INFRASTRUCTURE INTERDEPENDENCIES TABLETOP EXERCISE

BLUE CASCADES IV:
Critical Infrastructure and Pandemic Preparedness

FINAL REPORT

Held January 25, 2007 in Seattle, Washington

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Executive Summary

The effects of a global influenza pandemic on critical infrastructures and essential service providers was the focus of the fourth Blue Cascades regional interdependencies tabletop exercise, held January 25, 2007 in Seattle, WA. Participants included more than 250 representatives from public, private sector, non-profit, academic, community and other organizations. The overall goal of the exercise was to raise awareness of impacts on critical infrastructures and essential services from a pandemic and of stakeholder preparedness plans and resources; illuminate issues related to roles and missions; and gauge the effectiveness of regional communications and coordination. A major objective of Blue Cascades IV was to enable participants to identify shortfalls and potential solutions that could be incorporated into a regional pandemic preparedness Action Plan.

The scenario, procedures, and supporting materials for Blue Cascades IV were developed by a Scenario Design Team of more than 50 key stakeholders, with facilitation provided by the Pacific NorthWest Economic Region, a state-chartered consortium of five states (Washington, Oregon, Alaska, Idaho, and Montana) and three Canadian jurisdictions (British Columbia, Alberta, and The Yukon Territory). The scenario focused on Puget Sound, Washington State and cross-national border activities in response to a hypothetical avian influenza H5N1 outbreak that spreads to the United States from Asia.

During the day-long exercise, participants were provided "mini-briefings" from public health officials and experts on local, state, federal and private sector pandemic plans and policies. Among topics explored were public health impacts, implementation of disease control measures such as quarantines, isolation, travel restrictions, school closures, and bans on public gatherings; personnel shortages and related human factors; and impacts on transportation, water and waster water systems, supply chains (e.g., food and pharmaceutical supplies), hospitals, financial institutions, electric power, natural gas, and fuel. Also addressed were the roles of the National Guard, law enforcement, private security personnel, the Coast Guard, and regional military assets. A particular focus of the scenario was telecommuting and communications challenges and associated cyber security concerns related to employees working from their homes during a pandemic. The exercise scenario in addition looked at the ability of responders to deal with other disasters during a pandemic (in this case, a severe storm) and focused on restoration activities through a second wave of the influenza pandemic.

Findings

There were an extensive number of lessons learned from the exercise, identified by an Evaluation Team of representatives from the key stakeholder organizations and technical experts. Exercise participants also provided feedback on an evaluation questionnaire and by submitting comments on note cards during the proceedings.

Interdependencies Impacts, Risk Assessment and Mitigation

1. There is no knowledge base on the impacts of a pandemic on regional infrastructure interdependencies and capabilities to maintain and sustain critical services.

2. The exercise raised many more questions than it answered; much of the information on impacts was based on assumptions of how staff shortages would effect operations and business practices and how pandemic response procedures, such as social distancing, school closures, curtailment of air flights and shipping, passenger screening, and quarantines—could complicate and escalate disruptions.

3. There are no defined criteria or consistent, cross-sector approach for determining criticality of assets for regional pandemic preparedness. This and the limited knowledge base on pandemic vulnerabilities and consequences make it difficult at best to assess risk and identify cost-effective mitigation measures.

Communications and Critical IT Systems Reliability, Resilience and Security

4. Telecommuting is not a silver bullet for organizations to continue business or operations in a global pandemic. Internet service providers (ISPs) can become overwhelmed and the access/last mile can be congested. Organizations' IT infrastructures may not be capable of supporting a large upsurge of remote workers, and many essential workers may not have responsibilities that can be handled through working remotely. Shortages of communications and IT personnel also may impede telecommuting and remote operations.

5. Vulnerability to cyber attacks and viruses will dramatically increase with the number of users, many using personal computers that may not meet corporate security standards. This could compromise business practices and Supervisory Control and Data Acquisition Systems (SCADA) and other process control systems that run critical infrastructures.

6. Prioritization of local, regional, and global communications access and Internet traffic is a major issue. At the local level, there will be competition for this limited access among emergency response security practitioners, businesses and other organizations.

Cooperation, Coordination, and Information-Sharing

7. Each jurisdiction has its own plan. In Washington State, counties may have different procedures, complicating operations of utilities, commercial businesses and other organizations that have service areas extending beyond a single jurisdiction.

8. Significant preparedness issues that need to be explored include: impacts of restricting international travel, and screening or detaining passengers and crews of ships and planes; how insurance companies coordinate on servicing or denying claims and how hospitals deal with the uninsured; and how public health organizations can better collaborate and communicate plans and intentions with other key stakeholders.

9. U.S. Department of Defense facilities need to understand pandemic preparedness plans of government agencies and organizations on which mission assurance depends, including how military civilians will be assisted and what DOD-related resources may be required if the National Guard and law enforcement are overwhelmed.

10. Regional information-sharing and situational awareness among government agencies and among the broader stakeholder community will be essential in a pandemic. It is

unclear how response and recovery-related information will be collected and disseminated and what mechanisms would be used.

Roles and Responsibilities/Response and Recovery/Reconstitution Challenges

11. While public health officials have the lead in pandemic decision-making in their jurisdictions, it is unclear how this decision-making process will work, the authorities of state and federal agencies, and how regional key stakeholders would be involved.

12. Regional stakeholders will be "largely on their own" and should not expect assistance from federal government in a pandemic. Emergency management officials and other responders will be in a prolonged state of emergency and forced to continue response and recovery activities simultaneously while affected by staff shortages.

13. Public health plans for providing anti-virals have been developed and some larger companies and utilities have or intend to have their own stockpiles. It is not clear how identifying recipients and distribution will work at the local and regional level.

14. Planning and coordination needs to be done with social service agencies providing service to vulnerable populations, as well as to entities that will provide emotional and other support at the community level (e.g., church/other faith-based organizations).

15. Significant issues that need to be addressed include keeping employees that want to work at home; maintaining operations while implementing social distancing; communicating to the public pandemic response procedures; closure of businesses and maintaining quarantines; ensuring that there are enough security guards, National Guard and law enforcement, as well as drivers for mass transit and transporting essential products (food, pharmaceuticals, fuels, supplies, materials); the need for a credentialing system for utility maintenance, truck drivers for essential products, and other responders; also for a resource management system that includes the private sector and non-profits.

Business Continuity, Continuity of Operations, and Supply Chain Management

16. The impact of a global influenza pandemic on logistics and supply chains will be far-reaching, affecting virtually all products and services.

17. While large companies are developing pandemic contingency plans, small and medium-size businesses need assistance and incentives to develop plans and information on best practices, and to undertake training for staff and preparedness drills. These plans should take into account legal and liability issues.

Public Information, Training and Education

18. There is need for an effective regional public information plan coordinated with government agencies and other stakeholders to inform the public in advance of and during a pandemic. This plan should include the media and ensure that media owners, operators and communicators are engaged in regional exercises.

Recommendations

1. The federal government with regional key stakeholders should sponsor research and other studies of potential pandemic health effects and human factors to better gauge the threat to critical infrastructures with recommendations for revised or new approaches and solutions.

