

Blue Cascades VII

Cascadia Subduction Zone Earthquake Recovery Tabletop Exercise

After Action Report



March 21, 2018



May 8, 2018

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ADMINISTRATIVE HANDLING INSTRUCTIONS

1. The title of this document is *Blue Cascades VII, Cascadia Subduction Zone Earthquake, Recovery Tabletop Exercise*.
2. The information in this After Action Report (AAR) is Unclassified.

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SECTION 1: EXECUTIVE SUMMARY

Exercise Name	Blue Cascades VII, Cascadia Subduction Zone Earthquake, Recovery Tabletop Exercise
Exercise Date	March 21, 2018 / 0830-1600
Location	Hilton Seattle Airport & Conference Center, 17620 International Blvd, SeaTac, Washington, 98188- 4001
Purpose	<p>Improve knowledge and understanding of recovery issues building on the following principles:</p> <ul style="list-style-type: none"> • Engaged partnerships • Unity of effort • Timeliness and flexibility • Dependencies and interdependencies
Scope	<p>Puget Sound Region</p> <p>Focus is on 4 of the 16 critical infrastructures</p> <ul style="list-style-type: none"> • Communications • Energy • Transportation Systems • Water and Waste Water
Mission Area	Recovery
Core Capabilities	<ul style="list-style-type: none"> • Operational Coordination • Infrastructure Systems • Economic Recovery
Goals	<p>Participants should improve their collective recovery understanding by achieving the following goals.</p> <ol style="list-style-type: none"> 1. Understand recovery relationships and cooperation 2. Understand the recovery prioritization challenges, dependencies, and interdependencies 3. Develop an outline of the challenges and gaps in recovery 4. Develop an outline of next steps for recovery system improvement
Objectives	<ol style="list-style-type: none"> 1. To identify roles, responsibilities and communication between the entities involved in recovery 2. To identify the process for timely and flexible prioritization of infrastructure and economic recovery 3. To identify dependencies and interdependencies in recovery planning, prioritization, and structures 4. To identify the gaps in recovery processes and planning for improvement

Threat or Hazard	Earthquake and tsunami
Scenario	30 days following a large magnitude Cascadia Subduction Zone fault earthquake and tsunami
Sponsor	King County Emergency Management

SECTION 2: BACKGROUND

The Blue Cascades exercises are developed by Pacific Northwest Economic Region (PNWER), Center for Regional Disaster Resilience (CRDR), King County Office of Emergency Management and other regional partners. They are scenario-based discussion events developed by and for key stakeholder organizations that have significant interests in assuring the security and resilience of the Puget Sound Region and the critical infrastructures. Between 2002 and 2010 there were six Blue Cascades exercises:

- Blue Cascades I (2002) focused on a physical attack;
- Blue Cascades II (2004) on cyber attacks and disruptions;
- Blue Cascades III (2006) on a major subduction zone earthquake;
- Blue Cascades IV (2007) on pandemic disease;
- Blue Cascades V (2008) on disaster logistics and supply chains (food, water and fuel);
- Blue Cascades VI (2010) focused on a major flood combined with an H1N1 pandemic.

One goal of the Blue Cascades exercises is to raise awareness of infrastructure interdependencies and associated vulnerabilities and impacts. Discussions not only identify planning and preparedness gaps but help participants identify partner agencies and explore potential restoration and recovery solutions. Participants represent public, private, and non-governmental organizations. Infrastructure owners and operators from all sectors meet and build partnerships to understand interdependencies for a more resilient region.

Blue Cascades III: Managing Extreme Disasters

Blue Cascades III: Managing Extreme Disasters was a two-day tabletop exercise held in 2006. Over 300 participants from public and private sectors discussed the impacts of a major earthquake and tsunami. The following information was extracted from the Blue Cascades III After Action Report and addresses recovery findings and recommendations.

“BLUE CASCADES III covered response, recovery and longer-term restoration, as well as what preventative and mitigation measures already existed to address a large-scale regional disaster. In the scenario, the quake and resulting tsunami along the coast disrupted and damaged critical infrastructures and caused a prolonged electric power outage that lasted for weeks to months in parts of Washington, Oregon, and California. Among those infrastructures affected were electric power substations, and transmission and distribution lines; bridges, interstate highways, and railways; microwave, electrical and water towers; tunnels and underground cables; water, sewer and industrial waste; and natural gas and fuel pipelines. Exercise participants grappled with how to respond in a situation of widespread infrastructure failures and transportation gridlock as thousands of vehicles were abandoned along the roads and bridges with I-5 and other interstates turned into parking lots.”

Recovery and Restoration

Findings

1. Many participants did not recognize the extent of recovery and restoration challenges, or how long it would take to remove debris and to restore and rebuild structures and critical assets such as electric power transmission and distribution systems. A representative of an engineering firm observed that participants were not “prepared psychologically” to address a disaster in which infrastructure was damaged and destroyed and they lacked necessary recovery plans.
2. Most organizations appeared prepared for low level emergencies but do not have what one participant referred to as a “comfortable level of planning”.
3. While there are mutual assistance agreements in place (e.g., among utilities, local governments, and states) there would be no guarantee that these would be honored given the wide-spread impact of the disaster. Organizations would need to be as self-reliant as possible and arrange for mutual aid agreements with organizations outside the area that would not be affected by a disaster in the region.
4. Restoring electric power resulting from a prolonged regional outage requires cooperation, contingency planning, and exercise and training among regional power companies.
5. Availability of transportation infrastructure is necessary for restoration of critical infrastructure operations and other essential services. Impediments to road and rail travel could be compensated by use of marine transportation, and or medium and heavy lift helicopter, if such assets are available.
6. Organizations had no way to gain information on what resources were available. For example, Cingular noted that it has “loaner” cell phones, portable cell phone sites, and cellular phones that plug into laptop computers to create internet connectivity. The federal government was said to be working on a process to channel private sector assistance to government authorities in a crisis.
7. There was no management system to prioritize, allocate and ensure transportation of resources to areas of most need.
8. There was much discussion on priorities regarding service restoration in an environment when there would be great demand and competition for being towards the top of the prioritization list. Some participants pointed out that states, localities, and utilities had already established priority lists, and these should be followed. Other participants, such as the Postal Service, expressed concern that they were far down on the list and would not gain services for “some period of time”. Still others noted that priority restoration should be flexible depending on need. At the same time, most participants appeared to understand that in a major disaster priority lists would likely “go out the window”, and that infrastructure interdependencies should play a role in which services were restored and in what sequence. As one participant put it, “priorities are different depending upon where you sit.” In addition, there was also some discussion related to what is most critical. Participants questioned whether it is the water supply system, hospital, transportation, food and agriculture operation, or life safety such as emergency services. As an electric power representative observed, “understanding what ‘critical load’ is will help establish restoration priorities.”
9. How to manage the influx of volunteer aid (people, food, clothing, materials, equipment, etc.) from outside the region was not apparent. Also unclear was what organization would be in charge of

managing such donations or how organizations or jurisdictions that needed these resources would be identified, prioritized according to criticality of need, or how the donated service of materials would be dispatched to where it was most needed.

10. A major challenge identified by participants was the shortage of personnel needed for restoration activities, particularly construction workers, structural engineers to certify buildings, bridges, and tunnels as safe to enable businesses, utilities, and other key service providers to resume operations and to allow people to leave shelters, return to their homes, or to return to work.

11. Relighting pilot lights after a widespread and prolonged natural gas, propane (LPG), and power disruption was a major problem from a safety standpoint and particularly because of the large numbers of trained technicians and the time required. Water utilities, like natural gas utilities, could cause significant damage to buildings should they restore water service to buildings prior to checking the integrity of the plumbing systems installed in those buildings.

12. It would take a minimum of two weeks to put together storage and distribution of fuel, and this could be assisted by Navy tankers if necessary. For oil refineries that had not sustained significant damage, it would take two-to-seven days to resume operations if electric power was restored.

13. Debris removal and disposal emerged as a major issue. In certain cases, debris removal would need to take place before repairs to resume essential operations could be completed. Environmental and public health issues would need to be addressed.

14. Certification of workers brought into the region for restoration purposes was raised as a key need. Also needed were relief from, or streamlining and simplification of, permitting processes that are difficult and time-consuming. A utility representative noted it was “easier to get assistance from British Columbia than from other states.”

15. Security of infrastructures during the restoration process was also a concern; there would be a need to protect critical assets and resources such as fuel, power generators, and other equipment.

16. The role of the U.S. Military in restoration was not a focus of the exercise. As one participant noted, “It is not clear what the military could/would bring to the ‘fight’.” It was noted that in Canada the military is tasked with moving people and materials. A DoD representative said, “our hands are tied,” with regard to providing assistance.

17. It was noted that organizations will need to be constantly re-assessing their requirements against capabilities, available resources, and how much they will need to invest to restore operations. This will demand significant resources

Recommendations

1. Develop a cooperative long term regional post-recovery restoration strategy that takes into account all key stakeholder interests and which recognizes that the post-disaster status of the impacted communities will be different than pre-event.

2. Procedures should be developed to encourage and assist small businesses as part of restoration plans.

3. Develop a model Resources Management Clearinghouse to enable providers and requestors to register their respective supplies, products, services, and their needs.
4. Establish criteria and a plan for conducting system and structural certification inspections as part of disaster preparedness.
5. Develop a debris management plan.
6. Organizations should work together to determine the need for out-of-region workers and develop a plan for accessing, certifying, and bringing in personnel resources from outside the area if required.
7. Procedures should be developed to enable businesses to contribute resources without fear of liability.
8. Good Samaritan laws need to be adopted or improved to facilitate volunteer assistance.
9. The Puget Sound Partnership, or the broader Pacific Northwest Partnership, should hold a workshop for key stakeholders that focuses on what both civilian and defense federal authorities can “bring to the table” in terms of services and resources for recovery and restoration. The workshop would also examine issues associated with access to these services and resources and their effectiveness, including impediments, and recommend ways for improvement.
10. State, local government, and regional military facilities should develop guidelines to use military vessels to transport basic necessities and essential components and equipment to areas that are impassable to land transportation.
11. Sectors reliant on obtaining materials from manufacturers and distributors in other parts of the country to reconstitute their systems need to plan with their local suppliers as to how those resources are to be located and transported to the place they are needed and how the movement of these items is to be tracked and accounted for.

SECTION 3: EXERCISE PARTICIPANTS

About 130 people registered for the Blue Cascades VII exercise with over 100 in attendance. Participants were from local, state, and federal governments, special purpose districts, non-profit organizations, business, and others. Various disciplines were represented including transportation, water and wastewater delivery, healthcare, security, communications, emergency management, education, information technology, and energy. Participants serve their organizations in a variety of roles including analysts, supervisors, directors, program and project managers, coordinators, support roles, counselors, and volunteers.

Experience in recovery planning varied with just a few who considered themselves highly experienced, a few with little experience, and most of the room falling somewhere in between. Several participants had extensive experience working in the response phase of disaster and in planning efforts for response, but not much time spent on long term recovery planning.

SECTION 4: OVERVIEW

Blue Cascades VII, Cascadia Subduction Zone Earthquake, Recovery Tabletop Exercise was held at the Hilton Hotel, Seattle Airport & Conference in Sea Tac, Washington, on March 21, 2018. This event was sponsored by the Washington State Homeland Security Region 6, Critical Infrastructure Work Group.

