



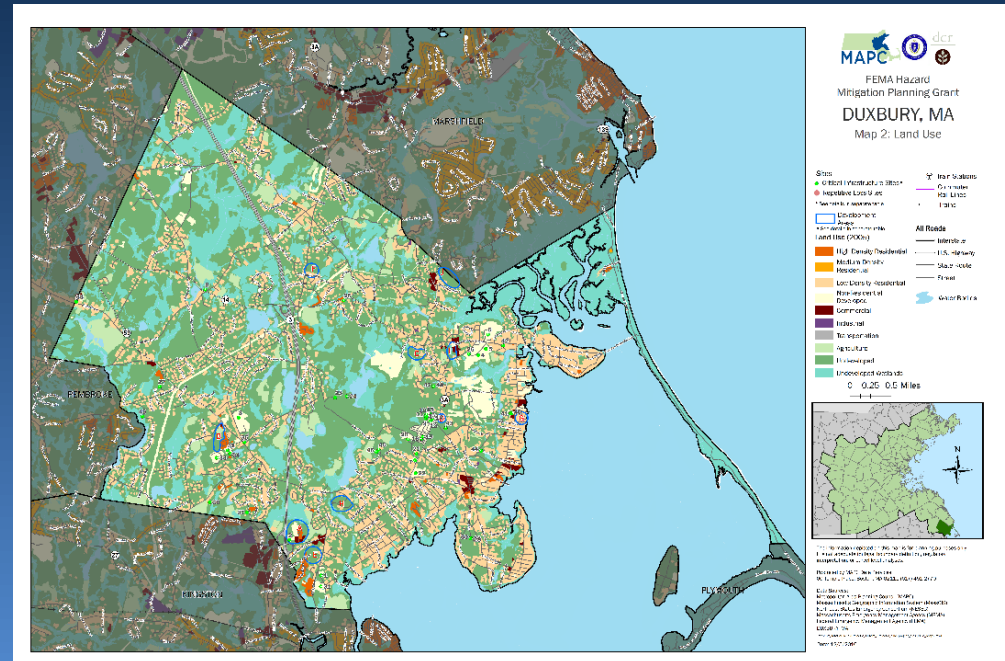
Duxbury Hazard Mitigation Plan

**Duxbury Local Hazard Mitigation Team
Public Meeting
Planning Board
March 22, 2017**

Martin Pillsbury
Metropolitan Area Planning Council

Why is Duxbury doing this Plan?

- The **Federal Disaster Mitigation Act** requires towns to adopt and update a Hazard Mitigation Plan to be eligible for FEMA mitigation grants.
- This Plan will meet FEMA's requirement
- The Plan offers the Town an opportunity to review its vulnerabilities and develop a mitigation strategy



Plan for Mitigating Damages from Natural Hazards

- **Flooding**
- **High winds, hurricanes, tornadoes**
- **Winter storms, snow and ice**
- **Brush fires**
- **Earthquakes, landslides**
- **Extreme temperatures**
- **Drought**



Note: Mitigation, not an Emergency Response Plan

What is Hazard Mitigation?

