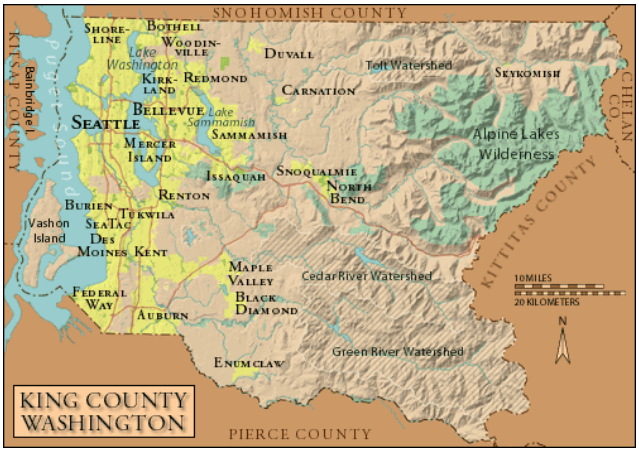
Attachment A
16715

King County
Regional Hazard Mitigation Plan
Phase 1



Prepared by:

Regional Partners and
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www.kingcounty.gov/prepare

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Acknowledgements

2009 RHMP Plan Update - Phase 1

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Please forgive us if we have inadvertently left your name off this important partner list. To add your name, contact Heather Kelly at King County Office of Emergency Management, 206–205–4034, and you will be added to the RHMP Phase 2 list.

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King County Regional Hazard Mitigation Plan 2009

Table of Contents

Section 1: Introduction

Executive Summary

In 2000, the federal government enacted the Disaster Mitigation Act (DMA 2000; P.L. 106-390) requiring states, local jurisdictions and tribal governments to have an approved mitigation plan in place to be eligible for mitigation funding. In 2004, King County and its Office of Emergency Management committed to providing coordination in an effort to identify possible alternatives and to secure funding for the benefit of the region.

The King County Regional Hazard Mitigation Plan (RHMP) is a living document and is now undergoing its first five-year major update in 2009. Most pertinent elements of the 2004 RHMP have retained their integrity in the 2009 RHMP. Some sections of this document have been significantly enhanced or are brand new in 2009 and will be indicated as such. General updates and updates to documented FEMA declarations and other significant hazard incidents have been updated and included from years 2004 – September 2009. Section 5, Hazard Identification, has added a new profile in 2009 titled Dam / Dam Safety and the Flooding hazard profile has been significantly updated, among other profiles as indicated in the 2009 RHMP. All footnotes / endnotes and links have been reviewed, verified, and updated as needed or possible. This entire document has been reviewed, and significantly improved, with many new sections.

In an effort to provide ease of understanding the RHMP update, the following information should be considered. **Matrix 1.1,** titled ***King County Regional Hazard Mitigation Plan 2009, Matrix of Changes***, has been created. This document details all major changes made to the updated RHMP. The Matrix is located at the end of this section. Additional changes are indicated within each RHMP section, and are referenced accordingly. During development of this updated document, some duplicated language has been removed, but reference has been made to the existing language in other portions of the 2009 RHMP.

This document is the culmination of a cooperative Regional Planning Team effort and required participation from King County internal government departments / agencies, local government city jurisdictions, fire and utility districts, special purpose districts, some school districts, King County Office of Emergency Management (OEM), State of Washington Emergency Management Division (State EMD), and the U. S. Department of Homeland Security's Federal Emergency Management Agency (FEMA). This RHMP meets the requirement for a Hazard Mitigation Plan under the amended Stafford Act (44 CFR, Part 201). Many local jurisdictions, communities,

governmental agencies, and the public were involved in the RHMP development and critical review process.

It is vital for the region to have a proactive, coordinated approach to mitigation. Mitigation measures save lives, reduce injuries and prevent or decrease financial losses from the many hazards our region faces. The 2009 RHMP examines efforts that can be applied to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs through prevention and mitigation efforts.

Some projects are being implemented with existing funding sources. As additional funding sources become available, the regional plan will guide the selection of eligible projects from the criteria set forth in the Hazard Mitigation Grant Program (HMGP) and from other mitigation funding sources.