2. Federal agencies should work with state/provincial agencies and key stakeholders to undertake a regional risk assessment and mitigation pilot project within the PNWER region to examine the impacts on infrastructure interdependencies of a global pandemic.

3. Regional stakeholders should incorporate infrastructure interdependencies into their pandemic contingency planning and hold workshops and targeted exercises internally and with other organizations within their respective sectors to examine challenges.

4. Further study should be undertaken of the feasibility of large numbers of personnel working electronically from their homes and what new procedures, system upgrades (including alternative communications systems) and personnel policies would be required for expected surges in phone, cell phone and Internet use.

5. Practical, cost-effective cyber security guidelines for a pandemic should be developed at the federal level with state and local agencies and communications and IT service providers to provide a baseline of shared security practices for contingency planning.

6. A regional information sharing and cross-sector decision-making process for a pandemic should be created using mechanisms already developed by law enforcement and the emergency management that include key stakeholders.

7. Within the Puget Sound/Washington State Partnership, create a Pandemic/Bio Security Preparedness Workgroup to orchestrate further activities in coordination with existing working groups within the Partnership (e.g., the Interdependencies Working Group and the Puget Sound Alliance for Cyber Security).

8. Federal government agencies (civilian and defense) should make available to key stakeholders information on those services they could provide in a pandemic, and the process/procedures on how such assistance could be obtained.

9. Procedures should be developed to standup Emergency Operations Centers (EOC's) for a pandemic and to ensure they will have the resources and capabilities necessary to continue operations over a period of months.

10. Efforts at the federal, state/provincial level should be accelerated to develop viable, cost-effective policies, plans, and procedures to address complex public health and related issues associated with pandemic response, recovery, and reconstitution.

11. Local government should identify significant vulnerable populations (e.g., elderly, ethnic groups, disadvantaged individuals and the homeless, and the critical

infrastructures, services and supporting institutions associated with these groups and take steps to determine pandemic preparedness gaps and outreach activities.

12. Pandemic exercises should be developed and conducted that include at least one additional significant disaster to test the capabilities of regional stakeholders to handle a major emergency while managing a pandemic.

13. Government in concert with companies that have developed pandemic plans should collaborate to develop a model continuity of business plan for small businesses that could be customized by local enterprises.

14. The federal government with key stakeholders should undertake an assessment on the regional impact of a global pandemic on provision of one or more essential products and services, e.g., food supplies; transportation; electric power, natural gas and other fuels; communications and critical IT services, and emergency services and healthcare.

15. Local public health and emergency management officials should develop a coordinated regional public information pandemic strategy that identifies questions and issues that would need to be addressed in a pandemic with coordinated answers and background information that can be provided and disseminated to key stakeholders and the media in advance. This strategy should include a pandemic preparedness training curriculum that can be customized for infrastructure personnel and the general public and media; the strategy should also ensure that media and community organizations, including representatives of ethnic, religious, and other special interest associations, are included in regional and sector exercises.

Infrastructure Interdependencies Table Top Exercise
BLUE CASCADES IV:
Critical Infrastructures and Pandemic Preparedness

Final Report

1. Background

The latest event in the Blue Cascades Regional Interdependencies Tabletop Exercise Series was held on January 25, 2007 in Seattle Washington. The focus of the fourth Blue Cascades exercise was on the effects of a global pandemic on regional critical infrastructures and essential service providers with the aim of improving Puget Sound and broader Pacific Northwest capabilities to withstand and recover effectively.

Like its predecessors, Blue Cascades IV was developed as an educational and training tool for regional key stakeholders—public, private sector, non-profits, academic, community and other organizations that either provide essential products and services or have roles or vested interests in disaster preparedness and management.

A Unique Training Tool. Each of the Blue Cascades events has been a learning experience for regional key stakeholders. Not traditional exercises that test plans and procedures, the Blue Cascades events are in reality intensive, scenario-centered interactive workshops designed by the stakeholders themselves. The overall goal is to foster cross-sector cooperation; raise awareness of infrastructure interdependencies and associated vulnerabilities; and identify readiness gaps and potential solutions. Blue Cascades I, held in Portland, Oregon in 2002, focused on largely physical attacks to critical infrastructures, while Blue Cascades II, held in Seattle in 2004, had a cyber attack/disruption scenario. Blue Cascades III, held in 2006 in Bellevue, WA, centered on a 9.0 magnitude Cascadia Subduction Zone earthquake that impacted regional infrastructures. [1]

At the same time, Blue Cascades IV was a departure from its three predecessors, which focused on terrorism or physical natural disasters. Emphasizing public health challenges and their effect on operations and business continuity, the pandemic scenario of Blue Cascades IV highlighted the importance of *people* as an integral element of regional and national sustainability, and of personnel as critical assets fundamental to infrastructure assurance and regional disaster resilience. The more than 250 participants in Blue Cascades IV identified a range of challenges that need to be addressed by local state/provincial jurisdictions, businesses and other key stakeholder organizations and the federal government.

[1] Development and conduct of all four Blue Cascades tabletop exercises were facilitated and hosted by the Pacific NorthWest Economic Region (PNWER), a state-chartered consortium of five states (Washington, Oregon, Alaska, Idaho, and Montana) and three Canadian jurisdictions (British Columbia, Alberta, and The Yukon Territory). For further information, executive summaries and reports on previous Blue Cascades regional exercises go to www.PNWER.org

2.1 Purpose

The overall goal of Blue Cascades IV, as determined by the key stakeholders in their initial concept development meeting, was to enable participants to utilize their experience from previous Blue Cascades exercises to examine the impact of a pandemic on infrastructure interdependencies, and how escalating, cascading disruptions of essential services could impede key stakeholder emergency and business continuity planning and activities.

2.2 Objectives

Key stakeholders also identifed five strategic exercise objectives:

- Provide as realistic as possible expectations of the impacts from a pandemic event on regional infrastructures/essential service providers and the communities they support;
- Provide a basic understanding of existing local, state, and federal pandemic preparedness plans, policies, regulations, expected actions and available resources;
- Assess the level and effectiveness of communication on, and coordination of public-private sector and other organizational preparedness and continuity of business or operations plans;
- Examine roles and missions of local, state/provincial, and federal (civilian and defense) agencies under the Incident Command System and of other key stakeholder organizations and their contribution to the decision-making process during response and recovery, with particular emphasis on how intelligent ad hoc decisions are made under changing situations;
- Create an integrated After Action Report that identifies shortfalls and points toward cost-effective mitigation measures.

2.3. Exercise Scope, Development, and Process

2.3.1. Scope

Although the objectives of the exercise were cross-national border in focus, because of the Seattle venue, active involvement of Puget Sound Partnership stakeholders, Washington State, and King County public health officials, Blue Cascades IV was largely centered on the Puget Sound Region and the state. Other PNWER member jurisdictions and cross-border issues received limited attention.