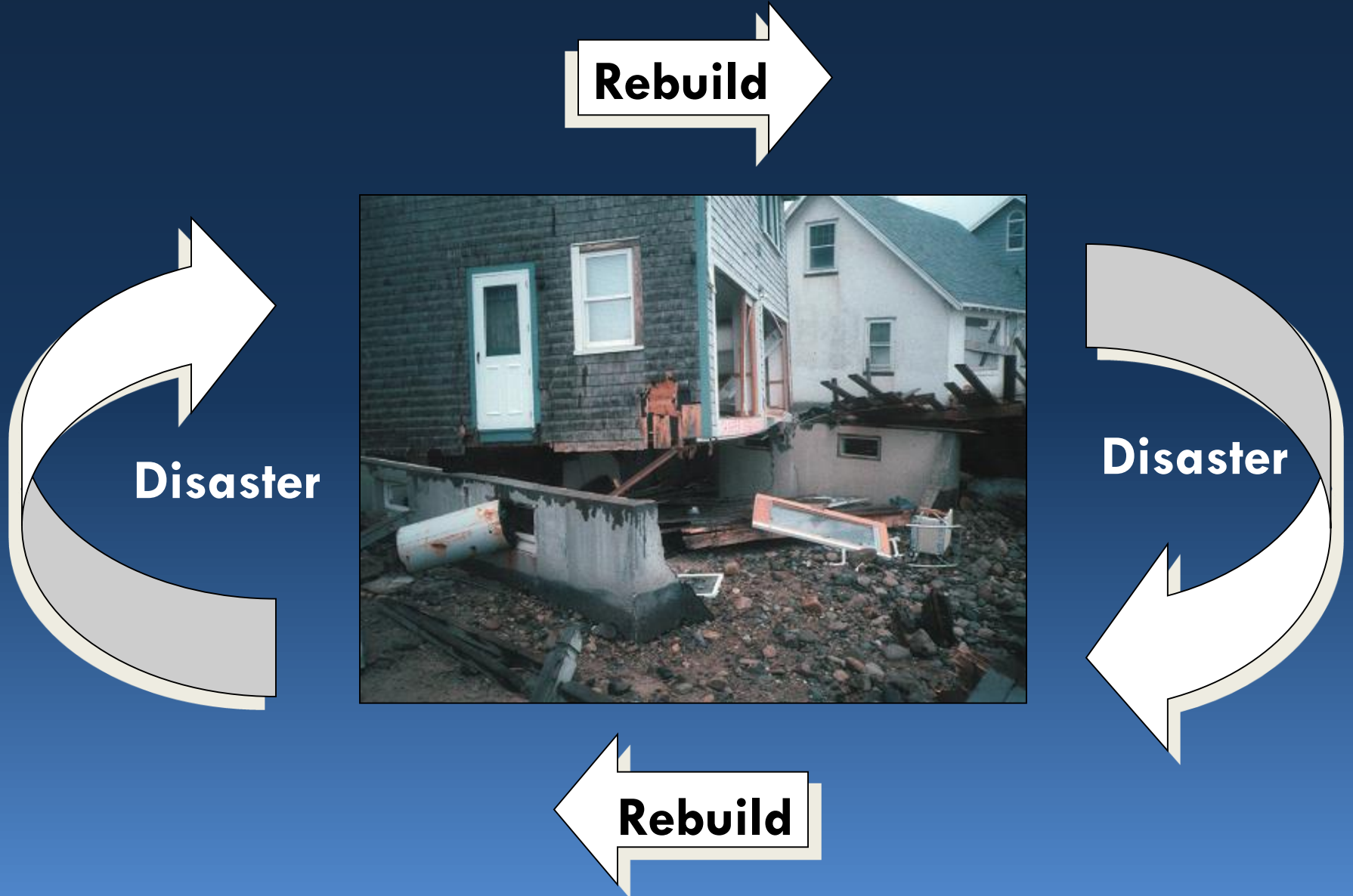


To permanently reduce or prevent losses of life, injuries, and property damage through long-term strategies

*What preventive actions are being taken **NOW** to reduce future risks and damages?*