Before the start of the exercise, participants were provided with an Exercise Scenario Document and a Situation Manual (attached as Appendix C) that provided an agenda, summary of damages, and issues to be discussed during the breakout sessions.

Though based on the 2016 Cascadia Rising exercise, the scope of this TTX is narrower and focuses on the Puget Sound Region. It addresses recovery efforts surrounding specific infrastructure issues in areas of communications, energy, transportation systems and water & wastewater issues, using the 2016 Cascadia Rising major subduction zone earthquake exercise as its scenario base. It begins 30 days following a 9.0 earthquake off the Oregon Coast which results in significant damage from the earthquake and tsunami that is generated following the earthquake. Damages identified in the Situation Manual are based on a combination of information from the Cascadia Rising 2016 Exercise Scenario, Resilient Washington Report 2012, and the 2013 Cascadia Subduction Zone report by the Cascadia Region Earthquake Workgroup.



Figure 2: Cascadia Subduction Zone

Catastrophic recovery planning is not common among government agencies in Washington State though some agencies have developed frameworks beyond what is normally found in a Comprehensive Emergency Management Plan. FEMA has developed some tools to help organizations as they develop disaster recovery plans and frameworks. They may be found on this website. <https://www.fema.gov/media-library/resources-documents/collections/566>.

The morning included welcoming comments from Robert Ezelle, Director of the Washington State Emergency Management Division, opening remarks from Eric Holdeman, Director of the Center for Regional Disaster Resilience (CRDR), and comments setting the stage for the day's events by Steve Meyers from Pacific Northwest Economic Region (PNWER). The day included four breakout sessions, each one supporting a different exercise objective:

Robert Ezelle, Director, Washington Military Department, Emergency Management Division

Robert Ezelle, Director of Washington State Military Department, Emergency Management Division began his session thanking those who attended. He appreciated seeing people from all levels of government including federal, state, local, and special purpose districts as well as schools, non-profits, the private sector and volunteer agencies.

During a catastrophic earthquake and tsunami such as the scenario depicted by the Cascadia Rising exercise, loss of life will be enormous, and infrastructure will be severely impacted. The challenge will be how to build back systems to support our economy and communities.

The Cascadia Rising exercise conducted in 2016 provided perspective and explored response but didn't address long-term recovery. Pre-disaster recovery planning helps in understanding the processes, decision making, and coordination needed by many organizations as they return their communities to business as usual or to a new normal.

Washington State EMD is developing a recovery framework for the State. The Washington Restoration Framework (WRF) will be flexible and scalable that includes roles, responsibilities and processes for recovery and provides a framework for coordination of multiple organizations. It may be used as a guideline for other organizations as they develop their own plans. The WRF is anticipated to be complete by the end of 2019. State EMD also recently completed a catastrophic incident planning document.

Recovering from a Cascadia Subduction Zone earthquake in our region will require innovative solutions to complex recovery issues. State EMD is continually following recovery efforts from other disasters throughout the country and world. There are already lessons learned from our most recent hurricanes where recovery continues.



Figure 3: Robert Ezelle, Director, Washington State Emergency Management Division

Recovery isn't exercised that often and yet it plays a major role in any disaster. Recovery is not about building back to the way things used to be, but is an opportunity to build back better, considering the new reality and lessons of the past to build a more resilient community.

West Coast Earthquake Early Warning: Time to Act

**Bill Steele, Director of Communication and Outreach
University of Washington, Pacific Northwest Seismic Network**

Bill Steele, Director of Communication and Outreach at the University of Washington Pacific Northwest Seismic Network spoke about the West Coast Earthquake Early Warning System.

Starting his presentation with a review of earthquakes in the past, Bill described different types of earthquakes that have caused damage to the Pacific Northwest in the past. These include shallow crustal quakes, deep quakes such as the Nisqually earthquake in 2001, and a subduction earthquake on the Cascadia Subduction Zone which runs from British Columbia to Northern California. Future quakes may be stronger than those recorded in the past.

Tectonic plates are continually on the move in various directions impacting mountain ranges as well as ocean beaches. The Cascadia Subduction Zone earthquake will cause varying amounts of damage depending on several factors including the location of the origin if the entire fault is ruptured. If the quake begins at the southern portion of the fault and 'rips' north, intensity in the Puget Sound area will be more severe than if the rupture initiates in the north and moves south.

Infrastructure and buildings are susceptible to significant damage from all earthquakes and mitigation efforts take time and cost money. Transportation routes, utility lines, and unreinforced masonry buildings are at risk, with damages having vast impacts not only on this region but also for those that rely on goods and services provided by this region.

Earthquake early warning (EEW) detects and measures earthquakes fast enough that warning can be given before the strongest shaking arrives, providing seconds to minutes to prepare. Shake Alert has improved and will soon be ready to roll out to the public. It is currently working well though there is still improvement to be accomplished. The Cascadia Subduction Zone (CSZ) earthquake provides the greatest opportunity for earthquake early warning. For more information on CSZ earthquakes and the Earthquake Early Warning System check the website below.

Web Resources

This Pacific Northwest Seismic Network, Earthquake Early Warning System website provides further description at <https://pnsn.org/pnsn-data-products/earthquake-early-warning>.

New Yorker Magazine "The Really Big One" (this article appears to require a subscription)
<https://www.newyorker.com/magazine/2015/07/20/the-really-big-one>

Only a Matter of Time: The Disaster Awaiting Pacific Northwest (YouTube)
<https://youtu.be/f4I7tHGLgA4>

Published on Mar 6, 2016, CBS Sunday Morning

GETS, WPS, TSP

Colleen Wright, Cyber Security and Communications, National Protection and Programs Directorate, Department of Homeland Security, Region X spoke briefly about the effectiveness of using priority telecommunications services during and following disasters. Government Emergency Telecommunications Service (GETS), Wireless Priority Service (WPS), and Telecommunications Service Priority (TSP) are available for qualified public and private organizations that provide emergency response and recovery services following a disaster.

The Government Emergency Telecommunications Service (GETS) supports national leadership; federal, state, local, tribal, and territorial governments; first responders; and other authorized national security and emergency preparedness (NS/EP) users. It is intended to be used in an emergency or crisis situation when the landline network is congested and the probability of completing a normal call is reduced.

Wireless Priority Service (WPS) supports national leadership; federal, state, local, tribal, and territorial governments; and other authorized NS/EP users. It is intended to be used in an emergency or crisis situation when the wireless network is congested and the probability of completing a normal call is reduced.

Telecommunications Service Priority (TSP) is a program that authorizes national security and emergency preparedness (NS/EP) organizations to receive priority treatment for vital voice and data circuits or other telecommunications services. Information regarding all of these programs is available on the DHS website <https://www.dhs.gov/government-emergency-telecommunications-service-gets>.

SECTION 5: EXERCISE ACTIVITIES

Introduction

This exercise focused on four objectives and each activity supported a different objective. Participants were initially assigned seats at 15 round tables. Before the first activity seven larger groups were formed merging two or three tables forming a discussion group of 12-20 people. For the first two activities, groups were comprised of people from common or related disciplines. For the last two activities, participants were shuffled so they could gain additional perspective. Each of the four activities focused on a different objective of the exercise. A facilitator was identified for each large group and most large groups also had a notetaker to assist in capturing main discussion points. Prior to the exercise, facilitators participated in a



Figure 4: Deborah Needham & Walt Hubbard

conference call to discuss guidelines and to answer any questions. During the call facilitators were reminded to:

- Allow everyone to participate
- Do not allow judgement of comments
- Do not allow one person to dominate conversation
- Break into subgroups if necessary
- Always ask why to expand answers
- Feel free to improvise as group dynamics dictate

Groups was asked to provide their top three responses to each of the four objectives. Those responses are recorded below. In the responses below, a general discipline was assigned though it is important to recognize that not all members of the group represented organizations working in that specific field.

Activity #1

Objective 1: To identify roles, responsibilities and communication between the entities involved in recovery.

1. Who is responsible for recovery? What conflicts exist? How are critical infrastructures prioritize during recovery? How much does economic recovery factor? Why?
2. What are some of the specific roles in recovery? When are they determined? Why?
3. How is recovery communicated between recovery entities? What entities? Why?

Responses

Tables 1, 2, 3 - Facilitator: Brandon Hardenbrook

- Coordinate early, before the event, blending existing plans together – Collaboration between stakeholders needs to be included before recovery planning and frameworks are developed.
- Economic recovery includes public and private sectors – Stakeholders should consist of both the private and public sectors. 85% of critical infrastructure is owned or operated by the private sector.
- Coordinate recovery efforts across jurisdictional boundaries – mitigate gaps – consider home rule issues – Collaboration needs to part of the planning process while respecting the autonomy of individual jurisdictions.

Tables 4,5 – Facilitator: Tristan Allen

- Recovery plans exist but are poorly communicated and seldom exercised – More awareness and review of these plans should be included in strategic planning.
- Competition for resources in both response and recovery – Several jurisdictions will be requesting the same resources and the region will have capacity and prioritization issues.
- Values conflict between different partners and can be difficult to resolve – More dialogue between jurisdictions and different levels of government and private sector is necessary to understand various roles during recovery.

Tables 6, 7 – Facilitator: Lis Klute

- Continue regional recovery.
- Identify who, what and type of decisions that need to be made.
- Ensure prioritization.
- Look at Recovery Support Functions and how they align with each other.

Tables 8, 9 – Facilitator: Dr. Dana Lockhart

- Formally establish quick fixes that allow for permanent, more sustainable fixes – Look at how to suspend regulations within acceptable safety requirements to speed recovery.
- We need to know how we are going to take care of employees, their families communities, etc. – The region needs to prioritize how to return people to work and students to schools.
- Do your job, but know when to go outside of your silos to work with others.

Tables 10, 11 – Facilitator: Patti Quirk

- We need to consider vulnerable populations in recovery planning – Communities that sometimes struggle with maintaining an acceptable standard of living will be further stressed by the impacts of an earthquake.
- The capacity of infrastructure will be challenged.

- Prioritization of resources will be necessary.
- Stick to the plan – It is important to have trust in plans and the discipline to implement them. However, flexibility needs to be built into the plan especially for dynamic disasters like an earthquake.

Tables 12, 13 – Lawrence Eichhorn

- Framework and prioritizing pathways – It is important to anticipate impacts on transportation routes from specific hazards.
- Capacity of transportation and communications systems – Many infrastructures will be impacted by the disaster and understanding interdependencies can build resilience for recovery.
- Resources will be overwhelmed – the region will have challenges meeting the demands of requests for resources.

Tables 14, 15 - Facilitator: Allen Alston

- Prioritizing and sharing resources is critical to effective recovery.
- Backbone and infrastructure restoration must be accomplished.
- Communication to the public (i.e. where you can get safe drinking water)
- Note: no infrastructure such as water or wastewater systems do not supply items such as portable toilets for the public.

Activity #2

Objective 2: To identify the process for timely and flexible prioritization of infrastructure and economic recovery

1. What is the process for infrastructure recovery prioritization? When is it done? How is it done? Why?
2. Why is being flexible and adaptable important to recovery priorities?
3. How is the economy factored into recovery priorities? Who participates?
4. Who is the ultimate decision maker during recovery? Why?

