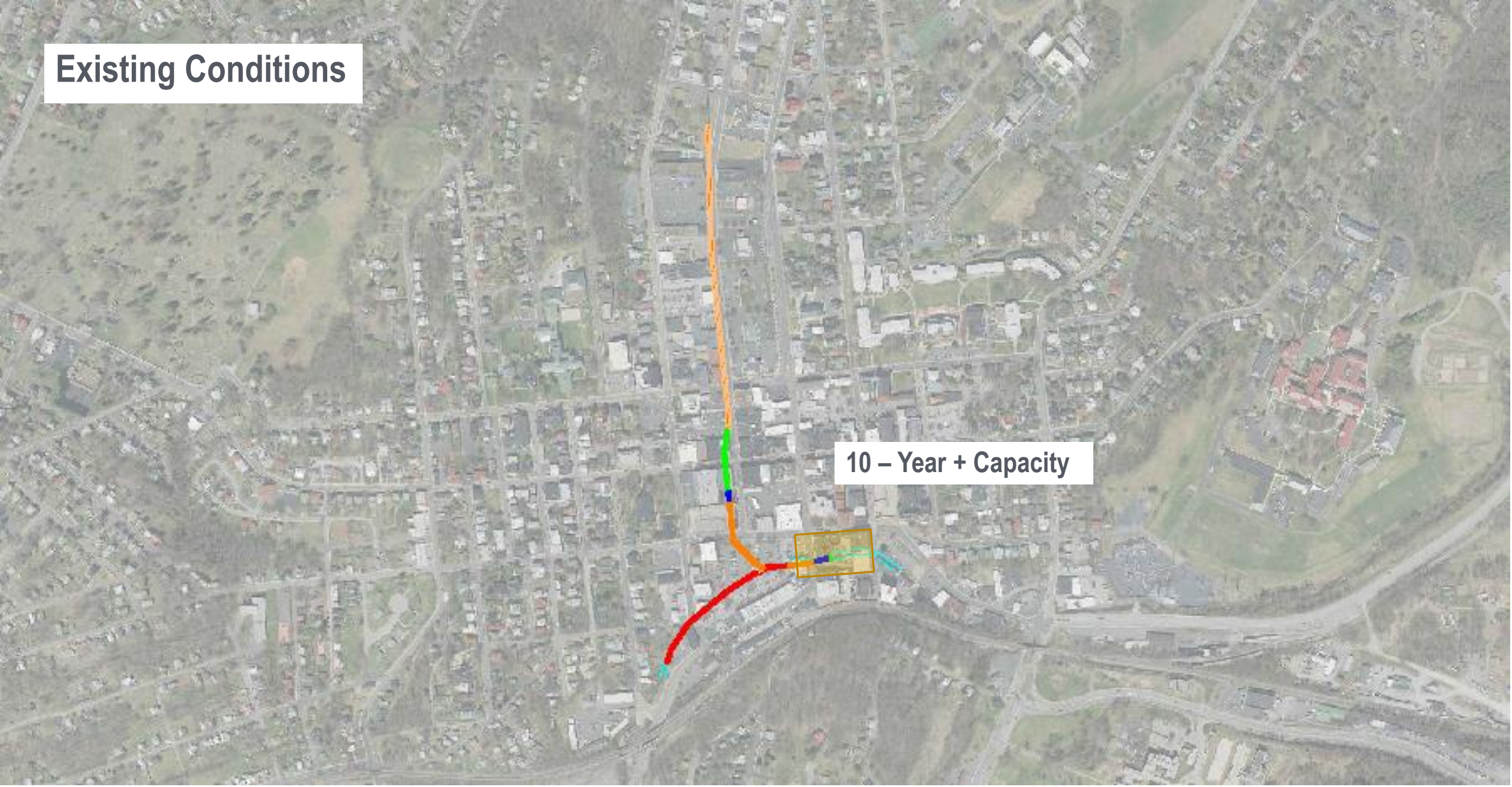


Existing Conditions



< 10 – Year Capacity

Existing Conditions



10 - Year + Capacity

REMOVE DEBRIS FROM TUNNEL



REMOVE DEBRIS FROM TUNNEL



REMOVE DEBRIS FROM TUNNEL



CLEAN CREEK BANKS

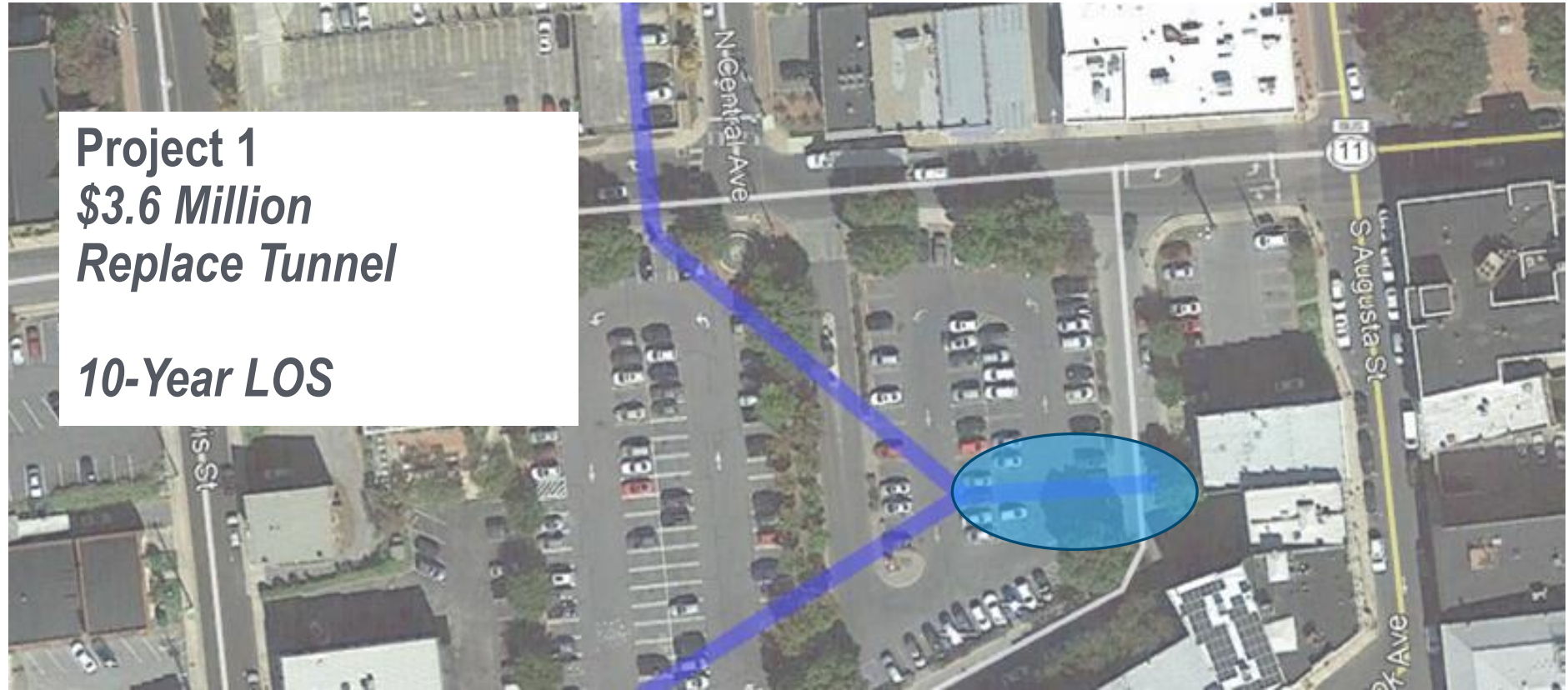