*What additional actions can be taken in the **FUTURE**?*

Breaking the Cycle of Disaster & Rebuilding



Six Tools & Techniques for Hazard Mitigation

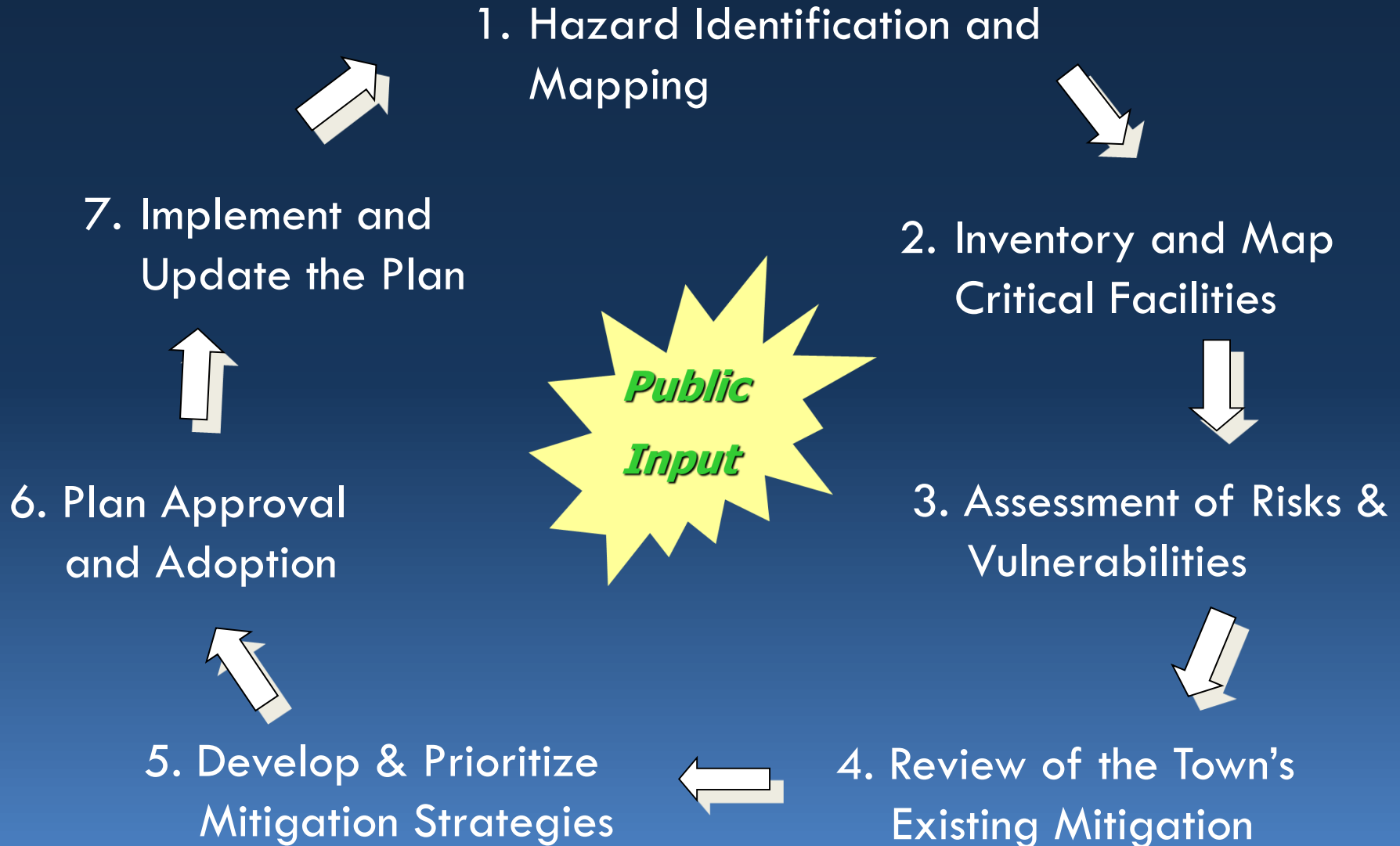


1. Prevention
2. Property Protection
3. Public Education
4. Natural Resources Protection
5. Structural Projects
6. Emergency Services Protection

How the Plan Is Developed

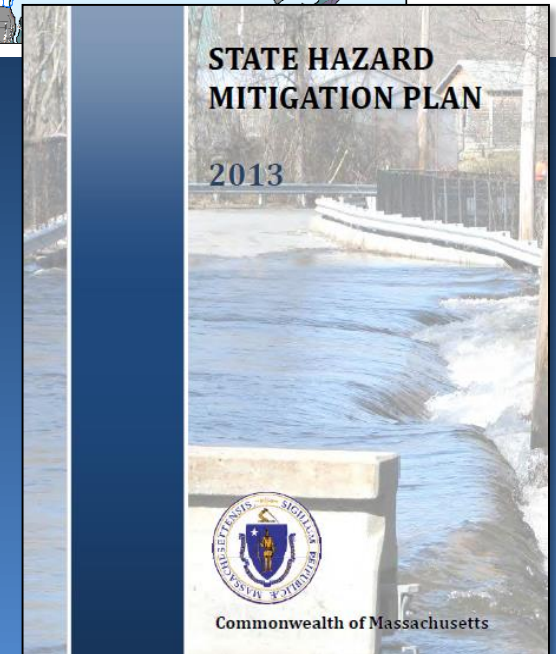
