

**BLUE CASCADES V**  
**Infrastructure Interdependencies Tabletop Exercise**  
**Focus—Post-Disaster Regional Supply Chain Resilience**

**FINAL REPORT**

**Washington State Homeland Security Region 6**



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**Held December 11, 2008**  
**Shoreline Conference Center, Seattle, WA**

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## Executive Summary

State and local governments and key stakeholder organizations convened on December 11, 2008 to hold a regional infrastructure interdependencies exercise focused on assuring critical supply chains in a major disaster. Blue Cascades V, the most recent exercise in the Blue Cascades exercise series, centered on providing food, fuel in a M. 6.7 Seattle Fault Earthquake scenario. The goal of the exercise was to explore impacts that would cause significant, extended disruptions in these critical supply chains; test disaster response plans and procedures; and identify gaps and mitigation and other measures that could expedite their restoration. Specific issue areas addressed in the exercise included interdependencies, coordination, roles and responsibilities, response, critical resource logistics and distribution, information sharing, economic/community recovery, public information, and training and education. The scenario, which was developed by an Exercise Planning Team with assistance from a regional stakeholder Scenario Advisory Group, also addressed infrastructure interdependencies that crossed state and national boundaries. The exercise used an interactive format of facilitated discussion among participants on scenario events using issues questions to focus discussion. An exercise evaluation team provided a hotwash presentation of lessons learned at the end of the exercise followed by participant discussion on exercise outcomes. The exercise concluded with a Next Steps session that outlined an After Action Report followed by development of an Action Strategy to address preparedness gaps and contribute to disaster supply chain planning and resilience.

### Selected Findings

- ◇ State and regional local plans are currently in the early development stage to assure the provision of essential supplies (food, water, and fuel) in the event of a major disaster that impacts interdependent infrastructures—power, water systems, transportation, etc.
- ◇ Seattle is built on a water economy--major bridge failures, lack of power for Port loading, unloading, and road and rail transport of commodities will disrupt food, water, and fuel supplies, and other freight and shipping. Warehouses and food distribution centers will likely be damaged in a major earthquake and road blockages and bridge damage will impede deliveries.
- ◇ Lighting and refrigeration will not be working at grocery stores and the Port of Seattle due to power outages. Emergency power generators will be in short supply, unavailable, or unable to reach where they are needed. Financial transactions of purchases of food, fuel, and water will be impeded by shutdown of financial services. Fuel and wastewater pipe breaks will disrupt supplies and also flood contaminants into creeks and rivers. Pipelines will need to be shutdown and be inspected before they are restored to service. Major issues include where fuel can be delivered, what type of fuel is needed, and where the fuel could be stored given unavailability of

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trucks. There is no bulk storage for oil except for Harbor Island, which would be inaccessible in a major earthquake.

- ◇ Communications are critical to service restoration and is limited to email, fax, phone, cell phone and the Internet—all of which would likely fail in a major earthquake. Needed is an alternate method of ordering emergency supplies if Electronic Order Systems and transmission lines are down between grocers and retail customers.
- ◇ Critical supply distribution is not coordinated and there is as yet no regional plan that currently addresses supply chains. For example, in the critical area of transportation, there is no cross-sector transportation management plan that address disruptions, route nor decision-making process that involves key stakeholders. The private sector and other key stakeholders have limited knowledge of state, local, and national plans, and rely on their own continuity plans. The National Response Framework Emergency Support Functions address individual aspects of supply chains, and recovery and would have to be coordinated through Emergency Management.
- ◇ There are no provisions to supersede rules currently in place governing service areas of refuse companies. This is a significant challenge for grocery stores and a major health hazard because of the need to dispose spoiled meat, produce, dairy and frozen products in the event of a prolonged power outage.
- ◇ Local military facilities are resources that could have a significant role in disaster supply and distribution planning and execution.
- ◇ Publicly accessible temporary distribution points with docks able to off-load trailers for eventual critical supplies will need to be designated and the public informed where they are located. Credentialing of delivery personnel remains an issue.
- ◇ A formal mechanism that includes all relevant stakeholders should be created to provide two-way situational awareness to expedite disaster supply and distribution for response and recovery. The cross-sector Information Fusion System that is being developed by the Washington State Information Fusion Center, PNWER, and regional stakeholders could be used for this purpose.
- ◇ A major need is to determine what agencies/organizations are in charge of supply and distribution decisions and management, both during response and recovery. While there would likely be a “long-term recovery task force” set up by the state to focus on different sector priorities, it is not clear how the decision-making process would work. Criteria needs to be developed to prioritize which organizations receive critical supplies and in what order.
- ◇ Plans, procedures, and mutual aid agreements are necessary to assure expeditious restoration of essential supplies, including contractual arrangements with organizations for distribution of food, water, and fuels. Businesses need to find ways to work together rather than compete during disaster recovery.

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- ◇ The public has unrealistic expectations of what government can provide regarding basic services in a major disaster. The region will not return to normal, but to a “new state of normalcy” that government must help define.
  - ◇ Targeted exercises and workshops should be held with regional stakeholders to investigate particular issues and challenges and elected officials need to be provided essential information to deal with disaster supply chain issues in advance of a major disaster.

