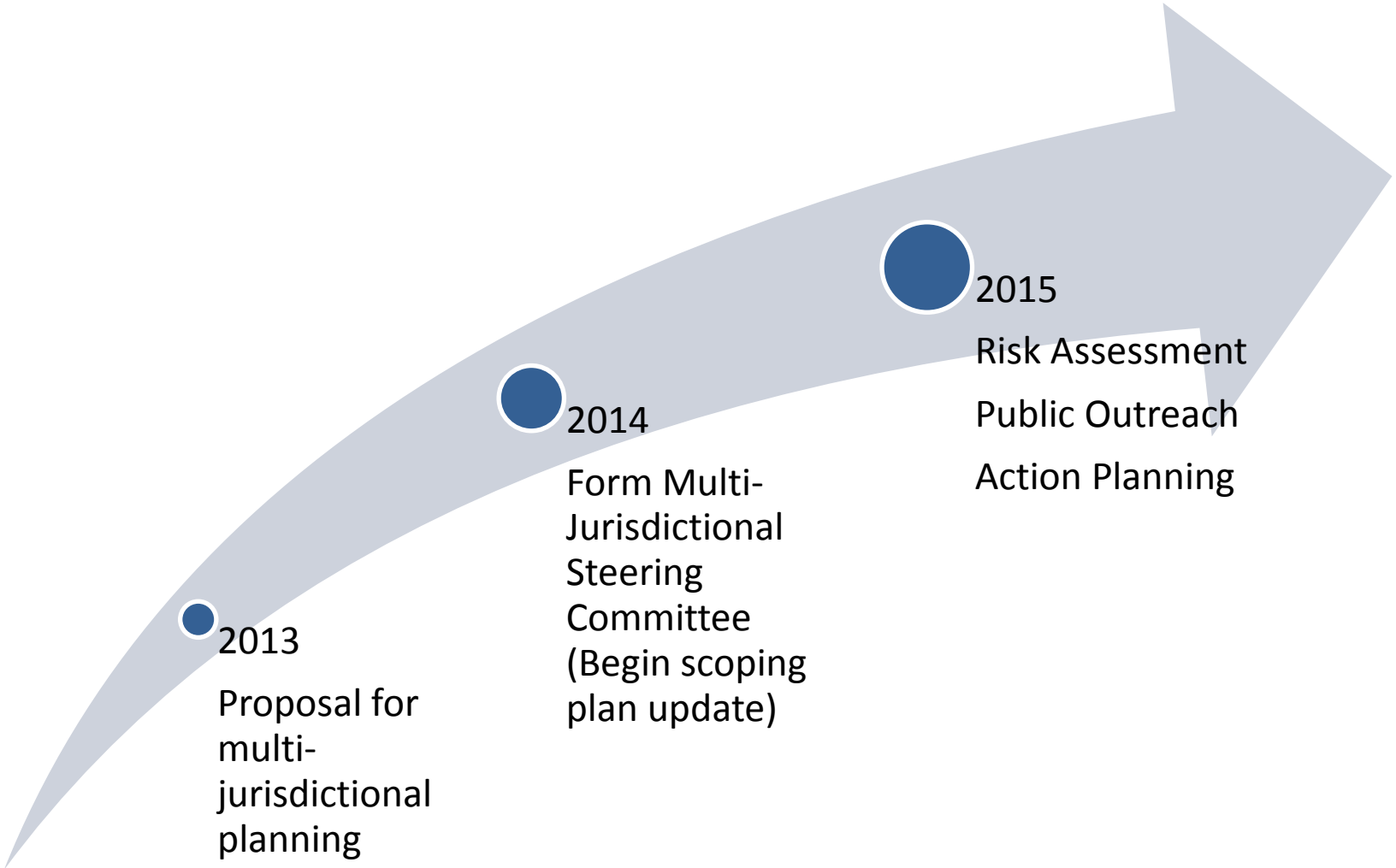
Hazard Mitigation

Strategy Workshop

Oct. 1, 2015

Hazard Mitigation // Planning Process



Hazard Mitigation // Mitigation Strategy

Today's portion of the process

Figure 6.1: Illustration showing Mitigation strat

Foster a disaster-resilient community:

