



# Hazard Mitigation for Infrastructure Owners

Planning – Projects – FEMA Hazard Mitigation Assistance

## Hazard Mitigation in Washington

- Hazard mitigation = long-term measures that reduce the risk from natural hazards.
- The Emergency Management Division is the primary “all-hazard” mitigation agency, administering FEMA grants to local jurisdictions.
- Most mitigation work takes place at the local level and is locally funded by, for example, flood control districts.



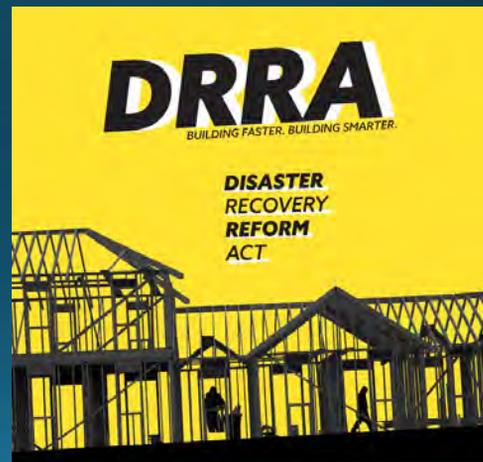
## What is a Hazard Mitigation Program?

- A hazard mitigation program is an effective and sustainable way to reduce risk. It does not have to be a separate function, but may be built by bringing together key partners:
  - Organizations that own vulnerabilities, regulate vulnerability, or own capability
- 3 components:
  - Hazard mitigation planning
  - Stakeholder engagement and relationship-building
  - Commitment to project implementation
- Any jurisdiction is capable of building a mitigation program.



## Disaster Recovery Reform Act of 2018

- Earthquake Early Warning explicitly eligible – can be included in virtually any seismic project\*
- Dramatically increases mitigation funding at the federal level by hundreds of million of dollars annually.
- Act fundamentally expands the role of mitigation for the foreseeable future.



## Capabilities - Grants

- *Pre-Disaster Mitigation Grant Program*: PDM is an annual program for cost-effective hazard mitigation projects and plans. The program has seen a large increase in funding in last two federal fiscal years and is being substantially enhanced through the recently-passed Disaster Recovery Reform Act.
- *Hazard Mitigation Grant Program*: HMGP is authorized statewide after a disaster declaration and is the most flexible of FEMA's three mitigation programs.
- *Post-Fire Hazard Mitigation Grant Program*: Program authorized following a Fire Management Assistance Grant (FMAG) declaration. Program focuses on wildfire risk and post-fire risk mitigation, including fuels reduction and post-fire flood control projects. Program prioritizes the county receiving the FMAG declaration.
- *Flood Mitigation Assistance Grant Program*: FMA provides funding to local jurisdictions and states for projects and planning that reduces or eliminates long-term risk of flood damage to structures insured under the NFIP

## Capabilities - Planning

- Planning identifies risks, vulnerabilities, and impacts from disasters, unites stakeholders, engages the public, develops mitigation strategies, and is required prior to receiving a federal grant.
- Flexible and broad: hazard mitigation plans may address unique local conditions, impacts, and adaptation measures.
- Plans may also be used to conduct data collection, outreach, or hazard mapping efforts.



The mysterious, innate intuition of some animals

## Hazard Mitigation Planning in Washington

- The purpose of local mitigation plans is to provide a baseline understanding of local hazards and vulnerabilities and then mitigate those vulnerabilities through strategies.
- Mitigation plans are some of the only plans FEMA pays you to write. Use them as the vehicle for your resilience objectives.
- Mitigation plans provide eligibility for Hazard Mitigation Assistance Grants.
- All counties, most cities, and most tribes develop hazard mitigation plans as a pre-requisite to receiving federal mitigation assistance grants.