The development of this document represents a coordinated effort of many elements in the region. We are indebted to the staff of Washington State Emergency Management, FEMA, technical writers, researchers and contributing members of the participating workgroups. Each local mitigation strategy can stand alone but the combined efforts provide greater return for the region as a whole. The underlying regional mitigation plan goal is to implement the regional strategy through mutually beneficial and cost-effective regional projects.

Plan Context and Limitations – Highlights

Planning for the 2009 RHMP update is occurring concurrently in two phases. Phase 1 is a King County Plan – Base Plan, and includes a limited number of jurisdictional annexes who were planning partners throughout the update process. Phase 2 will incorporate the majority of all remaining jurisdictions from within the county, as well as new planning partners who were not previously part of the county's RHMP. King County is comprised of over 154 distinct jurisdictional entities which include cities, fire districts, utility districts, school districts, special purpose districts, and others. Any jurisdiction can request to be incorporated into this RHMP in a prescribed way as defined in Section 2 – Plan Development, in the Plan Maintenance and Plan Management & Guidelines for Adding a Jurisdiction to the King County Regional Hazard Mitigation Plan sections. This process was elected because of the time constraints the county was operating under as a result of the potential flood issues surrounding the Howard Hanson Dam.

The county was required to shift focus from mitigation planning to plan for dam response efforts to help ensure life safety and infrastructure protection. When it became apparent that the county could not fulfill both requirements in the timeframe necessary, the county not only hired additional personnel to work on the update to the RHMP, but also shifted some of the responsibility associated with this plan to other county departments. Additionally, with the expedited

process necessary to gain plan approval in the most expeditious manner, the county was not able to devote the staff necessary to provide the technical assistance needed for all jurisdictions to be able to complete their plan. It was determined to be in the best interest of the county to ensure the county itself maintained 44 CFR compliance by completing the Base Plan in advance to all of the jurisdictional annexes. Therefore, the Phase 1 and 2 process was developed by the county's planning team. This allowed for continued compliance on the part of the county, while also allowing for the addition of jurisdictions after the Base Plan has been adopted.

Another major change within this RHMP update involves the King County Government portion of the RHMP. The 2004 RHMP was written with a King County Government Annex section contained in Annex B. For the 2009 RHMP, the appropriate contents of the 2004 King County Government Annex B section were incorporated into the Base Plan to include those parts being redistributed into Sections 1-8, as appropriate. Because of the time constraints involved, some of our partnering agencies chose to produce their own mitigation plan, while others chose not to participate at all. For this reason, the current planning document may lack details regarding particular portions of geographic King County.

In 2009, a new section has been added to include guideline information on how a jurisdiction can add on to the King County Regional Hazard Mitigation Plan. This guideline can be located in Section 2 - Plan Development, in the Plan Maintenance and Plan Management section.

Preface and Overview

Why Develop a Mitigation Plan?

The rising cost from the impacts of natural disasters has led to renewed interest in identifying effective ways to reduce our vulnerability to disasters. Natural hazard mitigation plans help communities to reduce their risk from natural and manmade hazards by identifying vulnerabilities and developing strategies to lessen and sometimes even eliminate hazards.

Many communities resist adopting mitigation measures as they can be seen to be restrictive, costly, without immediate tangible benefits, or are incompatible with community development. However, effective mitigation measures are designed with the future in mind. Consequently, our region is committed to convincing its constituents to view mitigation as an opportunity to provide sustainable development that improves the economic value and quality of life for the region, its communities, businesses and residents.

Here are some benefits of mitigation planning for agencies within King County:

- *Leads to a judicious selection of risk reduction actions* by setting clear goals and identifying and implementing policies and cost-effective programs and actions that reduce the effects of losses from future disasters.

- *Builds partnerships* to enhance collaboration and gain support among the parties whose interests may be affected by hazard losses.

- *Encourages a broad range of stakeholders to forge partnerships* that pool skills, expertise, and experience to achieve a common vision to ensure that the most appropriate and equitable mitigation projects are undertaken.