- Risk-consciousness
- Inclusive and collaborative
- Equity is a key consideration
- The risk to health and safety minimized
- Effectively and efficiently recover from disasters

Hazard Mitigation // Goals

1. Strengthen capacity of whole community
2. Consider economic, health and social services, housing, infrastructure, and natural and cultural resources.
3. Prioritize high benefit-to-cost ratio and increase social equity
4. Include mitigation after a disaster

(see handout)

Hazard Mitigation // Mitigation Actions

- Specific action, project, activity, or process to reduce long-term risk
- Categories (see handout):
  - Local Plans and Regulations
  - Structure and Infrastructure Projects
  - Natural Systems Protection
  - Education and Awareness Programs
  - Planning Process and Analysis

Hazard Mitigation // Actions Data

- Responsible Organizations (Lead or POC ideal)
- Participating Jurisdictions
- Timeframe: Year/range to complete project *or post-disaster* (avoid ongoing)
- Capacity/Funding Needs (estimate high, med, low if details not available)
- Potential Funding Source (e.g. local, grant, etc)
- Implementation Mechanism (e.g. CIP, plan, etc)

Hazard Mitigation // Screening Criteria

- ✓ No adverse social impacts
- ✓ Technically feasible
- ✓ Legal authority
- ✓ Administrative capacity exists
- ✓ Political/public support
- ✓ No adverse environmental impacts
- ✓ Addresses an identified risk
- ✓ Meets goals and consistent with other community plans' goals

Hazard Mitigation // Prioritization

Criteria	High	Medium	Low
Equity	Social equity benefits are highly likely	Social equity impacts likely neutral to positive	Social equity impacts likely neutral to positive
Benefit-Cost Ratio	Highly likely that benefits will outweigh costs	Likely that benefits will outweigh costs	May need more info for preliminary estimate of BC
Timing	Should implement as soon as possible	Implementation in 1-5 years would be desirable	Implementation can wait beyond 5 years if necessary
Available capacity	Capacity/funding highly feasible in 1-3 years	Capacity/funding feasible within 5 years but may need to be further explored	Capacity/funding uncertain to unlikely within 5 years