## What Makes a *Good* Mitigation Plan?

- A planning team consisting of groups that own or regulate risk.
- Plans that are coordinated so that land use, emergency management, mitigation, forestry, and others are mutually supporting.
- Varied mitigation strategies including outreach, regulatory options, environmental, and physical/infrastructure.
- The plan is goal driven and strategically mapped out from the start.
- Public engagement strategies that are participatory and include personal mitigation activities.
- Risk assessments are intelligible and applicable to community hazards and vulnerabilities and influence future development.
- Decision-makers participate in the process and are regularly updated on the status of mitigation strategies.



## Mitigation Strategies

- Be specific about targets, objectives, and timelines.
- Identify funding and resources by name, title, and/or program.
- Consider existing programs with potential expansion.
- Always look for project champions!
- Strategy development and implementation is the primary purpose of the mitigation plan.

Lead	Partners	External	Hazards/Goals	Funding/Costs
State RiskMAP Coordinator ECY	DNB EMD COM WSDOT Coastal Resilience UW OSPI	FEMA	Flood Earthquake Tsunami Wildfire Volcano Landslide	FEMA CTF annual grant \$150k/year to ECY Additional CTF grant for \$28k for one year to EMD
<b>Objective</b> Increase community resilience to natural hazards by identifying actions they can take now to reduce their hazard risk, enhancing local plans, improving outreach through risk communication, and delivering quality multi-hazard data and tools to support those actions. Achieve this, in part, by bringing in partner agencies, such as EMD and DNB, as Cooperative Technical Partners, as funding and project needs allow.				
<b>Description</b> Risk Mapping, Assessment, and Planning (Risk MAP) is a Federal Emergency Management Agency (FEMA) Program that provides communities with flood information and tools they can use to enhance their mitigation plans and take action to better protect their citizens. Risk MAP strengthens local government's ability to make informed decisions about reducing risk through more precise flood mapping products, risk assessment tools, and planning and outreach support.  In Washington State, Risk MAP is a coordinated alignment of several State & Federal Agencies focused on increasing our resilience to natural hazards including floods, earthquakes, wildfires, tsunamis, storms, and volcanoes. The program is managed by the Dept. of Ecology providing the full range of regulatory and technical assistance to local communities to reduce losses to life and property, and protect the natural environmental functions and values of our floodplains. DNB, EMD, COM, and others support Ecology as Cooperative Technical Partners.				
<b>2-Year Fiscal Cycle</b> • Maintain existing scope of work including both Program Management and Community Engagement and Risk Communication tasks.		<b>5-Year Plan Cycle</b> • Update based on 5-year evaluation of annual Business Plan updates.		<b>Long Term</b> • Advance the program to further integrate the State's interests and resources in natural hazard resilience strategies.
<b>Implementation Actions</b> • Complete Flood Map Adoption and Ordinance updates. • Discovery and Resilience Shapers produce reports with implementing actions. • Inform Critical Area Ordinance updates with RiskMAP data. • Technical Assistance is provided from Cooperative Technical Partner agencies. • Hazard Mitigation Plan updates include RiskMAP data and identified projects.				
<b>Recent Advances</b> • Integrating DNR LIDAR. • Partnering with EMD, Commerce, WSDOT. • Flood Map Updates to all Coastal Floodplains.				



## Why Utilities Should Join Mitigation Plans

- Unifying a community's understanding of risk is important to win support for:
  - Development regulations
  - Mitigation projects
- A misalignment of risk understanding can result in new vulnerability to known hazards
- Prioritize actions.
- Add new mitigation partners



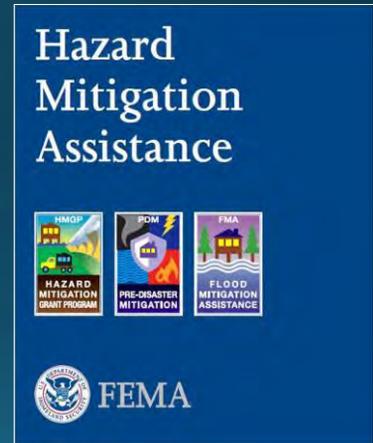


# Hazard Mitigation Assistance Grants: Federal-State-Local partnerships

There are 3 FEMA mitigation grant programs:

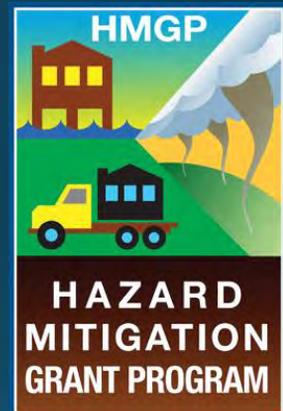
1. Hazard Mitigation Grant Program (HMGP)
2. Pre-Disaster Mitigation grants (PDM)
3. Flood Mitigation Assistance grants (FMA)

- Cost-Share Grants
- 3-year Periods of Performance
- Reimbursement-Based
- Available to Eligible Entities Only
- Competitive



## Hazard Mitigation Grant Program (HMGP)

- **Cost-Share:** 75% Federal, 12.5% State, 12.5% Local (applicant)
- **Application period:** usually 9-12 months
- **Period of Performance:** 3 years
- **Competitive statewide (not nationally)**
- **Frequency:** only available after a Presidential Declaration is declared in WA
- **Eligibility:** Governments and special purpose districts with a FEMA-approved Hazard Mitigation Plan, qualifying non-profit organizations
- **Funding:** 20% of overall FEMA response funds given to WA for the Declaration



## Pre-Disaster Mitigation (PDM) Grants

- **Cost-Share:** 75% Federal, 25% Local (applicant)
- **Application period:** usually 2-3 months
- **Period of Performance:** 3 years
- **Nationally Competitive**
- **Frequency:** Annual. FEMA typically announces in Spring/Summer
- **Eligibility:** government entities and special purpose districts that have, or are formally Annexed to, a FEMA-approved Hazard Mitigation Plan
- **Funding:** determined annually by Congress. 2018 funding is \$249 million



## Flood Mitigation Assistance (FMA) Grants

- **Cost-Share:** 75% Federal, 25% Local (non-federal)
- **Application period:** 2-3 months
- **Period of Performance:** usually 3 years
- **Nationally Competitive**
- **Frequency:** Annual (usually announced in the spring)
- **Eligibility:** government entities and special purpose districts that have, or are formally Annexed to, FEMA-approved Hazard Mitigation Plans
- **Funding:** determined annually by Congress. 2018: ~\$162m



## HMA Grants in WA State

125 ongoing or pending HMGP, PDM and FMA grants in WA State

- 98 are HMGP grants

Most Recent **HMGP**: DR-4309 (application period is now closed)

- 65 Pre-Applications received. 18 Full Applications submitted to FEMA

2018 **PDM & FMA**: Application Period scheduled to open in October

- Must have Hazard Mitigation Plan approved and adopted to apply



Eligible Projects/Activities	HMGP	PDM	FMA
Property Acquisition and Structure Demolition	✓	✓	✓
Property Acquisition and Structure Relocation	✓	✓	✓
Structure Elevation	✓	✓	✓
Mitigation Reconstruction	✓	✓	✓
Dry Floodproofing of Historic Residential Structures	✓	✓	✓
Dry Floodproofing of Non-residential Structures	✓	✓	✓
Generators	✓	✓	
Localized Flood Risk Reduction Projects	✓	✓	✓
Non-localized Flood Risk Reduction Projects	✓	✓	
Structural Retrofitting of Existing Buildings	✓	✓	✓
Non-structural Retrofitting of Existing Buildings and Facilities	✓	✓	✓
Safe Room Construction	✓	✓	
Wind Retrofit for One- and Two-Family Residences	✓	✓	
Infrastructure Retrofit	✓	✓	✓
Soil Stabilization	✓	✓	✓
Wildfire Mitigation	✓	✓	
Post-Disaster Code Enforcement	✓		
Advance Assistance	✓		
5 Percent Initiative Projects	✓		
Miscellaneous/Other <sup>(1)</sup>	✓	✓	✓



## Risk Reduction: Wildfire

Grant-eligible projects include:

- Creating defensible space around essential facilities and infrastructure
- Creating fuel breaks along key roadways and powerlines
- Retrofitting facilities with ignition-resistant materials, especially roofing and siding
- Installing external hydration systems to protect essential structures and facilities