2.3.2. KEY ASSUMPTIONS

The exercise scenario was based on a set of assumptions about impacts of pandemic flu on public health and then applied to what could happen in the Pacific Northwest to impact the provision of essential products and services:

- The outbreak of a new strain of influenza requires a unique approach to planning and a different set of skills and preparation than traditional disaster preparedness.
- A new influenza pandemic is comparable more to a war or severe economic crises than to an earthquake or act of terrorism.
- Susceptibility of populations will be universal.
- Civil disturbances and breakdowns in public order may occur.
- As a rule, illness rates will be highest among school-aged children (40%) and decline with age; among working adults 20% will become ill. (Actual rates will depend on the characteristics of the new virus.)
- Absenteeism rates of 40% or higher may result from illness, the need to care of ill family members and fear of infection.
- Typically, the risk of transmission will be greatest during the first two days of illness.
- Isolation and quarantine measures are likely, as are restrictions on travel.
- Epidemics will last 6-8 weeks in affected communities.
- Multiple waves of illness are likely to occur, with each wave lasting 2-3 months.
- Because of the mobility of the human population, every corner of the globe will be touched. This widespread effect has ramifications not only for health, but for national and economic security and the functioning of society. Sustaining the operations of critical infrastructures under conditions of pandemic influenza will depend largely on each organization and corporation's plans for business continuity and regional interdependencies, while facing staff shortages and the need to protect the health of its workforce.

2.3.3. PROCESS

The scenario, procedures, and supporting materials for Blue Cascades IV were developed using the process employed for previous Blue Cascades exercises. This entailed creating a Scenario Design Team, in this case of more than 50 key stakeholders, which included local and state government, private sector and non-profits, academic institutions and other organizations.

Key Stakeholder Organizations Participating in the Scenario Design Team ***(See Appendix A for list of individual Scenario Design Team members)***	
King County Office of Emergency Management	**Northwest Warning, Alert & Response Network**
Public Health-Seattle & King County	**Washington Department of Information Services**
Snohomish County Division of Emergency Management	**Good Samaritan Hospital**
Microsoft	**Overlake Hospital**
Bonneville Power Administration	**Regional Medical Resource Center**
Puget Sound Energy	**Puget Sound Security, Inc**
Cingular	**Setracon, Inc.**
Boeing	**British Columbia Ministry of Health**
Port of Seattle	**Washington Department of Health**
City of Seattle Department of Transportation	**Washington Department of Agriculture**
City of Seattle CISO	**Washington Military Department**
Seattle City Light	**Washington Office of Emergency Management**
Washington Mutual	**Pierce County Department of Emergency Management**
Washington Association of Sewer and Water	**Washington Association of School Principals**
Navy Region Northwest	**Regional Medical Resource Center City of Everett**
Seattle-King County Public Health	**US Army Corps of Engineers**
Seattle Police	**University of Washington**
Federal Bureau of Investigation	

PNWER & the Pacific Northwest Center for Regional Disaster Resilience **US Coast Guard** **US Postal Service** **Children's Hospital British Columbia** **Ministry of Health** **Public Safety and Emergency Preparedness Canada** **Navy Center for Asymmetric Warfare** **PEMCO** **Virginia Mason Medical Center**	**US Depart. of Transportation, Region 10** **U.S. EPA Region 10** **WAMU** **PCCS, INC** **CH2MHill** ***Technical Support to Scenario Design Team provided by:*** • **ESRI** • **GCS Research** • **Tunnell Consulting**

Scenario Design. Representatives of the above organizations met regularly through conference calls and planning meetings over a two-month period. These meetings included briefings from public health officials and other technical experts to make the scenario as realistic as possible. Scenario Design Team members submitted "injects" (hypothetical events) of particular interest to their organization for inclusion and accompanying discussion questions. These injects were integrated by a principal drafter into a detailed scenario script that was reviewed and augmented through successive drafts by the Team. The process of collectively developing the scenario enabled Team members from the range of infrastructures and essential service providers to exchange information, learn about and better appreciate interdependencies, and help assure the accuracy of the information contained in the final script that was used for the exercise.

Format. The Scenario Design Team developed a day-long, highly-interactive event that covered pre-event alert and warning, the initiating event and response, recovery and reconstitution. Participants were provided in advance of the exercise with a Background Package of information about the Blue Cascades exercise series, the process, and the actual scenario script, including the questions for each inject, for review within their respective organizations.

At the beginning of the exercise, participants were provided with instructions to maximize its utility and educational value, including an explanation that it was not a traditional exercise but an intensive, scenario-driven workshop designed to encourage knowledge-sharing, develop awareness of the current state of government and private sector pandemic preparedness; and identify shortfalls associated with critical infrastructures and ways to improve pandemic readiness, response and recovery and reconstitution. Participants were also provided "Rules of the Game" that encouraged

them to accept the scenario as hypothetical and a means to determine current capabilities, gaps, and challenges, as well as impacts from interdependencies. Participants were also requested to save their recommendations for solutions to shortfalls for the Exercise Report and the follow-up Action Plan Development Workshop.

Cross-Sector Interaction. To facilitate maximum coordination and discussion, participants were initially seated in their sector groups at tables but after the morning break, were provided seat assignments in cross-sector table groupings. They were provided short periods of time after certain injects to discuss among themselves at their respective tables particular issues and challenges.

Members of the Scenario Design Team facilitated their own injects or elements of the exercise that focused on their infrastructure or organization. Other members of the Scenario Design Team, public health and other experts and officials provided several "mini-briefs" throughout the exercise at key points. Meant to be no more than 5 minutes duration, these mini-briefs had the objective of providing participants useful information and to explore in more depth particularly challenging specific topics. Of particular note was a lessons learned presentation held as part of the working lunch by Dr. James Young, who led the Canadian Government's SARS (severe acute respiratory syndrome) emergency response activities in 2003.

Concluding Hot Wash. A team of evaluators from the Puget Sound/Washington State Partnership members and independent evaluators from research and academic institutions recorded observations of the proceedings. A Hot Wash that reported out these observations with inputs from participants was conducted at the end of the exercise.

2.3. Scenario Overview

Phase 1: Pre-Event (focus on preparedness)

The scenario opens on January 25, 2007 and with a series of events designed to illuminate regional preparedness activities. The initiating event is a report by the World Health Organization (WHO) that avian influenza H5N1 has infected individuals in China with the WHO upgrading the Pandemic Influenza Alert to Phase 4.

(Participants at this early point in the exercise were provided a chart demonstration on the WHO influenza pandemic phases and a mini-briefing by King County Public Health on how the Centers for Disease Control would distribute this information and how state agencies would handle disease surveillance and infestation.) [2]

Many jurisdictions activate their Emergency Operations Centers (EOC's) and inform key stakeholders and the public on infection control. U.S. and Canadian officials assess limiting flights from China and Southeast Asia.

[2] **For mini-briefings on state and local plans and on key issues, as well as other background information go to www.pnwer.org and click on Blue Cascades IV**

(Participants were provided a mini-briefing from the Port of Seattle and regional Coast Guard officials on how these flight curtailments might be carried out.)

A pandemic flu vaccine will not be available for an estimated three-to-six months, and only limited supplies of anti-viral medications are available, whose effectiveness are not assured.