### **Significant Recommendations**

- ◇ There needs to be more intensive and extensive exploration of interdependencies impacts on disaster supply chains.
- ◇ Various means of alternative energy resources to provide or supplement power need to be explored and a regional needs assessment of emergency power generation capacity and disaster requirements and a mitigation plan should be undertaken. Similarly, means of alternative communications should be investigated, including satellite phones with a database of relevant users, sharing satellite phone channels, and using ham radios.
- ◇ A regional cross-sector emergency transportation management system that covers road, rail, maritime, and air needs to be developed to enable informed and coordinated re-routing of shipments of essential supplies and publicly accessible distribution locations. Similarly, a regional emergency fuel storage and distribution system should be developed to assure adequate fuel is available to first responders, hospitals, power and communications maintenance vehicles, and delivery vehicles.
- ◇ Regional stakeholders need to meet and work to develop relationships and trust to collectively address response and recovery challenges and share disaster supply distribution plans. Essential service providers need to overcome competition and work together to develop agreements to cooperate in a major disaster. Included in the coordination group should be schools, other academic and community institutions and commercial businesses that would be involved in disaster supply and distribution planning and execution.
- ◇ State and local officials need to educate stakeholders on emergency management plans and provide them training in incident and recovery chain-of-command procedures once they are developed. It is important that plans specify clearly roles and responsibilities and outline how the incident management and recovery processes. Government and key stakeholder organizations should work together to develop procedures for prioritization of food, water, and fuel allocations to infrastructures and locations.

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- ◇ Pre-disaster agreements among government and organizations essential for disaster supply and distribution should be established to deal with legal and liability issues and potential environmental or regulatory constraints, such as “roadblocks” that impede transportation, fuel storage, or require certification of buildings as safe and other critical disaster supply distribution challenges. Pre-event points of distribution with alternate locations, and stockpiles of essential supplies should be established as practical and feasible.
  - ◇ Local military facilities, the Coast Guard, and National Guard should be involved in disaster supply and distribution planning and execution. Defense assets and capabilities should be identified in advance that could be used for disaster supply distribution, and key stakeholders should exercise with local military representatives to see how defense assets could be utilized to handle critical resources distribution.
  - ◇ Key stakeholder organizations willing to be involved in disaster supply and distribution of essential supplies should identify in advance the personnel who would contribute their services. A credentialing system needs to cover such personnel.
  - ◇ Local governments need to examine refuse disposal contractual arrangements and determine procedures to incorporate into disaster response/recovery plans to enable expeditious removal of spoiled food and other hazardous waste. Local plans will also need to take into account provision of portable toilets and other sanitary facilities for people without running water or in shelters.
  - ◇ A method for collecting information should be developed to create a regional inventory of normally available critical disaster supplies that could be readily mobilized after a major disaster. The inventory of available resources should be supplemented with an inventory of where to get additional resources in the event of a disaster. An advanced NWWARN that will be part of the cross-sector Information Fusion Center could provide the communications mechanism for critical supply distribution information/two-way situational awareness.
  - ◇ A regional public information plan should be developed on disaster supply chains that includes the media and provides for exercises and workshops, including an event to educate elected officials on these issues. The plan should include information on earthquake impacts and what the public can expect regarding food, water, fuel, and other critical supplies and what services the government can and cannot provide. The plan should include provisions for coordination among local government with food, water, and fuel and other essential service providers to deal with media inquiries.

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# Blue Cascades V Infrastructure Interdependencies Exercise

## 1. Background

Blue Cascades V, the latest of the Blue Cascades Exercise Series, was held December 11, 2008 in Seattle, WA. The exercise focused on a significant issue identified in previous regional exercises as needing attention: assuring critical supply chains—food, water, and fuel—in the aftermath of a major disaster, in this case a high-magnitude earthquake.\*

Of the many potential disasters faced today, a catastrophic earthquake would have one of the most devastating impacts on the region. Blue Cascades V focused specifically on how the region would restore and continue to provide these essential life-sustaining services after such an event. Exercise participants included many organizations that play a role in regional supply chain resilience—private, public, and non-profit stakeholders including local, state, and federal government agencies, utilities, grocery stores, hospitals, commercial businesses, and non-profits. Scenario events were tailored to:

- Facilitate discussion of critical links in these supply chains and to what extent in a major disaster they are vulnerable, either directly or through infrastructure interdependencies;
- The utility of disaster plans and procedures to provide emergency food, fuel, water and other essential resources while supply chains are being restored;
- Preparedness gaps and potential ways to address these gaps, and;
- Associated issues involving roles and responsibilities, coordination, two-way communication, and decision-making.

Blue Cascades V was sponsored by Washington State Homeland Security Region 6. The Pacific NorthWest Economic Region (PNWER), as with previous Blue Cascades exercises, provided assistance to regional stakeholders to develop and conduct the exercise.

## 2. Overview

### 2.1. Purpose, Goal and Objectives

The overall goal of the exercise was to test and enhance preparedness by addressing how food, fuel, water, and other essential needs can be assured, or if disrupted, rapidly restored after a large-scale disaster (in this case a major Seattle Fault earthquake).