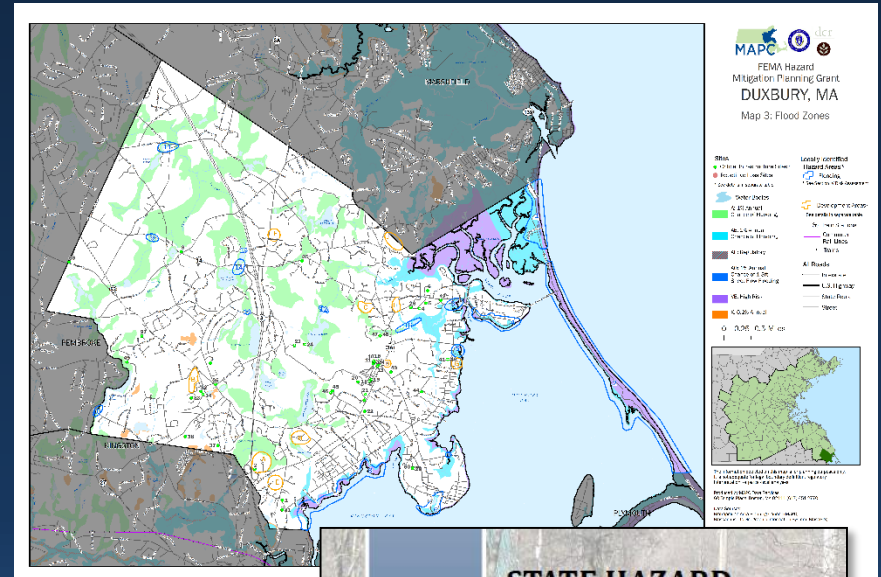
- The Town coordinates the plan through a Local Hazard Mitigation Team (Development Review Team)
- MAPC provides technical assistance for data and analysis, mapping, and preparing the plan.
- The planning process includes stakeholder engagement: residents, businesses, institutions, community organizations
- Two public meetings, during plan development and review of the draft plan