Hazard Mitigation // Equity Questions for Actions

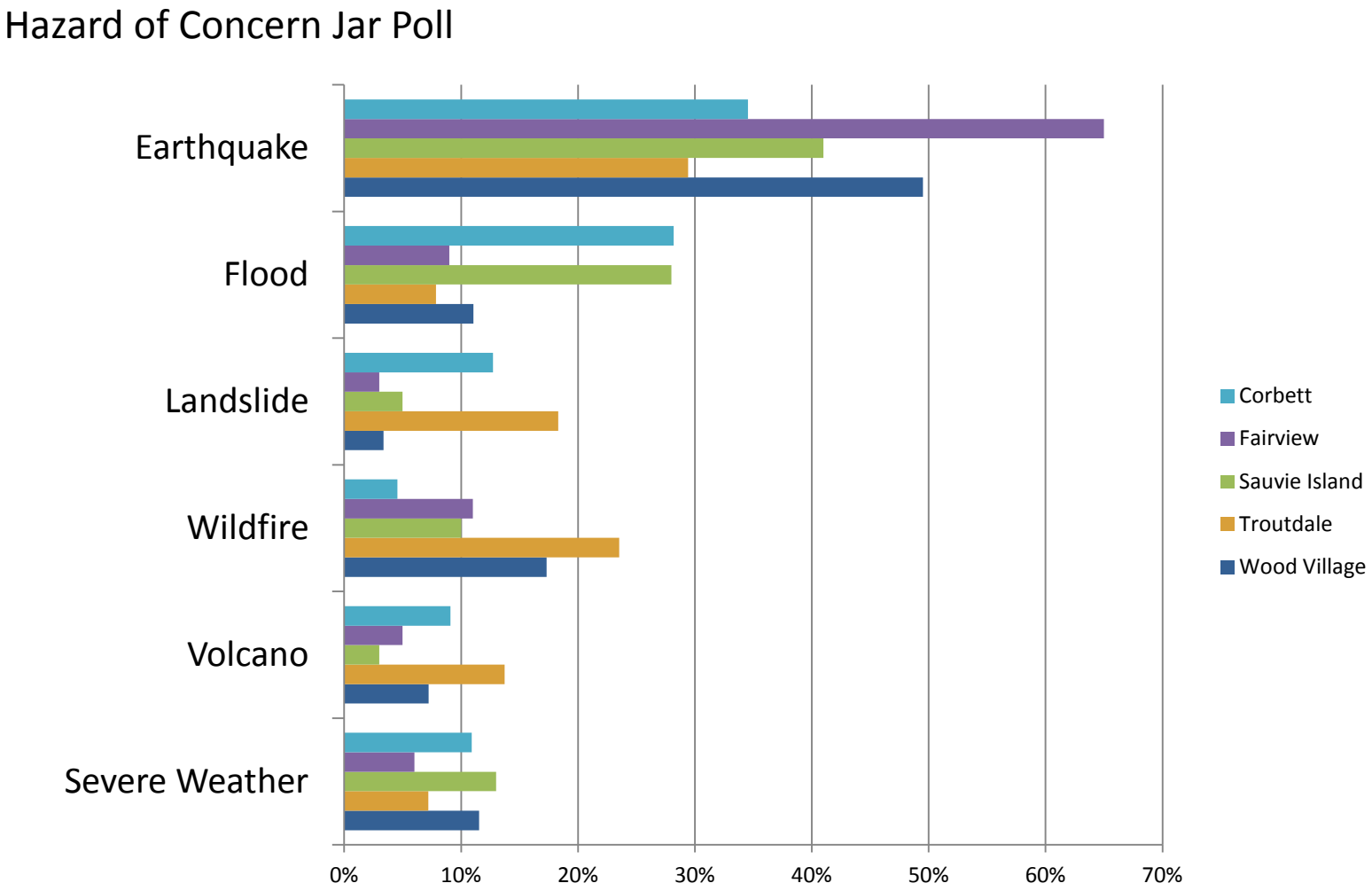
1. Disproportionate impacts avoided/mitigated?
2. Benefits targeted to reduce disparities?
3. Benefits broadly accessible across community?
4. Engages and empowers?
5. Builds capacity for underserved communities?
6. Aligns and supports communities?
7. Builds relationships and trust?
8. Economic opportunity to underserved community?
9. Appropriate accountability mechanisms?

Hazard Mitigation // Equity in Practice

- Understand socio-economic vulnerability and use to target progressive action
- Understand cumulative or collaborative effects of initiatives/policies
- People-friendly & culturally-responsive strategies, e.g. translated materials, childcare
- Partner with and support cultural liaisons
- Fund community-based initiatives /Avoid duplication of community initiatives
- Institutionalize representation from impacted communities in decision-making processes
- Provide transparent & proactive communication to impacted communities

See handout: Equity Objectives

Hazard Mitigation // Hazard Risks



Hazard Mitigation // Hazard Risks

- Infrastructure & utilities are vulnerable
- Pre-code structures
- Large liquefaction zones, e.g. Sauvie Island
- Cascading/ secondary hazards (e.g. fire, landslides, dam failures, HazMat releases, etc)