(Participants at this point were provided a mini-briefing by King County Public Health on antivirals and vaccines.)

By early February, Washington State and local officials have met to talk about the prospect of a full-fledged pandemic and implementing disease control measures, such as quarantines, isolation, travel restriction, school closures, and bans on public gatherings.

(Participants heard from Washington State Public Health and US Health and Human Services officials on quarantine policies and public outreach.)

Phase II: Focus on response (public health challenges, effects on interdependent infrastructures and cascading impacts)

The initiating event in the scenario is in mid-February with the outbreak of pandemic flu in Washington State focusing on initial impacts and response activities.

(King County Public Health provided participants with information on legal authorizes for health and compliance issues, including disease control measures.)

Personnel Shortage, Human Factors, and Supply Chain Issues. By the first week in March, publicity and panic has caused local stores to run low on food and other essential supplies. "Just in time" delivery of goods is disrupted because of increased illness among truck drivers and longshoreman at ports-of-entry for foreign goods. A major water utility has been unable to replenish its supply of chlorine and has run out. Meanwhile, the spread of pandemic flu is rapid, with three weeks after the initial outbreak in Washington State 1,300 cases and 34 deaths. Many local stores close; people stock up on food, batteries, over the counter medications, and other supplies, leading to growing shortages. Other people relocate to small towns and rural areas, only to find the pandemic there. The virus is especially lethal to those between the ages of 15 and 39. People are staying home from fear of infection or to take care of children not in school or care for ill loved ones. Businesses are affected by staff absences and public services, such as trash removal, gutter cleaning, and snow removal are curtailed. Utility field personnel, if available, are reluctant to go into homes to service customers. Banks limit service at teller windows and some ATMs are not being supplied with cash. Local hospitals are reporting that 25-35% of their staff is absent at the same time they are filled to capacity. Patients are now being cared for, and dying, in their homes. Mutual aid agreements that hospitals have in place with other healthcare organizations are ineffective because of widespread geographic impacts of the pandemic.

(Exercise participants received a mini-brief on public health and medical response from the Health Care Coalition that addressed how the number of cases, including deaths from the pandemic were estimated; how hospitals would try to ensure availability of surge capacity, resources, staff, and security, and how deaths in homes would be confirmed, and bodies collected and disposed of.)

National Guard, Law Enforcement, and Security Issues. By mid-March, with an additional 9,100 cases and 236 more deaths, the Premier of British Columbia and Governors of Alaska, Washington, Oregon, Idaho and Montana had officially declared a State of Emergency. In the affected states, the National Guard has been activated to assist state agencies in maintaining essential services. With roughly 30% of the state's National Guard currently deployed to national priorities or in training, available troops are assigned to priority services. Some medical assistance supplies are available from the Federal Government but in short supply. National Guard forces will not be enough to deal with the pandemic-related law enforcement and response demands, and U.S. defense assets need to be activated to support local and state authorities.

(Participants at this point received a mini-briefing on National Guard and Defense Department services to support civil authorities to deal with the pandemic.)

Escalating Infrastructure Impacts. Natural gas and other utilities are having trouble with access to homes under self- isolation or voluntary quarantine and need personal protective equipment for maintenance personnel responding to residences. Maintaining security at many infrastructures--oil refineries and chemical facilities, banks and hospitals--is a challenge with lack of staff and limited transportation. Local, regional and national postal and shipping companies are concerned about retrieving and distributing essential mail to affected areas with drivers and fuel in short supply.

Telecommuting and Communications Challenges. Business and other organizations have turned to remote access for their users to allow them to work from home. However, in order to accomplish this in a timely manner, most organizations have been forced to lower their cyber security protocols, providing opportunities for cyber criminals and other adversaries to target financial organizations, and government and other critical infrastructures. Many IT professionals are unable or unwilling to go to their workplaces. The Internet has been periodically overwhelmed due to the hugely increased traffic from remote users. An addition complication is congestion of cell phone and landline communications as people refrain from travel and resort to voice communications and conference calls.

Food Supply Issues. By late March, dairies and food processing facilities are reporting a 40% reduction in production; feed lots do not have sufficient personnel available to feed all the animals, and several dairies are also unable to milk the cattle. Meanwhile, internationally, the pandemic has shutdown much national and global business services with tremendous economic impacts. Grocery stores now are facing serious shortages as the pandemic gains in intensity. In some stores, armed police are required to maintain security and deter theft—a challenge because the police force is stretched thin by illness

and absenteeism. There have been isolated reports of home intrusion as armed individuals break in to steal food, cash and other valuables. In different businesses, especially pharmacies, there have been reports of looting. Police departments and emergency services are prioritizing responses to 911 calls and other emergency needs.

Dealing with Other Emergencies and Community/Individual Needs. The stress on responders is compounded by a severe storm that causes extensive power outages through much of region, washing out roads, creeks, and causing large-scale flooding, disrupting water supplies and causing raw sewage to be dumped onto streets, and challenging operators of regional dams to maintain normal operations.

By the end of the month, with a total of 610,000 pandemic influenza cases in Washington State with many thousands of deaths, the mortuary system has been overwhelmed for some time with temporary morgues established. A sudden influx of orphans is straining the State and local health services. There have been substantial deaths among elderly people and lack of nursing home staff poses an urgent problem.

Phase III: Focus on recovery/reconstitution (preparing for the next "wave")

The scenario's conclusion centers on recovery from first outbreak ten weeks into the pandemic and the second wave. By mid-April, the total cases in Washington State are 1,453,720. The pandemic is showing signs of waning. "Real time" shipments and deliveries of food, gasoline, and other supplies are resuming. Most survivors who were hospitalized during the pandemic have been released. Government agencies and businesses are beginning to recover but smaller businesses are finding it difficult to rebound from the economic losses and many close. Financial losses have been especially devastating for airlines and businesses, such as professional sport teams, theaters, and malls. Most schools and daycare centers have reopened.

The scenario now fast-forwards to mid-August. Two months have passed with no new pandemic flu cases, but now several suspected cases are in King County, Alaska and British Columbia, and an upsurge of cases throughout the Pacific Northwest and the United States is predicted. With most businesses and agencies still recovering from the devastating first wave, the second wave, although expected to be much milder with stakeholders better prepared, could derail recovery efforts.

Lesson Learned from SARS Briefing. As previously noted, a lunch-time address by Dr. James Young, who led the Canadian Government SARS response, was included to provide participants with a real-world example of the challenges posed by a prolonged public health emergency. Dr. Young's presentation focused on the practical considerations that need to be taken into account in an influenza pandemic, pointing out the need to weigh risks against adverse impacts and that it might not be feasible to quarantine planes, large numbers of people, or close borders.

3. Exercise Outcomes

3.1. Evaluation Process

The findings and recommendations that follow are the result of an evaluation process developed over the course of previous Blue Cascades exercises. An Evaluation Team comprised of representatives from key stakeholder organizations and technical experts, using guidelines and criteria centered on a range of "needs categories," collected and synthesized information from the exercise play and lessons learned. In addition to the Evaluation Team, participants were provided evaluation questionnaires to get their feedback on exercise utility and quality of discussions and on issues of particular interest to them that needed further study. Participants were also provided note cards to jot down thoughts and comments for inclusion in the exercise report. Finally, the exercise included a Hot Wash (post-play evaluation), which enabled participants to share insights with the Evaluation Team and among themselves at the end of the exercise.