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**\*The Blue Cascades regional infrastructure interdependencies exercises began in 2002. The previous four exercises focused on physical and cyber disruptions, a major subduction zone earthquake, and a pandemic scenario.**

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**Exercise objectives included:**

- Illuminate in greater detail the critical links in supply chains that provide the region's food, fuel, water, and other essential needs;
- Identify which elements in these regional supply chains are particularly important and to what extent they are vulnerable in a major earthquake, either directly or through infrastructure interdependencies;
- Utilize and build upon a Seattle Fault Earthquake scenario to explore the types and locations of impacts that would cause significant, extended disruptions in these critical supply chains;
- Examine the utility of disaster response plans and procedures to provide emergency food, fuel, water and other essential resources while supply chains are being restored; identify gaps and potential ways to address these gaps;
- Identify pre-event preparedness activities, mitigation and other measures that can accelerate restoration of these critical supply chains in a major earthquake.

## **2.2. Exercise Development**

The exercise was developed according to the Homeland Security Exercise Procedures (HSEEP) guidelines. A small Exercise Planning Team of core government and other stakeholder organizations developed the exercise scenario and process. The Exercise Planning Team was assisted by a broad regional stakeholder Scenario Advisory Group to ensure major issues of concern were addressed and the scenario was as accurate as possible. The exercise employed the magnitude 6.7 Seattle Fault Scenario for the trigger event to test the regional stakeholder's recovery plans. Both the Exercise Planning Team and the Scenario Advisory Group held a series of meetings and conference calls to prepare for the exercise over a three-month period. *(See Appendices A and B for member organizations of Exercise Planning Team and the Scenario Advisory Group.)*

### **2.2.1. Focus and Scope**

The geographic focus of the exercise scenario was the greater Seattle area: King, Pierce, and Snohomish Counties; Seattle and Bellevue, other local governments, state agencies, and private sector, non-profits, community institutions within these jurisdictions. The scenario also took into account infrastructure interdependencies associated with disaster supply chains that crossed state boundaries and cross-border into Canada.

### **2.2.2. Scenario Overview**

The four part scenario scene setter and events were based on a scenario used in previous exercises that focused on a major Seattle Fault earthquake. Hypothetical events, impacts and outcomes reflecting information provided by the Scenario Advisory Group were



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incorporated into the scenario to enable participants to meet the overall goal and objectives of the exercise.

The scenario opened with a pre-event short tutorial by an earthquake expert on the expected impacts to the region and critical infrastructures of a magnitude 6.7 Seattle Fault earthquake. The scenario then focused on pre-event preparedness, including short briefings and discussion on the status of state and local government and private sector plans to assure critical supply chains. Session 3 of the scenario focused on a post-event period covering days 3 through 7 after the earthquake, and finally Session 4 covered 12 days to two weeks after the event when recovery was well underway. (*See Appendix D for the scenario.*)

### 2.2.3. Exercise Format and Process

Blue Cascades V was a five-hour tabletop with the following format, as noted above:

1. Introductory and background information
2. Pre-event preparedness
3. Post-event days 3 through 5
4. 12 days to two weeks after the event
5. Hot wash to enable immediate sharing of evaluator/participant observations.

#### Exercise Agenda

8:30 a.m. – 8:40 a.m.	Welcome and Introductions
8:40 a.m. – 8:50 a.m.	Exercise Keynote
8:50 a.m. – 9:00 a.m.	Exercise Overview/Process
9:00 a.m. – 9:10a.m.	Session 1: Scenario Scene Setter—Earthquake Impacts with focus on Critical Supply Chains
9:10 a.m. – 10:00 a.m.	Session 2: Pre-Event—Status of Regional Preparedness to Assure Critical Supply Chains
10:00 a.m. – 10:15 a.m.	Break
10:15 a.m. – 11:15 a.m.	Session 3: Post-Event Days 3-5
11:15 p.m. – 12:15 p.m.	Session 4: Recovery Nearly Two-Weeks After
12:15 p.m. - 1:00 p.m.	Lunch
1:00 p.m. - 2:00 p.m.	Session 5: Hot Wash and Next Steps
2:00 p.m.	Adjourn

**Interactive Discussions.** Participants sat in mixed tables and were provided a few key questions per inject to address for specified time periods followed by report outs and general discussion.

**Evaluation Process, Hot Wash, and Next Steps.** Participants were provided evaluation forms to record their views, as well as note cards to provide comments and recommendations. Assigned evaluators recorded observations using an evaluation template. At the end of the exercise play, the evaluators met and developed a PowerPoint presentation of their observations with input from the exercise participants. The exercise

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adjourned after a concluding session on Next Steps. Participants were told that an Exercise After Action Report would be produced followed by an Action Strategy to address identified gaps and areas for further examination and testing by targeted exercises.

### **3. Findings and Recommendations**

The following findings and recommendations are based on information collected during the exercise proceedings by evaluators and by participants through their formal evaluations and observations and recommendation on the comment cards.

**Evaluation Criteria.** The results were grouped in nine general categories to address the exercise objectives: Interdependencies, Coordination, Roles and Responsibilities, Response, Critical Resource Logistics and Distribution, Information Sharing, Economic/Community Recovery, Public Information, and Training and Education.