Plan Development Process

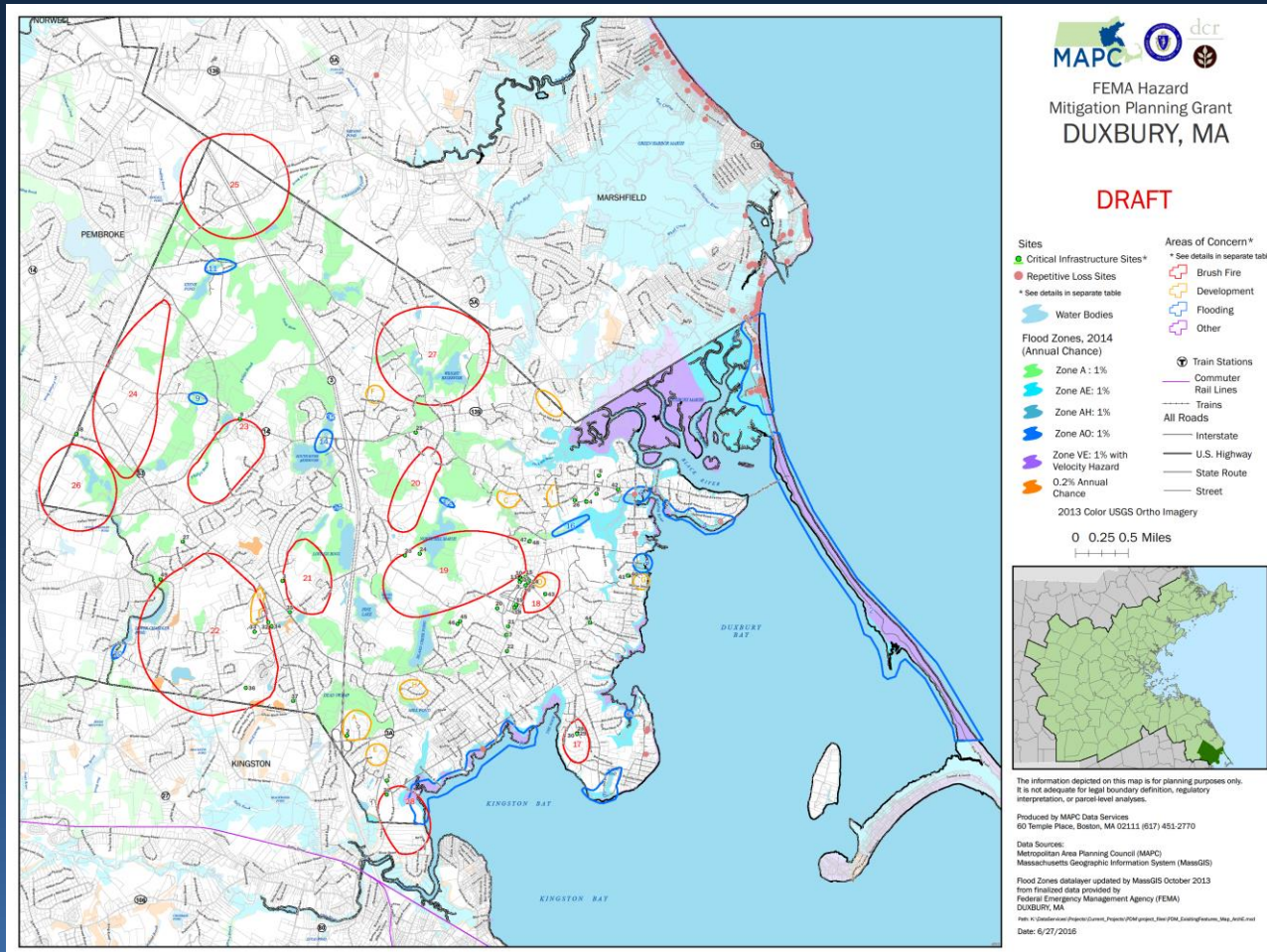


Hazard Identification & Mapping

- State & Federal data on floodplains, snowfall, wind speeds, hurricanes earthquake risk, etc.
- Review Mass. State Hazard Mitigation Plan
- The Local Team provides updated local information on hazard areas and potential future developments



Locally-Identified Hazard Areas



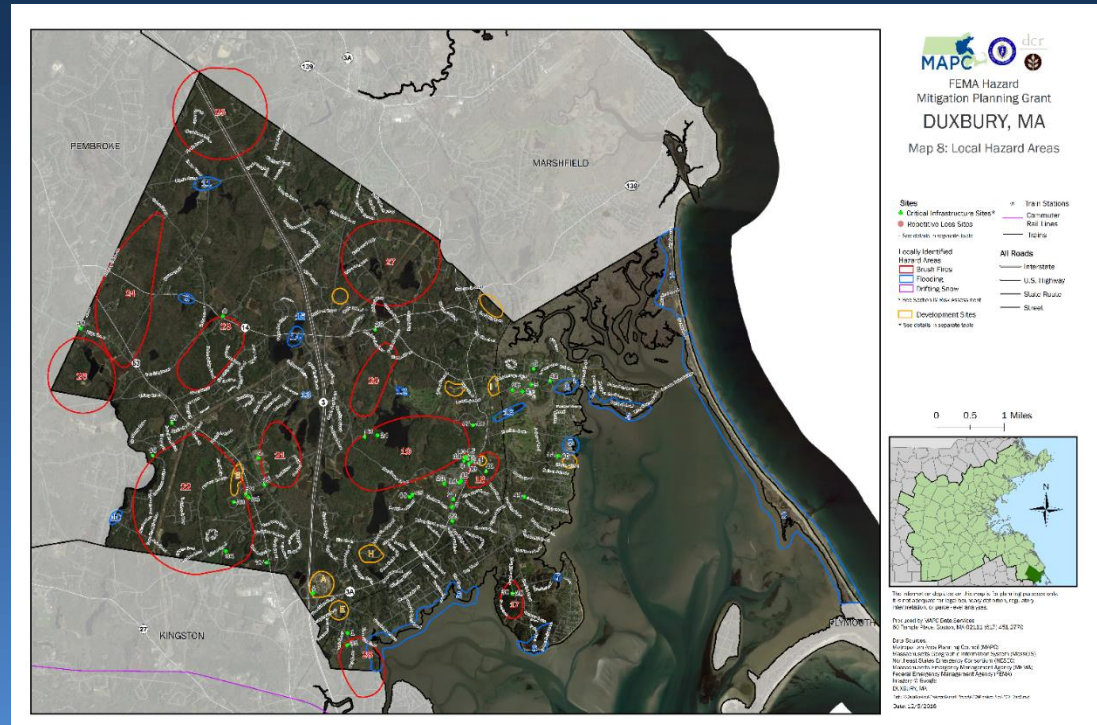
**28 potentially hazard prone areas identified:
16 for flooding and 12 for brushfires**

Critical Facilities

Database & GIS maps of critical facilities

Sites identified include:

- Disaster response sites such as fire and police stations
- Sites requiring assistance such as schools; elderly housing; child care
- Critical infrastructure (Wells, pump stations, communications)



Vulnerability Analysis: Estimated Damages

HURRICANE Estimated Damages

100 Year Hurricane property damage:	\$	33,894,270
500 Year Hurricane property damage:	\$	154,246,960

EARTHQUAKE Estimated Damages

Magnitude 5 total property damage:	\$	270,420,000
Magnitude 7 total property damage:	\$	2,073,540,000

FLOODING: Areas subject to localized flooding:

Low Estimate of Damages (10% Damage):	\$	5,319,360
High Estimate of Damages (50% Damage):	\$	26,596,798

Mitigation Strategies

Identify existing mitigation measures:

- Where are the gaps?
- What additional mitigation actions will further reduce vulnerability?
- What are the mitigation priorities?



Existing Mitigation Measures

MULTI-HAZARD

- Multi-Department Review of proposed developments
- Comprehensive Emergency Management Plan (CEMP)
- Enforcement of Massachusetts State Building Code
- Emergency Preparedness public education on town website
- Police and Fire Stations have backup generators

FLOOD RELATED HAZARDS

- Participation in the National Flood Insurance Program
- Flood Plain Conservancy District
- Wetlands Protection By-Law
- Massachusetts Stormwater Policy
- Stormwater Requirements in Subdivision / Site Plan Review
- Open Space Residential Developments allowed
- Protected open space and proactive land preservation programs
- Public Education on stormwater through the MS4 program
- Annual catch basin cleaning and annual street sweeping
- Drainage system maintenance is performed as needed
- Roadways improved/raised to reduce flooding
- Sacrificial dunes after 1991/92 storms and maintenance of 16' NVGD along barrier beach
- Beach re-nourished after 1993 flooding from storms
- Keene Brook maintenance of waterway
- Marshall Street Bridge improvements to reduce flooding
- Blue Fish River sewer line improvements

WIND-RELATED HAZARDS

- Tree Maintenance Program by Public Works

DAM FAILURES

- DCR Dam Safety Regulations
- Construction permits required
- CEMP addresses dam safety.
- North Hill Dam was repaired
- South Hill Reservoir dyke was reconstructed

WINTER-RELATED HAZARDS

- Snow removal operations
- Public Education on snow operations and winter snow safety is on the town website
- Sufficient space for municipal snow storage
- Bylaw prohibits vehicles from interfering with snow clearing
- Standard snow operations, restricted salt

GEOLOGIC HAZARDS

- Shelters and backup facilities available
- Evacuation plan in CEMP
- Maximum slopes for subdivision roads
- Earth Removal Bylaw

BRUSH FIRE RELATED HAZARDS

- Open burning permits required
- Fire Department reviews all development plans
- Fire Department provides public education on its website

Review and Update Mitigation Measures

- A) Maintain barrier beach off Powder Point to min. 16 feet NGVD**
- B) Study options for reducing flood impacts to Congress Street**
- C) Sacrificial Dune between two sections of seawall on Plymouth Avenue**
- D) Dam management and maintenance plan for private local dams**
- E) Assess the earthquake vulnerability of all public buildings.**
- F) Increase public information and awareness about fire hazards.**
- G) Open Space Protection and Land Acquisition**
- H) Regulatory Revisions for Stormwater Management**
- I) Drought: Promote drought tolerant landscaping and site design**
- J) Drought: Interconnections with Marshfield and Pembroke**
- K) Assess Public Buildings for Wind Loads and Retrofit Opportunities**
- L) Updated FIRM Maps and Bylaws**
- M) Provide Public Information on NFIP Compliance**
- N) Assess Municipal Structures for Snow Loads and Retrofit Opportunities**
- O) Address erosion problems at Patton Lane**

Next Steps

MAPC will assist the Duxbury Hazard Mitigation Team to:

- Update recommended mitigation strategies
- Prioritize mitigation measures
- Complete draft plan and submit to MEMA and FEMA
- Make any revisions required by MEMA and FEMA



Plan Approval and Adoption

- Draft plan is reviewed by MEMA and FEMA, revisions if needed
- FEMA issues notice of “Approval Pending Adoption”
- Board of Selectmen vote to Adopt the plan
- FEMA issues formal plan approval
- Approved plan in effect for 5 years
- Town is eligible for FEMA mitigation grants





Questions