This evaluation process, designed to gain maximum participant feedback, resulted in a large output of valuable information and observations on stakeholder priorities, operational and business practices, and insights into mostly unexplored preparedness gaps and potential solutions.

3.2 Findings and Recommendations

3.2.1. General Observations

It was clearly evident from the number of participants who were veterans of previous Blue Cascades interdependencies exercise and who knew each other that there was a significant level of regional cooperation already evident among key public, private and other stakeholders. The mini-briefs and comments from public health officials and other government agencies and organizations underscored that there are plans and policies developed or underway to prepare for and manage an influenza pandemic. Exercises to test state and local plans had been conducted or were scheduled and some utilities and larger businesses already had held in-house drills. The Western Electricity Coordinating Council comprised of western Canadian and U.S. electric power companies had a sector exercise scheduled for the day after Blue Cascades IV.

Overall, organizations represented at Blue Cascades IV had an already developed a strong level of awareness of the importance to prepare for a influenza pandemic and interest in hearing what others were doing, learning about government plans and identifying ways to improve their own. The detailed scenario script reflected this interest in learning and enhancing readiness, containing dozens of questions on a gamut of difficult issues.

Not unexpectedly, the results of the evaluation process and the Hot Wash resulted in a large number of findings and recommendations. A recurring statement in the concluding Hot Wash and in participant's written comments was that the exercise raised more

questions than answers. Preparedness and management gaps associated with assurance of critical infrastructures and essential services were identified across the spectrum of several broad inter-related shortfall areas: 1. understanding vulnerabilities and consequences, particularly interdependencies-related impacts; 2. communications and critical IT reliability, resilience and security; 3. cross-jurisdiction/cross-sector coordination, cooperation and information-sharing; 4.roles and responsibilities; 5. response, recovery and reconstitution challenges; 6. business continuity and supply chain assurance; 7. public information and the media, and 8. education and training.

3.2.2. Interdependencies Impacts, Risk Assessment and Mitigation

3.2.2.1. *Findings*

1. There is no established knowledge base on the impacts of a global pandemic on regional infrastructure interdependencies.

a. Unlike in attacks or natural disasters where critical assets and key resources may be physically or electronically damaged or disrupted, in a pandemic, the chief vulnerability is *unavailability of personnel*. Exercise participants were forced by the scenario to view personnel in terms of critical assets and communities as infrastructures. Some attendees had difficulty assimilating this concept into their idea of infrastructure protection, which is focused on structures and systems. Several of these participants observed that the exercise focused "too much on people issues" and not enough on infrastructures.

b. Another significant difference between a pandemic and other types of disasters is that the response period for an influenza pandemic is extended over several weeks to months as the state of emergency with escalating rate of infection and deaths continues, followed by another similar but less intense prolonged event (the second wave of the pandemic). How interdependencies in a prolonged, multi-phase response will affect regional capabilities to maintain and sustain critical services is unclear. .

2. As noted in the general observations, many participants observed in their comments that the scenario raised many more questions than it answered. Much of the information that was provided by public health and other officials and discussed during the exercise on impacts was based on best guesses of how staff shortages would effect operations and business practices. These assessments in turn were based on further assumptions about the rate of infection and deaths extrapolated largely from the 1918 flu epidemic and expected absenteeism percentages—which in turn were based on assumptions about patterns of individual behavior and possible local government actions on social distancing, schools closures, and other measures that disrupted normal activities.

3. It was clear from the exercise that there are many examples of best practices and capabilities developed by the public health and healthcare communities. At the same

time, there is a scarcity of information from the emergency management and security communities. A local public health official commented that, beyond the National Governments Association Report released last year on pandemic preparedness, there has been limited information on non-medical, emergency management aspects of pandemic preparedness.

4. Given the assumptions in the scenario of high staff shortages that utilities, businesses and state and local government agencies would face, depending upon the type of organization, there would be a significant curtailment of operations and business activities, with regional interdependencies exacerbating these impacts.

5. Government pandemic response procedures, such as social distancing, school closures, curtailment of air flights and shipping, passenger screening, and quarantines—could complicate and escalate interdependencies-related infrastructure disruptions.

6. Pandemic continuity of operations and business contingency planning might mitigate disruptions but could also slow-down services, depending on how well these plans were coordinated with interdependent infrastructures, customers and suppliers.

7. There are no defined criteria or consistent, cross-sector approach for determining criticality of assets for regional pandemic preparedness. Organizations thus far have determined internally what services and personnel they see as critical or essential largely within their own "fence lines."

8. Because of the limited knowledge base on potential pandemic vulnerabilities and consequences and the evolving state of government and private sector pandemic plans and policies, it is difficult at best to assess risk and identify cost-effective mitigation measures.

3.2.2.2. *Recommendations*

1. The federal government with regional key stakeholders should sponsor research and other studies of potential pandemic health effects and human factors to better gauge the level of the threat to critical infrastructure operations and provision of essential services. Along these same lines, there should be studies of the potential effectiveness of pandemic emergency management and security-related plans and procedures with recommendations for revised or new approaches and solutions.

2. Federal government agencies should work with state/provincial agencies and key stakeholder organizations to undertake a regional risk assessment and mitigation pilot project within the PNWER region to examine the impacts on infrastructure interdependencies of a global pandemic.

3. Regional stakeholder organizations should incorporate infrastructure interdependencies into their pandemic contingency planning.

4. Utilities and other essential service providers should hold workshops and targeted pandemic-focused exercises internally and with other organizations within their respective sectors to examine interdependencies challenges.

5. There should be follow-on cross-sector, regional interactive workshops to examine specific interdependencies factors that will be most problematic in a global pandemic.

3.2.3. Communications and Critical IT Systems Reliability, Resilience and Security

3.2.3.1. *Findings*

1. Telecommuting is not a silver bullet for organizations to continue business or operations in a global pandemic.

2. Internet service providers (ISPs) can become overwhelmed and cell phone systems congested.

3. ISPs have multiple levels of infrastructure, and depending on the ISP, the access/last mile or connection to core can be congested.

4. ISPs can build one capacity and neglect another. Demographics of neighborhoods can also determine feasibility of telecommute since providers have varying degrees of capacity and saturation on an area by area basis.

5. Along with denial of service and bandwidth problems, vulnerability to cyber attacks and viruses will dramatically increase with the number of users, many of whom will resort to utilizing personal computers. Typically home computers do not always meet corporate security standards, and organizations who allow computers with a lower degree of protection onto their networks increase security concerns and other risks. This will affect not only business practices but could put at risk Supervisory Control and Data Acquisition Systems (SCADA) and other process control systems that run critical infrastructures.

6. Organizations' IT infrastructures may not be capable of supporting a large upsurge of remote workers. Many organizations do not plan for more than a 20% telecommuting need. Those who plan for higher numbers can still be defeated by systems congestion issues noted above. Organizations contingency plans may not address where employees get last mile access.