RELOCATE UTILITIES



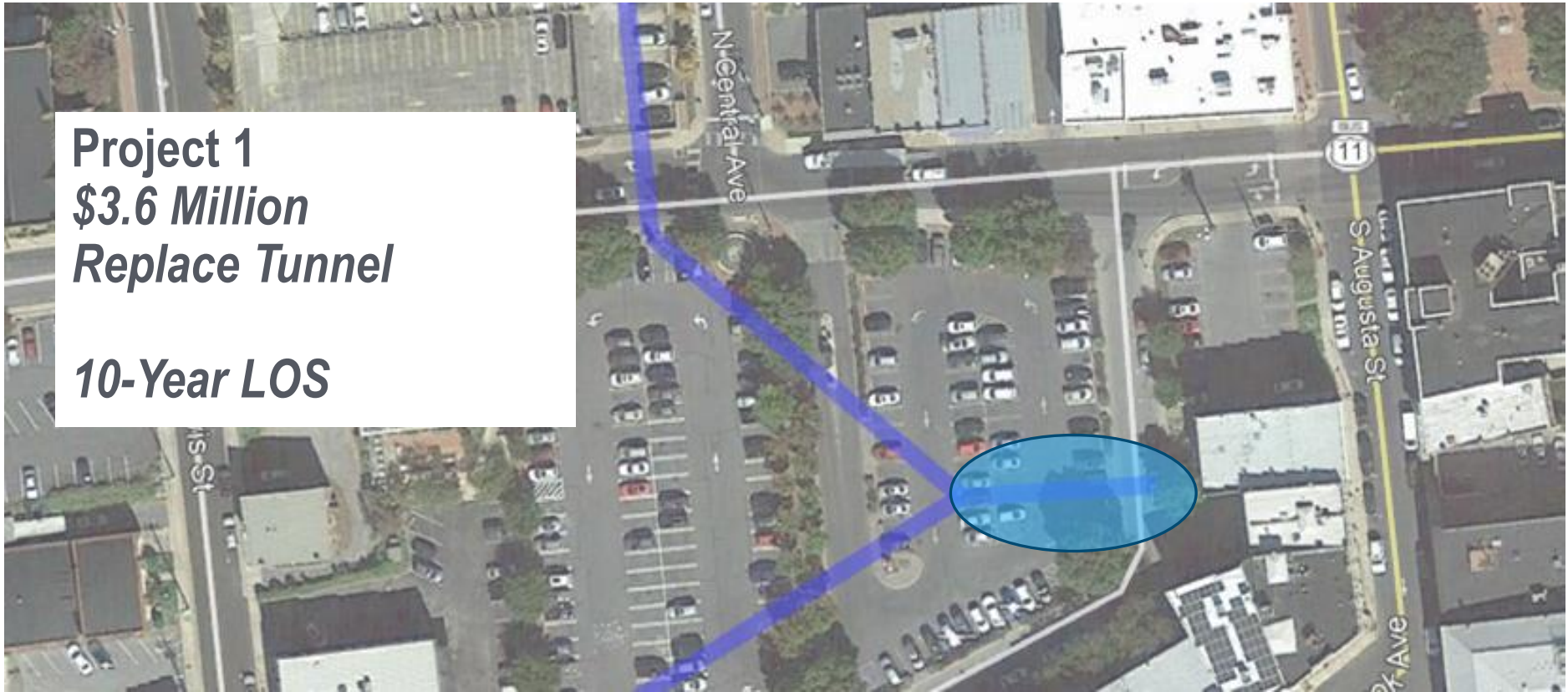
LEWIS CREEK PROJECTS



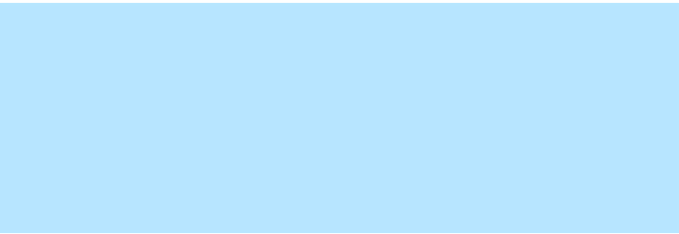
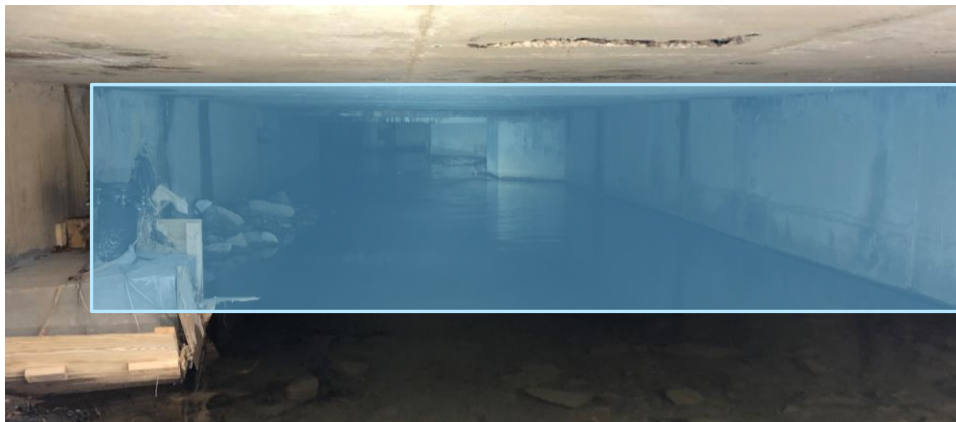


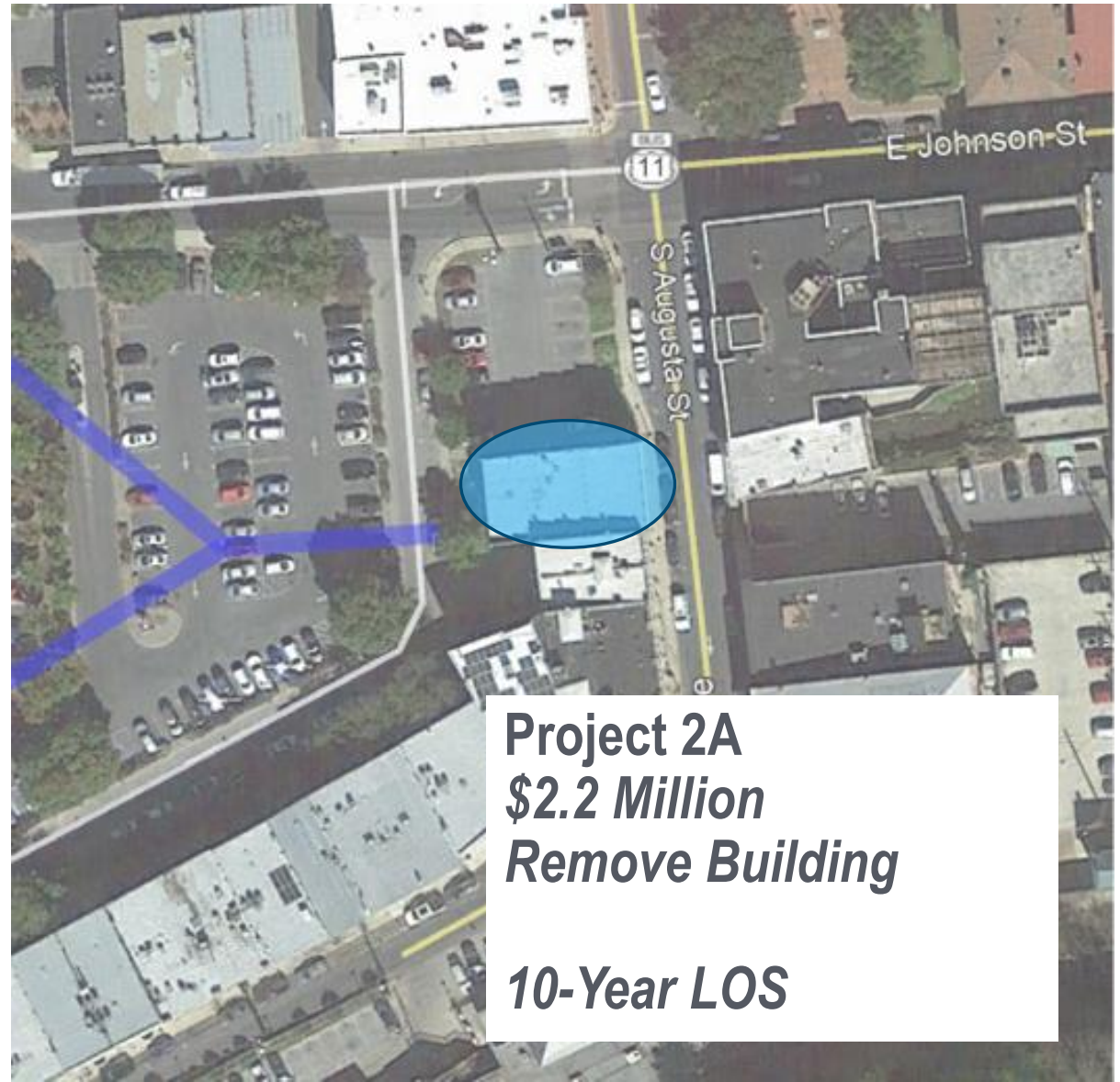
Project 1
\$3.6 Million
Replace Tunnel
10-Year LOS

