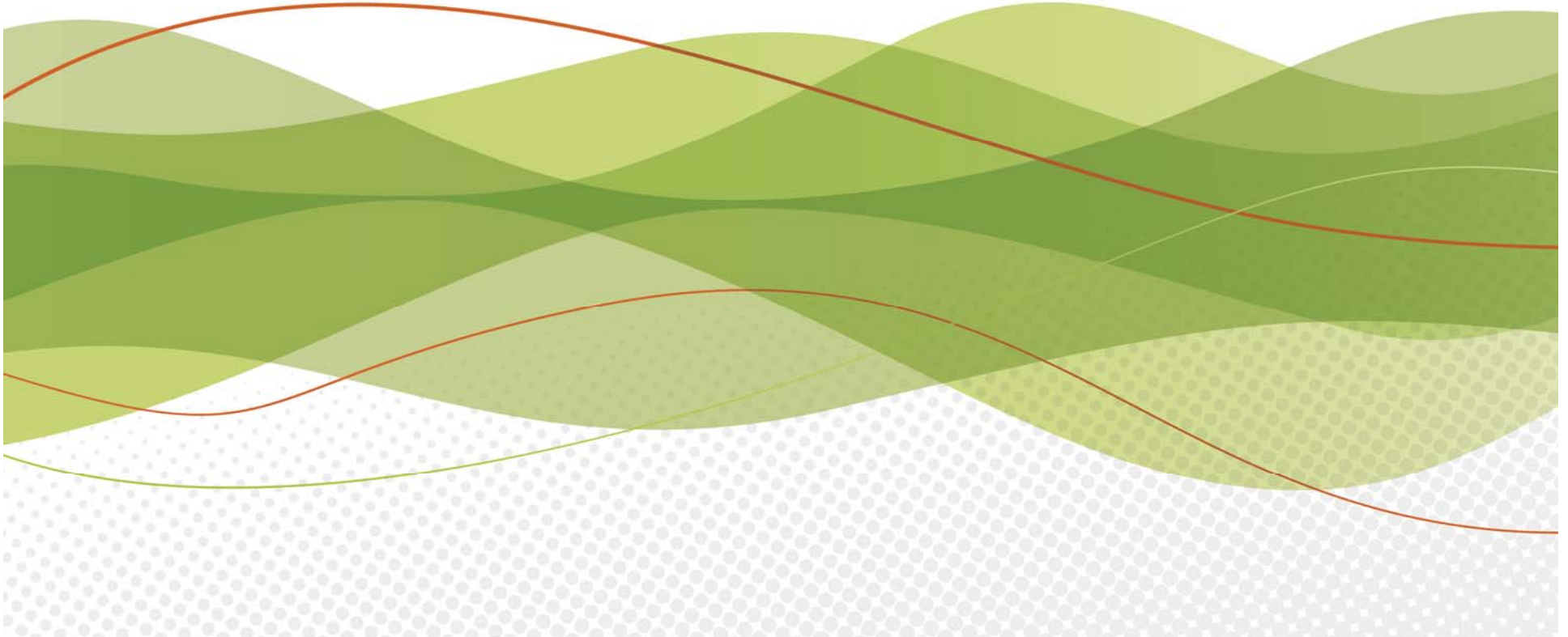




# TimberWorks: Resiliency and Restoration Plan

Community Meeting  
April 28, 2016



# Agenda

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1. Introductions
2. Review Purpose & Goals of Plan
3. Review Assessment of Existing Conditions
  - a. Areas of Recurring Flooding Impacts
  - b. Discussion of Drivers of Flooding
  - c. Discussion of Condition / Constraints in Current Drainage System
4. Discussion of Typologies of Improvements
  - a. Types of Projects
  - b. Applicable Locations
5. Update on Status of Northshore Levee Design
6. Next Steps



