

HAZARD PLANNING ON CAPE COD
CALLY HARPER, PHD
PLANNING + COMMUNITY DESIGN





EMERGENCY MANAGEMENT ACTIVITIES

PREPAREDNESS:

ACTIONS TO PREPARE FOR A DISASTER

RESPONSE:

ACTIONS TO SAVE + PROTECT DURING A DISASTER

RECOVERY:

ONCE AFFECTED, ACTIONS NECESSARY TO BOUNCE BACK

MITIGATION:

SUSTAINED ACTIONS TO REDUCE OR ELIMINATE RISK
TO LIFE + PROPERTY

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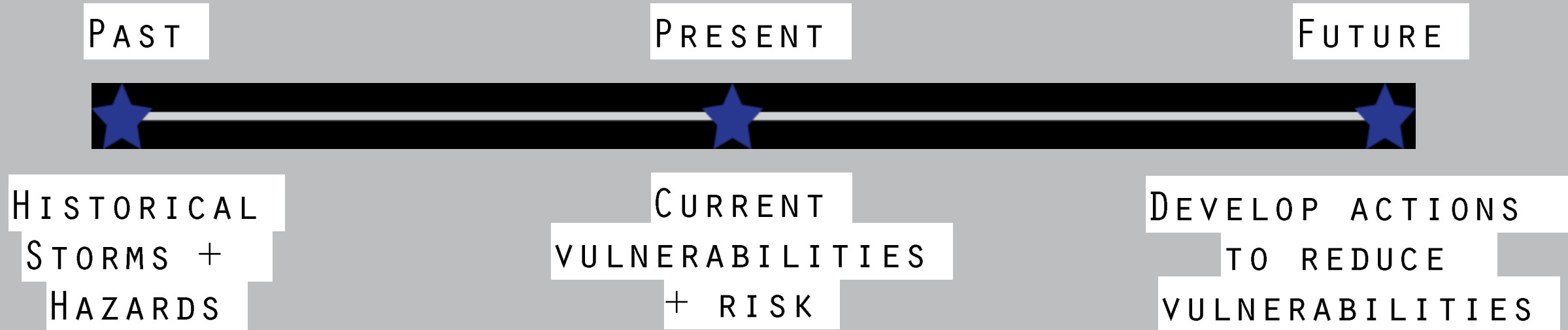
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HAZARD MITIGATION PLANNING (A BRIEF DESCRIPTION)



WHO DRAFTS A HAZARD PLAN?