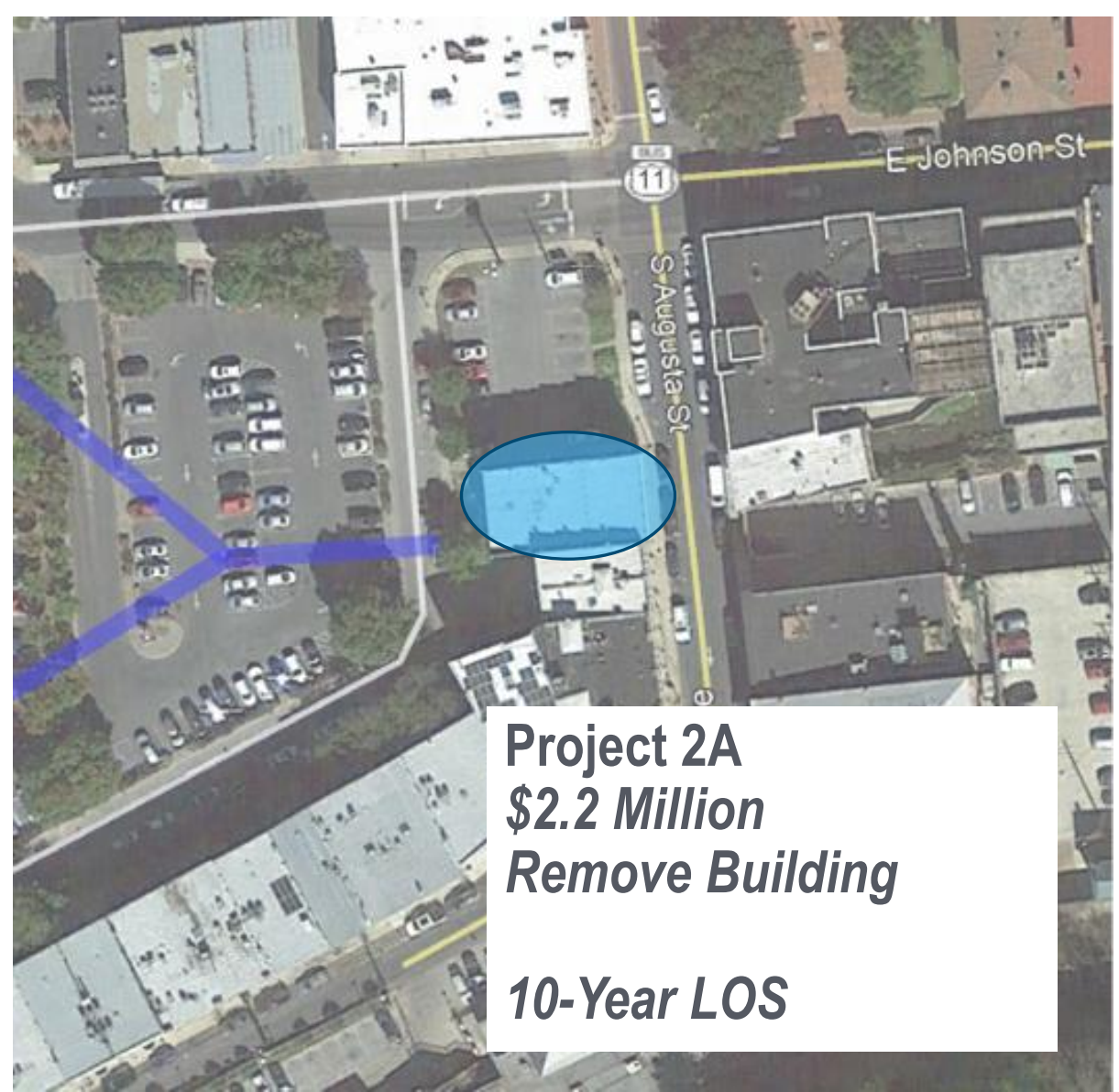


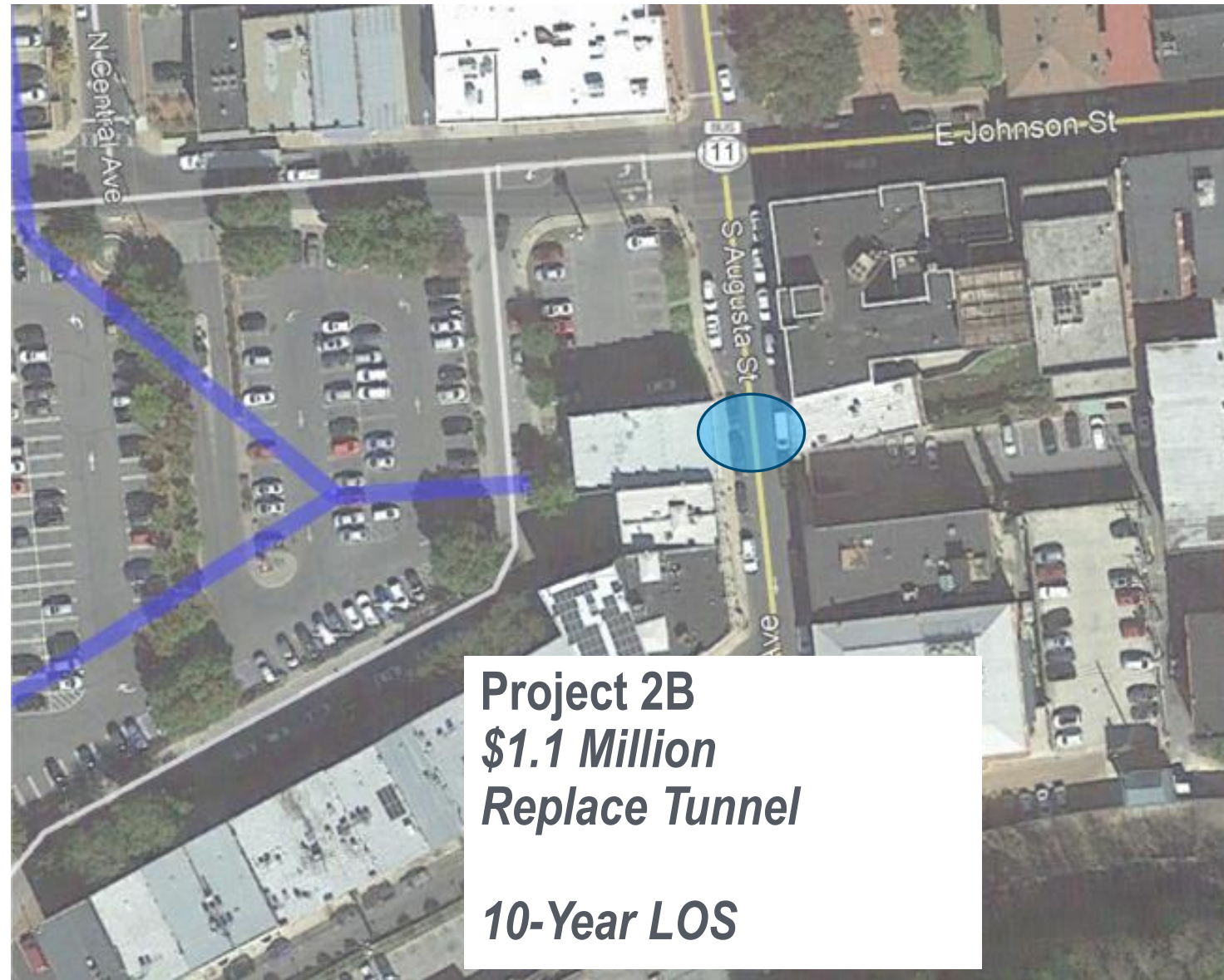


Project 1
\$3.6 Million
Replace Tunnel
10-Year LOS

