

An aerial photograph showing a large body of water in the foreground, likely a flooded area. The water is dark blue with some brownish patches. In the background, there are several houses and buildings, some of which appear to be partially submerged or surrounded by water. The trees are in autumn colors, suggesting the photo was taken in late summer or early fall. The overall scene depicts a significant flooding event in a residential area.

Leveraging Federal Infrastructure Funds  
For Municipal Resilience Projects

Land and Water Conservation Summit  
July 15, 2022

© *Butch Lombardi*

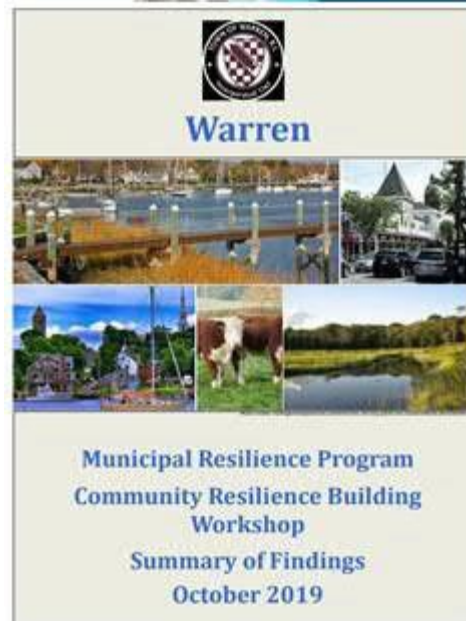
# Coastal Flooding Concerns

## ASSESSMENT OF IMPACTS

*Municipal Resilience Plan*

*Hazard Mitigation Plan*

*URI and UPenn Projects*



Emergency  
Management

EMS/Police  
Response

DPW /  
Utilities

Housing &  
Community

Habitat  
Restoration

Economy

Municipal  
Financial  
Solvency



## Data

- Property/tax data – Town of Warren
- GIS data – Warren/State of RI
- Climate forecast: NOAA
- Sea level rise and storm data: StormTools
- Disaster impact estimates: FEMA and FloodFactor
- Road/bridge data – RIDOT/Statewide Planning/national



RHODE ISLAND  
DIVISION OF  
PLANNING



FEMA





10/8/21@10:30 AM

Photos from RI – Sea Grant

Belchers Cove/Market Street

## Child Street – Route 103 Flooding

Stormwater flooding from  
9/1/21 – Child Street



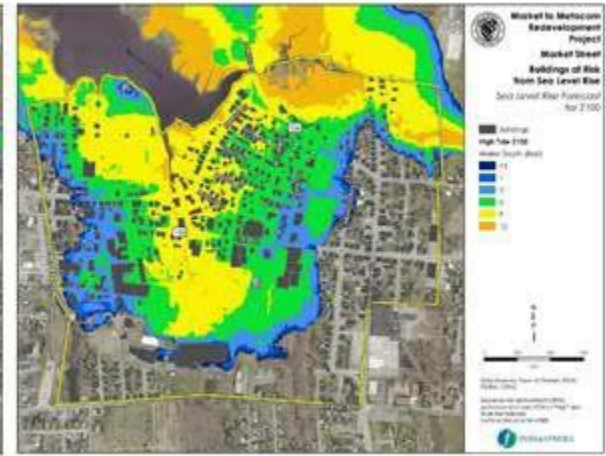
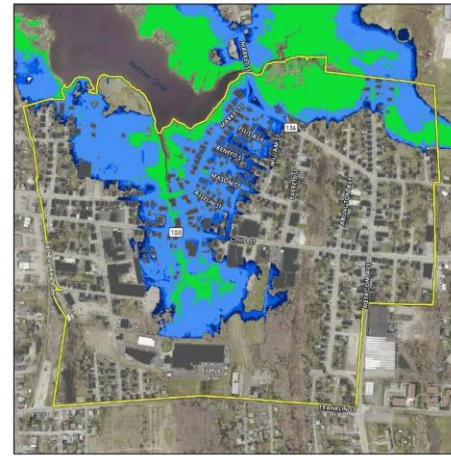
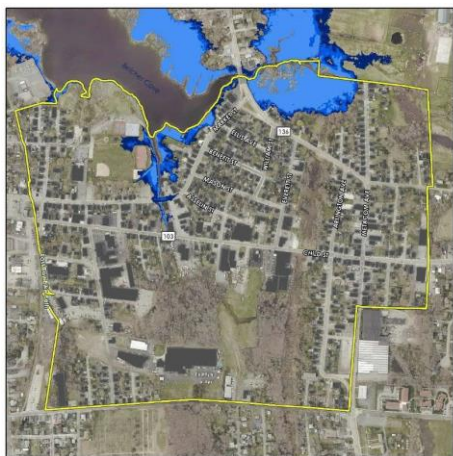
# Market Street – High Tide Projections 2035-2100