## Risk Reduction: Flood

Grant-eligible projects include:

- Increasing flow capacity of culverts and drainage channels
- Creek/stream channel improvements for floodwater management
- Creating detention ponds, adding buffers and riparian areas
- Retrofitting existing stormwater drainage systems to better handle high-flow events
- Elevating essential facilities and components in flood-prone areas (including roadways)



## Risk Reduction: Earthquake

Grant-eligible projects include:

- Retrofitting key structures and facilities to meet increased seismic performance standards
- Retrofitting water tanks with anchor chairs, increased concrete foundations, isolation valves and flex couplings, SCADA upgrades
- Retrofitting vulnerable pipelines and underground components
- Retrofitting vulnerable bridges



## Earthquake Early Warning: ShakeAlert Projects

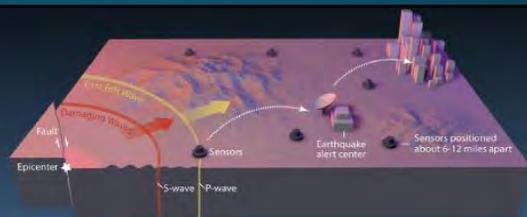
*The DRRA will ensure more EEW projects are eligible for FEMA mitigation grants*

Lake Whatcom Water & Sewer District's pending EEW grant proposal:

1. Complete the USGS pilot application
2. Develop policies and procedures for an early-warning activation
3. Purchase ShakeAlert system hardware and software
4. Integrate the ShakeAlert signal into the existing control system and facilities
5. Install seismic valves and hardware for auto shutoff to water reservoirs



# ShakeAlert™



## Risk Reduction: Severe Storm

Grant-eligible projects include:

- Undergrounding damage-prone sections of power line
- Purchase and installation of emergency backup power generators at essential facilities and components
  - Including automatic transfer switches

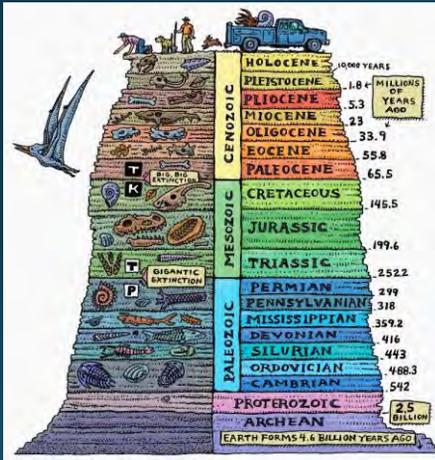


## Application Process (FEMA Grants)

1. FEMA releases a notice of funding opportunity
  - PDM/FMA: FEMA sets priorities
  - HMGP: EMD sets priorities
2. EMD releases guidance/notice via [HMA@mil.wa.gov](mailto:HMA@mil.wa.gov) and sets the application due dates
3. Jurisdiction submits applications, EMD reviews, RFIs, and works with jurisdictions to finalize applications
4. EMD selects finalists and submits the packets to FEMA
5. FEMA reviews and RFIs as necessary, EMD works with jurisdictions to complete RFIs. The speed of award depends on number of RFIs and FEMA/EMD workloads



## Mitigation Program – Philosophy



- Hazard mitigation sometimes works on a geologic time scale.
- Big changes, however, often happen all at once after a major event.
- Successful mitigation programs must work on both scales – iterative projects over many years and large changes all at once.