Responses

Tables 1, 2, 3 – Facilitator: Brandon Hardenbrook

- Need a structure to help elected officials stand with business leaders to help restore economy – Plans and frameworks need to incorporate the role elected officials and business leaders will play in recovery.
- Hear community voices – Take into consideration how the region could build back with stakeholder input.
- Develop a strong, well-practiced, Joint Information Center – Information sharing is an important part of recovery.

Tables 4, 5 – Facilitator: Tristan Allen

- How does government enable privately owned infrastructure within legal framework such as getting fuel – It will be important to have contracts in place before the disaster that includes commitments from private organizations.
- Recovery priorities favor big or critical systems over smaller operations – how does the region ensure all jurisdictions are also receiving resources.
- There is no ultimate decision maker – Key influencers are recovery task forces, governor's and elected official's offices, and industry leaders.

Tables 6, 7 – Facilitator: Lis Klute

- Consider developing more task forces.
- Conduct a regional exercise to look at decision making and to identify gaps.
- What are major employers expectations of government – It is important to understand the role of public and private sectors during recovery.
- What can we do to learn from those who have experienced long term recovery such as Japan and New Zealand?
- Look at maritime assets that can be useful in recovery – Innovative recovery options should be explored before a disaster.

Tables 8,9 – Facilitator: Dr. Dana Lockhart

- The private sector needs to integrate into public sector priorities – How do they collaborate?
- Who makes up recovery groups? - There needs to be awareness of the stakeholders involved in recovery.
- Priorities – Do they stay at the local level or do they come down from a higher level of government? – Top down or bottom up?

Tables 10, 11 – Facilitator: Patti Quirk

- Emerging public health issues – Consider additional impacts specific to vulnerable populations.
- Stay in the community or leave? – Develop a stable and secure environment for people to continue to live in the community following a major disaster.

Table 12, 13 – Facilitator: Lawrence Eichhorn

- Collaboration between public and private sectors – Make sure the right people are at the table to discuss and make decisions regarding specific issues.
- Manage expectations and be transparent.
- Establish relationships, determine staffing for recovery and conduct training.

Tables 14, 15 – Facilitator: Allen Alston

- Infrastructure must be coordinated in advance – Infrastructure can involve multiple disciplines from water and wastewater systems to transportation and electrical power systems. There are many dependencies and interdependencies among disciplines.
- Nothing really happens exactly as written in plans - The result will be different than planned so flexibility is required.
- Do the most good for the most people while managing recovery.

Eric Holdeman – *“By 30 days into a recovery, decisions will be made politically, not operationally. Political figures and key decision makers need to coordinate and make decisions together.”*

Activity #3

Objective 3: To identify dependencies and interdependencies in recovery planning, prioritization, and structures.

Dependency: A dependency is a linkage or connection between two things, by which the state of one influences or is reliant upon the state of the other (one-way relationship).

Interdependency: An interdependency is a bidirectional relationship between two things in which the state of each influences or is reliant upon the state of the other (two-way relationship).

1. Who determines the dependencies and interdependencies in recovery plans? How is it considered?
2. What are some of the dependencies and interdependencies in recovery priorities? How is it coordinated?
3. How are recovery entities dependent on each other? How are recovery entities interdependent? When does it integrate in planning for recovery?
4. Which infrastructure dependencies and interdependencies can you influence? How?

Responses

Tables 1, 2, 3 – Facilitator: Brandon Hardenbrook

- Cash – People depend on credit cards. More people are using less cash and moving towards financial transactions dependent on digital communications.
- Updated contact lists for contractors and vendors – Having a current list will increase the response time to begin the recovery process.
- Exercise agreements (MOUs, MOAs, Contracts) – Explore how jurisdictions could work together and test the advantages and limitations of agreements.
- People in key positions need to be informed and trained – Awareness of plans and agreements is essential for recovery.

Tables 4, 5 – Facilitator: Tristan Allen

- Laws and policies influence how recovery can occur – Consider issuing waivers to some permitting requirements or other regulations following a disaster.
- Some resources such as heavy equipment require additional support materials or resources such as a bulldozer requires a driver, fuel, and a flat-bed truck to get it to location.
- Mutual aid agreements are important for both personnel and other resources.

Tables 6, 7 – Facilitator: Lis Klute

- Private sector provides services for government – There must be a mechanism to receive revenue and pay vendors and contractors.
- Complete quick, visible projects as well as work on hard recovery projects to keep people in their communities.
- Define recovery framework and include private sector recovery so folks will stay in place.

Tables 8, 9 – Facilitator: Dr. Dana Lockhart

- Identify and know the difference between dependencies and interdependencies.
- Who are we serving? EX. Airport – who serves travelers?
- Everyone assumes the federal government will bail them out, but where will the money come from to reimburse disaster costs? What if the feds can help?



Figure 5: Dave Holcomb, Dana Lockhart

Tables 10, 11 – Facilitator: Patti Quirk

- Overlap of COOP and Business Continuity Plans – Ensure that plans are complementary to each other when multiple plans impact specific functions.
- Exercises – It is important that public and private sectors exercise together.
- Inventory of resources – The demand on resources will stress the capacity of the region and knowing what is available could help during recovery.

Tables 12, 13 – Facilitator: Lawrence Eichhorn

- How do you convene and start the process of recovery prioritization? – Each organization should not only engage in their own prioritization, but should also participate in regional prioritization.
- Sequencing various recovery activities – Identify policy, permitting, and cross jurisdictional issues during recovery planning.
- Recovery Support Functions (RSFs) need to be coordinated with stakeholders.

Tables 14, 15 – Facilitator: Allen Alston

- Continuity Planning needs to carry over to plans of contractors and vendors.
- Supply chain is critical to recovery.
- You need to know who provides lifeline services.
- PS Prep is a voluntary group for the private sector.
 - <https://www.fema.gov/about-ps-preptm>

Activity #4

Objective 4: To identify the gaps in recovery processes and planning for improvement.

1. What are gaps in the recovery processes (plans, priorities, economy, etc.)? Why?
2. What are the gaps in recovery communication and coordination? Why?
3. What are the important next steps to close recovery gaps? Why?
4. How should the consideration of social equity and justice be incorporated? Why?

Responses

Tables 1, 2, 3 – Facilitator: Brandon Hardenbrook

- Start with a vision and identify it.
- Include community in recovery planning.
- Establish a recovery coordinator dedicated to recovery efforts who is apart from the Emergency Manager.

Tables 4, 5 – Facilitator: Tristan Allen

- Think and operate within the same frameworks when possible - federal, state, and local agencies.
- Get buy-in from leadership and agree on top priorities across different jurisdictions and levels.

Tables 6, 7 – Facilitator: Lis Klute

- Recovery plans – What should we do in the future? We need incentive to move forward.
- Rebuilding communities – Consider social justice and equity issues.

Tables 8, 9 – Facilitator: Dr. Dana Lockhart

- Leadership needs to tell us recovery is important. Do they believe it is important?
- Planning assumptions and priorities must be established.
- Messaging to different cultures and groups is important. Will people who live in lower economic areas have a different recovery from those in a higher economic group?

Tables 10, 11 – Facilitator: Patti Quirk

- Funding – There is a lack of funding for identifying and addressing gaps that will lengthen or appear following a disaster. For example, those individuals who are underinsured or have no insurance will need additional assistance.
- Planning – Different cultures may have difference needs, values, or priorities.
- Job recovery – When possible, hire locally and use local equipment to help support the impacted community.
- If we build back better, by doing so do we price people out of the neighborhoods?



Figure 6: Group Activities

Tables 12, 13 – Facilitator: Lawrence Eichhorn

- Decision making process – Define the process and how we train elected officials.
- Social justice and equity – Reach out to cultures within our communities. How do we recover a neighborhood when people can no longer live there?
- Gaps in planning – There will be gaps not only within a single organization but also between organizations and jurisdictions.

Tables 14, 15 – Facilitator: Allen Alston

- Recovery planning – Plans than aren't coordinated, trained, and exercised become shelf art.
- Communication challenges – How does technology impact communications? Have all options been explored?
- Get buy-in for the plan from stakeholders and employees making them part of a successful recovery.

SECTION 6: EVALUATION

Recovery plans are not in place for many organizations represented during this exercise and there have been few regional recovery planning efforts. Goals and objectives of this exercise were partially met, recognizing that additional work must be done in recovery planning before plans can be fully tested.

Participant Feedback

Participants were asked to provide feedback via a handwritten form provided at the beginning of the day. Over 100 people attended the exercise however only 36 feedback forms were returned at the end of the day. Over 95% of those completing forms rated the exercise as Satisfactory, Very Good, or Excellent. The forms that were completed provided excellent feedback, some of which is summarized below. Detailed comments are not attributed to individuals and are included in Appendix C: Participant Feedback.

Did the Exercise meet your objectives?

- **Yes** – 20
- **No** –

Common Statements Across Multiple Questions

- *Engagement of Whole Community*
- *Consider social justice and equity issues in all planning efforts*
- *Engagement of decision makers in planning, training, and exercises is critical*
- *Communication systems and information sharing must be functional and frequent*
- *Policy makers at all government levels and business must participate*

- **Somewhat** – 7

What, if any, was the most valuable ‘take away’ or insight you gained from today’s discussion?

1. Recovery planning efforts have been initiated by some organizations but wide-spread planning, training, and exercising of recovery plans is limited.
2. The importance of coordination, inclusion of stakeholders as well as community, and support and participation of elected and high-level officials is required in planning efforts.
3. There is a need for individuals to continually build relationships through networking and discussion among and between representatives of all levels of government, private companies, and communities.
4. Communication systems as well as information sharing are vital in recovery.

Based on the exercise today, what are your top recommendations for the region related to recovery planning. List any areas in regional recovery planning that should be improved or explored (i.e. prioritization, gap in communication, planning for interdependencies, regional planning etc.)

1. Conduct on-going regional recovery planning at all levels from policy making to operations and procedures.
2. Establish regional recovery priorities.
3. Identify the region, who has regional decision-making authority in what areas, and how will long term recovery be managed across jurisdictional boundaries.
4. Be inclusive by engaging representatives of government, business, non-profit, and community organizations in regional planning efforts.

Based on your participation in today’s exercise, what are the gaps/strengths related to the roles, responsibilities and communication between the organizations involved in recovery?

1. Communications strategies are developed in many organizations and work well for day to day information sharing, however strategies that cross organizational boundaries need to be developed.
2. Federal, state, and local agencies are expected to work together during catastrophic disasters however, clear procedures coordinated among impacted agencies are not necessarily in place.
3. Coordination between public and private sectors regarding recovery planning should be incorporated into all planning efforts.
4. Skills, knowledge, and experience of personnel working in various disciplines will benefit other organizations during recovery.
5. The willingness of individuals to bring organizations and resources together to work toward common goals will help the region recover.

Based on your participation in today's exercise, what are the biggest challenges for timely and flexible prioritization of infrastructure and economic recovery?

1. Communication with all partners
2. Decision maker relationships and political agendas
3. Economic recovery is impacted by business and individuals invested in remaining in the area
4. Resource management, lack of resources, and diminished workforce
5. Ensuring that low capability communities are considered in the priority setting process ("haves vs have nots")
6. Competing priorities

What were the top insights you discovered today related to the dependencies and interdependencies in recovery planning and prioritization?