- *Contributes to sustainable communities*, ensuring future generations will continue to enjoy the same or improved quality of life that we do.

- *Links sustainability and loss reduction efforts to other goals,* like promoting open space planning that also prevents development in hazard locations such as floodplains or landslide areas.

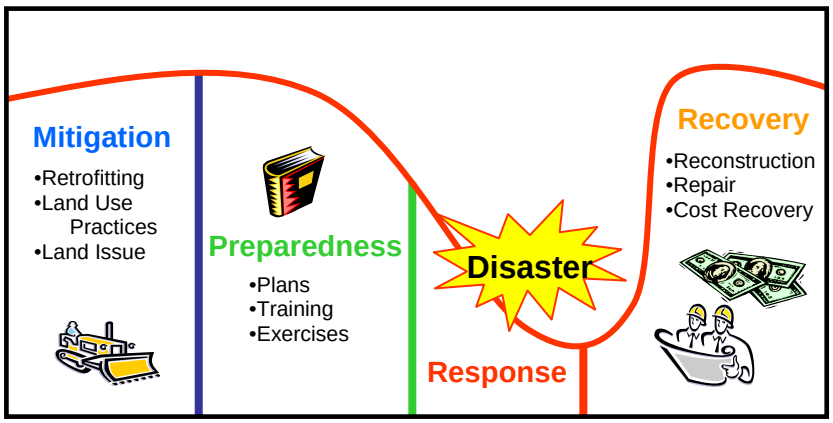
- *Establishes funding priorities* so agencies can better articulate their needs to state and federal officials when funding becomes available, particularly following a disaster for prioritized projects. Such communities can present projects as an integral part of an overall, agreed-upon strategy, rather than as projects that exist in isolation.

Most importantly, hazard mitigation **"saves lives and property"** from natural, technological, or manmade, hazards through mitigation actions. If we can identify potential hazards in our community, assess potential risk and impacts, and access vulnerability assets and populations, then we have the opportunity to develop strategies to help mitigate the impacts before, during and after a hazard event.

In addition, future federal and state funding of mitigation projects depend on the successful completion of a hazard mitigation plan. Only those states and jurisdictions with approved plans that meet the Disaster Mitigation Act of 2000 and amended requirements criteria will be eligible to receive Hazard Mitigation Grant Program (HMGP) funds in the future. Through a "regional" hazard mitigation planning approach, participating agencies within King County will optimize the benefits of working together and ensuring the best opportunity for gaining future competitive grant funding for hazard mitigation projects.

Mitigation Planning Process

Mitigation planning is the first of the four "phases of emergency management" followed by preparedness, response and recovery. This "prevention-related" aspect of emergency management often gets the least attention, yet is one of the most important steps in creating a disaster-resistant community.



Four Phases of Emergency Management

Mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Mitigation encourages long-term reduction or elimination of hazard vulnerability. The goal of mitigation is to save lives and reduce property damage. Mitigation can accomplish this, and should be cost-effective and environmentally sound. This, in turn, can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical jurisdiction facilities, reduce exposure to liability, and minimize community disruption. Examples include land use planning, adoption of building codes, elevation of homes, acquisition and relocation of homes away from floodplains, and public education.

There are also six steps in mitigation planning (new steps for 2009 update):

1. Organizing resources
2. Identifying hazards and vulnerability
3. Assessing risks
4. Developing mitigation strategies
5. Developing the Plan
6. Implementing, monitoring and updating the Plan

From the start, jurisdictions need to focus on the resources needed to develop a successful mitigation planning process. An essential step includes identifying and organizing interested members of the community as well as those with technical expertise. A wide cross-section of planning participants is a necessary ingredient in identifying and addressing regional hazard mitigation concerns, as well as building overall consensus.

Next, communities must identify the characteristics and potential consequences of hazards that can occur locally and regionally. It is important to understand how much of the community can be affected by specific hazard events and what the impacts could be on important community assets. Some assets may be more at risk than others simply because of where they are located and the function they serve. Examples can include emergency operations centers, hospitals, telecommunications, etc. Certain populations may be more at risk because of where they live – densely-populated urban areas in a liquefaction zone are more likely at risk during an earthquake than smaller populations living in more stable areas of rural parts of the county. Other sectors of the population may get limited emergency information because of communication obstacles.