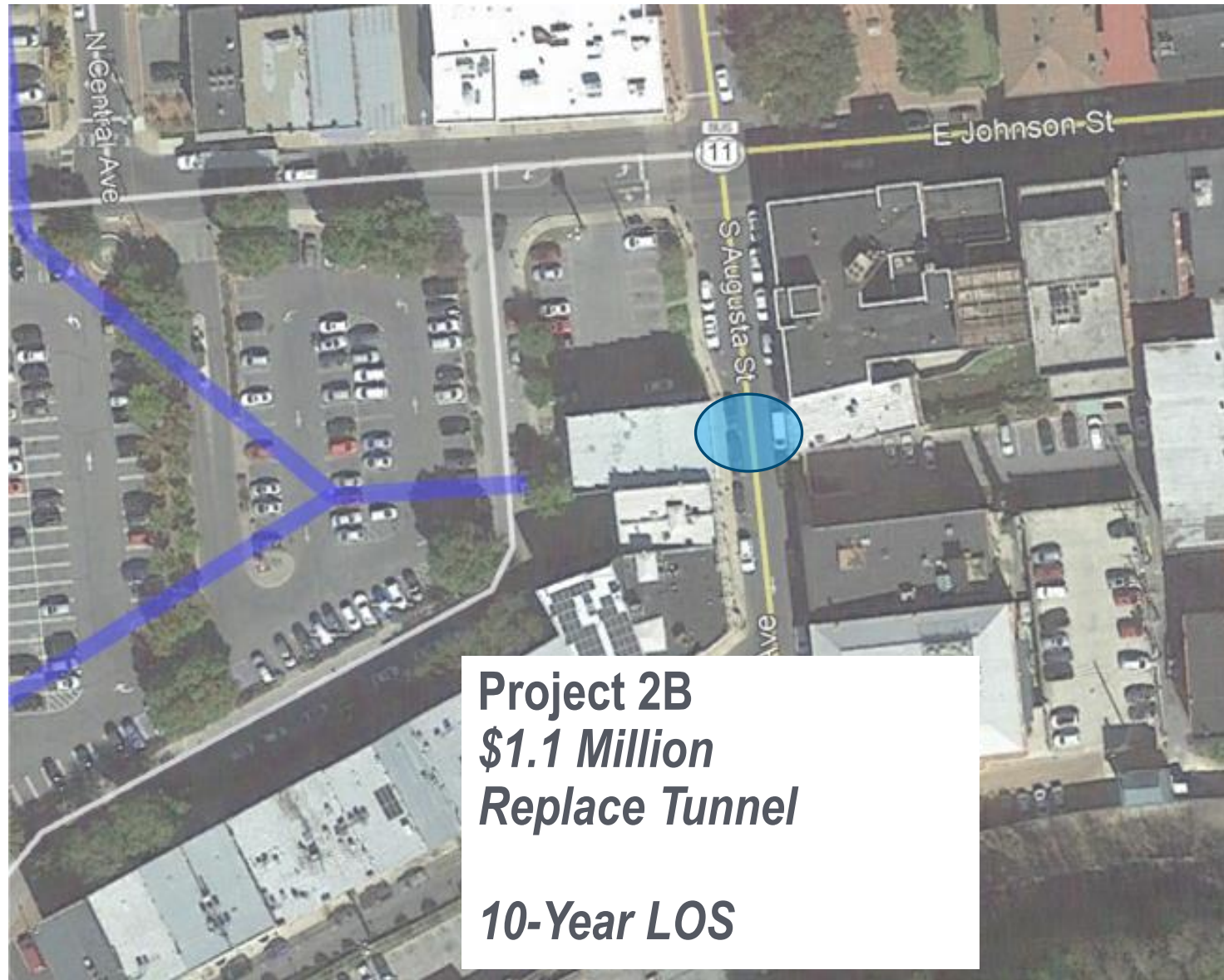




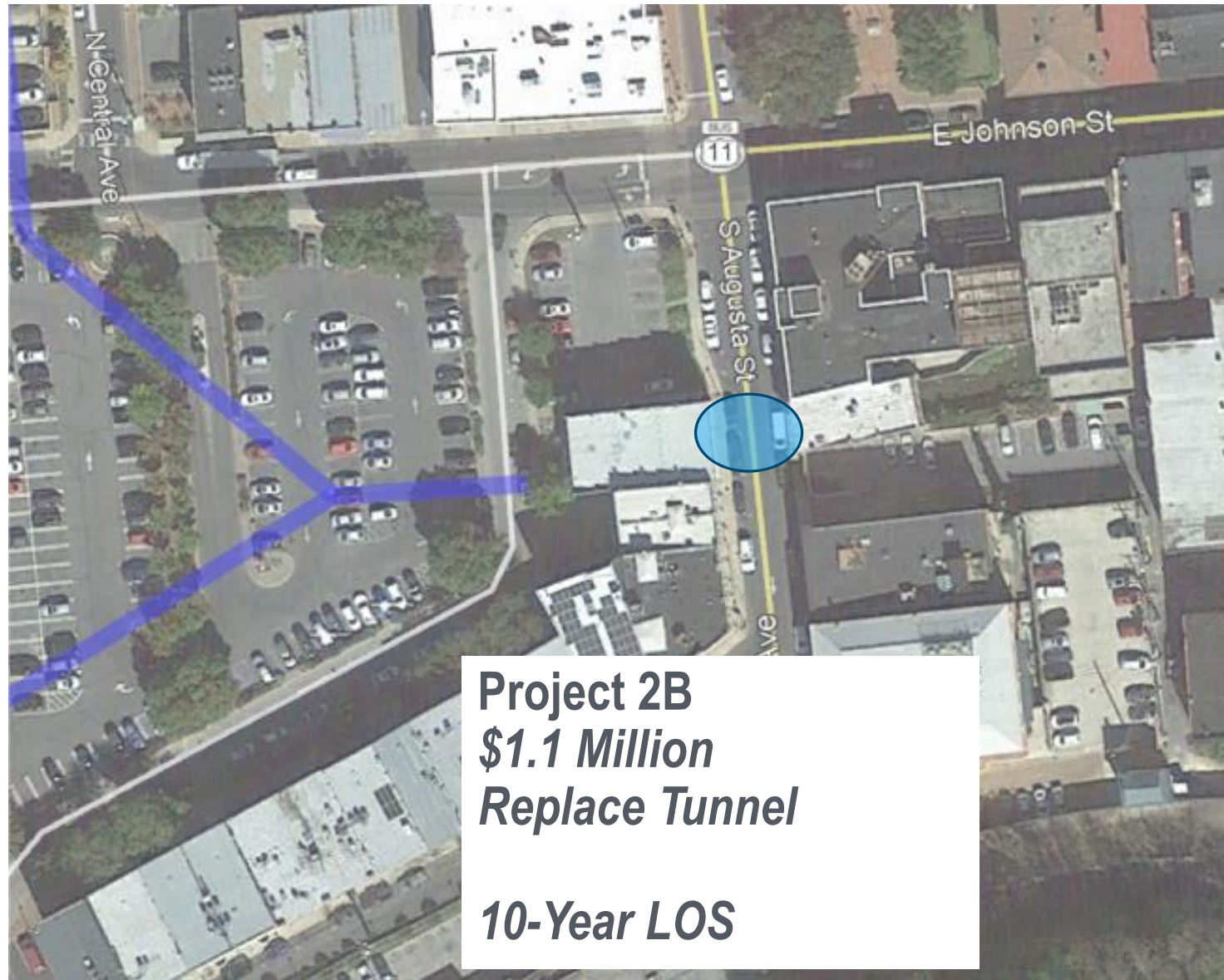
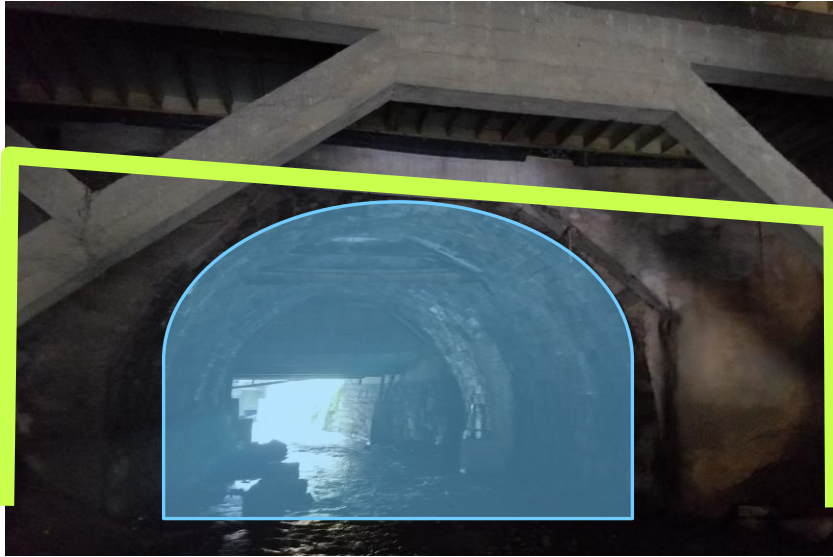




Project 2B
\$1.1 Million
Replace Tunnel
10-Year LOS