1. Continuity of Operations and business continuity planning is important for vendors, contractors, and other support services
2. Public and private sectors must work together to achieve successful recovery due to dependencies and interdependencies and currently they may be disconnected and not aware of each other's recovery planning efforts
3. There is a need for coordinated recovery planning between public and private organizations
4. Communications and information sharing between public, private, and community organizations is critical to effective recovery

What are the biggest gaps in recovery planning based on today's discussion? How can we address those?

1. Many agencies tend to plan within their organizational structure but not necessarily with other public or private agencies whose services impact their agency. Plans need to be coordinated and aligned with various stakeholders.
2. Plans are developed and signed by the head of an organization. They also need to be presented to, trained on, and exercised by those tasked with various functions.
3. Regional recovery plans are non-existent and need to be developed, presented to, trained on, and exercised.
4. Top level officials; corporate and government, should participate in recovery planning to establish how they will determine a regional vision, establish priorities, and make decisions following a major event.
5. Consider all community members in planning efforts including situations unique to different cultures and vulnerable populations including homelessness, addiction, and those with other mental health issues.

What issues were not addressed that you would like included in follow-up activities or exercises?

1. Act on some of the identified gaps. King County Emergency Management could choose a single issue identified as a gap, examine it in depth and follow through.
2. Explore how private industry can engage, assist, communicate, and work with public agencies.
3. Consider an exercise or workshop where you begin with a vision for the future following a major disaster and work backward to identifying dependencies. There may be differences in dependencies and interdependencies that have not been discovered.
4. The workforce will be impacted by a major or catastrophic event including physical or emotional trauma. Explore the human side of workforce recovery.
5. Provide and explore examples of good recovery plans.

What other suggestions do you have to improve future exercises of this type?

1. There were logistical challenges within the room. It was difficult to hear, the tables were round, hard to move and talk around during larger group discussions. The recommendation is to use breakout rooms or find a way to separate groups, so they can focus and communicate comfortable within the group.
2. Focus recovery exercises on specific areas such as prioritization, decision making, and equity issues. If discussing policy issues, make sure there are policy level as well as journey level participants. Outcomes of exercises should include action items.
3. It is good to have experts participating but speak and discuss issues in common English avoiding industry jargon.
4. Questions for discussion were good and I will steal. Could work harder on recovery for real. This exercise was more about immediate/stabilization than recovery – Great exercise overall.
5. Schedule in networking breaks. This is where much of the reflection and connection happens that results in working partnerships and action items
6. Conduct a recovery prioritization drill using an identified process or in which the process is developed adhoc.

Participant Final Comments

Top Takeaways

- Recovery is never ending and a large undertaking
- There is a link that needs to be explored between resilience and recovery efforts
- Social justice and equity must be considered during recovery planning efforts

Future Discussions and Next Steps

- The private sector has a critical role to play in recovery – keep bringing public and private sectors together in the planning process
- There needs to be community involvement in recovery planning
- Conduct more long-term recovery exercises and workshops – we tend to focus on operations and then short-term recovery – Look at recovery even further out than 30 days
- Matt Morrison, Director of Pacific Northwest Economic Region (PNWER) will take this report to the resilience caucus for legislators.

SECTION 7: RECOMMENDATIONS

The Blue Cascades III was a two-day exercise in 2006 that identified numerous findings and made recommendations cited in Section II of this document. Though 12 years has passed, in general, recovery planning, training, and exercising is still in early development for many public sector organizations. Recovery activities conducted to date include; King County established the Resilient King County Initiative which is a white paper that identifies a strategy for recovery following a major earthquake or other catastrophe. Snohomish and Pierce Counties both have developed recovery frameworks as has the City of Seattle. Private and public sector organizations must continue to work toward the development of disaster recovery plans. Planning efforts must include:

- Support from those in high levels of the organization including elected officials, chief executive officers, commissions, councils, boards of directors, as well as internal directors and managers;
- Representatives from stakeholder organizations including other jurisdictions, vendors, contractors, and other service providers;
- Vulnerable populations, different cultures, and community representatives;
- Hazard identification and risk assessment; and
- Consideration of dependencies and interdependencies and coordination with those organizations that have defined tasks or are expected to provide resources to an individual organization.

FEMA Region X states there will be an opportunity to participate in a follow-on exercise to the 2016 Cascadia Rising Earthquake Response Exercise. This next Cascadia Subduction Zone Exercise is scheduled tentatively for the summer of 2022. With this exercise scheduled, now would be an excellent time for organizations to focus on their internal organizational recovery plans and business continuity plans. Additionally, it provides an opportunity to prepare for the regional recovery aspects of a Cascadia event. While the exercise is slotted to be another response exercise, it would be appropriate to be doing recovery planning and perhaps conduct a recovery workshop leading up to the larger response event. This will require leadership, coordination, and participation from a wide variety of public and private sector entities.

Homeland Security Region 6 should consider establishing a regional disaster recovery effort/project. This Blue Cascades Exercise exposed the need for recovery planning on a regional basis. Support from political leaders is critical, not just from the jurisdiction that is the lead agency but also elected and appointed officials from impacted organizations. Initial steps include:

- Identify a regional recovery planning core team to determine the viability of developing a regional recovery plan.
- Define the geographical regions such as single county, a tri-county effort, or additional counties.
- Garner support from political leaders.
- Identify funding that may be used to hire a consulting firm to assist with plan development if that is an option.
- Review regional hazards, risks, and regional impacts vs: single agency issues.
- Identify regional resources that will be overwhelmed or inadequate.

- Develop an organizational structure that includes coordination and decision-making processes across jurisdictional boundaries.
- Establish and maintain executive support.
- Encourage representation from the whole community in planning efforts including large and small business, different cultures and religions, all socio-economic groups, various levels of government, and other stakeholders involved in disaster recovery efforts.

Develop a Regional Joint Information Center that stands up during regional disasters. The purpose of this group is to address region-wide issues that unite in a single voice providing direction to those living, working, or visiting the area defined as the region which may be King County, a tri-county area, or the Puget Sound area). Things to consider:

- Individual agencies maintain their own JIC or PIO to address jurisdiction-only concerns.
- The Regional JIC must pre-identify a group of individuals that will lead planning efforts and who are assigned to work in the Regional JIC during regional incidents.
- A Regional JIC plan and procedures should be developed and practiced by individuals not only in the core group but also by others who might be assigned to work in the Regional JIC.
- Composition of the Regional JIC should include individuals representing the whole community including business, governments, non-governmental organizations, and community groups.

Ensure that individuals from various entities understand their roles and responsibilities during recovery through progressive training and exercise programs.

APPENDIX A: ACRONYMS

AAR	After Action Report
CEMP	Comprehensive Emergency Management Plan
CRDR	Center for Regional Disaster Resiliency
CSZ	Cascadia Subduction Zone
DEM	Department of Emergency Management
DHS	Department of Homeland Security
EEW	Earthquake Early Warning
EMD	Emergency Management Division
EMAC	Emergency Management Assistance Compact
FEMA	Federal Emergency Management Agency
GETS	Government Emergency Telecommunications Service
HSEEP	Homeland Security Exercise and Evaluation Program
ICS	Incident Command System
IT	Information Technology
JIC	Joint Information Center
MOA/MOU	Memorandum of Agreement / Memorandum of Understanding
NIMS	National Incident Management System
OEM	Office of Emergency Management
PIO	Public Information Officer
PNWER	Pacific NorthWest Economic Region
RSF	Recovery Support Function
TSP	Telecommunications Service Priority
USGS	United States Geological Survey
WAMAS	Washington State Mutual Aid System
WPS	Wireless Priority Service
WRF	Washington Restoration Framework

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APPENDIX B: PARTICIPANT FEEDBACK

Blue Cascades VII: Cascadia Subduction Zone Earthquake Recovery Exercise ATTENDEE FEEDBACK FORM

March 21, 2018 Hilton SeaTac SeaTac, Washington

Overall impression and general comments on the seminar- **Please rate each component on a scale of 1-5 (5 being excellent /valuable; 1 being not valuable)**

Exercise	Excellent	Very Good	Satisfactory	Fair	Poor	N/A
Overall Impression of Exercise	5	4	3	2	1	N/A
Quality of the Discussion	5	4	3	2	1	N/A
Exercise Format	5	4	3	2	1	N/A

1. What industry or type of organization do you represent? (e.g., Utilities; Transportation; Emergency Services; Law Enforcement; Energy; Local, County, State, Federal Government...etc.)

- Emergency Management
- Higher Education
- Boeing
- Transportation
- Healthcare
- Federal Government
- Communications
- Emergency Services
- Industry
- Consultant
- Public Health
- State Government
- Community Volunteer
- Utility/Water/Wastewater
- Local Government
- Logistics

2. Did the Exercise meet your objectives?

Yes – 20

No – 0

Somewhat – 7

3. What, if any, was the most valuable ‘take away’ or insight you gained from today’s discussion?

- Perspective from many different organizations
- Need for coordination at highest levels
- Ease with which tech companies can bail on the region
- Private/public coordination of recovery planning (relationships)
- Grass roots communications amongst local communities and neighborhoods
- Clarity into current challenges

- Supply chain redundancies
- How gratifying to hear so many jurisdictions committed to recovery planning and coordination
- Importance of trained facilitators
- Achieve some consistency between groups
- Open discussion that makes the situation real
- We are not as prepared for the recovery phase as I thought we'd be – There's a response plan but no recovery plan
- Traditional emergency management agencies may not be the way to address recovery efforts. A project management philosophy might be better
- We are still acting as silos. I personally need to review the plans and annexes that are in place
- As always, networking, cross-collaboration, and a growing insight and awareness into the concerns and challenges of other stakeholders
- The mess we are in. So sad human input was addressed last aka "social impact"
- It seems that everyone has their own agenda and theirs little communication between groups
- We are overly confident in our hierarchical systems and plans
- We tend not to give enough weight to community input in shaping recovery
- Lots of new ideas and some things that refreshed my memory of things that need to be addressed on my 'to do' list
- Some ideas to better engage / support private sector during recovery
- Need for better recovery
- Ideas of facilitation and networking opportunities
- Recovery will require strong relationship coordination and collaboration
- Mitigation and recovery need to be integrated into planning
- Learning what other stakeholders and partners are concerned about, doing about, and how
- 30 days out, we may have to hit reset (aftershocks - what was fixed breaks) – More community grassroots @ local ground level – need knowledge and must be empowered to take personal / community responsibility. Help each other
- Need for separate recovery job title
- Develop recovery task force within organization
- The severity of a subduction earthquake and its effects across the region
- Need for more action and cross agency coordination (public/private) – planning is good, but implementation needs to be adaptable and flexible
- Practice and communications are key
- Must coordinate planning and practice recovery response – then update both (plans and practice)
- This was my first recovery exercise. I learned a massive amount about dependencies and interdependencies in recovery planning and to be cautious about your assumptions within your agency plan
- More planning in place than expected
- More planning and exercises need to be mandated
- Plan and train for recovery
- Relationships

4. Based on the exercise today, what are your top recommendations for the region related to recovery planning. List any areas in regional recovery planning that should be improved or explored (i.e. prioritization, gap in communication, planning for interdependencies, regional planning etc.)