#### **3.1. Interdependencies**

##### **3.1.1. Findings**

1. State and regional local plans are currently under development to assure the provision of essential supplies (food, water, and fuel) in the event of a major disaster that impacts interdependent infrastructures—power, water systems, transportation, etc.
2. Seattle is built on a water economy--major bridge failures, lack of power for Port loading, unloading, and road and rail transport of commodities will disrupt food, water, and fuel supplies, and other freight and shipping.
3. Food, water, and fuel supply are particularly dependent on transportation, also power and communications infrastructures.
4. Much of the Seattle area's food supply comes from California.
5. Warehouses and food distribution centers will likely be damaged in a major earthquake and road blockages and bridge damage will impede deliveries.
6. Refrigeration will not be working at grocery stores and the Port of Seattle due to power outages. Furthermore, refrigeration containers at the port are not owned by the Port of Seattle and could not be used for disaster recovery without the permission of the shipping companies. The Port could pass the request onto the shippers but there is no requirement for them to comply with the request.
7. Financial transactions of purchases of food, fuel, and water will be impeded by shutdown of financial services.

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8. Private sector organizations on their own will need to determine priority restoration of their assets given that government assistance is likely to be unavailable or delayed.
  9. Fuel and wastewater pipe breaks will disrupt supplies and also flood contaminants into creeks and rivers.
  10. Pipelines will need to be shutdown and be inspected before they are restored to service.
  11. Major issues include where fuel can be delivered, what type of fuel is needed, and where the fuel could be stored given unavailability of trucks and the need for boats and barges that could be used for this purpose.
  12. There is no bulk storage for oil except for Harbor Island, which would be inaccessible in a major earthquake.
  13. For some major grocers, store generators are powered by natural gas and will not work if the lines are severed or the supply is cut off, which is likely in an earthquake. Without power for sales, emergency lighting, and refrigeration, these stores would be forced to close. Restoration of limited power would require an electrical crew and a large capacity diesel generator transported by a tractor trailer. This could take several hours even if the electrical crews and generators are available. Moreover, the generator would need to be refueled every four-to-six hours by an available electrical crew.
  14. Hospitals will need fuel for generators after three days and will need to evacuate if they run out of fuel.
  15. Communications are critical to restoration of services and is limited to email, fax, phone, cell phone and the Internet—all of which would likely fail in a major earthquake. One private sector participant commented that the region would be unlikely to have usable traditional communications systems operable for a week or more. Amateur radio may fill basic communications needs for State, county, and city emergency operations.
  16. There is a need for an alternate method of ordering emergency supplies if Electronic Order Systems and transmission lines are down between grocers and retail customers.

### 3.1.2. Recommendations

- There needs to be **more intensive and extensive exploration of interdependencies impacts** on disaster supply chain issues.

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- Various means of **alternative energy resources to provide or supplement power need to be explored**. Participants suggested solar, wind, additional generators for small enterprises or buildings, installation of rainwater cisterns or using existing wells.
  - Various means of **alternative communications likewise should be examined**. Suggestions included satellite phones with a database of relevant users, sharing satellite phone channels, using ham radios, and designating collaborative space in EOCs to enable public-private sector interaction and communication during the response and recovery process. One participant recommended providing old police and fire radios to private sector organizations as alternative communications resources that can tie directly into the Emergency Operation Center and not disrupt the current systems employed by the police and fire.
  - A **regional emergency transportation management system** needs to be developed to enable informed and coordinated re-routing of shipments of essential supplies and prudent and practical siting of publicly accessible distribution locations.
  - A **regional emergency fuel storage and distribution system** needs to be developed to assure adequate fuel is available to first responders, hospitals, power and communications maintenance vehicles, delivery vehicles and to grocers and other distributors of essential goods and services.
  - An **emergency power generation needs assessment** should be undertaken to determine regional emergency power generator capacity, identify suppliers and locations of available generators, and ascertain and prioritize the needs of essential service providers for emergency power generation. Once the assessment has been completed, a plan for accessing/stockpiling generators with procedures for providing electrical teams for fueling and necessary fuel should be established.

## **3.2. Coordination**

### **3.2.1. Findings**

1. Critical supply distribution is not coordinated, nor is government emergency management plans coordinated on this aspect of disaster response and recovery. The Emergency Support Functions address individual aspects of the supply chain, and recovery and would have to be coordinated through Emergency Management. However, there is no plan that currently addresses Supply Chain. The individual functions are not well understood by the private sector.
2. Prioritization issues need to be addressed; as one participant put it, “Who is at the beginning of the line?”
3. The biggest challenge is how to coordinate across all sectors.

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4. Several participants observed the need for close coordination between state and particularly local emergency managers and private sector organizations with greater private sector representation in EOCs, which could be handled through a private sector liaison function.
  5. It is unclear what organization would be providing information to the media and public on food, fuel, and water shortages and distribution information.

### 3.2.2. Recommendations

- State and local government plans need to work with and educate private and non-profit organizations to **provide for effective means and mechanisms for cross-sector coordination** in disaster supply plans.
- **Regional stakeholder organizations need to continue to meet and work to develop relationships and trust** necessary to collectively address response and recovery supply and distribution challenges.
- Stakeholders should **share disaster supply distribution plans**.
- Government and key stakeholder organizations should work together to develop an agreed **cross-sector methodology for prioritizing food, water, and fuel allocations to infrastructures and locations**.
- Providers of essential services need to overcome competition and work together to develop arrangements and agreements to cooperate in a major disaster.

## 3.3. Roles and Responsibilities

### 3.3.1. Findings

1. Several participants cited the need to determine who (what agency) is in charge of supply and distribution decisions and management, both during response and also recovery. Others noted the need to understand “chain of command” procedures.