By understanding the risks posed by hazards, jurisdictions and communities can then determine their priorities and look for possible ways to avoid or mitigate the impacts. The result is a well thought-out plan and strategy, along with effective activities to mitigate such potential hazards.

To ensure the success of an ongoing program, it is critical that the RHMP remains relevant. In order to do this the regional hazard mitigation planning group must continually update the RHMP, monitor its progress, and conduct periodic evaluations. In King County's case, this can include incorporation of new regional partners, incorporating improved collection and evaluation of hazard data, and making sure mitigation activities are being accomplished.

How the Plan is Organized

The 2009 King County Regional Hazard Mitigation Plan is organized into eight basic sections:

- **Sections 1 and 2** provide an administrative overview of the planning process.
- **Section 3** provides a comprehensive profile of the region including maps; this information is key in understanding the various aspects of the community that are involved or can be impacted during hazard events.
- **Section 4** profiles individual participating agencies.
- **Section 5** includes hazard identification, vulnerability and impact assessment information based on the eight of nine most common natural hazard types that occur within our region with summaries of other major hazard incidents our region experiences; additional identified hazard topics will be addressed in priority order in subsequent years.
- **Section 6** summarizes critical facilities in the region by category, and summarizes the hazard incident of flooding with a detailed risk assessment and repetitive losses in the six river basins in King County (new for 2009).
- **Section 7** outlines the county's regional hazard mitigation strategy.

- **Section 8** includes annexes and other information in support of the first seven sections of the main document. The sections are arranged in a sequence that reflects the mitigation planning process itself.

Mission and Vision

The 2004 RHMP Taskforce developed the mission and vision statements with input from the Partner's group. It was the intent of both groups to keep these statements simple and broad in scope, and to carry these forward in 2009. The RHMP Taskforce reaffirmed the Mission, Vision, Goals and Objectives for the 2009 RHMP update.

Mission

"Reduce the impact of natural, technological and human-caused disasters upon the communities within King County."

Vision

"King County is a region where disasters have minimal impact on people, infrastructure and the environment."

Goals and Objectives

The goals and objectives are based on the mission and vision statements and are listed in order of planning priority. Mitigation strategies and activities are based on these goals:

1) Protect Life and Property
2) Support Emergency Services
3) Increase Public Awareness
4) Preserve Natural Systems and Resources
5) Encourage Partnerships
6) Enhance Planning Activities

1. Protect Life and Property

A. Implement activities that assist in protecting lives and property by making homes, businesses, infrastructures, critical facilities, and other community assets more resistant to losses from natural hazards.

B. Maintain essential services, facilities and infrastructures during disasters.

C. Identify populations with special needs or those who may be more vulnerable to the impacts of disasters or hazard events.

D. Reduce losses and repetitive damages from chronic hazard events.

E. Provide and/or improve emergency warning systems.

2. Support Emergency Services

A. Strengthen and support countywide disaster and emergency response efforts.

B. Protect and maintain critical facilities, infrastructures and services essential to emergency service and disaster response activities.

3. Increase Public Awareness

A. Enhance the public's knowledge about hazards that occur in the region and how they can be impacted.

B. Support education and outreach programs to increase the public's awareness about disaster preparedness, mitigation, emergency response, and recovery activities.

C. Develop education strategies, programs and materials to reach populations with special needs.

D. Provide and support comprehensive education activities that address all sectors of the community.

4. Preserve Natural Systems and Resources

A. Ensure protection of agriculture, fish, wildlife, and natural resources.

B. Balance watershed planning, natural resource management, and land use planning with natural hazard mitigation to protect life, property, the environment and economy.

5. Encourage Partnerships

A. Strengthen communication and participation among public agencies, citizens, non-profit organizations, businesses and industry.

B. Coordinate hazard mitigation planning efforts with other local and regional organizations involved in disaster preparedness, response, and recovery activities.