# TimberWorks Plan

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- **Purpose:** Reduce floods, improve fish habitat, improve community spaces, stimulate economy
- **Outcomes:**
  - Comprehensive, broadly supported approach
  - Prioritized set of projects
  - Funding and implementation strategy



# TimberWorks Plan

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- **Goals:**

- Reduce flood risk in Aberdeen and Hoquiam
- Enhance habitat for fish and wildlife and improve water quality
- Create attractive and active public spaces
- Support economic and community development
- Maximize cost efficiency and build community support through meeting multiple goals
- Foster partnerships and collaboration among public and private parties



# TimberWorks Plan

Step 1: Master Plan

Step 2: Feasibility Analysis

Step 3: Design & Permitting

Step 4: Construction /  
Implementation

Community Engagement and Partnerships

Pilot Project / Proof of Concept – Expedited to Design and Construction

## Elements

- Research - Compiling Existing Information, Review State Of The Science / Case Examples, Targeted Additional Studies
- Identifying Universe Of Opportunities To Address Challenges
- Defining Action Steps To Move Projects Forward

## Outcomes

- Articulate Vision, Goals And Objectives
- Set Of Prioritized Opportunity Sites And Projects – 10% Design Level
- Funding Strategy

## Elements

- Detailed Engineering Analysis & Cost Estimating
- Detailed Hydraulic and Hydrologic Analysis

## Outcomes

- Concept Plans – 30% Level
- Prioritize Opportunity Sites
- Analysis of Construction and Maintenance Funding Options
- Economic Assessment of Costs and Benefits

## Elements

- Engineering Design
- Cost Estimating
- Bid Documents
- Land Use And Environmental Permitting

## Outcomes

- Final Plans & Bid Documents
- Documents
- Funding Strategy

## Elements

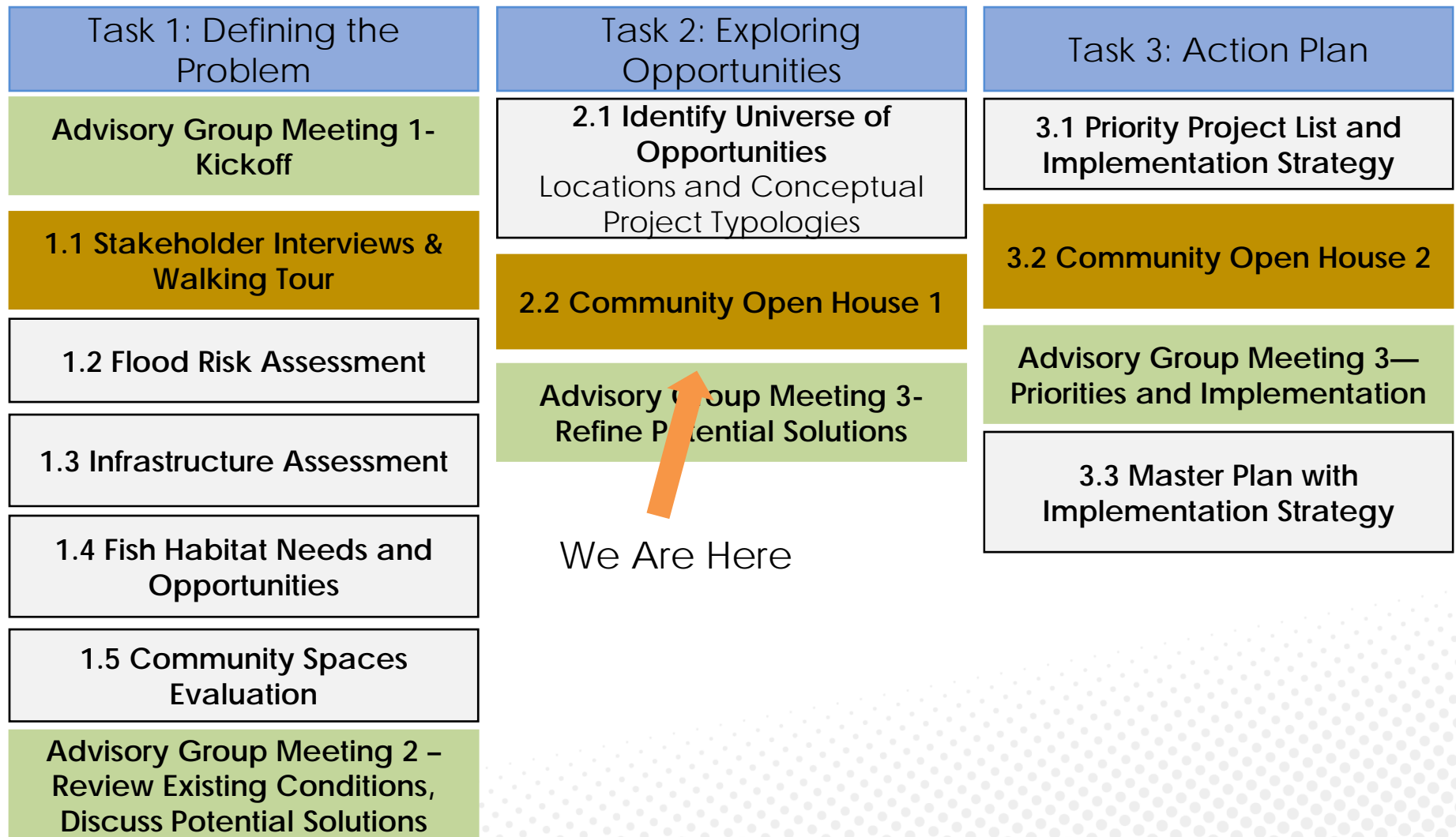
- Construction of Physical Improvements
- Implementation of Programmatic Efforts