7. Many essential workers may not have responsibilities that can be handled through working remotely or will need computers provided to them, instructions in their use and tech support.

8. Shortages of communications and IT personnel necessary for system operation, maintenance, and technical assistance may disrupt services and will impede telecommuting and remote operations.

9. Temporary alternative communications systems may not provide organizations the backup capabilities they need because of interoperability, incompatibility, and bandwidth issues. Also, backup mechanisms may have not been tested and drilled so employees may not be able to utilize them efficiently.

10. There is no consensus or agreed procedures on whether basic cyber security practices should be waived to enable mass telecommuting or continue to be enforced by organizations (e.g., allowing access to secure systems by un-vetted personnel, suspending the need for passwords, and using non-secure systems to store or transfer sensitive information).

11. Prioritization of local, regional, and global communications access and Internet traffic is a major issue. Currently, no technology exists for prioritization of Internet traffic – it is up to the organizations who use Internet resources to collaborate with the ISP's and Governing organizations (see #11 below) to prioritize use and to manage different scenarios.

12. At the local level, there will be competition for this limited access between emergency response and security practitioners and businesses and other organizations.

13. Companies that rely on international or other out-sourced services for business operations and IT support will need to devise ways to maintain services.

14. A related challenge is which organizations have responsibility for service prioritizations and under what circumstances—federal, local, or state agencies? ISPs? Individual organizations?

3.2.3 2. *Recommendations*

1. Further study should be undertaken of the feasibility of large numbers of personnel working electronically from their homes or via conference call and what system upgrades would be required for expected surges in phone, cell phone and Internet use.

2. Stakeholder organizations should identify backup communications and IT technical personnel that can be mobilized in a pandemic. At the same time, given that many of these backup staff could be unavailable, organizations should identify those minimal critical communications and IT services that are essential to keep running.

3. Stakeholder organizations should cross-train IT technical personnel to develop greater depth of backup support staff to ensure resiliency of critical and

essential communications and IT services during times of increased absenteeism.

4. Stakeholders should incorporate alternative communications systems into pandemic response as part of prudent business practices and test their use with other stakeholders as part of a regional system in both sector-specific and cross-sector exercises to assure interoperability, reliability and resilience.

5. Stakeholders should undertake realistic risk assessments of those minimal critical communications and IT services that are essential to keep running. It helps if organizations run through risk management scenarios for a pandemic to enable them to have pre-determined courses of action and choices worked out ahead of time.

6. Sensible, cost-effective cyber security guidelines for a pandemic need to be developed at the federal level with state and local agencies and communications and IT service providers to provide a baseline of shared security practices for regional organizations to incorporate into contingency planning.

7. A pilot project should be undertaken by federal government and regional stakeholders to assess the range of Internet service prioritization challenges at the local, national, and international level and determine optimal policies and procedures that could be utilized.

8. Stakeholders should incorporate into IT/communications continuity activities the following:

   - Negotiation of agreements with ISPs that serve large portions of their employee populations to handle access issues;
   - Structuring of work products and activities in a way that can be conducted via telecommute;
   - Incorporation of enabling technologies and solutions that provide for high productivity in a telecommute environment.

9. Federal and private sector research and development programs should include development of standards and technology solutions that can address the difficult technical problems associated with communications and critical IT resilience, reliability, and security during a global pandemic.

3.2.4. Cooperation, Coordination, and Information-Sharing

3.2.4.1. *Findings*

1. Several public and private sector exercise participants cited coordination of plans among local, state and federal government as one of the biggest challenges. Each jurisdiction has its own plan. In Washington State, counties may have different procedures, including for school closures, social distance and quarantines. Utilities, commercial businesses and other organizations that have service areas extending beyond a single jurisdiction will have to cope with these different plans.

2. The US Coast Guard has its own plans and policies and needs to know those of key stakeholders and particularly organizations that provide essential services to, or which are dependent upon, the Port. Major issues that need to be addressed include restricting international travel, screening or detaining passengers and crew of ships and planes.

3. Insurance companies will need to put aside competition to coordinate on servicing or denying claims, while hospitals will have to address what to do with the uninsured.

4. Regional U.S. Department of Defense facilities need to understand plans of government agencies and organizations on which mission assurance depends. Key issues include which organizations will establish priorities for response and recovery, how will military civilians be assisted in a pandemic, and what DOD-related resources may be required and under what circumstances if the National Guard and law enforcement are overwhelmed.

5. A key issue raised during the hot wash was the need for public health organizations to better collaborate and communicate plans and intentions with other key stakeholders as part of regional pandemic preparedness activities.

6. Information-sharing and situational awareness among government agencies and among the broader stakeholder community will be essential in a pandemic. While certain mechanisms exist for state and local public heath officials to gain different types of health-related data (e.g., on the numbers of infected and fatalities), it is unclear how response and recovery-related information will be collected and disseminated in a pandemic, which organizations will receive which types of information, and what mechanisms would be used for this purpose.

3.2.4.2. *Recommendations*

1. Local, state/provincial and federal agencies with key stakeholder organizations should identify specific priority issues where regional coordination and cooperation are required and develop collaborative plans and procedures.

2. Avenues need to be explored to facilitate two-way information-sharing within specific sectors and among key stakeholders on a regional basis. Information

sharing and analysis could be through a local or state EOC's or through an enhanced all-hazards Regional Information Fusion Center that has public health agencies and key stakeholders as participants. (Most states and major municipalities now have such information fusion centers. Although most are still chiefly law enforcement and intelligence-focused, others are taking on an all-hazards scope and are moving toward incorporating the broader key stakeholder community, including public health.)

3. Within the Puget Sound/Washington State Partnership, create a Pandemic Preparedness Workgroup to orchestrate further activities of regional stakeholders to move toward regional pandemic resilience. Existing working groups within the Partnership (e.g., the Interdependencies Working Group and the Puget Sound Alliance for Cyber Security) should also incorporate those recommendations for activities in this exercise report that fall within their purview.

3.2.5. Roles and Responsibilities

3.2.5.2. *Findings*

1. The "who is in charge" question was the focus of detailed discussions among participants and emerged as overall the most challenging issue raised by the scenario. Participants were told that public health officials had the lead in pandemic decision-making in their respective jurisdictions, and that authority rested at the local level. How this decision-making process would work, and the authorities of state and federal agencies was unclear. Nor was there an apparent decision-making process that involved regional key stakeholders to enable public health officials to gauge the effects of actions that could affect interdependent critical infrastructures and essential service providers. Several government officials used the pronoun "we" when speaking of whom would make pandemic response decisions, prompting one commercial business representative to comment, "Who's we?" Another observed that it was not clear what gave public health departments "legal authority" to enforce policy directives in a pandemic. Yet another attendee commented that it was vague as to when public heath would assume the lead emergency management role in a pandemic.

2. Roles and responsibilities were further complicated by the fact that jurisdictions have their own plans that may have differing procedures and policies, and many private sector organizations have developed their internal pandemic contingency plans that may not take into account incident command coordination issues.