TOWN
STAFF

ADMINISTRATION, PLANNING,
DPW, POLICE, FIRE, HEALTH +
CONSERVATION



THE
PUBLIC

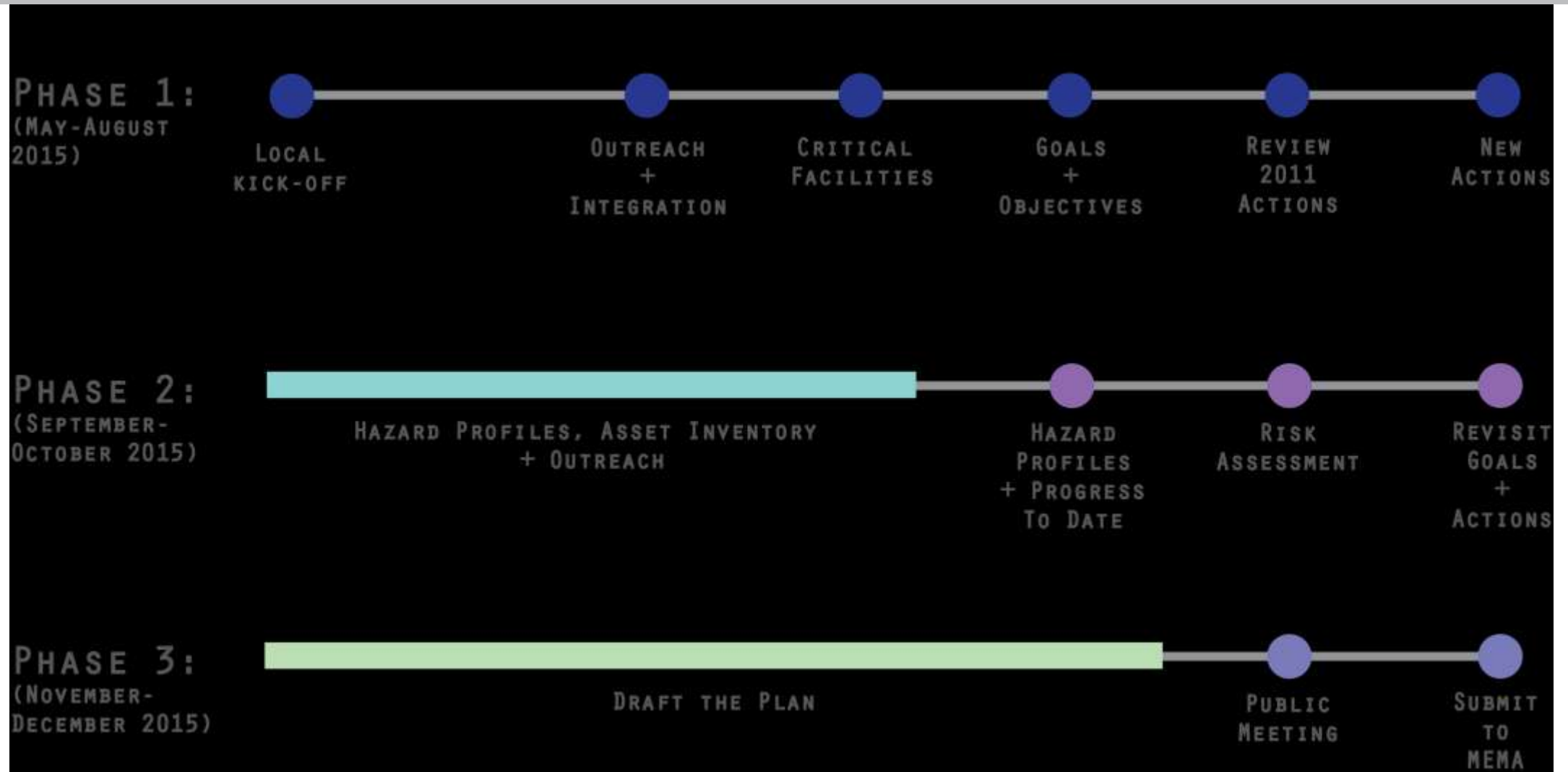


STAKEHOLDERS

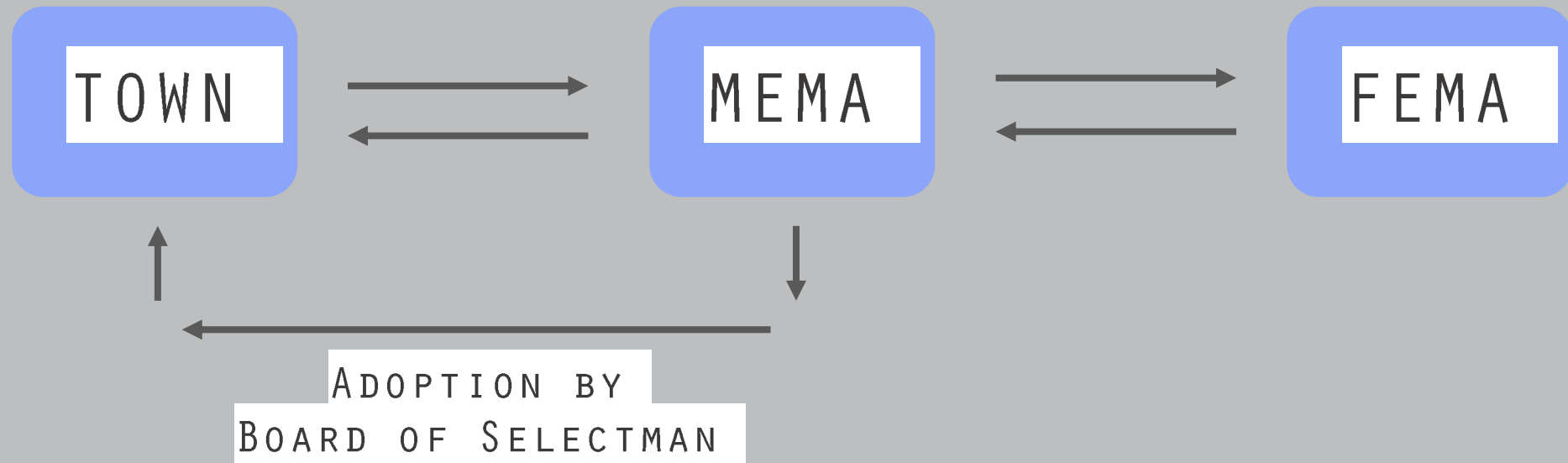


PROCESS OF HAZARD MITIGATION PLANNING

(EXAMPLE FROM PROVINCETOWN, TRURO, SANDWICH)