### 3.3.2. Recommendations

- State and local **plans need to specify clearly which agency or agencies are in charge of which responsibilities** in regard to supply/distribution decisions and management and outline the procedures for how this process works.
- **Educate stakeholders** on emergency management plans and process.

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- Key stakeholder organizations with major roles in disaster supply and distribution need to participate in incident and recovery management **training on chain-of-command procedures** once they are developed.

### **3.4. Response**

#### **3.4.1. Findings**

1. State and local plans focusing on food, fuel, and water supply are in the early developmental stage:
  - a) The federal government will send a great deal of supplies and the state will try to organize and manage the process.
  - b) The State is working with the trucking association and federal agencies to protect goods on the road from hijacking and commandeering.
  - c) King County has 39 cities to coordinate and a regional emergency management plan that focuses on Emergency Support Function 21 relating to Recovery under the National Response Framework
  - d) The City of Seattle has a multi-hazard disaster plan with two groups— one of City departments with key stakeholders and a Community Recovery Network.
  - e) The City of Seattle is reliant on WSDOT and other key state agencies for disaster transportation assistance and management.
  - f) FEMA can pre-stage and send in critical resources and can move large amounts of water.
  - g) A regional management system is being developed by the UASI regions with DHS.
  - h) Sea-Tac, in a major disaster, will handle increased cargo after it becomes operational.
2. It is estimated that 80 percent of first responders live outside the Seattle area and will be unable to go where needed with transportation affected.
3. A concept-of-operations to coordinate critical supply distribution has not been tested in Seattle because there has not been a big enough disaster to test it.
4. There are no provisions to supersede rules currently in place governing service areas of refuse companies. This is a significant challenge for grocery stores and a major health hazard because of the need to dispose spoiled meat, produce, dairy and frozen products in the event of a prolonged power outage.

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5. Several participants remarked that government representatives during the exercise often said they were “working on it” when asked specifics about a particular need and what their agencies plan would do. The stage of planning development is cause for concern for some private sector representatives. What timeframe can the region expect a finalized plan will be in place and shared? Also what coordination has been done to include the private sector?
  6. A few participants commented that their expectations of federal government assistance were low while others noted that the general public had high expectations of government assistance in a major disaster.
  7. Credentialing remains an issue to expedite distribution of food, water, fuel, and other essential services.
  8. Private sector organizations need a means to notify or volunteer availability to assist in providing essential supplies or technical assistance in a disaster.
  9. Local military facilities are resources that could have a significant role in disaster supply and distribution planning and execution.
  10. Schools and community institutions need to be included in disaster supply and distribution planning and execution.
  11. In addressing water needs, exercise participants did not focus to any degree on waster water and lack of sanitary facilities.

#### 3.4.2. Recommendations:

- **Pre-disaster agreements among government and organizations essential for disaster supply and distribution should be negotiated** to deal with legal and liability issues, and potential environmental or regulatory constraints.
- **Pre-event points of distribution with alternate locations, and stockpiles of essential supplies should be established** as practical and feasible.
- **Local military facilities, the Coast Guard, and National Guard should be involved** in disaster supply and distribution planning and execution.
- **Defense assets and capabilities should be identified in advance** that could be used for disaster supply distribution.
- **Schools and other community institutions need to be involved** in disaster supply and distribution planning and execution.

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- Disaster response/recovery plans need to **include arrangements for food and shelter for government and stakeholder personnel** who are providing essential goods and services during disaster response and recovery.
  - Key stakeholder organizations willing to be involved in disaster supply and distribution of food, water, fuel and other essential supplies should **identify in advance the personnel who would contribute their services**.
  - A **credentialing system needs to include personnel that may be involved in supply and distribution of essential goods and services** in a disaster.
  - Local governments need to examine **refuse disposal contractual arrangements and determine procedures** to incorporate into disaster response/recovery plans to enable expeditious removal of spoiled food and other hazardous waste. Local plans must also take into account provision of portable toilets and other sanitary facilities for people without running water or in shelters.

### **3.5. Critical Resource Logistics and Distribution**

#### **3.5.1. Findings**

1. Safeway coordinates with the State on disaster-related supply issues, but not thus far with King County or other local governments.
2. The Navy has a broad sealift capability that could be utilized to bring in critical supplies.
3. There is limited knowledge of how to make supply chains more resilient through prevention and mitigation measures.
4. There is a need to determine how fuel will be brought into Sea-Tac if there is no operational pipeline given the airport will have approximately 3 days supply.
5. Water can be obtained from other states, but how it gets to where needed at the local level is the challenge.
6. Bulk food and water will not be able to be delivered until at least a week after a major earthquake.
7. Publicly accessible temporary distribution points with docks able to off-load trailers for eventual critical supplies will need to be designated and the public informed where they are located.
8. There is a need to determine how businesses can work together rather than compete during the recovery phase of a disaster.



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9. Fuel-rationing will be necessary.
  10. Criteria needs to be developed to prioritize which organizations receive critical supplies and in what order.