6. Enhance Planning Activities

A. Improve data collection and evaluation processes for identifying critical facilities, infrastructures, essential services, and populations at risk.

B. Improve hazard assessment information and resources.

C. Enhance and increase participation and representation on the Regional Hazard Mitigation Plan Taskforce and Partners Committee.

D. Facilitate ongoing review and implementation of the RHMP.

E. Actively monitor and evaluate the status, implementation and completion of mitigation action items.

F. Routinely review, update and enhance all aspects of the RHMP.

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2009 King County Regional Hazard Mitigation Plan Matrix of Changes

Section 1, Matrix 1.1

Note: This *Matrix of Changes* documents most of the pertinent changes made from the 2004 RHMP Plan to the 2009 RHMP Plan update. This 2009 Matrix represents high level changes made during Phase 1 of the RHMP planning process. Phase 2 planning information is indicated in the RHMP.

Section 1 – Introduction	
	2009
Executive Summary	News additions for 2009 Plan update are shown as: (*new in 2009);* General, grammar, and statistical data updates as available and/or are noted or assumed made; Flooding hazard significantly updated, Section 5; New sections added: Dam / Dam Safety, as example, in Section 5, and throughout RHMP; The 2009 Plan retains the same integrity in 8 sections, as the 2004 RHMP, Section 1 – 7, Basic Plan, and Section 8 – Annexes; *Matrix of Changes* – New tracking document for 2009
Planning Context and Limitations	Defined Phase 1 and Phase 2, for 2009 Plan update The 2004 Annex B for King County Government was eliminated and the information incorporated back in 2009 RHMP Sections 1-7, as appropriate. New guideline information on how a jurisdiction can request being added to the King County RHMP, located in Section 2, for Phase 2.
Plan Organization	Updated for 2009; Sections delineated No KC Govt.; Annex B - incorporated
	Matrix of Changes document will be located the end of Section 1.

Section 2 – Plan Development
Planning Process - significantly updated for 2009; Phase 2 explained in detail Common RHMP planning elements
For 2009, moved Cost-Benefit info to Section 7; from 2004 Plan, Section 2 and 5.
Public Involvement - significantly updated for 2009 Phase 1, King County Public Involvement Participation Table 2009, Annex E
Plan Maintenance and Plan Management - new for 2009 New tables to show 2004 and 2009 participants, in Phases New - How Jurisdictions can join to the 2009 KC RHMP

New Letter of Intent, document 1.1 – in Annex B
2009 Adoption of Plan - updated
2009 RHMP Plan elements to be incorporated into other KC documents – updated
2004 Historical Planning Process Section, removed to Annex C in 2009

Participating Agencies Tables new for 2009

	2004	2009
King County Government	**KC Govt - Annex B;** Independent filing of **7 King Departments**	**Phase 1 - King County Govt.** No Annex B for KC Govt.: info incorporated back into Basic Plan, Sections 1-7 and Annexes; Status update of KC Internal Government agencies
		Phase 2 – Jurisdictions (expected for 2009 update)
Cities	**14 cities** • Auburn • Bellevue • Bothell • Burien • Duvall • Federal Way • Issaquah • Kirkland • Medina • Normandy Park • North Bend • Redmond • SeaTac • Woodinville	**11 cities** Loss of 7 cities • Duvall, • Kirkland • Normandy Park • North Bend • Redmond • SeaTac • Woodinville Gaining 4 cities • Des Moines • Newcastle • North Bend • Pacific • Tukwila **Net loss of 2 cities**
Fire Districts	**8 fire districts** • #2 • #11 • #36 • #39 • #40 • #43 • #44 • #45	**3 fire districts** Loss of 6 districts • #2 • #11 • #36 • #40 • #44 • #45 Gaining 1 district • #20 **Net loss of 5 districts**
Utility Districts	**15 utility districts** • Cedar River Water and Sewer • Coal Creek Utility • Covington Water • KC Water District #19 • KC Water District #20	**9 utility districts** Loss of 8 districts • Cedar River Water and Sewer • Coal Creek Utility • Newcastle • KC Water District #20