Project 2B
\$1.1 Million
Replace Tunnel
10-Year LOS



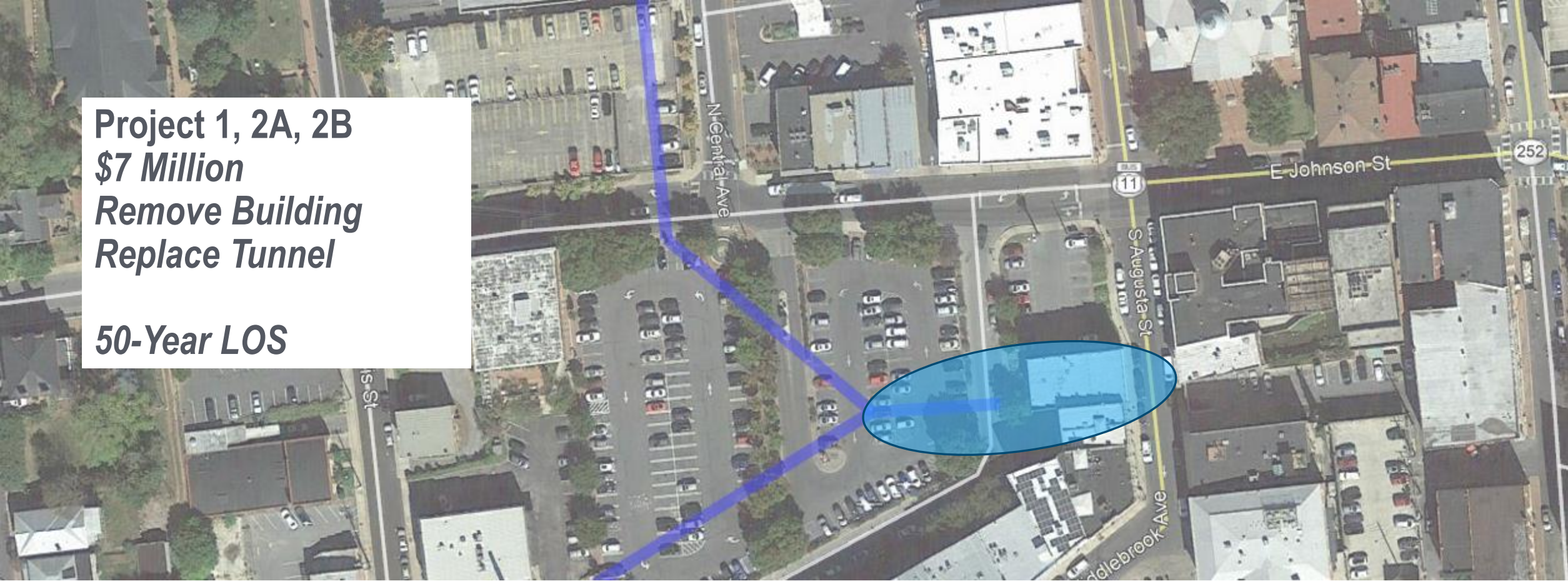
Project 2B
\$1.1 Million
Replace Tunnel
10-Year LOS