PLAN APPROVAL PROCESS



PLAN IS ACTIVE FOR 5 YEARS

WHAT ARE THE BENEFITS OF HAZARD PLANNING?

1. GIVES TOWN STAFF A CHANCE TO “LOOK BACK”

2. AN OPPORTUNITY TO ENGAGE THE PUBLIC + STAKEHOLDERS

3. BUILDS PARTNERSHIPS WITH NEIGHBORING COMMUNITIES

4. PROVIDES AN OPPORTUNITY TO “LOOK FORWARD”

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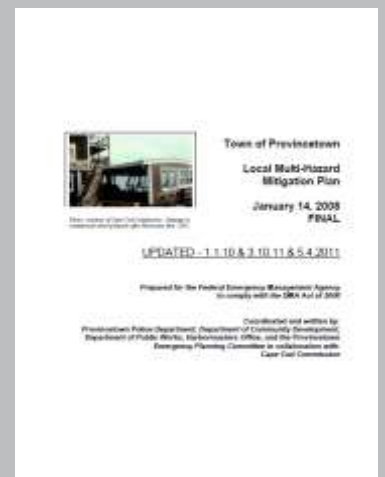
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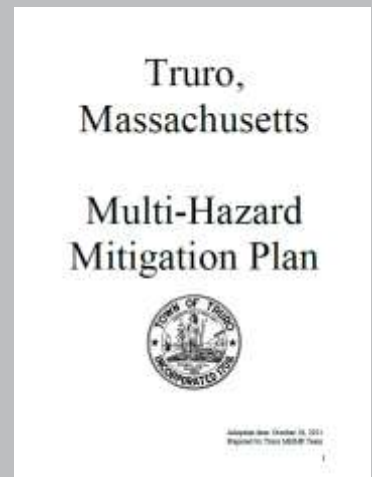
2 OUTER CAPE PROJECTS