	• KC Water District #90 • KC Water District #111 • Midway Sewer • Northshore Utility • Ronald Waste Water • Shoreline Water • Soos Creek Water • Southwest Suburban Sewer • Val Vue Sewer • Woodinville Water	• Northshore Utility • Ronald Waste Water • Shoreline Water • Val Vue Sewer • Woodinville Water • Gaining 2 districts • Covington Water • Sammamish Water and Sewer Gaining 2 districts • Highline Water • Sammamish Water and Sewer **Net loss of 4 districts**
School Districts	**2 school districts** • Lake Washington • Vashon Island	**1 school district** Loss of 2 districts • Lake Washington • Vashon Island Gaining 1 district • Federal Way **Net loss of 2 districts**

Section 3 – Regional Profile[1,2]	
	2009
Phase 1	General updates if available
Population and Demographics	Updated 2009 estimates • **Population Distribution** (update Table 3-1) • **Population by Age and Sex** (update Table 3-2) • **Household, Cultural Diversity** (update Tables 3-3, 3-4) • **Population Growth and Trends.** No updates available • **People with Disabilities and Disability Type**
Housing	Updates for 2009 • **Growth** • **Household Size** (update Table 3-7) No updates available • **Age of Construction** • **Group Housing**
Geopolitical Jurisdiction	Updates for 2009 • **King County Cities and Towns** **(**2009 U.S. estimates for population, land area, and land value. Update to Table 3-10) • **Native American Tribes** • **School District Enrollment and School District Population** (update to table 3-11) • **Fire Districts Services Population** and **Area** (update Table 3-12)

	• **Flood Control Zone Districts** (re-written for 2009 by DNRP) • **Drainage Districts** (and additional 6 district contacts and map 3.7.5)
Economy	Updates for 2009 • **Employment and Employment by Industry** (update to Table 3-13) • **Removed Bon-Macy's, Washington Mutual Bank, and Airborne; added World Vision and Weyerhaeuser** • **International Trade** • **Income and Wages** • **Unemployment and Poverty** (update to Table 3-14)
Transportation	Updates for 2009 • **Air Service** for **Sea-Tac** (updated for Plan 2009) • **Sound Transit Commuter Rail** (updated for 2009) • **Commuting Trends / Patterns, Public Transit** (updated for 2009, update of Figure 3.1) • **Washington State Ferries**
Emergency Services	Updates for 2009 • **Fire Service** (update to Table 3-15) • **Emergency Medical Service** • **Law Enforcement** (updated Table 3-16) • **King County Sheriff's Office** (Tables 3-17, 3-18 statistics and response calls updated for 2009) • **Emergency Communications (***9-1-1)* **and Puget Sound RCPPP** Map • **Emergency Management and Search and Rescue** • **Public Health** No updates available • **Hospitals – Emergency Care**
Education	Updates for 2009 • **Public Primary** • **Secondary Education** • **and Post Secondary Education** No updates available • **Types of Educational Buildings**
Resources	Updates for 2009 • **Water (new color watershed map for 2009)** • **Seattle Public Utilities and Waste Water Treatment** • **New for 2009: King County Solid Waste Management Plan** • **Electricity** • **Fuel Transmission Systems**
Land Use, Development and Growth, and **Annex F**	Updated for 2009 **by DDES** • **Designated Urban Growth Areas** • **Land Use Trends and Growth Targets**
Maps	2003 maps were removed to New 2009 Annex K – 2004 Plan Maps

Section 4 – (2009 Title) - Participating King County Government and Jurisdiction Profiles (2003 Title) - Participating Agency Profiles		
	2004	**2009**
		Phase 1 & 2 Explained, as in Section 1, and 2 **Expanded Phase 2 language**
For Phase 1 - King County Government Departments / agencies	**1 conglomerated King County Annex B** **7 King County departments /agencies**	KC Annex B – removed; info incorporated into Basic Plan Sections 1-7, as appropriate New summary tables for 2009, updates of the 7 KC internal departments; Addition of status for King County internal departments involved in 2009.
		Phase 1 & 2 Explained, as in Section 1, and 2 **Expanded Phase 2 language**
For Phase 2 - City and, Fire Districts, Utility Districts, and School Districts	• **14 cities and** • **departments** • **8 fire districts** • **15 utility district** • **2 school districts**	Summary tables new for 2004 and 2009, updates of the previous or additional agencies • **11 cities** • **3 fire districts** • **9 utility districts** • **1 school district** Addition of profiles for agencies involved in 2009. Omission of agencies no longer involved in 2009. (for Phase 2)