2035

2050

2070

2100



## No Action Scenario – ROADWAY IMPACTS

- Market, Child and Rte. 136 are flooded during 100-year storm events
- Market Street at Redmond is flooded every day (by 2035)
- Child Street (Rte. 103) is flooded every day (by 2050)
- Rte. 136 at Belcher Cove Bridge is flooded every day (by 2050)

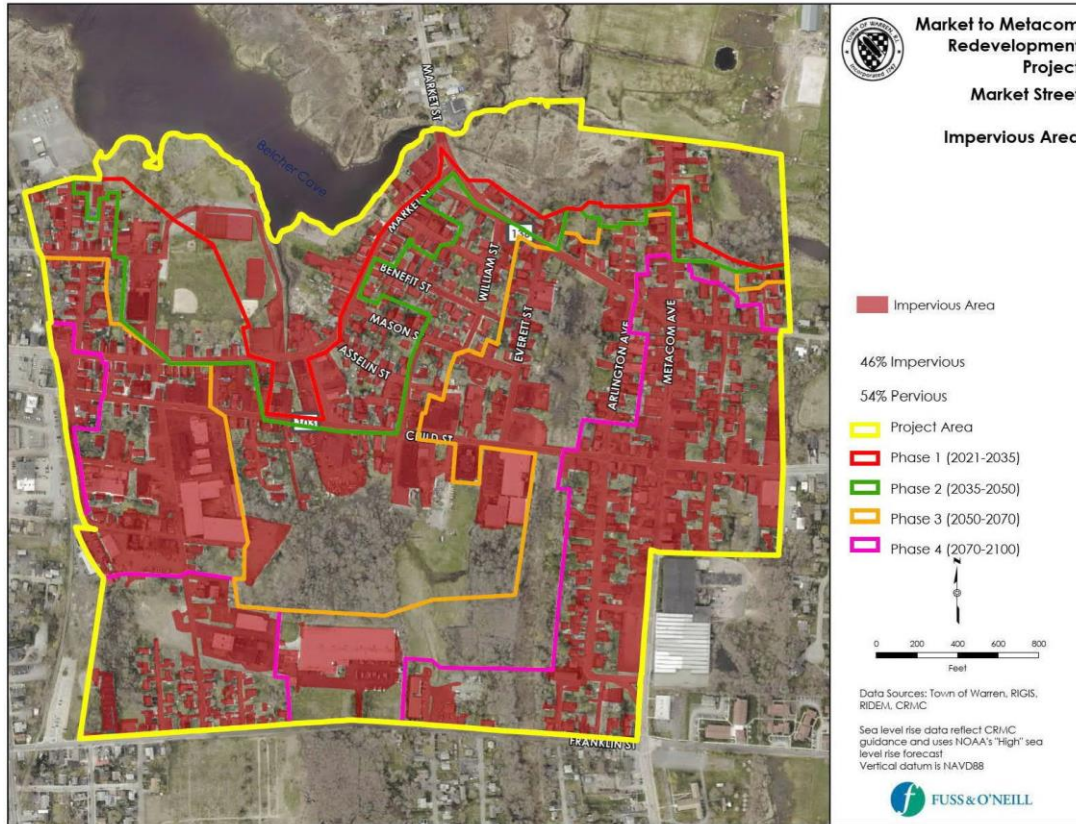




## No Action Scenario – COSTS SUMMARY

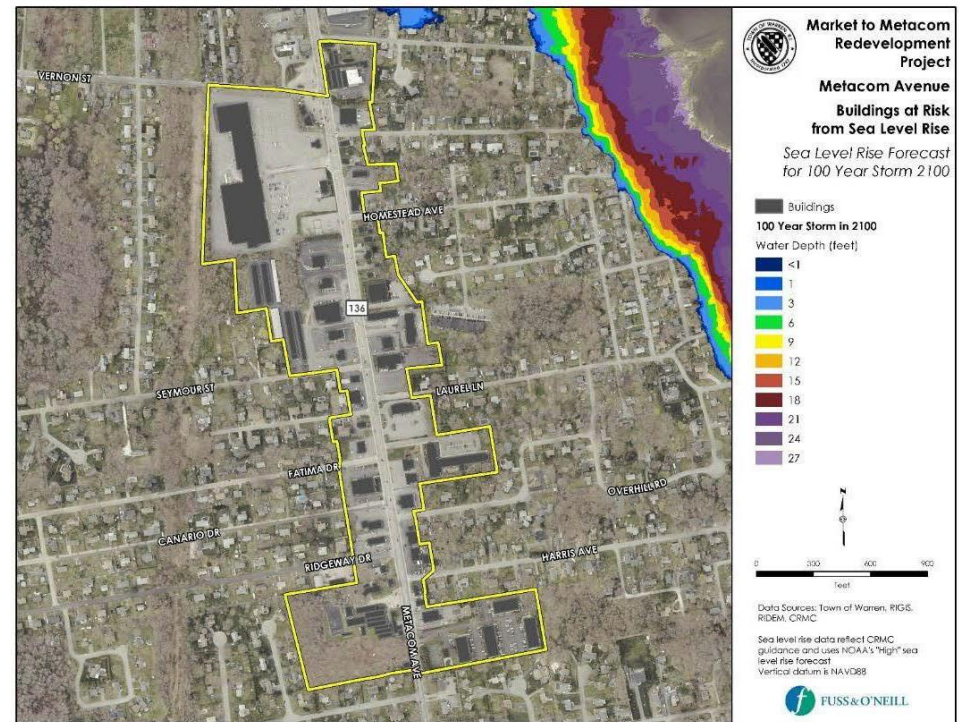
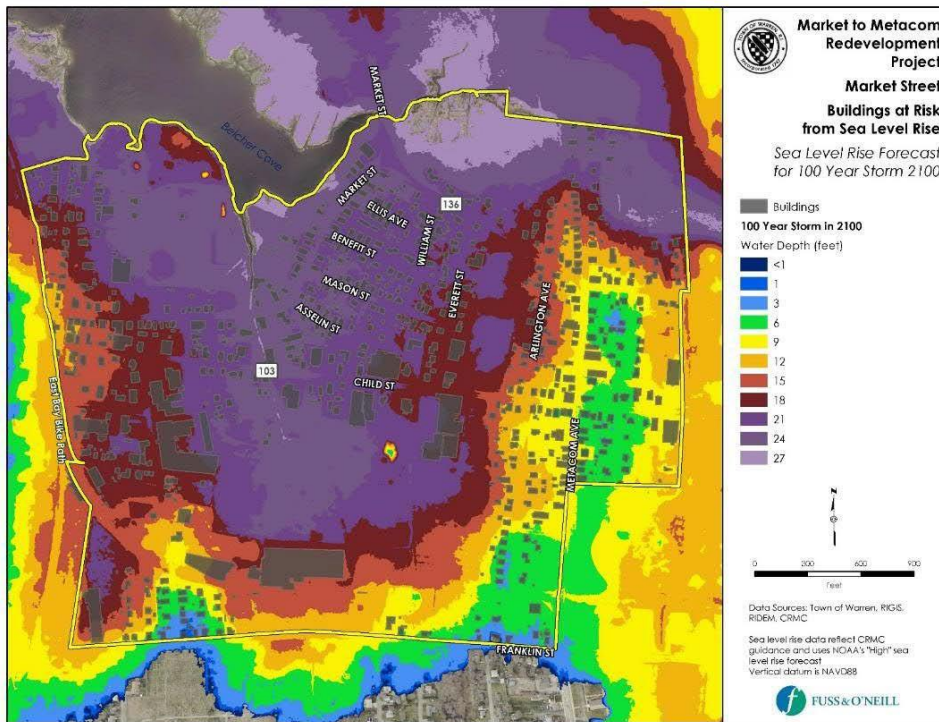
<b>Time Period</b>	<b>2025-2035</b>	<b>2035-2050</b>	<b>2050-2070</b>	<b>2070-2100</b>	<b>Total by 2100</b>
Properties Flooded by Sea Level Rise	58	75	113	137	<b>383</b>
Buildings Flooded by Sea Level Rise	31	65	92	118	<b>306</b>
Building Loss Cost	\$8,100,000	\$16,600,000	\$23,000,000	\$38,100,000	<b>\$85,800,000</b>
Damage from 24" Flood Event	\$3,500,000	\$8,500,000	\$13,100,000	\$27,500,000	<b>\$52,700,000</b>
Lost Business Revenue from 24" Flood Event	\$5,400,000	\$3,600,000	\$22,000,000	\$95,200,000	<b>\$126,300,000</b>