## Outcomes

- Constructed

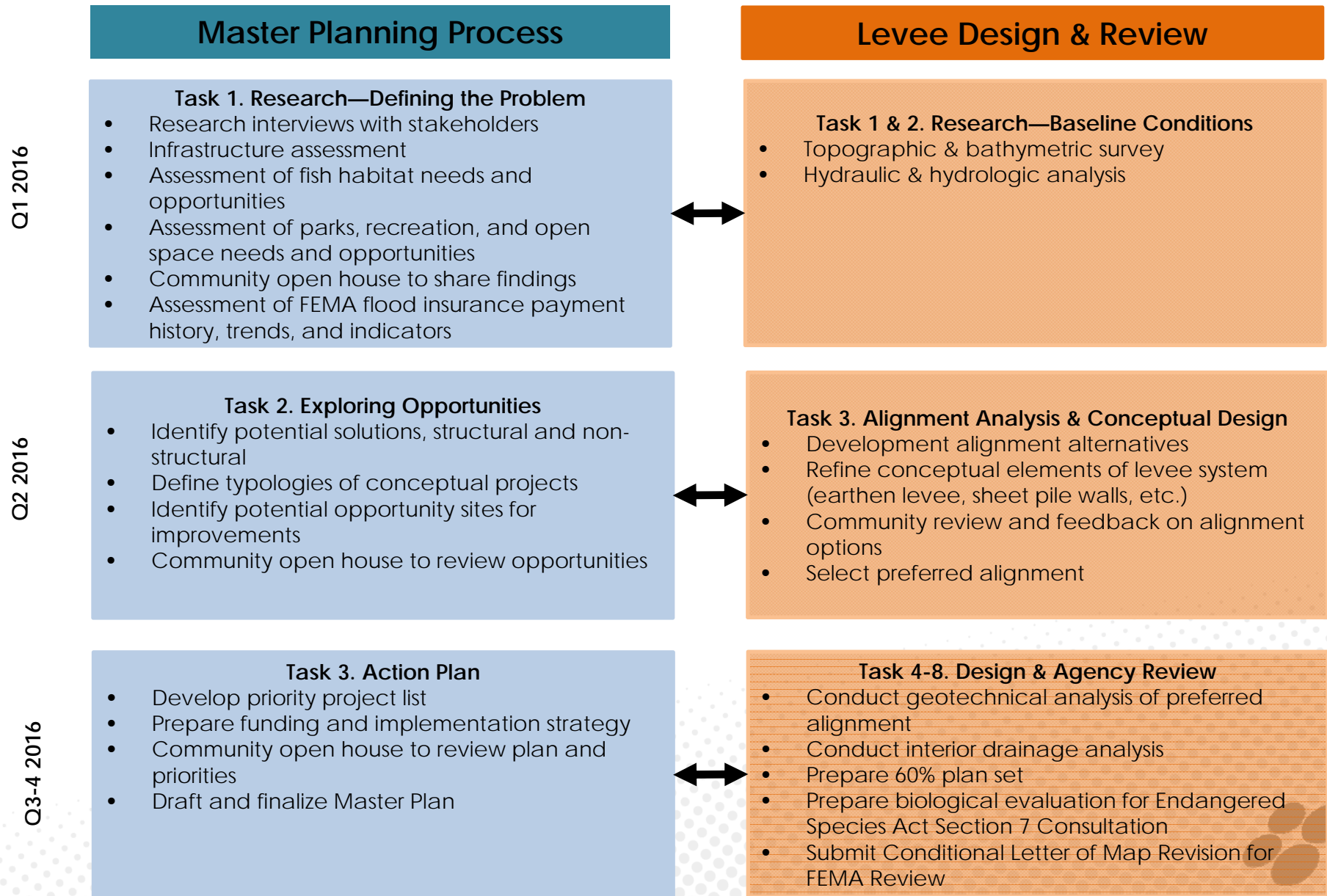


# Work Plan





# Coordination: Master Plan and Levee Design



# FEMA Risk Assessment Statistics

City	Flood Insurance Policies	Total Insurance Coverage	Buildings in Special Flood Hazard Area	Projected Building Loss for 100 Year Flood
Aberdeen	933	\$137 M	32%	\$72 M
Hoquiam	1,153	\$150 M	83%	\$68 M

- Source: FEMA. Draft Risk Report for Grays Harbor County. 2014.





# Economic Impacts of Flood Insurance

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## National Flood Insurance Program

- Aberdeen in program since 1984
- Hoquiam in program since 1979
- 2016 annual premiums: \$2.3 M
- Paid losses since inception: \$5.1 M
- Paid losses prior to Jan 2015 Storm: \$0.9 M
- Total # of Policies
  - 2015: 1,780
  - 2016: 1,632
- Source: FEMA – Aberdeen and Hoquiam Claims Records Request



# Stakeholder Interviews

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- Key Themes
  - Flooding in Hoquiam and Aberdeen is a combination of storms, tides, and aging conveyance and pump systems
  - Flood rates are a huge concern for residents and businesses, preventing community investment.
  - Biggest flooding issues on Cherry Street, Queets Street, K Street, South Aberdeen
  - Drainages and culverts are old and in declining condition
  - Pump stations in many cases are not adequate to address 100 year storm event
  - Need to plan for rebuilding systems
  - Open space to address flooding is of interest to the community