- Facilitate gap and differing issues within RSFs
- Focus on economic continuity
- Exercise actual recovery plans; obligate organization to write them by knowing they will have to speak to them
- Include a shift from response to recovery exercise
- Invite private sector into every form of public sector planning
- Continuity of resources in the planning documents
- Establishing pre-determined prioritization and communication strategies

- How do we align specific agendas to co-exist in establishing what is in the best interest of all parties
- Recovery #1 Priority – Communications – test response and cell providers
- Recovery #2 Priority – Transportation - test
- Conduct a regional interjurisdictional exercise focused on recovery
- State of Washington should sponsor recovery training and recovery planning
- Prioritization – it needs more clarity perhaps planning with different agencies to understand
- All of it – each individually – then combine – integrate
- Prioritization
- More regional planning is needed
- Continued venues to meet and share even if it doesn't end in a larger coordination, it does encourage others to go back to their communities and inject their lessons into plans and coordination
- Language vulnerabilities – Real “community” engagement
- Better policy – decision coordination, training and exercising
- Paradigm shift to build into recovery strategies the values of the community. In order to do that we need more emphasis on community relationships and skillful convening during a crisis
- Form a regional (Homeland security zone?) based IMT to which all levels of government and agencies can contribute personnel (paid, contract and volunteer) to be used as augmentation to local IMTs as relief or use specific ESF/RSF roles as needed. I would help form, train, develop and lead the effort
- Regional strategic recovery planning (whole community) – more training and exercising using building block HSEEP approach
- Resource prioritization
- Identification of funding / projects for long term recovery before the event
- Improve cooperation – include behavioral health in planning and preparedness
- Develop a training standard for recovery
- Gaps (at least in some places) – education planning (getting children back to school so economics can get back), public/mental health concerns as part of long-term recovery efforts
- Long term vision is recovery
- Clarity at outset of planning/exercising on the knowns of incident management: who will have what authority; what systems and procedures will be in place; how the disaster will be managed (fed, state, private, non-profit) and legal limitations and responsibilities that will remain constant – think and operate in the same framework
- Not enough focus on transporting of recovery materials (overland -including mountain passes, ports etc.)
- Gap – mitigation between cities i.e. Bellevue/Seattle/Burien – education / empowerment campaign at the community level
- Economic recovery will be immensely challenging including how to communicate it
- Preplan priorities, synchronize plans, then identify conflicts
- Regional recovery priorities, development of policy makers and executives in recovery planning
- Planning for dual use of MOU/MOAs with other organizations
- Decision making around priorities (response and recovery – regional decision making)
- Communication protocols and procedures for communication among agencies
- Practice / implementation of training around recovery
- Equity and social justice – impacts to vulnerable communities – service areas vary by agency
- Public / private joint exercises and shared knowledge of plans
- Coordinated early plans, updated with some regularity (every 2 years) that are agile and rehearsed or exercised
- Buy-in necessary from leadership and executives
- Coordinate and communicate recovery planning efforts
- Private organizations must build work relationships to restore continuity
- Planning between public and private
- Planning for interdependencies

5. Based on your participation in today's exercise, what are the gaps/strengths related to the roles, responsibilities and communication between the organizations involved in recovery?

- Gap – contingency plans
- Decision making structure is deeply tied to elected officials, but that is not engaging private sector
- Even if plans identify dependencies and interdependencies, how is that being shared?
- Hierarchy of different management frameworks that include recovery planning
- Need to mitigate or accept known gaps
- Gap - bureaucracy, undefined jobs, and responsibilities
- Strength – industry and sector experience
- Pipeline operators
- Air support, helicopter services
- Lots of confusion on how the local/state/federal coordination takes place.
- The best thing jurisdictions can do is organize and communicate with partner agencies
- Competing priorities, communication gaps
- No central communication mechanism – no 911 stakeholders included or engaged
- Lack of recovery training and planning
- General identification of roles and responsibilities. Understanding of NIMS and the concept of local authority
- Real “community” engagement
- Gap – between locals, the state, and FEMA – need more cross-pollination and coordination
- Coordination and communications organizations lacks planning and exercising lacks
- Policy
- Communication and coordination to local level
- Training
- Gaps – recovery training standard – recovery decision making processes
- Strengths – awareness of importance
- Needs to be more communication between recovery planning efforts at different levels – will certainly help streamline decision making at policy maker levels
- Roles: capacity building for personal preparedness and resilience – Responsibilities: cooperative agreements – Communications: redundant strategies for contact each other
- Structured, tiered, multi-level communication structure from elected officials down to the ground, community, neighborhood level. Start early. Identify the key decision makers
- Gaps – During recovery talk to whole community and small businesses, diverse communities – what do we do with the homeless population during recovery
- Strengths – collaboration among individuals
- Gap - Disruptions around decision making and prioritization (top down planning)
- Strength – understanding of interdependencies (utilities)
- Gap – integration around public health agencies and utilities – roles and responsibilities
- Gap – role of community – educational awareness (not allowing media to drive an emotional response around emergencies and disasters)
- Public / private cross collaboration
- Tackle fewer topics through solution vs briefly discussing many topics with no tangible outcomes / decisions / deliverables
- Major focus on tracking material is on response – Not much on recovery
- Recovery structure missing across the region at all levels of government and non-government agencies
- Lack of funding, resources personnel to meet current demands – capacity issue
- Lack of recovery awareness – What is recovery? What is recovery planning? – Many emergency managers are unaware
- Lack of education and training and exercising around recovery (resources and awareness issue)
- Gap is lack of planning and preparedness – documents may exist but have not been read or signed
- We recognized the need for valid communication between organizations, departments, and agencies, but no suggestions to ‘make it so’ – sponsor round tables

6. Based on your participation in today’s exercise, what are the biggest challenges for timely and flexible prioritization of infrastructure and economic recovery?

- Communication with all partners
- Decision maker relationships
- Ease with which private sector (especially tech) can leave the area
- Resource management
- People, agendas, no specific direction
- Providing a safe and secure environment for recovery efforts, martial law, curfews, and National Guard
- Representation of low capability communities in the priority setting process. “Haves” will get repaired quicker than “have-nots”
- Conflicting priorities, interdependencies, under-reported vulnerable communities
- Resources (lack of) – competing priorities as such over different jurisdictions – based on size of cities and resources on hand
- Economic recovery – when can we support and bring infrastructure to par to resource economic impact while still maintaining basic needs
- Concepts not well understood by decision makers – Common processes should be evaluated so streamlined processes can be quickly implemented
- Vulnerable populations – need to disseminate information to them and address their continuing needs
- No clear authority to define recovery priorities – the vastness overwhelms
- Language gaps
- Turf and centric decision making. We need mechanisms to permit and encourage a shift from “I” thinking to “We” thinking in the decision making
- Competition for limited resources, ability to hear, develop and maintain relationships and exercise plans
- Economic recovery – with tech sectors easy to be invested in community recovery
- Staffing to dedicate to recovery planning and implementation
- Planning for and adapting to on-going damage to infrastructure from aftershocks, i.e. persistence of the response phase and consequent drain on resources (financial, human, material), in order to restore service delivery
- Organization of the must have employees on site is critical – The people who help do recovery operations
- Diminished workforce
- Gaining senior leadership / elected support
- The biggest challenge will be getting a whole big picture of damage assessment and the impacts on local economy
- Coordination and decision making among regional stakeholders for prioritization
- Resources (people) to develop and facilitate COOP/Cog/Recovery planning activities
- Home-rule nature of Washington State
- Taking the time and providing resources to plan and implement
- Lack of dedicated funding and other resources
- Common communications source – single point of information
- Bringing the appropriate persons from the various infrastructures / government agencies together
- Balancing response priorities with recovery priorities

7. What were the top insights you discovered today related to the dependencies and interdependencies in recovery planning and prioritization?

- State, region, county, city need better understanding of existing plans contained therein
- Public sector and private sector disconnected – not aware of each other’s recovery planning including dependencies and interdependencies
- We don’t think about this as much as we should
- Need to support vendor continuity of operations planning requirements
- Most players are fairly limited in understanding interdependencies – every piece is inter-related so just make that an assumption
- Importance of coalitions and pre-existing communication channels and partnerships
- Dependencies and interdependencies need to be evaluated separately and prioritized by agencies
- Importance of communication among agencies and to the public

- The talent by compartmentalization and a feeling of inter-organizational collaboration
- Everyone seemed to kowtow to big industry
- The role of community groups is often overlooked yet we depend on them for many things
- We tend to all plan in a silo
- I will have enough work in planning, training, and exercising until I retire
- Community planning level is critical
- Centralized permitting
- Economic forum to drive recovery priority
- The friendly reminder on supply chain distribution – issues and importance of vendor relationships
- In a major earthquake the dependencies and interdependencies in recovery planning and prioritization are going to depend on regional input and priorities to bring us back to normal
- Continuing planning and on-going training with staff
- Need more resource investment (people and money) towards cash reserves for emergency)
- Government agencies are siloed but planning OK internally
- We (boots on the ground types) want to work jointly but our organizations don't make that easy, or even allow overtime
- Many communities may not have a recovery plan, but they may have plans that include a long term "vision" for their community / company that could be a start to recovery planning
- Business continuity of operations

8. What are the biggest gaps in recovery planning based on today's discussion? How can we address those?

- Lack of understanding of supply chain
- Relationship between public and private sectors – lack coordination and communications pathways
- Need a sit down between top level officials; corporate and government
- Plans need to be presented, trained on, and exercised on a regional level
- Plan alignment – agencies that have plans in place need bridges to other agencies that are interdependent
- Decision makers in any capacity
- Addressing lowest economic groups, homelessness, those addicted, etc.
- Emergency managers are not economic or community development experts – training in basics of recovery would help a lot – Emergency management offers a couple of issues for community recovery planning.
- Common vision of what we recover to
- Not necessarily assuming we recover to where/what was pre-disaster
- Lack of a recovery plan – many agencies (private / public) don't have one but we all need one. How is the plan released and how do we keep it current? -
- Short term recovery – long term recovery – restoration
- Policies that expedite recovery
- We don't spend enough time planning for recovery
- Identifying the foundational sectors upon which to grow the recovery
- Not really addressing on the ground issues – too much focus on big players and not human beings – Amazon, Boeing, Starbucks like we all work for them and not for people
- We have never exercised all the levels of decision making around resource prioritization
- Lack good mechanisms and skill sets for community engagement and facilitation
- Lack of needed relationship building and sustainment of those relationships
- Funding long term
- Behavioral health
- Infrastructure
- Social and economical
- Clear and understood decision making process
- Education and mental health
- Addressing plan assumptions and limitations, both within recovery plans and in exercising

- Equity and social justice concerns and impacts to utilities, and communication methods to the public
- Public outreach – keeping public informed to minimize panic
- Practice and cross coordination
- Plan + coordinate + practice = Repeat
- Understanding the communication framework from local to other entities
- Lack of recovery prioritization at top level (fed, state) resulting in a lack of dedicated funding and other resources
- Lack of trainings and exercises that include recovery
- Empty head – stakeholder buy-in
- Having multiple agreements in place