### 3.5.2. Recommendations

- **A regional system should be developed to manage supplies and logistics** after a major disaster that incorporates local agencies across jurisdictions and relevant state agencies. King County is currently developing this system through a DHS pilot program. The system should include:
  - Alternate routes for distribution if certain roads, bridges, or tunnels are impassable;
  - Alternate sites to be used as distribution warehouses;
  - Alternative suppliers if local suppliers are unavailable;
  - An inventory of heavy equipment; e.g., cranes, backhoes, tracked loaders, dump trucks to open roads, and refrigerated trucks, delivery trucks and helicopters to bring in needed supplies;
  - Procedures to delay payments and provision of mobile ATMs.
- **Local agencies should develop a contact list of private and non-profit sector organizations** that would be involved in disaster supply and distribution.
- **Contracts covering payments and other arrangements should be made in advance** between local government and food, water, fuel suppliers and other private sector organizations for provision of critical supplies.
- **Government and other key stakeholders should exercise with local military representatives** to see how defense assets could be utilized to handle critical resources distribution.
- **A method for collecting information should be developed that includes the private sector to create a regional inventory** of normally available critical disaster supplies that could be readily mobilized after a major disaster.
  - The inventory of available resources should be supplemented with an inventory of where to get additional resources in the event of a disaster.
- **WSDOT should consider constructing temporary gravel roads and investigate temporary bridges** to deal with major disaster disruptions of transportation.

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- A **coordinated public communication plan** should be developed among local government with food, water, and fuel providers to deal with media inquiries.

### **3.6. Information Sharing**

#### **3.6.1 Findings**

1. A cross-sector, formal mechanism that includes all relevant stakeholders needs to be created to incorporate them into the information flow and two-way situational awareness to expedite disaster supply and distribution for response and recovery.
2. The cross-sector Information Fusion System that is being developed by the Washington State Information Fusion Center, PNWER, and regional stakeholders could be used for this purpose.

#### **3.6.2. Recommendations**

- **Explore utilizing the advanced NWWARN that will be part of the cross-sector Information Fusion Center** now under development as the communications mechanism for critical supply distribution information/two-way situational awareness.

### **3.7. Economic/Community Recovery**

#### **3.7.1. Findings**

1. Response and recovery phases will overlap—it is not clear how the disaster recovery management system would work.
2. There would likely be a “long-term recovery task force” set up by the state to focus on different sector priorities.
3. Plans, procedures, and mutual aid agreements are necessary to assure expeditious restoration of essential supplies.
4. The region has many individual plans for long-term recovery. There is work underway for the development of a regional plan through the Regional Catastrophic Planning Grant Program (RCPGP)
5. Contractual arrangement with organizations for the distribution of food, water, and fuel need to be developed before, not during disasters.
6. Heavy equipment will be essential for debris removal and it will be necessary to determine how to obtain it and the fuel to operate it.

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7. Certain industries related to food production and distribution may not stay in the region.
  8. The region will not return to normal, but to a “new state of normalcy”.

### **3.7.2. Recommendations**

- Explore Navy, Coast Guard and other untraditional federal capabilities that could be utilized for restoration.
- Need to **identify regulatory “roadblocks”** that impede transportation, fuel storage, or certification of buildings as safe and other critical disaster supply distribution challenges, **and create MOUs** to get around these constraints during and after a disaster.

## **3.8. Public Information**

### **3.8.1. Findings**

1. There is limited knowledge on the part of the public on earthquake impacts.
2. The public has unrealistic expectations of what government can provide regarding basic services in a major disaster.
3. Government in coordination with key stakeholders needs to be able to define for the general public what the “new normal” is.

### **3.8.2. Recommendations**

- Need to **educate public on earthquake impacts and what to expect** regarding food, water, fuel, and other critical supplies, what services the government can provide, including when and how—and what the government cannot provide.
- Develop a **regional public information plan** focused on disaster supply chains that includes the media.

## **3.9. Training and Education**

### **3.9.1. Findings**

1. Targeted exercises and workshops need to be held with regional stakeholders to investigate particular issues and challenges.
2. Elected officials need to be provided essential information to deal with disaster supply chain issues in advance of a major disaster

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### 3.9.2 Recommendations

- Once critical supply distribution plans are in place, **conduct bi-annual functional testing of plans.**
- **Conduct targeted workshops and drills** to explore and test critical different supply chain issues and plans.
- **Hold a conference to educate and sensitize elected officials** to disaster supply distribution challenges.

## 4. Exercise Utility

The exercise received positive evaluation from participants.

- 77 percent of those who filled out evaluation forms said the exercise was well-structured and organized.
- 84 percent saw the exercise scenario was plausible and realistic.
- 84 percent said the facilitators were knowledgeable, on target, and sensitive to group dynamics.
- 89 percent felt participation in the exercise was appropriate for someone in their position.
- 79 percent said the exercise included the right mix of people.

Several participants observed that, although the exercise was supposed to test government plans, exercise discussion focused more on generalities. As one participant noted, the discussion appeared to be at a “micro” level focused on business continuity and not regional collaboration, while another observed that “comments made during the hot wash were “focused on response rather than recovery.” As noted previously, several participants highlighted statements by government officials that they were ““working on plans” when asked specific details about disaster resource management. One participant observed that the exercise “seemed more like a pre-exercise discussion,” adding that “clearly more structured plans are needed.” Another participant felt the questions needed to be narrowed to allow more discussion of “priority items.”