# Walking Tours – March 30

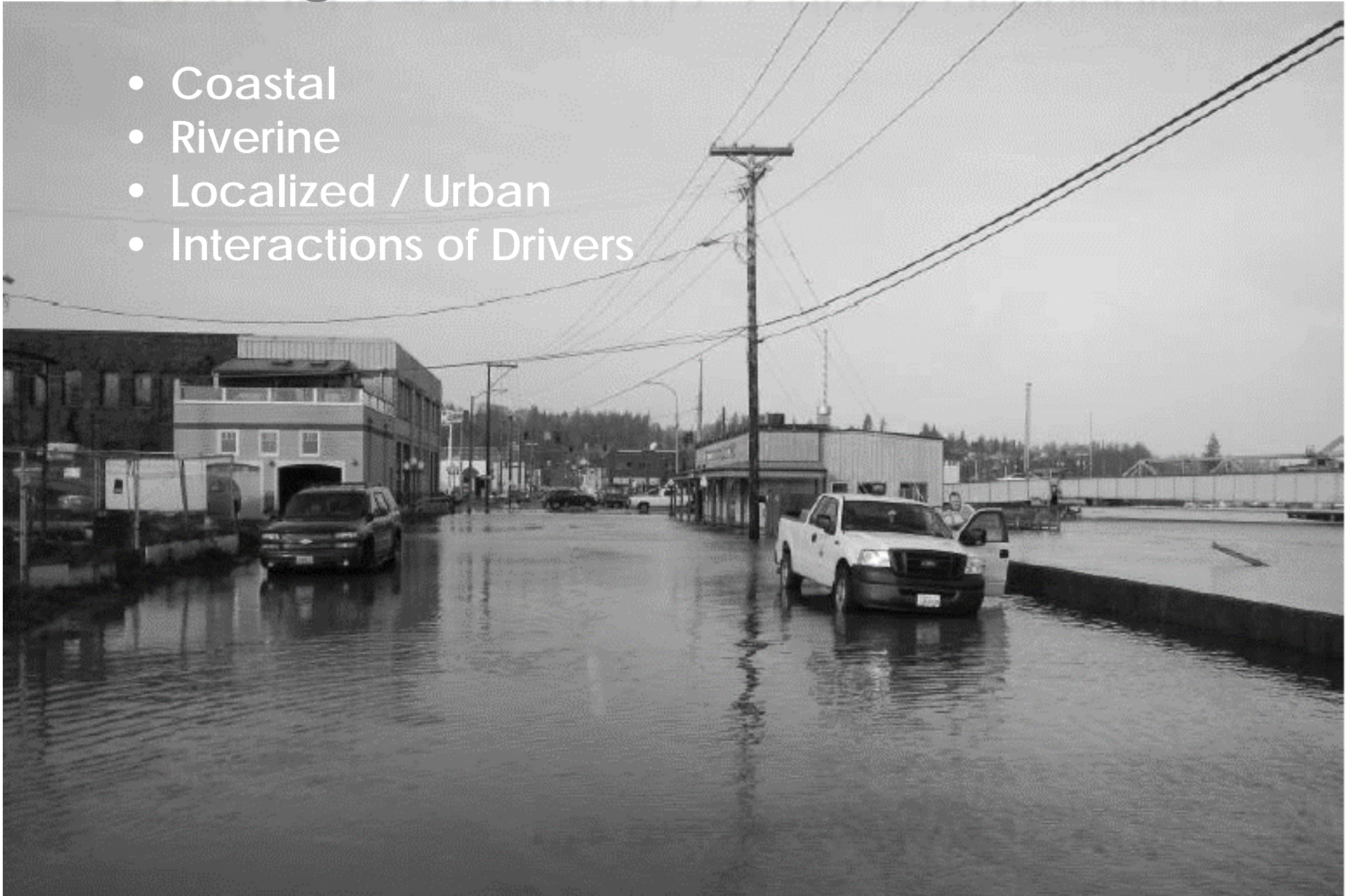
- Key Themes
  - Extent and frequency of flooding impacts and property owner responses
  - Opportunities to use publically owned lands
  - Interest in combining open space, habitat, and flood protection