9. What issues were not addressed that you would like included in follow-up activities or exercises?

- What actions are actually going to be taken on the gaps identified for future exercises, having King County Emergency Management choose a single issue and examining it in depth and following through on gaps would be excellent. Want to see action on gaps
- Aftershocks from main event may result in additional damages
- Private industry involvement – how do we engage, assist, communicate, more efficiently with various civil agencies
- Trauma as a factor in recovery – workforce, including public sector, will be immobilized in an event like this
- We should have started at the decision point of when you go from response to recovery
- Working backwards from a vision of the future to determine what is necessary to establish first – It might make the dependencies more apparent
- Where do I start? Pick one! There are many I can't think of right now
- Planning and preparing in the post 30-day environment for 30-60-90 months down the road
- How to begin coordinating, getting the right people at the table, and making decisions around prioritization
- Public / private cooperation and communication
- Examples of superior plans – Examples of superior responses to disasters or cautionary tales of failed examples
- A closer look at the phases of recovery – reconstruction, restoration, redevelopment, etc. and what does recovery look like not just 30 days out but 60-90 1 year, etc.
- Recovery will look different from a tsunami vs earthquake
- Multi-day power outage region-wide

10. What other suggestions do you have to improve future exercises of this type?

- Hard to hear – greater separation between breakout groups
- Scenario feeds discussion but does not spur decision-making or action commitments
- The region seems ready for this
- Would like to see exercises and decision making specifically focused on equity in response and recovery
- Breakout sessions need to be held in smaller spaces (too much cross talk and too noisy to hear each other
- Facilitators need to either speak loudly or with a microphone
- Understanding that there is a high level of expertise in the room, however, tear down silos by emptying jargon (job of the facilitators)
- Train jurisdictions to let conversations flow – frequent interruptions need to be brief
- Bigger room – too hard to hear
- Questions for discussion were good and I will steal. Could work harder on recovery for real. This exercise was more about immediate/stabilization than recovery – Great exercise overall.
- Perhaps on break out session have larger rooms/space where we aren't talking over each other and unable to hear peers table discussions

- I liked the concept of using the Cascadia Rising exercise scenario to base the regional exercise on – It allowed for lessons learned from it to be further explored today
- How can we get the railroad (BNSF, Amtrak) involved?
- Silent breakout room. Activity variety
- I didn't like the overall format of the exercise – we could barely hear each other
- Smaller table groups. So hard to hear, not workable
- Schedule in networking breaks. Telling people to take breaks 'whenever' does not bring people together to talk – need at least one 20-minute informal break in AM and PM. This is where much of the reflection and connection happens that results in working partnerships and action items
- Have signs out from parking area to conference room so we don't waste 15-20 minutes going to the wrong building (closest to parking) and then the right building but wrong side of it because there were no directional signs until we arrived in the right side of the building and there was just one sign – little help
- Moving tables was difficult
- Conduct a recovery prioritization drill using an identified process or in which the process is developed adhoc
- Incorporate messaging into each objective
- Have a recovery exercise specifically targeted at elected officials and private organization CEO levels
- Coordinated/facilitated decision making event for agencies / utilities around prioritization and situational events
- Move forward – Come away with formal recommendations
- Videos – walk through exercises – Role playing scenarios (might require pre-homework assignments)
- Make questions for group discussions clear for facilitators – have a facilitator and another person man the whiteboard
- Where are the humanitarian, non-profit organizations and Tribal representation? Legislators and elected officials?
- Properly communicate meeting name – asked at front desk for Blue Cascade – no such animal – ICS – States no codes – common terminology – not sponsoring agency
- Do not use round tables if combining later into groups. Suggesting a smaller large room and separate breakout rooms for coordination

Blue Cascades VII
Cascadia Subduction Zone Earthquake
Recovery Tabletop Exercise
March 21, 2018

Situation Manual



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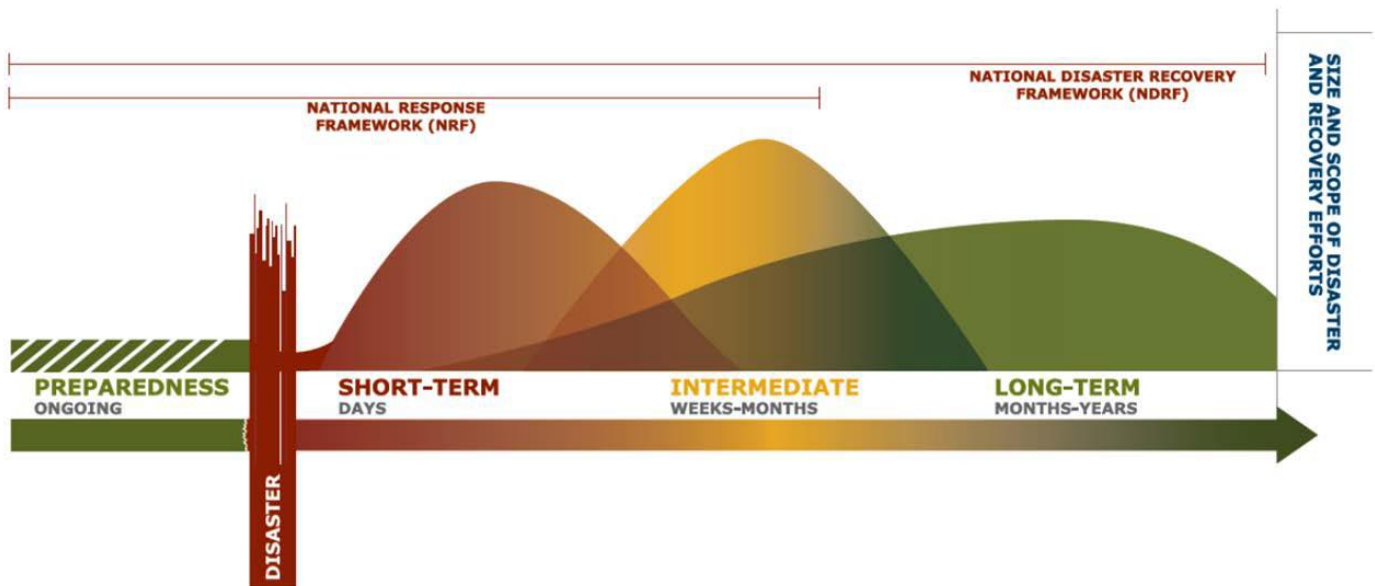
Agenda

Time	Activity	Presenter
7:30 AM	Registration and Continental Breakfast	All
8:00 AM	Welcome and Introductions	Eric Holdeman, Director, Center for Regional Disaster Resilience Robert Ezelle, Director Washington Emergency Management Division
8:45 AM	Exercise Brief – What to expect – explain first breakout	Steve Myers, Senior Program Manager, Pacific Northwest Economic Region
9:00 AM	First table breakout – Objective 1 (roles, responsibilities and communication)	Facilitator/Recorder
10:10 AM	Group out-brief summary	Facilitators
10:30 AM	Exercise Brief – second breakout	Eric Holdeman
10:45 AM	Second table breakout – Objective 2 (infrastructure prioritization and economic recovery)	Facilitator/Recorder
11:45 AM	Group out-brief summary	Facilitators
12:00 PM	Pick up lunch	All
12:15 PM	Lunch presentation or working lunch?	Bill Steele, University of Washington, The Pacific Northwest Seismic Network
12:45 PM	Exercise Brief – third breakout	Steve Myers
1:00 PM	Third table breakout – Objective 3 (dependencies and interdependencies)	Facilitator/Recorder
2:15 PM	Group out-brief summary	Facilitators
2:30 PM	Exercise Brief – fourth breakout	Eric Holdeman

2:45 PM	Fourth breakout – Objective 4 (gaps and improvement plan)	Facilitator/Recorder
3:30 PM	Group out-brief summary	Facilitators
3:45 PM	Evaluation – hot wash	Steve Myers
4:00 PM	Close	Eric Holdeman

Introduction

Blue Cascades VII is a disaster recovery tabletop exercise is a one-day facilitated discussion exercise designed to explore and apply skills and knowledge involving recovery issues from a catastrophic subduction zone earthquake. The timeline for the exercise begins day 30 following the event in the intermediate recovery phase.



Instructions for Participants

The following instructions are provided to exercise participants to allow for structured free-flowing discussion without reworking or challenging prepared information. Please accept these instructions during the exercise:

- Accept the scenario
- Accept assumptions as the present reality
- Accept the damage observations
- Accept the limits on objectives and questions
- Accept the limits on core capabilities for the exercise
- Allow all input, do not judge
- Keep your input short and concise

Purpose

The primary purpose of this exercise is to improve knowledge and understanding of recovery issues building on the following principles:

- Engaged partnerships
- Unity of effort
- Timeliness and flexibility
- Dependencies and Interdependencies

Scope

The scope of the exercise is focused on the Puget Sound region divided into the following geographic regions:

- North Sound (Everett North)
- Central Sound (Everett South, Tacoma North, Bellevue West)
- South Sound (Tacoma South)
- East Sound (Bellevue East)

The scope of exercise is focused on four of the sixteen critical infrastructures. There may be discussion regarding dependencies and interdependencies of other critical infrastructures, however, the focus will revolve around these:

- Communications
- Energy
- Transportation Systems
- Water and Waste Water



Scenario (from the Cascadia Rising 2016 scenario)

A large magnitude Cascadia Subduction Zone (CSZ) fault earthquake and tsunami is perhaps one of the most complex disaster scenarios that we face in the Pacific Northwest. Due to this complexity, recovery operations will hinge on the effective coordination and integration of governments at all levels – cities, counties, state agencies, federal departments, the military, and tribal nations – as well as non-governmental organizations and the private sector. It is this joint-operational whole community approach that we seek to discuss during the Blue Cascades VII recovery tabletop exercise.

The Cascadia Region is comprised of the area west of the Cascade Mountains stretching from Northern California, through Oregon and Washington and into British Columbia.

Lying mostly offshore, the CSZ plate interface is a giant fault—approximately 700 miles long (1,130 km). Here, the set of tectonic plates to the west is sliding (subducting) beneath the North American Plate. The movement of these plates is neither constant nor smooth: the plates are stuck, and the stress will build up until the fault suddenly breaks.

The scenario assumes an epicenter approximately 95 miles west of Eugene, Oregon.

The entire fault zone ruptures from end to end, causing one great earthquake measuring magnitude 9.0. The shaking that results from this abrupt shifting of the earth's crust will be felt throughout the Pacific Northwest—and the ground is expected to go on shaking for four to six minutes.

See the following two graphics for the impact areas and severity during this event.



Figure 2. Expected ground shaking intensities from a M9.0 Cascadia Subduction Zone earthquake

THE MODIFIED MERCALLI INTENSITY SCALE

Intensity	Shaking	Description/Damage
I	Not Felt	<i>Not felt except by a very few under especially favorable conditions.</i>
II	Weak	<i>Felt only by a few persons at rest, especially on upper floors of buildings.</i>
III	Weak	<i>Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.</i>
IV	Light	<i>Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.</i>
V	Moderate	<i>Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.</i>
VI	Strong	<i>Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.</i>
VII	Very Strong	<i>Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.</i>
VIII	Severe	<i>Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.</i>
IX	Violent	<i>Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.</i>
X	Extreme	<i>Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.</i>

Table 2. The Modified Mercalli Intensity (MMI) Scale describes the observed effects of ground shaking at each corresponding shaking intensity level, designated by Roman Numerals.