Project 2C
\$2.3 Million
Remove Building
10-Year LOS

Project 1, 2A, 2B
\$7 Million
Remove Building
Replace Tunnel

50-Year LOS



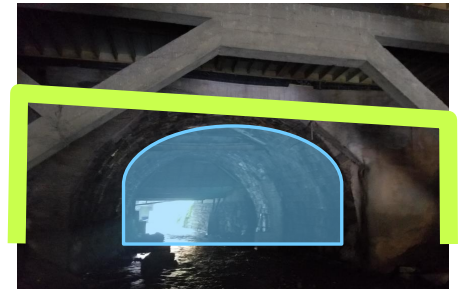
Project 1

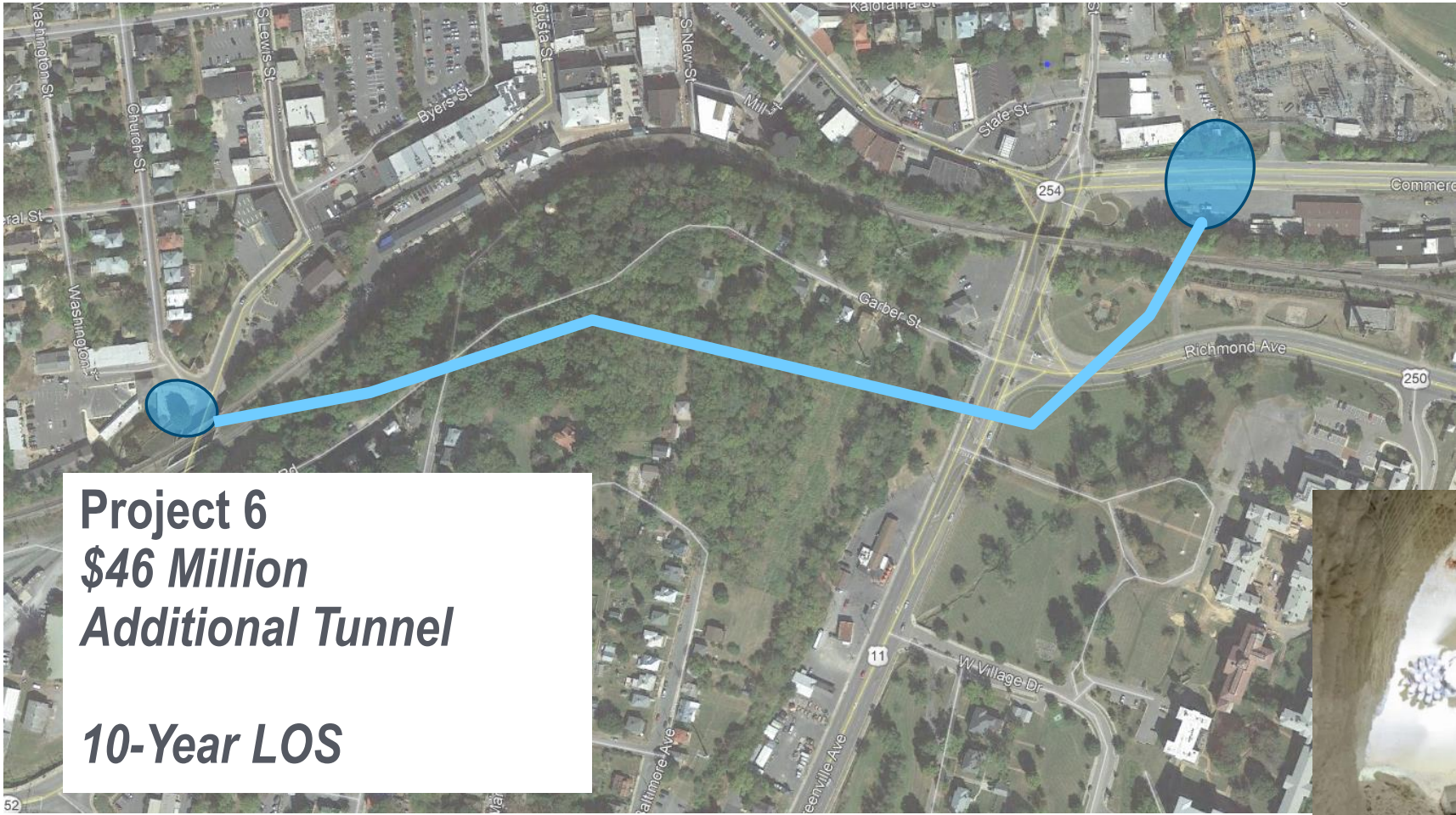


Project 2A



Project 2B





Project 7
\$49 Million
Stormwater Pump Station
50-Year LOS

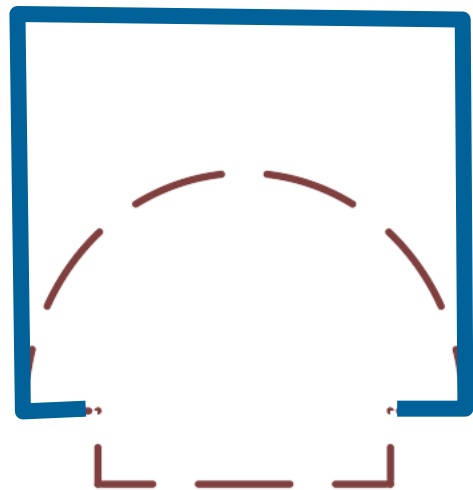


PEYTON CREEK PROJECTS

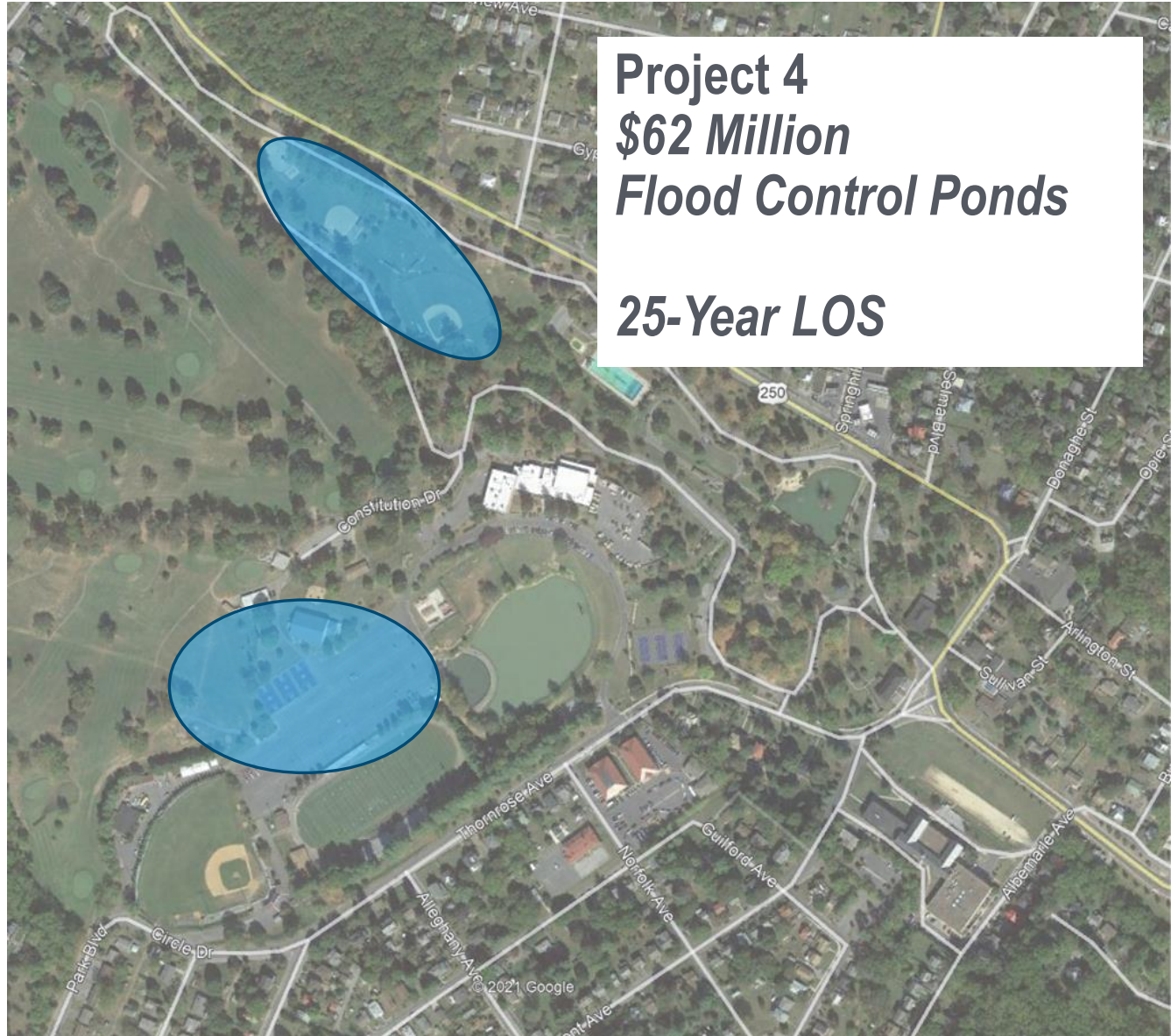




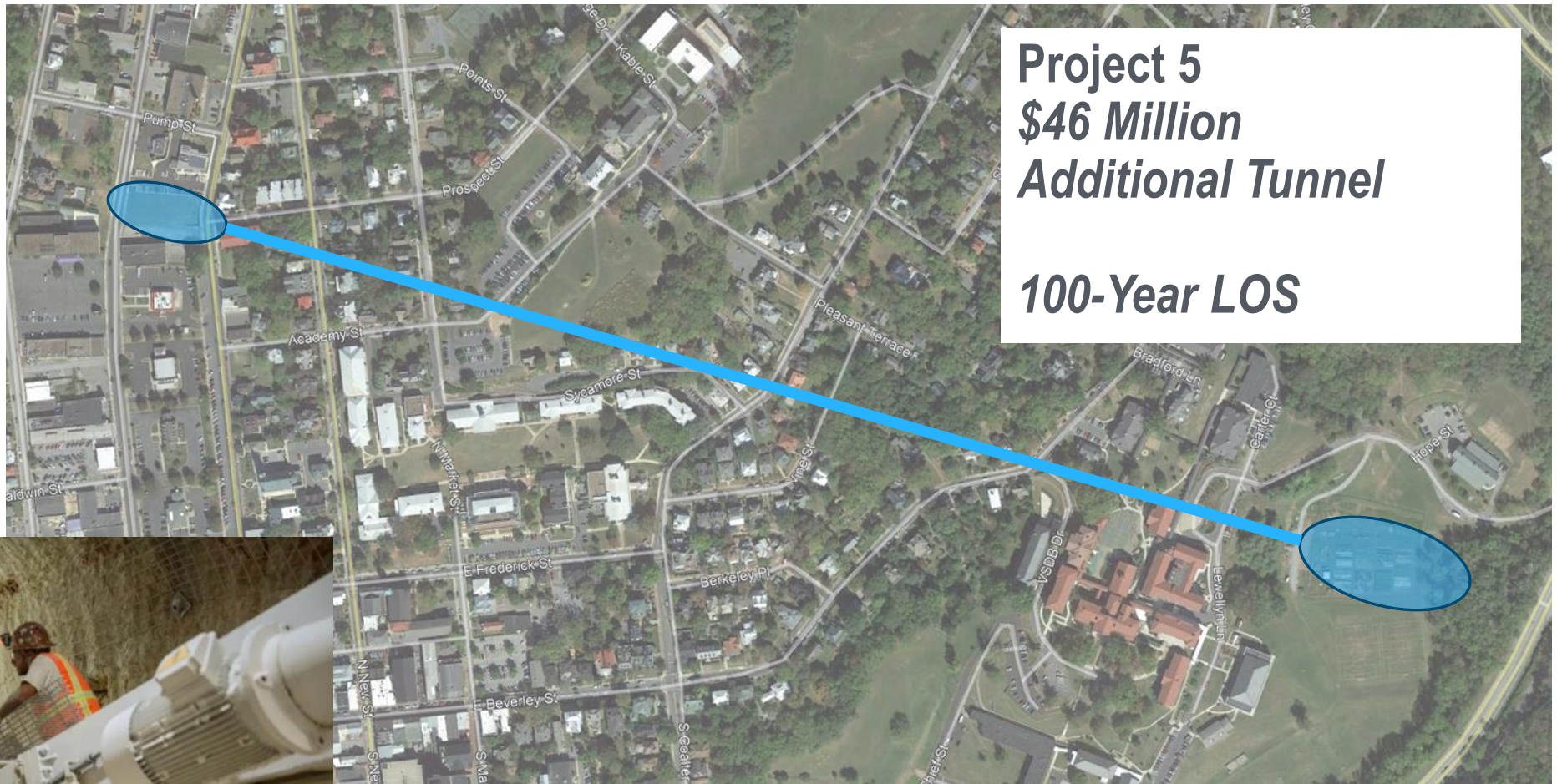
Project 3
\$12 Million
Replace Tunnel