# Existing Conditions: Causes of Flooding

- Coastal
- Riverine
- Localized / Urban
- Interactions of Drivers





# Typologies of Solutions



# Potential Solutions

#	Project Type	Coastal Flooding	Local Flooding
1	Upgrade Pumps	Yes	Yes
2	Levees	Yes	No
3	Land Use Controls in Upper Watersheds – zone change, clearing limits	No	Yes
4	Land Preservation in Upper Watersheds	No	Yes
5	LID Stormwater Retrofits – Upper Watershed – <i>rain gardens and swales along streets</i>	No	Yes
6	LID Stormwater Retrofits – Lowlands – rain gardens and tree planting	No	Yes
7	Flood Storage Parks	No	yes
8	Floodplain Reconnection	No	Yes
9	Property Buyout	Yes	Yes
10	Sediment Trap Basins	No	Yes
11	Drainage Pipe Capacity Increases	No	Yes



# Potential Solutions

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## 1. Upgrade Pumps

- Increase capacity to drain pipes
- Reduce impacts to fish
- Requirement of FEMA approval of levee



Example fish screen



Typical pump station





# Potential Solutions

## 2. Levee System

- Barrier to coastal flooding
- Potential to remove areas from FEMA flood zone
- Combination of floodwall, earthen levee, raised streets, and tie ins to high elevation areas



Flood wall  
Mt. Vernon, WA



Earthen levee with trail  
Washougal, WA



# Potential Solutions

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## 3&4. Land Protection

- Zoning and Regulatory Controls
- Conservation Easements





# Potential Solutions

## 5&6. Low Impact Stormwater Retrofits

- Limited infiltration capacity
- Dispersed potential to retain and slow runoff



Green street  
Portland, OR



Rain barrel example



# Potential Solutions

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## 7. Flood Storage Parks

- Limited by depth to groundwater
- Consider creating storage tanks
- Opportunities in publically owned lands



Aberdeen



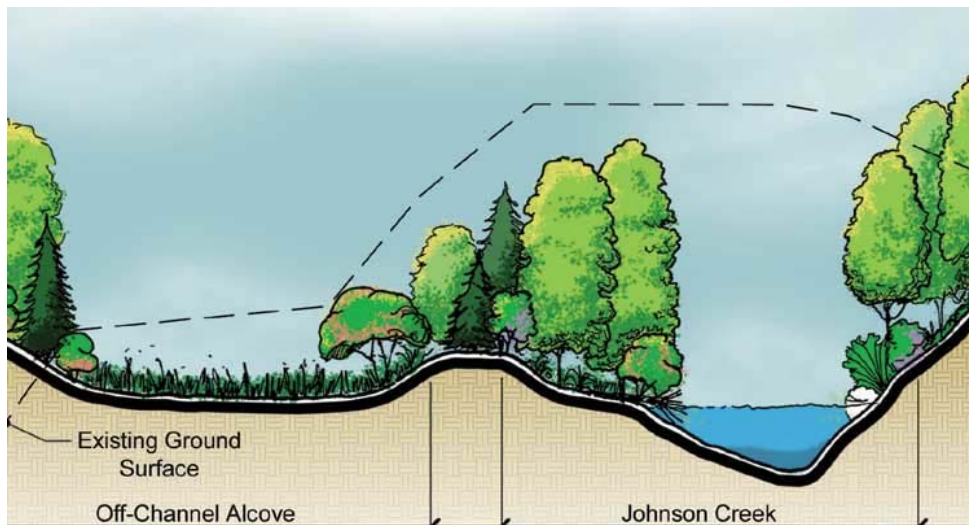
Madison Valley  
Seattle



# Potential Solutions

## 8. Floodplain Reconnection

- Increase flood storage capacity
- Increase habitat diversity
- Fry Creek, Wilson Creek



Johnson Creek,  
Oregon





# North Shore Levee: Status Update



- Project to obtain 60% design and FEMA Conditional Letter of Map Revision (CLOMR)
- Topographic and bathymetric survey under way
- Hydraulic and hydrologic modeling under way



# Next Steps

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- Community Open House
- Preliminary Evaluation of Solution Types
  - Flood benefit
  - Habitat benefit
  - Community benefit
  - Order of magnitude costs
- Recommended project list
- Advisory Group Meeting #3
  - Review Recommended Projects





# Thank You

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