A few government participants remarked they liked the smaller number of attendees in the exercise than in previous Blue Cascades exercises because it facilitated discussion. At the same time, other stakeholders pointed to the absence of a number of stakeholder organizations as limiting the utility of the exercise. Organizations cited as missing and needed to be included in future exercises included local military installations, the

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National Guard, the Coast Guard, schools, community institutions, non-profit organizations involved in emergency response and recovery, a larger representation from utilities, and commercial organizations involved in disaster supply and distribution.

## **4. Path Forward**

Blue Cascades V provided a wealth of information on disaster supply and distribution challenges and needs, both during the exercise development process through inputs provided by the Exercise Stakeholder Scenario Advisory Group, and in the exercise proceedings. This information will have significant value-added for local and state agencies involved in emergency planning/disaster management and for regional key stakeholder organizations with roles in providing food, water, fuel, and other essential products and services during disaster response and recovery. The exercise findings and recommendations point clearly to what is needed to develop a comprehensive regional resource management plan for catastrophic disasters that assures effective distribution of life-sustaining supplies under the most adverse conditions—a major earthquake.

Developing this plan will require involvement of all key private and non-profit stakeholders and needs to be closely coordinated with State catastrophic disaster planning and the National Response Framework.

The lessons learned from Blue Cascades V in this Final Report, as with previous Blue Cascade exercises, will be incorporated into a draft Action Plan of activities for consideration by the exercise participants at an Action Planning Workshop to be held February 3, 2009. After the Action Plan activities are finalized and prioritized at the Workshop, the Action Plan will be utilized by government and other key stakeholders to help build the a regional plan, augment individual organizational continuity plans, and undertake targeted projects to further improve regional preparedness and resilience.

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## **6. Appendices**

### **Appendix A. Exercise Planning Team Member Organizations**

**Safeway, Inc**

**King County Emergency Management**

**King County Wastewater Treatment Division**

**Seattle Department of Transportation**

**AT&T**

**Virginia Mason Medical Center**

**Puget Sound Energy**

**Olympic Pipeline, BP Logistics**

**PNWER**

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## **Appendix B. Scenario Advisory Group Members**

**City of Seattle Department of Transportation**

**U.S. Postal Service**

**King County Transportation**

**Washington Emergency Management Division**

**Safeway, Inc.**

**Unified Grocers**

**Seattle-King County Public Health**

**Overlake Hospital**

**US Postal Service**

**Children's Hospital**

**PEMCO**

**Washington Department of Health**

**University of Washington – PNW Seismic Network**

**Virginia Mason Medical Center**

**Washington State Dept. of Transportation**

**Port of Seattle**

**PNWER Center for Regional Disaster Resilience**

**King County Regional Medical Resource Center**

**Washington Trucking Association**

**JP Morgan Chase/ Washington Mutual**

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## Appendix D. Scenario

### BLUE CASCADES V SCENARIO Regional Infrastructure Interdependencies Tabletop Exercise *Focus—Post-Disaster Regional Supply Chain Resilience*

*(Note: all events are hypothetical)*

#### **Thursday, December 11, 2008 6:00 AM**

- It's pre-dawn on a wet, windy and cold late fall Thursday in the Seattle area. As people begin to prepare for the day, none realize what lays in store for the region--a magnitude 6.7 scenario earthquake on the Seattle Fault. Its aftermath will disrupt for weeks and months individuals, families, businesses and governments throughout the region.
- Collapsed buildings or falling debris will kill or injure thousands of people, and trap hundreds of others.
- Earthquake losses will include an estimated \$33 billion in property damage, more than 1,600 deaths, 24,000 injuries and an estimated 9,700 buildings destroyed.
- More than 29,000 buildings will be severely damaged and unsafe to occupy with another 154,000 moderately damaged with restricted use.
- Areas closest to the fault rupture, as well as areas of poor soils such as river valleys and steep slopes, will experience strong ground motions with the greatest damage in areas including the Duwamish River-Green River Valley, Issaquah Creek Valley, Sammamish River Valley, Snoqualmie River-Snohomish River Valley, Puyallup River Valley, and the shorelines of Puget Sound, Lake Washington, Lake Union and Lake Sammamish.
- All critical infrastructures will be affected with in many cases widespread, cascading prolonged disruptions—electric power, natural gas and fuel pipelines, banks, hospitals, manufacturing plants, schools, port facilities, and transportation routes, with collapse or damage to major bridges affecting from the south end of downtown Seattle east through Bellevue and throughout river valleys north and south of the cities.
- Communications will be difficult if not impossible throughout the region.

#### **Disruptions of Life-Sustaining Products and Services.**

Among the biggest concerns facing the region immediately after the earthquake are how to provide food, water, fuel and other essential products and services to communities across the region.

- Damage to road, rail and marine transportation systems, lack of power and communications will impede daily food deliveries to local groceries and cause stores to close their doors.
- More than \$250 million worth of goods move to or from warehouses and distribution centers via truck daily in King, Pierce and Snohomish Counties. Commodities that move through

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these centers include food and related products, drugs and medical supplies, paper products, furniture, meats and fish, lumber and wood, steel and metals, petroleum products, machinery, and electrical supplies. Some of these products are shipped out of the region and out of state. The primary outbound destinations for trucked commodities are Oregon, Canada, and California.