Damage Observations

The observations are based on a combination of information from the Cascadia Rising 2016 Scenario, Resilient Washington Report 2012 and the 2013 Cascadia Subduction Zone report by the Cascadia Region Earthquake Workgroup.

Key to the Table – Communications Systems Sector

Target timeframe for recovery:

Operational impact expectations

Under 50%



51% to 70%



71%+



Estimated Time to reach 80%-90% operational status

X

State of Recovery Communications Sector

	Event Occurs	0-24 Hours	1-3 Days	3-7 Days	1 Week – 1 Month	1-3 Months	3 Months – 1 Year	1-3 Years	3+ Years
Landline Telecommunications								X	
Fiber Network							X		
Cellular Systems								X	
Internet Capacity							X		

Anticipated damages to overcome: 40% of above ground poles require replacement; 30% of fiber network using bridges is broken (bridge collapse); 20% of cell towers down; Internet capacity using fiber network or landline connectivity is reduced to 50%.



Key to the Table – Energy Systems Sector

Target timeframe for recovery:

Operational impact expectations Under 50% 51% to 70% 71%+

Estimated time to reach 80%-90% operational status

X

State of Recovery Energy Sector

	Event Occurs	0-24 Hours	1-3 Days	3-7 Days	1 Week – 1 Month	1-3 Months	3 Months – 1 Year	1-3 Years	3+ Years
Electricity Transmission									X
Electricity Distribution (home & business)									X
Natural Gas Transmission (pipes)									X
Natural Gas Distribution (home & business)									X
Petroleum Transmission (pipes)									X
Petroleum Distribution (road, rail, water)								X	

Anticipated damages to overcome: 40% of above ground poles require replacement; 30% of high voltage towers damaged; home and business customers must be inspected before power can be restored; 25% of natural gas pipes are known damaged, system has been shut down to inspect; home and business customers must be inspected before gas can be turned on; 35% of petroleum pipelines are broken, system has been shut down; 50% of gas stations are without fuel.



Key to the Table – Transportation Systems Sector*Target timeframe for recovery:**Operational impact expectations*

Under 50%



51% to 70%



71%+

*Estimated time to reach 80%-90% operational status***X****State of Recovery Transportation Systems Sector**

	Event Occurs	0-24 Hours	1-3 Days	3-7 Days	1 Week – 1 Month	1-3 Months	3 Months – 1 Year	1-3 Years	3+ Years
Interstate 5 North Sound									X
Interstate 5 Central Sound									X
Interstate 5 South Sound									X
Interstate 90									X
Interstate 405									X
Floating Bridges									X
SR 99									X
Ferry System									X
Port Systems									X
Rail Systems									X
Transit Systems									X
Aviation Systems									X

Anticipated damages to overcome: 40% of elevated section of I-5 from Everett to Marysville is damaged and unpassable; ship canal bridge on I-5 has partially collapsed and is unpassable; 20% of I-5 south of Tacoma has some buckling and cracking; part of Mount Baker tunnel has collapsed; approach to I-90 floating bridge has settled and cracked due to liquefaction; west bound approach to SR 520 floating bridge has buckled at Clyde Hill; SR 99 viaduct has collapsed; ferry system docks at Coleman, Edmonds, Bremerton have sustained damage, all must be inspected before routes can be resumed; ferry dock at Mukilteo has collapsed; Port of Seattle, Tacoma and Everett have sustained damage due to liquefaction with cracking and separation; 40% of container cranes have collapsed or must be inspected; 50% rail lines from Bellingham to Olympia have sustained damage due to twisting, landslides and liquefaction; 65% of public transit systems are in operable due to road closures, 15% of transit facilities have sustained damage; airports at Sea-Tac, Tacoma, Paine Field and Olympia have sustained damage and are 40% functional, runways have all sustained damage due to cracking and buckling and are 35% functional.

Key to the Table – Water & Waste Water Systems Sector

Target timeframe for recovery:

Operational impact expectations Under 50% 51% to 70% 71%+

Estimated time to reach 80%-90% operational status **X**

State of Recovery Water & Waste Water Systems Sector

	Event Occurs	0-24 Hours	1-3 Days	3-7 Days	1 Week – 1 Month	1-3 Months	3 Months – 1 Year	1-3 Years	3+ Years
Domestic Water Supply (safety)							X		
Domestic Water Supply Transmission (pipes)									X
Wastewater Treatment Facilities							X		
Wastewater Transmission (pipes)									X

Anticipated damages to overcome: 30% of water supply may be contaminated and being tested; 25% of water mains have ruptured and system shut down; all water pipes must be inspected before charging; 20% of wastewater treatment facilities have been damaged, awaiting engineering assessment; 30% of waste water transmission pipes have ruptured, all pipes must be inspected.



Core Capabilities

The following core capabilities will be applied as the key distinct critical elements for this exercise. Other core capabilities may be considered, however, these three will be used for development of gaps and next steps.

- Operational Coordination
- Infrastructure Systems
- Economic Recovery

Assumptions

The following assumptions are made to begin the discussion.

Assumption	Impact	Considerations
1. Recovery exercise begins earthquake +30 days	<ul style="list-style-type: none"> • All Emergency Operations Centers have transitioned to long term recovery 	<ul style="list-style-type: none"> • Communications systems are compromised and 60% functional
2. All response activities have concluded	<ul style="list-style-type: none"> • Fire operations routine • Law enforcement operations routine • Emergency Medical response routine • Fatalities recovered 	<ul style="list-style-type: none"> • Transportation systems compromised at 70% functional or detours operating • Traffic control stretching personnel • Debris management continues
3. Damage assessment started	<ul style="list-style-type: none"> • Engineers required to assess structural integrity 	<ul style="list-style-type: none"> • Qualified engineers in short supply • Private sector companies paying twice the normal wage • Government agencies losing some engineers
4. FEMA recovery operations continue	<ul style="list-style-type: none"> • Individual assistance is ongoing (residents) • Public assistance is ongoing (government buildings and infrastructure) • Debris management is being coordinated and funded by FEMA • Points of Distribution for supplies of food, water and other supplies remain open • Intermediate housing has been 	<ul style="list-style-type: none"> • Disaster Recovery Centers are open in 35 municipalities for Individual Assistance (personnel impact) • Deadlines for Public Assistance grants having personnel impact • Points of Distribution are open in 28 municipalities (personnel impact) • Locations for temporary housing stock has yet to be

Assumption	Impact	Considerations
	<ul style="list-style-type: none"> offered (mobile homes) Federal Disaster Recovery Manager (FDRM) appointed 	<ul style="list-style-type: none"> secured Impact of FDRM on State and Local recovery
5. Regional Transportation Recovery Annex implementation	<ul style="list-style-type: none"> Regional coordination begins Existing transportation agency actions 	<ul style="list-style-type: none"> Calls for separate transportation recovery organization Demands on available personnel
6. Jurisdictions using Recovery Support Functions	<ul style="list-style-type: none"> Organization structure Functional alignment Recognizable integration Coordination lacking 	<ul style="list-style-type: none"> Level of organization (federal, state, local) Personnel demand Private sector availability
7. Initial Congressional recovery funding bill approved	<ul style="list-style-type: none"> \$8.4B approved for Washington & Oregon recovery 	<ul style="list-style-type: none"> Funding to be provided through the State Emergency Management Division
8. Housing and Urban Development funding approved	<ul style="list-style-type: none"> \$2.0B approved for low income housing assistance 	<ul style="list-style-type: none"> Funding to be provided through the State Department of Social and Health Services
9. Governor holds local government and private sector summit on recovery	<ul style="list-style-type: none"> Estimated recovery assessment exceeds \$100B 	<ul style="list-style-type: none"> Rebuild Washington initiative to capture and coordinate recovery projects statewide
10. Employment/Economy	<ul style="list-style-type: none"> Unemployment continues unabated at 19% Business leaders call for expedited transportation recovery 	<ul style="list-style-type: none"> Major employers reporting 35% absenteeism Recovery jobs center to open Business leaders want a say in recovery priorities
11. Public Information	<ul style="list-style-type: none"> Recovery transparency expectations for public and employers 	<ul style="list-style-type: none"> Limited methods of communication available
12. Continuity of Operations (COOP) and Government (COG)	<ul style="list-style-type: none"> Only essential functions are operational 	<ul style="list-style-type: none"> Lack of functional facilities impact Lack of personnel mobility impact

Goals

Participants should improve their collective recovery understanding by achieving the following goals.

Goal 1: Understand recovery relationships and cooperation.

Goal 2: Understand the recovery prioritization challenges, dependencies and interdependencies.

Goal 3: Develop an outline of the challenges and gaps in recovery.

Goal 4: Develop an outline of next steps for recovery system improvement.

Objectives

Objective 1: To identify roles, responsibilities and communication between the entities involved in recovery.

Objective 2: To identify the process for timely and flexible prioritization of infrastructure and economic recovery (using the four infrastructures from the damage observations page 8-11 of this manual).

Objective 3: To identify dependencies and interdependencies in recovery planning, prioritization and structures.

Objective 4: To identify the gaps in recovery processes and planning for improvement.

Discussion Questions

Objective 1:

1. Who is responsible for recovery? Why? What conflicts exist?
2. What are some of the specific roles in recovery? When are they determined?
3. How is recovery communicated between recovery entities? What entities?

Objective 2:

1. What is the process for infrastructure recovery prioritization? When is it done? How is it done?
2. Why is being flexible and adaptable important to recovery priorities?
3. How is the economy factored into recovery priorities? Who participates?
4. Who is the ultimate decision maker during recovery? Why?

Objective 3:

1. Who determines the dependencies and interdependencies in recovery plans? How is it considered?
2. What are some of the dependencies and interdependencies in recovery priorities? How is it coordinated?
3. How are recovery entities dependent on each other? How are recovery entities interdependent? When does it integrate in planning for recovery?
4. Which infrastructure dependencies and interdependencies can you influence? How?

Objective 4:

1. What are gaps in the recovery processes (plans, priorities, economy, etc.)? Why?
2. What are the gaps in recovery communication and coordination? Why?
3. What are the important next steps to close recovery gaps? Why?
4. How should the consideration of social equity and justice be incorporated?

Terms and Definitions

Capability: The skills, knowledge and experience to accomplish a task.

Capacity: The quantity of people, equipment or resources available to complete a task.

Cascadia: The region impacted by the Cascadia subduction zone—roughly 700 miles from northwestern California, western Washington, western Oregon, and southwestern British Columbia.

Continuity of Government (COG): The principle of establishing defined procedures that allow a government to continue its essential operations in case of a catastrophic event.

Continuity of Operations (COOP): An organizations ability to continue performance of essential functions under a broad range of disruptive circumstances.

Core Capabilities: Distinct critical elements which the whole community must be able to perform. They provide a common vocabulary describing the significant functions that must be developed and executed across the whole community to ensure national preparedness.

Critical Infrastructure: Providing the essential services that underpin society and serve as the backbone of our economy, security, and health. We know it as the power we use in our homes, the water we drink, the transportation that moves us, the stores we shop in, and the communication systems we rely on to stay in touch with friends and family. There are 16 critical infrastructure sectors that compose the assets, systems, and networks, whether physical or virtual, so vital that their incapacitation or destruction would have a debilitating effect on security, economic security, public health or safety.