PROVINCETOWN



TRURO



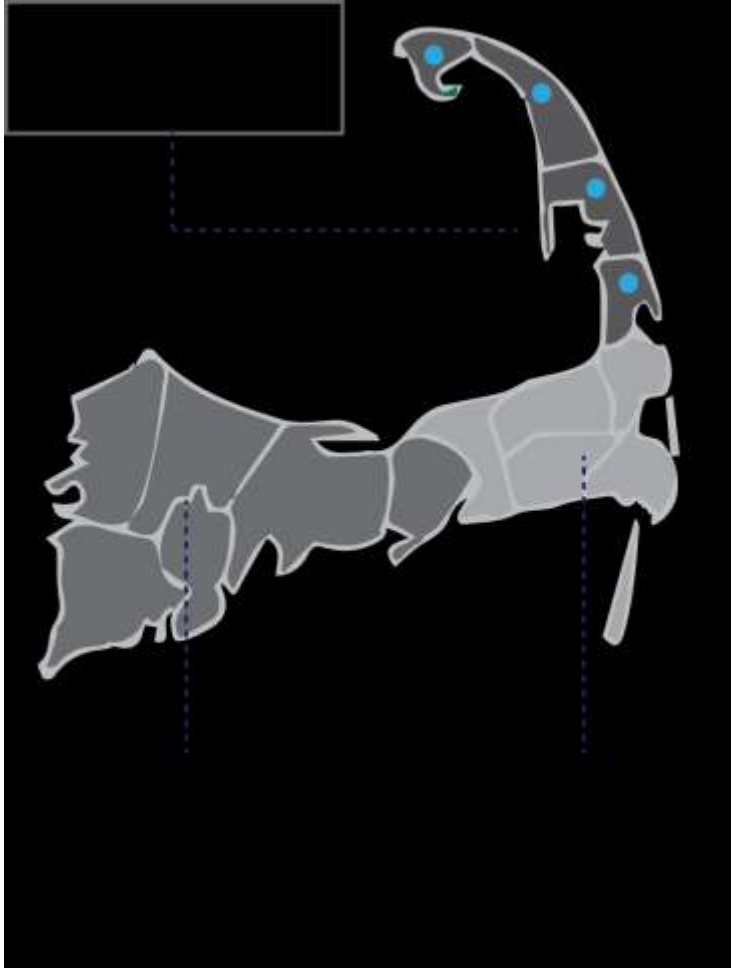
WELLFLEET



EASTHAM



CLIMATE CHANGE VULNERABILITY STUDY: A SUB-REGIONAL APPROACH:

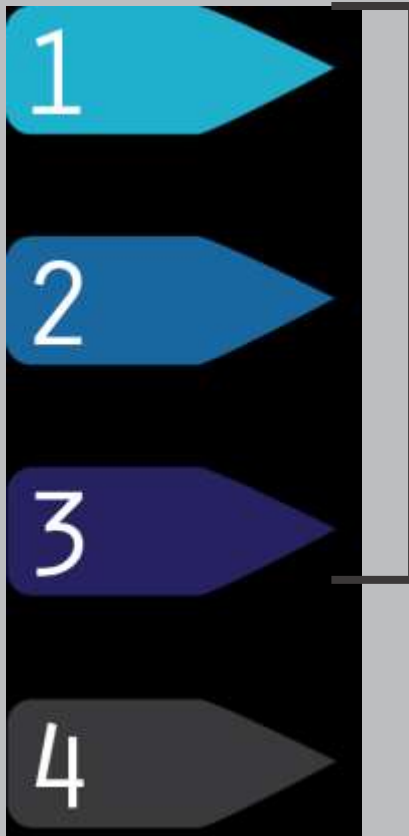


DIVIDED CAPE COD INTO 3 SUB-REGIONS

KICKED OFF WITH THE OUTER CAPE

WILL REPEAT THIS PROJECT IN REMAINING
SUB-REGIONS

MEETINGS WITH OUTER CAPE DPW DIRECTORS



ONE-ON-ONE MEETINGS (12 TOTAL)

GROUP MEETING TO TRANSFER INFO

1



CREATED AN ONLINE
GIS TOOL TO GATHER
DATA

“BRIGHT SPOT”:
ASSETS THAT ARE
RESILIENT TO
HAZARDS

“OPPORTUNITIES”:
ASSETS THAT ARE
VULNERABLE TO
HAZARDS

2



NAME OF ASSET:

PROVINCETOWN MUNICIPAL
AIRPORT

DESCRIPTION:

AIRPORT IS LOCATED IN AN
AREA SUSCEPTIBLE TO FLOODING

		RATIONALE (REASON FOR THE RATING)	RATING (HIGH, MEDIUM, LOW)
SEA LEVEL RISE	SENSITIVITY	_____	<input type="checkbox"/>
	ADAPTIVE CAPACITY	_____	<input type="checkbox"/>
STORM SURGE	SENSITIVITY	_____	<input type="checkbox"/>
	ADAPTIVE CAPACITY	_____	<input type="checkbox"/>
SHORELINE CHANGE	SENSITIVITY	_____	<input type="checkbox"/>
	ADAPTIVE CAPACITY	_____	<input type="checkbox"/>
CRITICALITY	NETWORK	_____	<input type="checkbox"/>
	COMMUNITY	_____	<input type="checkbox"/>