- Given small inventories on hand at the time of the earthquake, residents around the region will have trouble securing basics such as groceries and prescriptions. The need for basic services will be made more pressing by the extensive numbers of people who are unable to get back into their home and are in shelters, and that one third of the region's households and businesses will lose water service.
- Outages of electricity, water and waste water collection and treatment, natural gas and liquid fuels, and communications will last from days to weeks and in some cases, months.
- Transportation disruptions will be a major factor impeding delivery of essential products and services. The Alaskan Way Viaduct, which carries a combination of transmission and distribution lines running along and beneath the structure, will be heavily damaged in the earthquake, and there will be serious damage to all six major freeways – Interstates 5, 90 and 405, and State Routes 99, 167 and 520 – with partial closures in some cases lasting for months or years due to major damage from collapsed bridges and elevated freeways. Because of extensive damage to port facilities in the region, many shippers will move their operations to undamaged facilities; some will not return for years, if at all.

## **SESSION 2: Pre-Event—Status of Regional Preparedness to Assure Critical Supply Chains**

### **Thursday, December 11, 2008 8:00 AM**

- The state of Washington, Seattle area jurisdictions, and many private sector and other providers of essential products and services have developed emergency response and restoration plans for a major earthquake that have procedures to deal with disaster supply chain challenges.

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## **SESSION 3: Post-Event Days 3-5**

### **Sunday, December 14,, 2008 1:00 PM**

- Regular deliveries to area large grocery stores, such as Safeway, Kroger, Super Value, Albertsons, and the region's dozens of independent stores, including those in the rest of the state, Hawaii and Alaska, have stopped or are delayed. For the independent grocers alone, this is a core group of 150 stores with approximately 90 truck loads to the core group each week.
- Shipment of food and goods to Seattle warehouses, which are six days/week, are also halted. Many warehouses, built in 1950s and/or situated in areas most prone to earthquake effects, collapse or are significantly damaged with loss of product totaling in tens of millions of dollars.

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- For independent grocers, fuel in on-site fuel tanks, if not damaged, can last 7 to 10 days with normal service to customers. However, most of the hundreds of employees that work at the wholesale level, Safeway's and approximately 5,500 "independent" retail grocery employees in King and Pierce County can't get to work. If they can, loss of power, communications and water has forced most area grocery stores to remain closed.
  - There is a need to establish alternate means of communication for situational awareness and for ordering emergency supplies with Electronic Order System and transmission lines down between Unified and retail customers.
  - There is also a need for refrigerated trailers. Stores that remain open are endeavoring to get product or requesting extra deliveries and are seeking delayed payments to suppliers.
  - Spoiled food and other refuse are a big problem, and it will be necessary to supersede the rules currently in place delineating areas of cities and counties among the various disposal companies.
  - Private sector organizations in the region not directly affected by the earthquake have also been donating goods, equipment, and other resources, including personnel to assist in the recovery activities.
  - Well-meaning Americans and donors overseas, contributions of food and other essential supplies have been flooding the region. Local and state officials have been trying to cope with the situation.

**Monday, December 15, 2008 8:00 PM**

- Availability of fuel is become a huge regional challenge since the earthquake and has been compounded by continuing aftershocks, some of them fairly severe. Most fuel supplies in storage three days after the quake have been exhausted. The region Olympic Pipeline System had shut down with the initial quake.
- A rupture in the Bellevue area on the "mainline system" impacted both of its pipelines, which includes a 24" line that feeds the Portland, Oregon market and the 16" line that feeds the Seattle, SeaTac markets. Unfortunately, the product in the impacted pipeline was gasoline, which resulted in explosions, significant fire, and damage which will delay restart of operations for an estimated. The pipeline is the only source of fuel to SeaTac airport.
- In addition, most of the product storage in the Seattle market is located on Harbor Island, which has experienced significant damage with a rupture where the pipeline leaves the ground to connect to tanks. Depending on obtaining waivers of environmental and other regulatory requirements, Olympic Pipeline may be able to repair the pipeline ruptures in one to two weeks. Under normal condition, restoration could take several months. Damage at the Harbor Island tank farms poses a longer term problem along with damaged roadways which will impede fuel delivery.

**Tuesday, December 16, 2008 10:00 AM**

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There has also been widespread damage to regional water services—ruptured and displaced pipes, damaged pumping systems, and prolonged power outages which have caused water contamination in several communities.

- While supplying potable water to affected communities is a paramount concern, wastewater disposal is a growing health threat in many areas.
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#### **SESSION 4: Recovery Nearly Two-Weeks After**

##### **Tuesday, December 23, 2008**

- King County, other local EOCs and State agencies continue to wrestle with assuring supplies of essential products and services 12 days after the earthquake.
- Most top priority needs are being addressed—hospitals that were not damaged and are open are receiving food, water, pharmaceutical and other supplies as available.
- The larger grocery chains and some independent grocers are open for business with very limited inventories. Customers are being limited to certain amounts of in-demand basic products.
- While communications have been largely restored, there are still extensive power outages throughout the region that limit connectivity; natural gas supplies are limited, and water services have yet to be restored to many communities, rendering them uninhabitable although there is little damage to buildings and homes.
- Transportation remains a significant problem area because of downed or damaged bridges, roadways, and extensive debris which must be removed.
- The National Guard and US DOD support to civil authorities has been called in by the Governor and are assisting local and state authorities to clear debris and expedite transit of essential products and services to specified distribution points.
- There have been some challenges with coordination among local, state, federal agencies, utilities and key businesses in the transition from response to recovery/restoration.