100-Year LOS



Project 3
\$12 Million
Replace Tunnel
100-Year LOS



Project 5
\$46 Million
Additional Tunnel
100-Year LOS

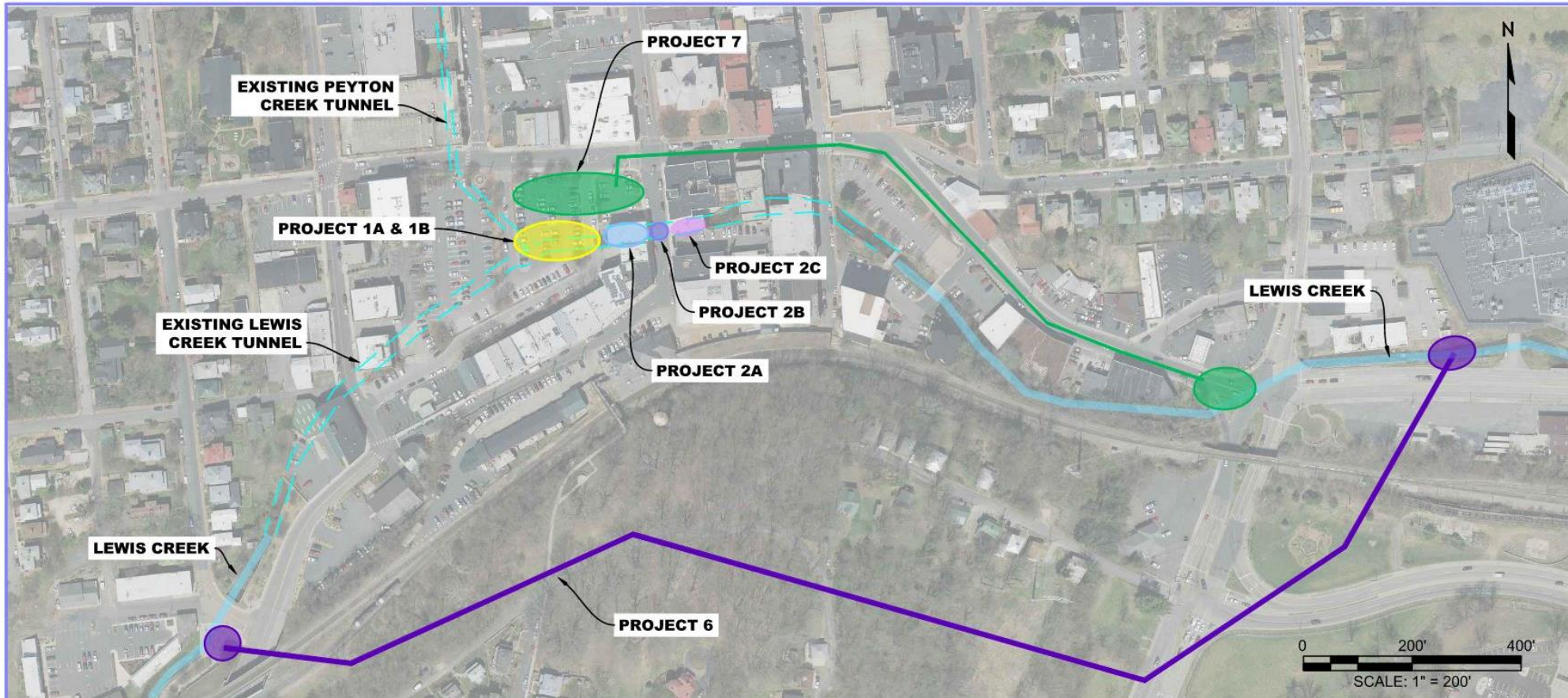


LEVEL OF SERVICE

	<i>Existing Tunnel Capacity</i>	Cost to Provide Level of Service			
		<i>10 - Year</i>	<i>25 - Year</i>	<i>50 - Year</i>	<i>100 - Year</i>
Lewis Creek	<i>< 10 - Year</i>	\$1 to \$4 Million	\$5 to \$7 Million	\$6 to \$10 Million	Not Feasible
Peyton Creek	<i>10 - Year</i>	-	\$10 to 20 Million	\$10 to 20 Million	\$10 to 20 Million