3. Some participants representing state and federal government recommended that training in the National Incident Management System (NIMS) and the National Response Plan be provided to private sector emergency management personnel as a means to clarify roles and responsibilities in a pandemic. Other participants commented that such training would not address the complexities involved in authorities and decision-making that

required cooperation of a large number of diverse key stakeholder organizations with their own operational and business contingency plans.

3.2.5.2. *Recommendations*

1. Procedures for cross-sector decision-making should be developed as part of regional pandemic preparedness planning. It is recognized that such procedures will require the development of information sharing protocols and agreed mechanisms, such as regional all-hazard information fusion centers that include public health and healthcare organizations.

2. Targeted workshops and exercises should be held on pandemic roles and responsibilities within each level of government, within sectors, and on a regional basis.

3. Based on the preceding recommendation, where applicable or achievable, procedures should be developed to augment existing plans to better delineate authorities and decision-making processes.

3.2.6. Response and Recovery/Reconstitution Challenges—Public Health and Other Issues

3.2.6.1. *Findings*

1. A point raised on a number of occasions by both public and private sector participants was that, because of the national and global scope of an influenza pandemic, regional organizations and jurisdictions would be "largely on their own" and should not expect assistance from federal government.

2. Given the long duration of the first wave of an influenza pandemic and subsequent "waves" of the disease, public health, emergency management officials and other responders will in a prolonged state of emergency that will be unprecedented. Key stakeholders will be forced to continue response and recovery activities simultaneously while affected by staff shortages. A concern is they not "burn up resources" they will need for the duration. Sustaining operations under these circumstances will be a major challenge.

3. It was not apparent from the exercise when local government and state/provincial emergency operations centers (EOCs) would be activated, how long they would remain operational and at what point they would stand down.

4. Public health plans for providing anti-virals to essential and at risk populations are evolving. At the federal level, protocols have been developed, and some larger companies and utilities have or intend to have their own stockpiles. How the

process of identifying recipients and distribution actually will work at the local and regional level was not clear from the exercise.

5. Planning and coordination needs to be done with social service agencies, especially those providing service to vulnerable populations, as well as others who will provide emotional and other support at the community level (e.g., church and other faith-based organizations).

6. There were a number of challenges unique to a prolonged public heath emergency that were raised:

   - Human resources issues, such as how to keep employees who need to work to remain at home; how to maintaining operations while implementing social distancing; how to enforce social distancing, closure of businesses and retail establishments; and maintain quarantines;
   - How to bring a "sick ship" into port or turning a ship away and detaining well passengers on an airline if a case of pandemic influenza is suspected;
   - How to ensure that there are enough security guards, National Guard and law enforcement personnel available to meet needs;
   - How to ensure there are enough drivers for mass transit and transporting essential products (food, pharmaceuticals, fuels, supplies, materials, etc.);
   - How to compensate for the loss of top public officials due to illness; and
   - How to get relief from government regulations that could impede response, recovery activities.
   - Communicating information to the public about enforcement of social distancing procedures and closures of sites and businesses were people would normally congregate (e.g., movie theatres, grocery and convenience stores, pharmacies, coffee houses, gyms, and churches.)

7. A number of preparedness gaps identified in previous Blue Cascades exercises were very much evident in the pandemic scenario. Examples include:

   - The need for a credentialing utility maintenance, truck drivers for essential products, and other types of responders;
   - How utility services are prioritized for high-need customers if these services are limited; and
   - Development of a resource management system that includes the private sector and non-profits for pandemic response, recovery and reconstitution.

8. Public and private sector pandemic plans do not take into account, nor have they tested a scenario where major disasters, deliberate or otherwise, could occur during a pandemic when response resources are severely constrained or unavailable.

3.2.6.2. *Recommendations*

1. Federal government agencies (civilian and defense) should make available to key stakeholders information on those specific actions they could take and services they could provide in an influenza pandemic, the process/procedures on how such assistance could be obtained, and the limits on such federal assistance given the global scope of a pandemic.

2. Procedures should be developed to standup EOC's and to ensure they will have the resources and capabilities necessary to continue operations over a period of months.

3. Efforts at the federal, state/provincial level should be accelerated to develop viable, cost-effective policies, plans, and procedures to address the large number of complex public health and related issues associated with pandemic influenza response, recovery, and reconstitution. At the same time, organizations responsible for disaster preparedness and emergency management should move rapidly to address major challenges that are common to all-hazards scenarios that come into play in a pandemic, including development of a credentialing system, of a collaborative, prioritized regional service restoration system, and a regional resource management system.

4. Local government should identify significant vulnerable populations (e.g., elderly, ethnic groups, disadvantaged individuals and the homeless, and the critical infrastructures, services and supporting institutions associated with these groups, and take steps to determine pandemic preparedness gaps. Procedures and outreach activities should be incorporated into pandemic preparedness plans to address needs of these vulnerable populations.

5. Pandemic exercises should be developed and conducted that include at least one additional significant disaster to test the capabilities of regional stakeholders to handle a major emergency while dealing with staff shortages and disruptions of critical infrastructures and essential services.

3.2.7. Business Continuity, Continuity of Operations, and Supply Chain Management

3.2.7.1. *Findings*

1. Pandemic preparedness plans that businesses currently are developing need to be flexible to address different assumptions and changing situations and should include

human resources policies to deal with staff shortages and a range of personnel issues, social distancing needs, etc., and include testing telecommuting and communications capabilities.

2. While large companies are developing pandemic contingency plans, small and medium-size businesses need assistance and incentives to develop plans and information on best practices, and to undertake training for staff and also preparedness drills. As one local public health official commented, "given how dependent we are on small businesses, we can't just assume 40% or more will fail."

3. Although there has been some limited modeling and simulation development at the federal level and for risk assessment within the private sector, the impact of a global influenza pandemic on logistics and supply chains is difficult to assess but clearly will be significant. There will be impacts on virtually all products and services affecting all critical infrastructure sectors.

4. Legal and liability issues in some cases could affect the ability of companies to carry out pandemic-related polices.

3.2.7.2. *Recommendations*

1. Government in concert with companies that have developed pandemic plans should collaborate to develop a model continuity of business plan for small businesses that could be customized by local enterprises. Such a model plan should take into account local and state plans and also address legal and liability issues.

2. At the local level, county or city government should develop and offer to small and medium-size businesses a training course on pandemic preparedness and develop and conduct exercise to further improve and enable testing of organizational contingency and regional pandemic preparedness plans.

3. The federal government with key stakeholders should undertake an assessment on the regional impact of a global pandemic on provision of one or more essential products and services, e.g., food supplies; transportation; electric power, natural gas and other fuels; communications and critical IT services, and emergency services and healthcare.

3.2.8. Public Information and the Media

3.2.8.1. *Findings*

1. There needs to be an effective regional public information plan with established dissemination mechanisms to continuously inform the public in advance of and from the advent of pandemic influenza in the U.S. through the months that follow. Such a strategy must be designed to maintain public confidence in a pandemic. It will need to be coordinated with key government agencies and other stakeholders and have

identified spokespersons of authority and credibility who can inspire trust and optimism.