Dependency: A dependency is a “linkage or connection between two infrastructures, by which the state of one infrastructure influences or is reliant upon the state of the other.” (Rinaldi, Peerenboom, and Kelly, 2001)

Interdependency: An interdependency is a “bidirectional relationship between two infrastructures in which the state of each infrastructure influences or is reliant upon the state of the other.” (Rinaldi, Peerenboom, and Kelly, 2001)

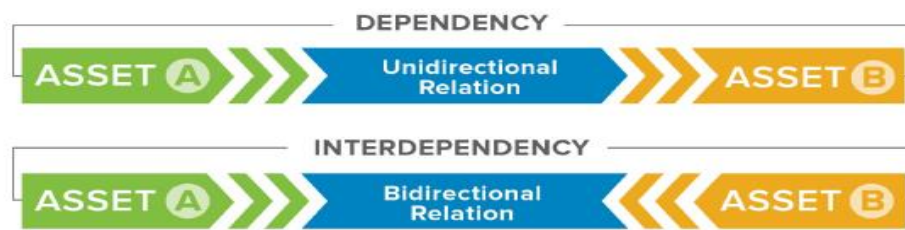


Figure 2: Dependency and Interdependency between Two Assets

Individuals and Households Assistance Program: IHP provides financial assistance and direct services to eligible individuals and households who have uninsured or underinsured necessary expenses and serious needs. IHP is not a substitute for insurance and cannot compensate for all losses caused by a disaster; it is intended to meet basic needs and supplement disaster recovery efforts.

Long-Term Community Recovery: "Long-term" refers to the need to re-establish a healthy, functioning community that will sustain itself over time.

Public Assistance Program: Grant program providing funds to assist communities responding to and recovering from major disasters or emergencies declared by the President. The program provides emergency assistance to save lives, protect property, and assists with permanently restoring community infrastructure affected by a federally declared incident. Eligible applicants include states, federally recognized tribal governments, local governments, and certain private non-profit (PNP) organizations.

Recovery: The recovery phase starts after the immediate threat to human life has subsided. The immediate goal of the recovery phase is to bring the affected area back to normalcy as quickly as possible. Recovery is often characterized as six processes, reconstruction, rebuilding, restoration, redevelopment, revitalization and reshaping. There are generally three phases of recovery: Short-Term (days); Intermediate (weeks to months); and, Long-Term (months to years).

Recovery Support Functions (RSFs): RSFs involve collaborative partners not typically found in the Emergency Support Functions (ESFs) but that are *critically* needed for disaster recovery.

Coordination through the RSFs encourages and complements investments and contributions by the business community, individuals and voluntary, faith-based and community organizations. RSF activities assist communities with *accelerating* the process of recovery, redevelopment and revitalization.

Social Equity and Justice: The National Academy of Public Administration defines the term as “The fair, just and equitable management of all institutions serving the public directly or by contract; the fair, just and equitable distribution of public services and implementation of public policy; and the commitment to promote fairness, justice, and equity in the formation of public policy; taking into account historical and current inequalities among groups; fairness is dependent on this social and historical context.”



Subduction Zone: The zone along which one tectonic plate meets and slides beneath another. In the Pacific Northwest, this is the 684-mile-long (1,100 kilometer) Cascadia subduction zone, a thrust fault along which the Juan de Fuca oceanic plate subducts beneath the North American plate. This zone extends from Brooks Peninsula on Vancouver Island to Cape Mendocino in California (where a second oceanic plate, called the Gorda plate, subducts beneath northern California).

Whole Community: An approach to emergency management that reinforces the fact that FEMA is only one part of our nation's emergency management team; that we must leverage all of the resources of our collective team in preparing for, protecting against, responding to, recovering from and mitigating against all hazards; and that collectively we must meet the needs of the entire community in each of these areas.



Recovery Plan Crosswalk

This crosswalk is based on reading each plan and making an educated guess based on similar language regarding agencies expected to participate in the recovery processes identified in the plans.

Key: Y = Yes N = No L = Limited Note: Same Resource Requirements is an agency or organization named in one or more plans listed Note: Unique or Special Interest Items is something in a plan noteworthy						
Plan	Implemented Concurrently	Local Impact	Regional Impact	Same Resource Requirements	Observation	Unique or Special Interest Items
National Recovery Framework (June 2016)	Y	L	L	L	Federal Recovery Centers will request local, regional and state participation. Implementing Recovery Support Functions will place additional resource demands.	None
King County Recovery Plan (May 2014) (Currently under revision, for example only)	Y	Y	N	Y	Plan is based on ESF-14 Long-Term Recovery, has many expectations for resources same as other counties on private sector, volunteer organizations and state resources	Focus on FEMA programs for Individual Assistance and Public Assistance
Seattle Recovery Framework (July 2015)	Y	Y	N	Y	Modeled after National Recovery Framework. If Recovery Support	Core values is a good model. RSF-3 adds Education to the Housing

Key: Y = Yes N = No L = Limited

Note: Same Resource Requirements is an agency or organization named in one or more plans listed

Note: Unique or Special Interest Items is something in a plan noteworthy

Plan	Implemented Concurrently	Local Impact	Regional Impact	Same Resource Requirements	Observation	Unique or Special Interest Items
					Functions are implemented may conflict with Federal and County needs for similar resources.	and Social Services Recovery Support Function. Adds a seventh RSF to address Buildings and Land Use Planning
Snohomish County Recovery Framework (August 2016)	Y	Y	N	Y	Modeled after National Recovery Framework. If Recovery Support Functions are implemented may conflict with Federal and other County needs for similar resources	Has identified positions within the Recovery organization with good position descriptions. Has some identified templates to use in recovery.
Pierce County Recovery Framework (September 2014)	Y	Y	N	Y	Support Annex 8 to their Comprehensive Emergency Management Plan. Separates short-term and long-term recovery, implanting RSFs in long-term recovery.	None
Kitsap County Recovery Plan (December 2003)	Y	Y	N	L	Uses ESF concept	Uses well developed

Key: Y = Yes N = No L = Limited

Note: Same Resource Requirements is an agency or organization named in one or more plans listed

Note: Unique or Special Interest Items is something in a plan noteworthy

Plan	Implemented Concurrently	Local Impact	Regional Impact	Same Resource Requirements	Observation	Unique or Special Interest Items
					throughout similar to ESF-14 Long-Term recovery.	checklist format.
Regional Catastrophic Disaster Coordination Plan (March 2013)	Y	Y	Y	Y	Response focus, some short-term recovery implications. Has expectation of many resources in other plans.	Synch matrix developed for a visual implementation guide.
Transportation Recovery Annex (July 2014)	Y	Y	Y	Y	Appears short-term recovery as uses ESF-1 in response phase although indicates a long-term strategy.	Uses well developed checklist and guide format.
Emergency Response Planning Guide for Public Water Systems (WA Dept of Health) (January 2017)	Y	L	L	L	Guide for recovering water systems after an emergency or disaster.	Gives interim solutions for short-term recovery.

Recovery Resources

Resource	Website
National Disaster Recovery Framework	https://www.fema.gov/media-library/assets/documents/117794
Pre-Disaster Recovery Planning Guide for State Governments	https://www.fema.gov/media-library-data/1485202780009-db5c48b2774665e357100cc69a14da68/Pre-DisasterRecoveryPlanningGuideforStateGovernments-1.pdf
Pre-Disaster Recovery Planning Guide for Local Governments	https://www.fema.gov/media-library-data/1487096102974-e33c774e3170bebd5846ab8dc9b61504/PreDisasterRecoveryPlanningGuideforLocalGovernmentsFinal50820170203.pdf
Community Recovery Management Toolkit	https://www.fema.gov/national-disaster-recovery-framework/community-recovery-management-toolkit
Small Business Administration Disaster Loan Program for Individuals and Business	https://disasterloan.sba.gov/ela/Information/DisasterLoanFactSheets
Individuals and Households Assistance Program	https://www.fema.gov/media-library-data/1483567080828-1201b6eebf9fbbd7c8a070fddb308971/FEMAIHPUG_CoverEdit_December2016.pdf
Public Assistance Program	https://www.fema.gov/media-library-data/1515614675577-be7fd5e0cac814441c313882924c5c0a/PAPPG_V3_508_FINAL.pdf https://www.fema.gov/media-library/assets/documents/90743
Long-Term Community Recovery Planning Process A Self-Help Guide	https://www.fema.gov/media-library-data/20130726-1538-20490-8825/selfhelp.pdf
Disaster Impact and Unmet Needs Assessment Kit	https://www.hudexchange.info/resource/2870/disaster-impact-and-unmet-needs-assessment-kit/
Arizona State Emergency Response and Recovery Plan	https://dema.az.gov/sites/default/files/publications/EM-PLN_SERRP_Jan_2018.pdf
King County Long-Term Recovery Plan Note: Under revision	http://www.kingcounty.gov/~media/safety/prepare/documents/EMProfessionals_Plans/CEMP/14_KC_CEMP_ESF_14_Recovery.ashx

Resource	Website
Snohomish County Disaster Recovery Framework	https://snohomishcountywa.gov/DocumentCenter/View/38783
Pierce County Disaster Recovery Framework	http://www.co.pierce.wa.us/DocumentCenter/View/35772
Kitsap County Comprehensive Recovery Plan	http://www.kitsapdem.org/pdfs/kc_plans/RecoveryPlan2004.pdf
Seattle Disaster Recovery Framework	http://www.seattle.gov/Documents/Departments/Emergency/PlansOEM/Recovery/SeattleDisasterRecoveryFramework7-7-15v2.pdf
Puget Sound Regional Catastrophic Disaster Coordination Plan	https://www.mil.wa.gov/uploads/pdf/PLANS/coordinationplannew.pdf
Puget Sound Regional Catastrophic Disaster Coordination Plan and Annexes (Plan Summary)	https://www.mil.wa.gov/uploads/pdf/PLANS/PlanSummariesMay2013.pdf
Puget Sound Regional Catastrophic Disaster Coordination Plan (Emergency Authorities Report)	https://www.mil.wa.gov/uploads/pdf/PLANS/EmergencyAuthoritiesReport.pdf
Puget Sound Regional Catastrophic Disaster Coordination Plan (Recommendations Report)	https://www.mil.wa.gov/uploads/pdf/PLANS/RecommendationsReport.pdf
Puget Sound Regional Catastrophic Disaster Coordination Plan (Synchronization Matrix)	https://www.mil.wa.gov/uploads/pdf/PLANS/Synchronization%20Matrix.pdf
Puget Sound Regional Catastrophic Disaster Coordination Plan (Transportation Recovery Annex)	https://www.mil.wa.gov/uploads/pdf/PLANS/transportationrecoveryannexnew.pdf
Additional Regional Disaster Coordination Plan Resources	https://www.mil.wa.gov/emergency-management-division/regional-catastrophic-preparedness-grant-program-rcpgp

Resource	Website
Washington Catastrophic Incident Planning Framework	https://mil.wa.gov/uploads/pdf/emergency-management/catastrophic-incident-planning-framework_version-1_101217.pdf
Incorporating Prioritization in Critical Infrastructure Security and Resilience Programs	https://www.hsaj.org/articles/14091
State Energy Resilience Framework Report, Argonne National Laboratory	https://www.energy.gov/sites/prod/files/2017/01/f34/State%20Energy%20Resilience%20Framework.pdf