CREATED “REPORT CARDS” FOR
EACH ASSET

DPW PROVIDED ADAPTIVE CAPACITY
+ CRITICALITY SCORES BASED ON
THEIR KNOWLEDGE

SENSITIVITY SCORES CAME FROM
TOOLS DEVELOPED BY CCC AND
STATE AGENCIES

3

CREATED ANOTHER TOOL TO RANK VULNERABLE ASSETS

INPUTS: SENSITIVITY, ADAPTIVE CAPACITY + CRITICALITY SCORES

OUTPUT: VULNERABILITY RANKING SCHEME

Sea Level Rise					Storm Surge					Shoreline Change					Criticality					Total Score	Asset Rank
Sensitivity	S score	Adaptive Capacity	AC score	V score	Sensitivity	S score	Adaptive Capacity	AC Score	V Score	Sensitivity	S score	Adaptive Capacity	AC score	V Score	To the Transportation Network	Score	To the Community	Score	Crit Score		
5 ft - low	1	low	3	4	cat 3 - low	1	low	3	4	low	1	na	0	1	high	3	high	3	6	15	2
6 feet - low	1	high	1	2	over cat 4 - low	1	high	1	2	high	3	high	1	4	low	1	low	1	2	10	6
6 feet - low	1	high	1	2	over cat 4 - low	1	high	1	2	high	3	high	1	4	medium	2	medium	2	4	12	4
4 feet - medium	2	medium	2	4	cat 3 - low	1	medium	2	3	na	0	na	0	0	medium	2	medium	2	4	11	5
6 feet - low	1	high	1	2	over cat 4 - low	1	high	1	2	high	3	medium	2	5	low	1	high	3	4	13	3
6 feet - low	1	medium	2	3	cat 3 - low	1	medium	2	3	na	0	na	0	0	high	3	high	3	6	12	4
6 feet - low	1	low	3	4	over cat 4 - low	1	low	3	4	high	3	low	3	6	high	3	high	3	6	20	1

Based on FHWA's VAST tool and "Ready for Tomorrow" Salem's Climate Change Vulnerability Assessment + Adaptation Plan

ASSETS VULNERABLE TO SLR, SURGE + EROSION:



6 ROADWAYS, 1 AIRPORT

5 CULVERTS, 3 ROADWAYS, 2 PARKING
LOTS

4 CULVERTS, 5 ROADWAYS, 4 PARKING
LOTS, 2 TOWN LANDINGS, 1 BRIDGE

7 ROADWAYS, 4 CULVERTS, 1 ROTARY

MOST VULNERABLE ASSETS TO SLR, SURGE + EROSION:

PROVINCETOWN

- RYDER/BRADFORD STREETS
- SNAIL/COMMERCIAL STREETS
- PROVINCETOWN MUNICIPAL AIRPORT

TRURO

- PARKING LOT AT BALLSTON BEACH
- CULVERTS IN THE PAMET SYSTEM
- ROUTE 6 CULVERT NEAR EAST HARBOR

WELLFLEET

- COMMERCIAL STREET
- MAYO CREEK CULVERT
- BLACK FISH CREEK CULVERT

EASTHAM

- BRIDGE ROAD
- CULVERT NEAR CAMPGROUND BEACH
- ROUTE 6 CULVERT
- EASTHAM ROTARY

REPORT COMING SOON...

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GROUP MEETING TO DISCUSS ASSETS THAT AFFECT
THE OUTER CAPE SUB-REGION

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CULVERT

- BLACK FISH
CREEK CULVERT

EASTHAM

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CAMPGROUND BEACH

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PROVINCETOWN



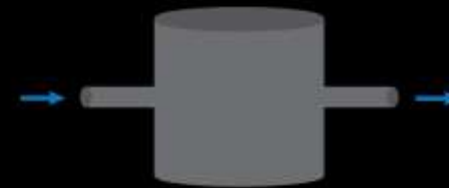
SINCE PROVINCETOWN HAD A
FEMA APPROVED HAZARD PLAN,
THEY APPLIED FOR FEMA FUNDS TO
FIX THE DRAINAGE ISSUES



1. RELOCATE AND UPSIZE STORM WATER PIPE



2. INSTALL STORM WATER PUMP



3. INSTALL POROUS PAVEMENT NEAR TOWN HALL



TAKE AWAY CONCEPTS:

1. HAZARD PLANNING EFFORTS LEAD TO FUNDING FOR FORWARD THINKING PROJECTS IN COMMUNITIES

2. PUBLIC PARTICIPATION IS ONE OF THE MOST IMPORTANT PARTS OF THE HAZARD PLANNING PROCESS

TAKE AWAY ACTIONS:

1. PARTICIPATE + ENGAGE IN THE HAZARD PLANNING PROCESS
EITHER AS A RESIDENT OR AS A STAKEHOLDER

- ATTEND TOWN MEETINGS OR BOS MEETINGS
- ONLINE SURVEYS
- OUTREACH EVENTS WITH POLICE AND FIRE

2. IF YOUR TOWN IS NOT USING A FORM OF COMMUNICATION THAT
WORKS FOR YOU, PLEASE SPEAK UP.