2. The media is an essential participant in pandemic preparedness planning and management. Local government and key stakeholders should view the media as a friend and not as an adversary and should ensure that media owners and operators and communicators are engaged in exercises with regional stakeholders with the goal to raise awareness of issues and challenges facing communities, including constraints on the ability of government to "come to the rescue".

3.2.8.2. *Recommendations*

1. Local public health and emergency management officials should develop a coordinated regional public information pandemic strategy. The strategy should identify the range of questions and issues that would need to be addressed in a pandemic with coordinated answers and background information provided and disseminated to key stakeholders in advance. This information and Q's and A's should be updated as new information emerges and plans are improved and used in targeted exercises.

2. Briefing sessions should be held for local media representatives that include what is known about the regional impacts of a global pandemic; what is not known, including the uncertainties behind assumptions on rates of infection and deaths; and on government and other preparedness plans.

3. Media and community organizations, including representatives of ethnic, religious, and other special interest associations, should be included in regional and sector-focused exercises.

3.2.9. Training and Education

3.2.9.1. *Findings*

1. Key stakeholders should ensure that their personnel receives training on organizational pandemic preparedness plans and participate in in-house and where appropriate, regional exercises.

2. The general public should be provided educational materials on what to expect in an influenza pandemic and opportunities to become familiar with local preparedness plans, and selected representatives included in regional and organizational exercises.

3.2.9.2. *Recommendations*

1. A pandemic preparedness training curriculum should be developed that can be customized respectively for infrastructure personnel and the general public and media.

2. Local public health with the academic and other key stakeholders should develop instructional courses on pandemic influenza and preparedness that can be utilized by schools from the K through 12.

4. Exercise Utility

Blue Cascades IV was in many respects the most challenging of the Blue Cascades exercise series to date. The pandemic influenza scenario—primarily a public health prolonged emergency with a global scope—raises many different and unique preparedness and management challenges. The Scenario Design Team demonstrated creativity and flexibility in incorporating some innovations into the exercise. The informational mini-briefs and employment of a GIS-based system to demonstrate regional impacts of the developing pandemic on a screen during the exercise were new tools meant to increase the value of the event to participants.

Attendee Evaluations. More than three quarters of the participants in their evaluations said their overall impression of the exercise and the quality of the discussion was very good to excellent. A few cited it as the best of the four regional exercises. As in previous Blue Cascades exercises, attendee perceptions and suggestions reflected their organizational backgrounds and often varied and at times conflicted.

Mini Briefs v. Time for Discussion. Most of the attendees singled out the presentation by Dr. Young on the Canadian SARS experience as their most valuable "take-away" from the exercise. One state official described it as "a common sense approach to pan flu." Many also cited the mini-briefs as particularly useful, although a few observed that the slides were not as detailed as they would have liked. Comments included "excellent, really helpful" and "I really liked the mini-briefs." At the same time, these individuals and others pointed out that most of the briefers went well beyond the five minutes allotted for their presentations and that this impeded the flow of the exercise and limited interaction and discussion among the participants. In general, public sector participants were more inclined to appreciate the mini briefs for providing state and local health officials a means to inform the key stakeholder community of what they need to know. At the same time, local law enforcement, representatives of infrastructures and essential service providers wanted greater opportunities to discuss issues of concern to them. As one pointed out, "We need more discussions; this issue is very different from earthquakes and terrorism."

Exercise Duration. Many participants felt the exercise scenario focused on too many issues for one day and that participants became, as one individual noted, subjected to "information overload." They recommended that future exercises should be a two day event with the mini-briefs and other informational discussions the morning of the first day. (This had been the approach in Blue Cascades III, which contained a workshop within the exercise on the first day that focused on technical and policy issues related to preparedness for the scenario—a major subduction zone earthquake.) A few participants,

on-the-other hand, felt the exercise was too long—and should have run no more than six hours.

Importance of Networking and Building Contact Base. As in previous Blue Cascades exercises, participants overall particularly liked the opportunity to network and build relationships with other regional key stakeholders. One attendee suggested that PNWER sponsor a photo and business card exchange to help them keep contact lists current and "associate a name with a face." In regard to identifying organizations that were absent and needed to be at the exercise, organizations cited by participants included non-governmental organizations that represented the elderly, mentally ill, and ethnic groups; community organizations, mass transit, human resources groups, and tribal representatives; also, additional federal agencies such as the CDC; companies with supply chain priorities, and particularly the media.

Scenario Focus and Scope. Several participants noted that the exercise was focused primarily on the Puget Sound Region, and that PNWER should make an effort to facilitate the development of exercises that reached out to include broader representation from the Pacific Northwest. A few other attendees pointed out that the exercise was based on, as one federal official put it, "a worst case scenario and not realistic—facts laden with unidentified assumptions". One participant wanted the exercise to focus more on business continuity concerns rather than, as he expressed it, "government issues." At the same time, another attendee called for focusing "less on business impacts and more on working though local, multi-state, and federal emergency management issues." Still others thought focusing the exercise on a few topics and exploring them in depth would have been more useful.

Exercise Graphics and Aids. Many participants, while appreciate of the ESRI work to develop the GIS system to demonstrate pandemic impacts during the exercise, viewed the continual and changing displays on the screen as not relevant or useful and distracting. However, another participant felt using GIS to illustrate the progress of a pandemic had potential for exercises when integrated with the script.

5. Next Steps

Blue Cascades IV demonstrated that, in many respects, key stakeholders are only in the early stages of learning how to deal with a global pandemic. In their comments, many attendees observed that the exercise demonstrated that the region has a long way to go to develop pandemic resilience. A representative from a power and water utility observed that the exercise was based on "a lot of assumptions" that "may not make sense, work, or be advisable" and it was important to continue to try to "clarify reality from myth." A health official noted that there was a "lack of real knowledge of the implications of a pandemic." A financial official expressed that there were "Many questions: few answers," and a utilities representative echoed "I have more questions than I came in with."

At the same time, there came out of Blue Cascades IV a significant number of findings and recommended solutions that were identified in one or more of the three preceding Blue Cascades exercises. Regional resilience, including pandemic resilience, will greatly be improved by moving forward on activities already in the *Blue Cascades Series Integrated Action Plan.* These activities include developing the tools and approaches to better understand regional interdependencies, vulnerabilities, consequences and assess risk; undertaking activities to enhance communications and critical IT resilience and security; better delineating and exercising roles and missions; developing a regional information fusion capability that includes key stakeholders; establishment of an effective credentials system and a process and mechanism that enables management of public, private sector and non-profit resources for disaster response, recovery and reconstitution.

Action Plan Development. As in the case of previous Blue Cascades exercises, participants will be invited to return to review and prioritize the findings and recommendations in this exercise report for incorporation into the *Blue Cascades Series Integrated Action Plan* as the beginning of a regional pandemic preparedness strategy. It is anticipated that this step will provide the foundation for the work that needs to be accomplished to achieve regional pandemic resilience for the Pacific Northwest.

Appendix A

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Appendix B

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