QUESTIONS





STAUNTON FLOOD STUDY

LEWIS CREEK PROJECTS

Project 1A - Replace Tunnel, confluence of Lewis & Peyton Creeks to Byer Street, Box Tunnel

- Open cut construction
- Remove existing 7'x23' Box Tunnel
- Construct approximately 150', 7'x40' Box Tunnel
- Replace asphalt surface parking

Project 1B - Remove Tunnel, confluence of Lewis & Peyton Creeks to Byer Street, Construct Open Channel

- Open cut construction
- Remove existing 7'x23' tunnel
- Permanently remove approximately 30 parking spaces
- Construct approximately 150', 10'x40' Open Channel

Project 2A - Demolish 120 S Augusta St Building, Construct Open Channel

- Demolish 120 S Augusta St building
- Remove existing 16'x26' Box Tunnel
- Construct approximately 100', 16'x40' Open Channel

Project 2B - Replace Tunnel, S Augusta Street, Box Tunnel

- Open cut construction
- Remove existing 16'x18' Arch Tunnel
- Construct approximately 50', 17'x19' Box Tunnel

Project 2C - Demolish 113 S Augusta, Construct Open Channel

- Demolish 113 S August St building
- Remove existing 12'x19' Box Tunnel
- Construct approximately 60', 17'x19' Open Channel

Project 6 - Additional Gravity Line

- Tunnel 8' Diameter Gravity Pipe
- Outfall near Commerce Drive

Project 7 - Stormwater Pump Station

- Construct 30'x40' Pump Station
- Construct 50'x50' Inflow Well
- Permanently remove approximately 25 parking spaces
- Construct 1,200', Dual 4' Diameter Force Mains
- Construct 25'x25' Outflow Structure near Coalter St and Greenville Ave intersection

PROJECT

TITLE

COMM. NO.
220184

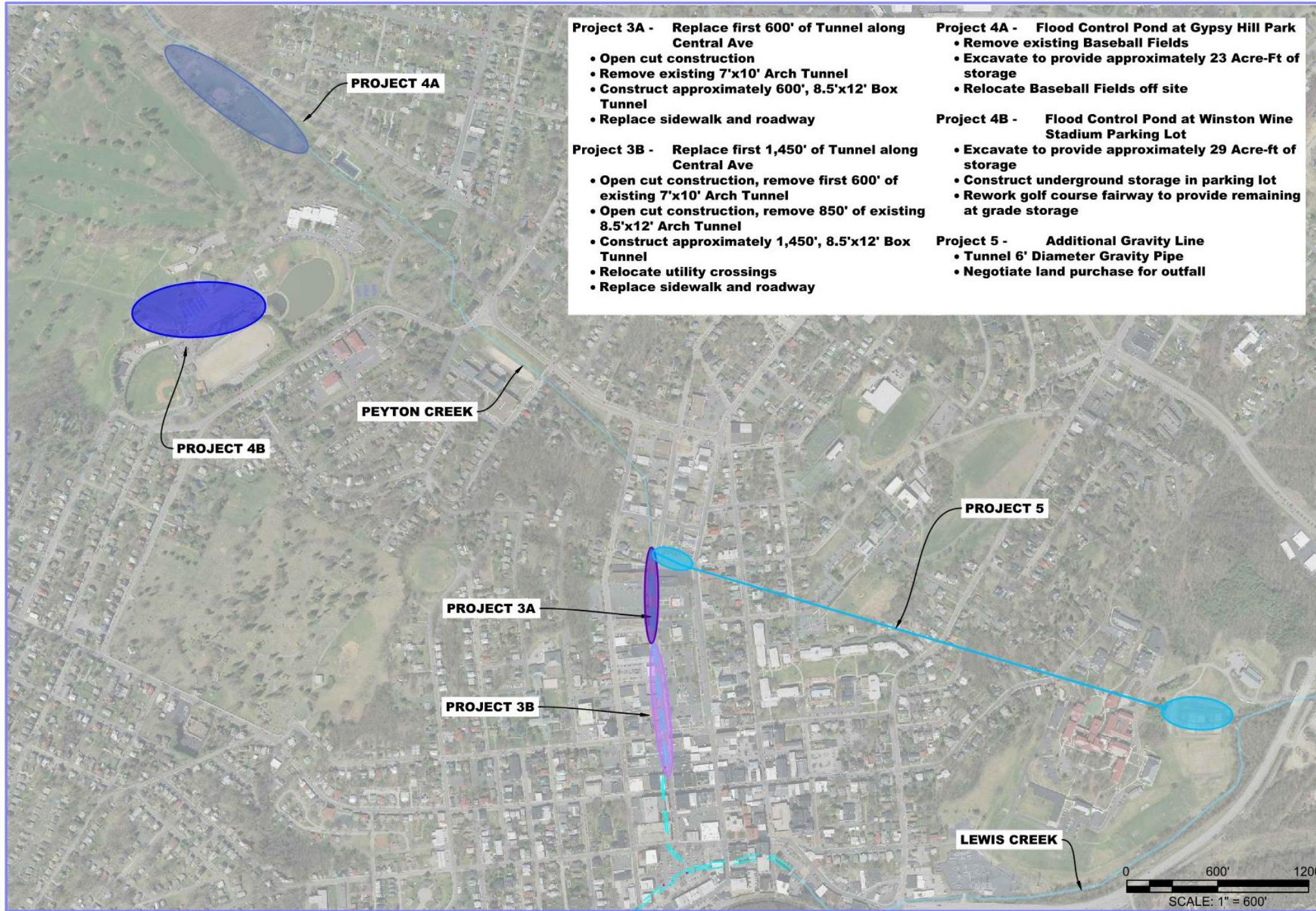
DRAWN CHECKED

SKETCH NO.

SK-01

DWG. REFERENCE NO.

DATE: REV.



Project 3A - Replace first 600' of Tunnel along Central Ave

- Open cut construction
- Remove existing 7'x10' Arch Tunnel
- Construct approximately 600', 8.5'x12' Box Tunnel
- Replace sidewalk and roadway

Project 3B - Replace first 1,450' of Tunnel along Central Ave

- Open cut construction, remove first 600' of existing 7'x10' Arch Tunnel
- Open cut construction, remove 850' of existing 8.5'x12' Arch Tunnel
- Construct approximately 1,450', 8.5'x12' Box Tunnel
- Relocate utility crossings
- Replace sidewalk and roadway

Project 4A - Flood Control Pond at Gypsy Hill Park

- Remove existing Baseball Fields
- Excavate to provide approximately 23 Acre-ft of storage
- Relocate Baseball Fields off site

Project 4B - Flood Control Pond at Winston Wine Stadium Parking Lot

- Excavate to provide approximately 29 Acre-ft of storage
- Construct underground storage in parking lot
- Rework golf course fairway to provide remaining at grade storage

Project 5 - Additional Gravity Line

- Tunnel 6' Diameter Gravity Pipe
- Negotiate land purchase for outfall

PROJECT: STAUNTON FLOOD STUDY
 TITLE: PEYTON CREEK PROJECTS

COMM. NO.	220184
DRAWN	CHECKED
SKETCH NO.	SK-02
DWG. REFERENCE NO.	
DATE:	REV.

0 600' 1200'
 SCALE: 1" = 600'