Earthquake

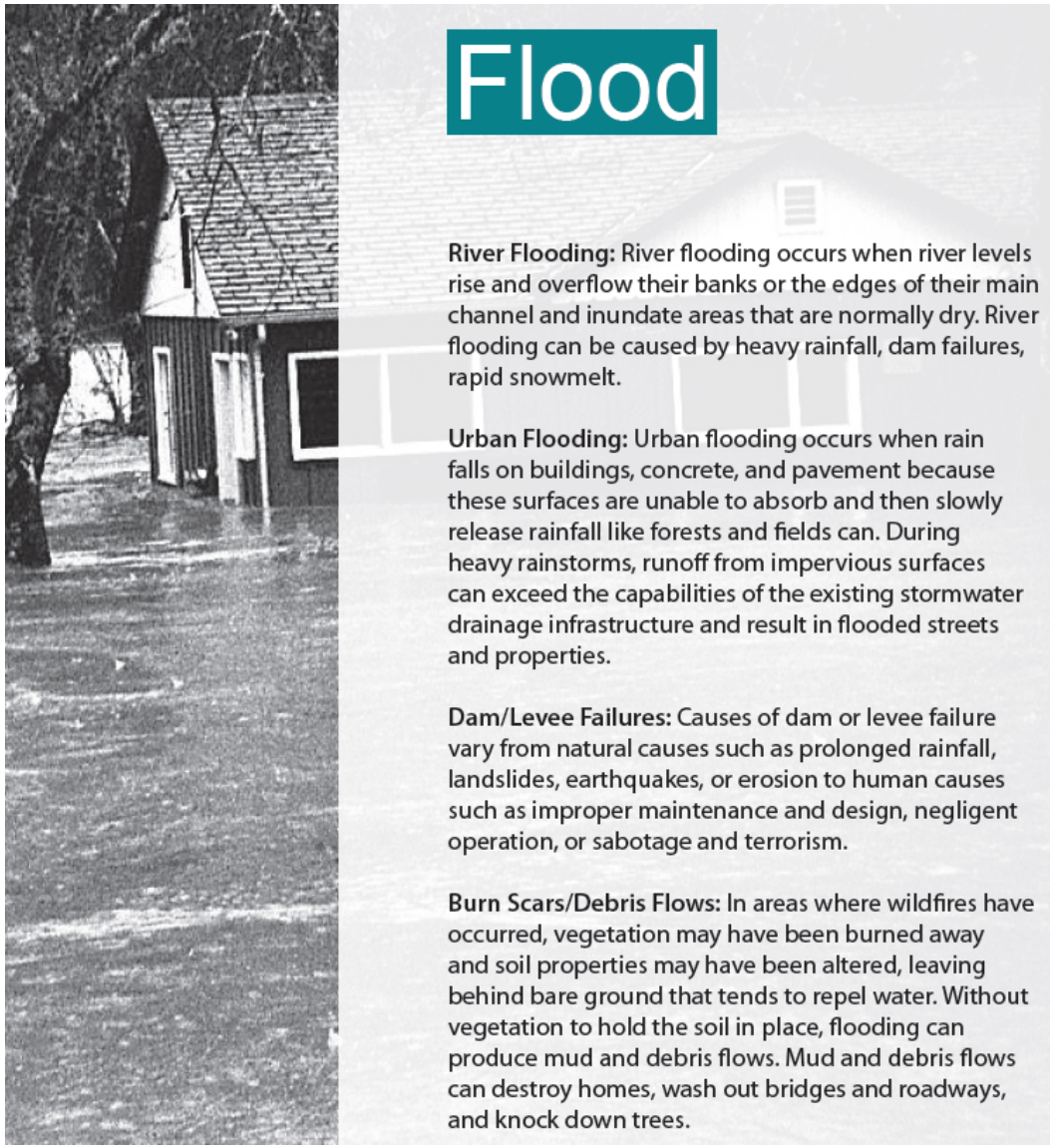
Ground shaking: Ground shaking describes the vibration of the ground during an earthquake. Most earthquake damage results from the shaking caused by seismic waves passing beneath buildings, roads, and other structures. For example, ground shaking may cause a store's exterior building walls to crumble, injuring people, blocking sidewalks and streets and bringing down utility lines. Ground shaking is also the trigger for other hazards such as liquefaction and landslides.

Landslides: Earthquakes can trigger landslides, especially in areas with water-saturated soils, a common characteristic here. Landslides may result in falling rocks and debris that collide with people, buildings and vehicles. They also can block roads and disrupt utility lines.

Liquefaction: Liquefaction describes the way in which soil liquefies during ground shaking. Liquefaction can undermine the foundations and supports of buildings, bridges, pipelines, and roads, causing them to sink into the ground, collapse or dissolve.