Section 5 – Hazard Identification and Vulnerability Analysis **Title Change in 2009 (from Assessment (2003) to Analysis (2009)**		
	2004	**2009**
Profile of Hazards	2004, Section 2 – cost benefit info moved to Section 7 (2009)	To make the hazard analysis more helpful, adjective descriptors (high, moderate, and low) are established for each hazard's probability of occurrence and the county's vulnerability, or impact, in the event of a hazard. Moved Cost-Benefit info to Section 7, from 2004, Section 2 and 5. Flooding Hazard increase to High Risk

Understanding Risk Ratings, Terminology Defined		New for 2009; new tables for 2004 and 2009, Updated from (2004) Probability vs. Impact to Probability *and* Impact
Summary of Results		New Table for 2004 and 2009, to include new Total Risk column
Five Year Plan cycle and Source of Data		Expanded in 2009
HAZARDS		All hazards updated with history of events, links footnotes/end-notes; as possible
Severe Weather	High frequency / moderate impact	If severe weather contributes to a flooding incident(s), these additional hazard rankings may be suddenly upgraded because flooding impacts increases the risk of possible increased frequency of secondary hazards
Tornado		Added in response to recent occurrence(s) as a result to severe weather; new in 2009 text
Wind	1993 Windstorm	Updated with 2006 Windstorm
Avalanche		Updated with Interstate closures since 2004
Flooding	High frequency / moderate impact	Risk rating upgraded to **high frequency / high impact** because of the increased Howard Hanson Dam issues and Green River Valley risk of potential flooding in the next five year period starting 2009 and beyond
Major King County River Basins & King County Flood Control District & Flood Forecasting & Green River Valley potential flooding		Added for the 2009 Plan update by the KC DNRP New Tables 5.5A and 5.5B Added New Table 5-7 History Update
(Flooding) Hazard Impacts		Updated economic impacts listed in accordance with Green River Flooding Past / Present Mitigation Efforts updated New NFIP added New KC Flood Warning Center
Dams / Dam Safety		New Section in 2009 Added in response to the increased risk of potential flooding within the Green River Valley and Howard Hanson Dam situational awareness
Landslide		Updated to history and new map

(Earthquake) Hazard Impacts		Added critical infrastructure interruption as a result of disasters associated with Earthquakes
Civil Disorder		Updated to include increased surveillance of annual Mardi Gras
Drought		Updated to include 2005 history update of water/snow pack shortages
Hazardous Materials		Updated to include current waste sites and material response teams
Transportation		Updated with current demographics for transportation modes and accidents since 2004; Update of RPIN wording
Tsunami / Seiches		Map new for 2009
• Pandemics(Epidemics) • Volcanoes / Volcanic activities • Extreme Heat • Pipeline (Utility Energy Shortage)		Future hazard topics are identified for the next RHMP

Section 6 – (2009 Title) - Vulnerability Assessment, Risk Analysis and Capabilities (2004 title) Vulnerability Assessment and Risk Analysis	
2004	**2009**
Planning Methodology	Updated to include emphasis on Flooding, 6 major KC river basins
Critical Facilities King County	Per KC DNRP King County Flood Hazard Management Plan Located in Annex G (FOUO)
King County Six Major River Basins	Per KC DNRP; New in 2009, pages 6 - 3 through pages 6 - 22 Risk and Vulnerability assessment NFIP language expanded NFIP Repetitive Loss properties Incorporated cities and unincorporated
Table 6-1	Deleted, replaced with **Table 6.1: Major King County River Basins,** specifically the analysis of the **6 major King County river basins** • South Fork Skykomish River • Snoqualmie River • Sammamish River • Cedar River • Green River • White River