## Mitigation Program – Time

- A typical award timeline:
  - Year 1: Application (4-6 month application period)
  - Year 2-3: Grant award (key decider is amount of environmental assessment required pre-award)
  - Year 6: End of the period of performance (extensions may be possible)
- The key elements necessary for a successful application include:
  - Pre-application submission work
  - Successful cost-benefit analysis
  - Plan and strategy to complete work within the period of performance
  - A good “story” and clear need for the project
  - Persistence, patience, and experience submitting applications



## Long-Range Mitigation Projects

- Evergreen State College facility retrofit program
  - Started with a plan and prioritized facilities for retrofits
  - Retrofitted over half of their prioritized list over the past 10-15 years, many (but not all) with FEMA mitigation grants
- Success:
  - Long-term strategy
  - Patience
  - Leadership support



## Short-Term Mitigation Opportunities

- Major disaster declarations trigger the Hazard Mitigation Grant Program – if your county is declared, you may be prioritized for significant funding.
- Disasters also trigger local awareness and the opportunity to do more before the public forgets.
- Disasters may trigger big changes in land use due to new zoning or land use restrictions.



## Turn Strategies into Project Applications

### Applicants ask:

- What's the problem and how will my proposal offer a long-term solution?
- Where will the proposed work occur, and who will implement it?
- What grant "eligible activity" category does the proposed work fit into?

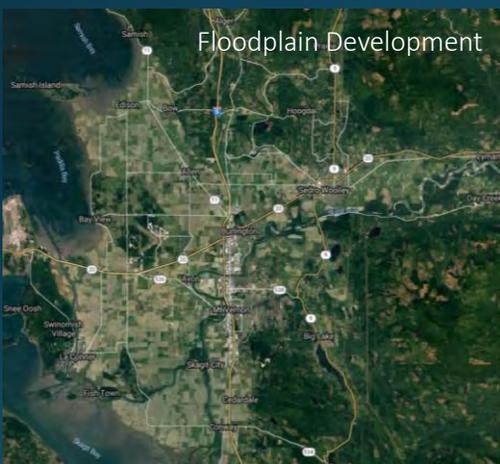
### Proposal Reviewers ask:

- Is the applicant eligible for the grant program?
- Is the proposed action *conceptually* eligible?
- Is the Cost Estimate suitable or competitive, given the total available grant funds?
- Is the proposal likely or unlikely to get a positive Benefit-Cost-Analysis ratio (1 or above)?
- Can the proposed action be completed within a 3-year Period of Performance?
- Overall, how competitive would this proposal be if fully developed for the grant round?





# Hazard Risks in Washington





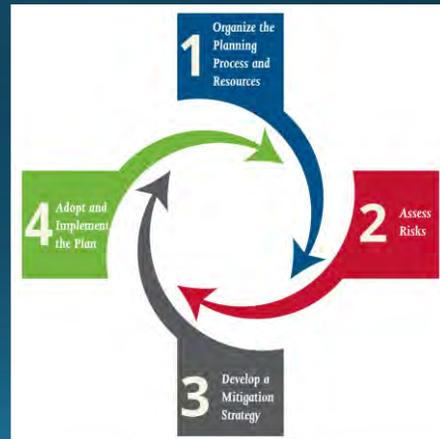
# Beyond Code Requirements

	National Benefit-Cost Ratio Per Peril <small>*BCR numbers in this study have been rounded</small>	Federally Funded	Beyond Code Requirements
<b>Overall Hazard Benefit-Cost Ratio</b>		<b>6:1</b>	<b>4:1</b>
<b>Riverine Flood</b>		7:1	5:1
<b>Hurricane Surge</b>		Too few grants	7:1
<b>Wind</b>		5:1	5:1
<b>Earthquake</b>		3:1	4:1
<b>Wildland-Urban Interface Fire</b>		3:1	4:1



## Hazard Mitigation Planning in Washington

- Hazard mitigation planning is driven by FEMA grants and regulations.
- Hazard mitigation is led by emergency management agencies.
- All counties, most cities, and most tribes develop hazard mitigation plans as a pre-requisite to receiving federal mitigation assistance grants.



## Land Use Planning in Washington

- Washington has a mosaic of land use plans that take into account elements related to natural hazard risk.
- Shoreline master programs help build resilient shorelines and focus on landslides, coastal erosion, flooding, channel migration, and sea-level rise.
- Comprehensive plans include land use codes and mitigation requirements for frequently-flooded areas, erosion areas, and geologically-hazardous areas.
- Washington recommends that hazard mitigation planning teams involve departments responsible for planning and land use regulation.