Hazard Mitigation // Hazard Risks

- Levees need certification to protect along Columbia
- East county areas due for flood map updates
- Gresham, Fairview, Troutdale, and Sauvie Island estimated to have many damaged homes in a 1% flood
- Sandy River channel migration: structures & infrastructure at risk in unincorp. & Troutdale
- Potential for dam failures



Hazard Mitigation // Hazard Risks

- New wildfire risk maps need vetting
- Majority of high risk is in West Hills and east of Sandy River, although 57 Communities at Risk (CARs) identified in CWPP
- Risk issues in CARs include: structural ignitability, access, heavy fuels, water supply, human-caused ignitions
- Recent drought and hot summers increasing risk

Hazard Mitigation // Hazard Risks

- Lahar zone along Sandy River through unincorporated, Troutdale, Fairview, Wood Village, and small portion of Gresham (.001% annual chance/ 100,000-year event)
- Ash fallout from Mt. Hood or Mt. St. Helens could impact countywide

Volcano

Lahar: Lahar is an Indonesian term that describes a hot or cold mixture of water and rock fragments flowing down the slopes of a volcano and (or) river valleys. Eruptions may trigger one or more lahars directly by quickly melting snow and ice on a volcano or ejecting water from a crater lake. More often, lahars are formed by intense rainfall during or after an eruption. Past lahars at Mount Hood completely buried valley floors in the Sandy and Hood River drainages all the way to the Columbia River.

Ash/Tephra Fall: Tephra is a general term for fragments of volcanic rock and lava regardless of size that are blasted into the air by explosions or carried upward by hot gases in eruption columns or lava fountains. Airborne ash causes eye and respiratory irritation, damages unprotected machinery, can short circuit electric–power transmission and distribution lines and endangers aircraft.

Lava Flows: Lava flows are streams of molten rock that pour or ooze from an erupting vent. Lava flow hazards are restricted to the flanks of Mount Hood.

Pyroclastic Flows: Growing lava domes are unstable and shed hot debris, sometimes in large volumes, that may create pyroclastic flows. These flows may sweep out as far as 12 km (7 mi) from their source. Pyroclastic flows can produce lahars and ash clouds. Dome-collapse pyroclastic flows have occurred during all eruptive periods of the past 30,000 years on Mount Hood. They are very likely to occur in future eruptions.

Hazard Mitigation // Hazard Risks

- New, more detailed landslide analysis coming next year
- Landslide hazards mostly in unincorporated east county, West Hills, Troutdale

Landslide

Rockfall: Falls are abrupt, downward movements of rock or earth, or both, that detach from steep slopes or cliffs. The falling material usually strikes the lower slope at angles less than the angle of fall, causing bouncing. The falling mass may break on impact, may begin rolling on steeper slopes, and may continue until the terrain flattens.

Topple: Toppling is sometimes driven by gravity exerted by the weight of material upslope from the displaced mass. Sometimes toppling is due to water or ice in cracks in the mass. Topples can consist of rock, debris, or earth. Topples are often prevalent in volcanic terrain, as well as along stream and river courses where the banks are steep.

Slides: A slides is a downslope movement of soil or rock mass occurring on surfaces of ruptures or on realtively thin zones of intense shear strain. The volume of displacing material enlarges ffrom an area of local failure.

Spreads: Lateral spreads usually occur on very gentle slopes or essentially flat terrain where a stronger upper layer of rock or soil undergoes extension and moves above an underlying softer, weaker layer.

Debris Flows: A form of rapid mass movement in which loose soil, rock, and organic matter combine with water to flow downslope. Debris flows can be deadly as they can be extremely rapid and may occur without any warning.

Hazard Mitigation // Hazard Risks

- Winter storms and wind storms produce power outages and transportation impacts countywide
- Extreme heat has become more of an issue, particularly for vulnerable populations and particularly in the urban areas

Severe Weather

Winter Storm: A winter storm is an event in which the main types of precipitation are snow, sleet or freezing rain. Most deaths from winter storms are not directly related to the storm itself. Impacts typically include hazardous road conditions, power outages, and prolonged exposure for homeless populations.

High Winds: A windstorm is generally a short duration event involving straight-line winds and/or gusts in excess of 50 mph. High wind events can result in windborne debris, downed trees and power lines, and other minor damage to structures.

Extreme Heat: For this area, several days in a row above 90 degrees Farenheit is typically considered a heat hazard. We have already experienced warming average temperatures and climate change projections show this trend continuing as well as more pronounced seasonal increases in temperature. Extreme heat increases health threats, can impact infrastructure, and can greatly increase energy demands.

Gaps to watch out for:

- Each jurisdiction must have actions specific to them and based on their community risk and priorities
- Action Plan must consider actions to reduce risk to existing built environment and new development