# Impervious Surface = Marshland Restoration & Creation Opportunity



Phase	Impervious Area Removed (Acres)	Marshland Created (Acres)
1	8	34
2	10	21
3	17	42
4	29	56
<b>Total</b>	<b>63</b>	<b>153</b>

# Sea Level Rise Projection + 100-Year Coastal Storm in 2100



## MARKET TO METACOM

Grant from Southeast New England Program (SNEP) of Restore America's Estuaries



Existing Conditions

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## MARKET TO METACOM

OCEAN STATE JOB LOT CONCEPTUAL PERSPECTIVE RENDERING

PAGE 6



UNION STUDIO  
ARCHITECTURE & INTERIOR DESIGN

# Job Lot Plaza Site

# Metacom Avenue Redevelopment Scenario - Totals

NEW HOUSING	+ 520 UNITS	(from 66)
NEW COMMERCIAL SPACE	+ 107,500 SF	
FUTURE PROPERTY VALUE	+ \$70 MILLION*	↑ 322 %
FUTURE PROPERTY TAX	+ \$1.25 MILLION / YEAR*	

\* In today's dollars, unadjusted.

## Phased Relocation and Restoration Scenario – AVAILABLE FUNDING

- **IIJA – Infrastructure Investment and Jobs Act**
- NRCS (USDA): Watershed and Flood Prevention Program (WFPO) – AWARDED! – up to \$ 7 mil.
- NFWF – National Coastal Resilience Fund (joint w/ RIDOT)
- EPA: Pre-Disaster Mitigation Grants
- FEMA: BRIC Program – Building Resilient Infrastructure and Communities
- Army Corps Of Engineers
- RI Infrastructure Bank
- Tax Increment Financing (TIF)

COMPETE RI /  
PARTNERSHIP RI

FEMA to open up more  
money for resilience projects

**\$400 million+**\*

Building Resilient Infrastructure  
and Communities (BRIC) program,  
expected annual funding

**\$56 million**

Predisaster Mitigation Program,  
on average from 2009-2016

\* \$400M figure depends on disaster expenditures and is at the discretion of FEMA.



## Additional Information

Project Website <https://bit.ly/M2M-Warren>