## Comprehensive Mitigation Programs

- A successful plan and planning process can help build a culture of risk reduction, personal preparedness, and thoughtful regulations.
- Comprehensive mitigation programs include a framework of plans, policies, practices, and public engagement.
- Models to do this exist with groups like the Fire Adapted Communities Learning Network.
- There are too many pieces to the risk reduction puzzle to manage within a single agency. The key to resilience is a frank analysis of risks, the development of strategies to reduce them, and the commitment of partners to implement them.



## Purpose of Plan Integration

- Unifying a community's understanding of risk is important to win support for:
  - Development regulations
  - Mitigation projects
- A misalignment of risk understanding can result in new vulnerability to known hazards
- Prioritize actions.
- Add new mitigation partners



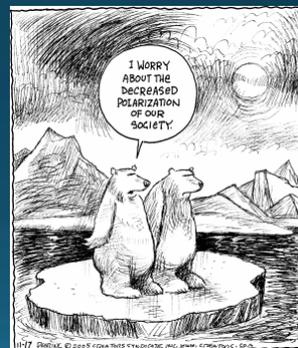
## Current State Initiatives

- An assessment of local hazard mitigation plans revealed major gap in regulatory hazard mitigation strategies.
- EMD, Ecology, and other hazard agencies are contributing to several Growth Management-related processes:
  - Washington's planning framework
  - Building Lands guidance
  - Critical Areas ordinance guidance



## Dealing with Disagreement

- There is often resistance to the integration of hazard data into development regulations.
- Permit offices and planners err toward the “regulatory minimums”
- Often planners might encounter situations where both sides are right.
  - Washington Supreme Court Hirst Decision



## Planning for Risk Reduction



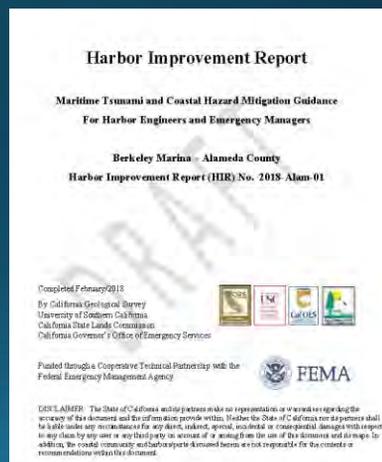
Washington is Beautiful

- Leverage hazard-conscious land-use codes
- Map future floodplains
- Changes in wildfire patterns
- Buy-out threatened properties
- Integrate planning capabilities
  - Comprehensive Floodplain Management Plan
  - Comprehensive Land Use Plan
  - Capital Improvement Plan
  - Hazard Mitigation Plan
  - Community Wildfire Protection Plan



## Port Planning and Distant Source Tsunami

- Distant-source tsunami are the highest-probability event.
- Washington has a recent history of these tsunami.
- Port Resilience Planning is useful more for this event than for any near-source scenario.
- Much of our capability, including tsunami warning buoys, are for distant-source tsunami.



# Strengths and Weaknesses of Our Approach

- Most communities go through a plan update on a regular schedule.
- Mitigation plans require a statement linking different planning mechanisms.
- Regulatory strategies often omitted from mitigation plans due to lack of local integration.
- Mitigation programs are managed across many agencies with different local partners and coordination is difficult.
- **Reluctance to regulate development beyond minimums**



## EMD-Managed Grants

- Pre-Disaster Mitigation
  - Annual, Nationally-Competitive
- Hazard Mitigation Grant Program
  - Disaster-declaration specific, statewide competitive
- Flood Mitigation Assistance
  - Annual, Nationally-Competitive
- Post-Fire Hazard Mitigation Grant Program
  - FMAG-declaration specific, statewide competitive, but prioritize impacted counties

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- Tsunami structures will only meet cost/benefit requirements if they are built to the L1 scenario.



## Disaster Recovery Reform Act of 2018

- Earthquake Early Warning explicitly eligible – can be included in virtually any seismic project\*
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- Act fundamentally expands the role of mitigation for the foreseeable future.



## Planning for Change: La Conner, WA



- La Conner, WA is a city with a Historic District on the National Register that is developed right on the water.
- High tide events have increased dramatically in recent years. As sea level rises, the entire historic district will be threatened, and require significant investment in elevating historic structures, updating the wastewater treatment plan, and other measures.
- The coastal flood events can happen any time that even relatively minor storms are paired with high tide. A tidal event above 12.8 feet causes localized groundwater and coastal flooding as well as wastewater system backups. A tidal event above 14 feet would devastate downtown buildings and infrastructure.
- They have 30-50 years to figure this out.



## Some Potential Land Use Tools

- Transfer of Development Rights
- Buffers and Setbacks
- Stormwater Ordinance
- Building and Development Design Standards
- Post-Disaster Building Moratorium
- Site-Specific Standards
- Use-Specific Standards
- Overlay Zoning
- Critical Areas Ordinance



## Some Potential Mitigation Opportunities

- Better data for critical areas and shoreline planning
- Access to hazard mitigation funding for key infrastructure and related retrofits
- Better data for land use codes and development regulations
- More points for the Community Ratings System (helps lower flood insurance premiums)
- Unified list of mitigation strategies



## Levels of Effort

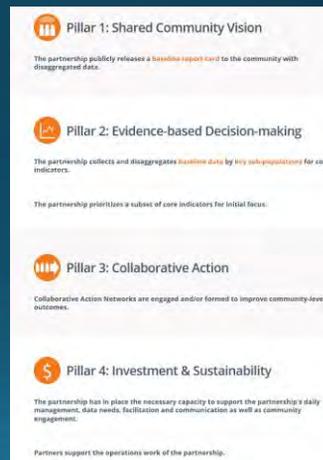
1. Broaden planning teams to include each other's primary stakeholders.
2. Overlay hazard risks onto land use maps prior to establishing growth areas or permitting new development.
3. Update the critical areas ordinance to include hazard extents identified in the mitigation planning process.
4. Specifically authorize or encourage land use tools that can help mitigate hazard risks.
5. Specifically require built-in mitigation in hazard-vulnerable development or prevent new development in hazard zones.
6. Publish higher-than-required code options and explain what building codes mean in terms of hazard survivability.



## A Model for Successful Community Action

- Focus on the data
- Focus on community assets, not deficits
- Create a backbone organization that can bring all the players together, coordinate decision-making and action, and share accountability

Source: *StriveTogether*



## Discussion: Plan Integration

- Break into groups:
  - Policy group (elected and appointed commissions and officials)
  - Land use code group
  - Urban design/building code group
  - Critical areas group
- Review the City of Westport HMP and Comp Plan
- Using PAS Report 560, [PlanningforHazards.com](http://PlanningforHazards.com), and the FEMA guide, identify an approach to integrate hazard-consciousness into the Westport Comprehensive Plan.
- Report out in 45 minutes.



## Tsunami-Conscious Code

- Using your tools, what would a tsunami-conscious land-use code look like for Westport?
- Report out in 30 minutes.



## Climate Change-Conscious Code

- Using your tools, what would a climate-conscious land-use code look like for Westport?
- Report out in 30 minutes.



## Risk Communications

- Using the materials, please develop talking points useful for executives, city staff, and interested residents.
- What are the potential arguments and counter-arguments you (and they) might face?
- The goal is to develop talking points and a communications strategy you will use to support your clients in convincing skeptical residents and decision-makers.
- Report out in 30 minutes.



## Discussion Topics

- Should Westport develop a “hazards” element to the comprehensive plan or integrate hazards throughout the comprehensive plan?
- What are the key pivot points where hazard information could help Westport develop a better comprehensive plan and a more resilient future?
- What data and information do you need to be effective in helping Westport plot a path forward on hazard integration?
- How do you propose addressing the sentiment “this won’t work in my community because they don’t believe/care/etc?”
- What do you think of the quote, “our state is program rich but system poor?” What does this mean in the context of our work to implement resilient planning strategies?