King County Flood Control District Information for Six major King County River Basins	Analysis for the 6 river basins provided by the King County Flood Control District for 2009 • Flow • Flood Characteristics • Flood Exposure • Economic Impact • Development Trends • Repetitive Loss
Capability Assessment	New in 2009 Legal and Regulatory Administrative and Technical Fiscal
Vulnerable Populations Defined	Updated
Table 6-1	Replaced in 2009 with Six Major River Basins
Table 6-2	Deleted as information is provided in Section 3

Section 7 – Regional Mitigation Strategy	
2004	**2009**
	Section 7 - Rewritten
	Moved Cost-Benefit info to Section 7; from 2004 Plan, Section 2 and 5.
Critical Facilities	List(s) Located in Annex G (FOUO)
Mitigation Strategies	From 2004 Plan, KC Annex B, King County Departments / Agencies; Evaluation of 2004 Initiatives - Status (upper right hand corner) (retained in 2009) New tables for 2009 King County Government - Internal / Agencies; Status
	Addition of status for King County internal departments involved in 2009. Omission of KC Department / agencies who have completed projects, removed to **New 2009 Annex L**; 2004 King County Government Initiatives – Completed

Section 8 – Annexes	
2004	**2009**
Annexes for 2004 **A-J**	**Annexes for 2009; New Annex Index with 4 title changes (B-E) **** Updated content, as indicated **A-J** **K-L (*new for 2009*)**
Annex A	**Annex A – Plan Distribution List**
****Annex B – Individual Agency Plans**	****Annex B – Individual Jurisdiction Plans (new title)** New Form 1.1 Letter of Intent; to join KC RHMP **<u>Phase 1</u>** **KC Annex B** - Moving pertinent sections back into Basic Plan, Sections 1-7 for 2009, (partial list)

	Updated 2009 • KC Govt. department /agency tables (Section 2 and 4) • Assistance (with mention of HHD hazard) • 20/20 Software use • KC Govt. Department / Agency Initiatives • Recent Phase 1 and Phase 2 expected participation • For 2009, from 2004 Plan, KC Annex B, King County Departments / Agencies; Evaluation of 2004 Initiatives Status (See upper right hand corner) **(Phase 2 – Expected Jurisdiction Participation – Section 2 and 4 Tables)**
****Annex C – Agency Participation**	****Annex C – King County Government and Jurisdiction Participation (new title)** New - KC Govt. Chart Historical KC 2004 Planning Process Info (retained in 2009)
****Annex D - Plan Adoption Documentation**	****Annex D – King County Plan Adoption Documentation (new title)**
****Annex E - Public Participation**	****Annex E - Public Involvement Participation (new title)** New KC Govt. Chart
Annex F	**Annex F – Policy and Program Analysis**
Annex G	**Annex G – Critical Facilities (FOUO)** New – KC DNRP Critical Facilities List - Flooding
Annex H	**Annex H - Potential Funding Sources**
Annex I	**Annex I - References and Resources**
Annex J	**Annex J - Glossary**
	New Annexes for 2009
	Annex K - 2004 Plan Maps (removed from Section 3 and Section 5 to Annex K) (Note: Maps are identified as 2003)
	Annex L – 2004 King County Government Initiatives - Completed (removed from 2004 KC Annex B)

Section 2: Plan Development

This Section has substantive additions for 2009.

2009 King County Government and Jurisdiction Participation
(New for 2009)

Planning for the 2009 King County Regional Hazard Mitigation Plan (RHMP) update is occurring in two phases, concurrently. Phase 1 is a King County Plan – Base Plan, and includes a limited number of jurisdictional annexes who were planning partners throughout the update process. Phase 2 will incorporate the majority of all remaining jurisdictions from within the County, as well as new planning partners who were not previously part of the County's plan. King County is comprised of over 154 distinct jurisdictional entities which include cities, fire districts, utility districts, school districts, special purpose districts, and others. Any jurisdiction can request to be incorporated into this Plan in a prescribed way as defined in Section 2, Plan Maintenance and Plan Management, Guidelines for Adding a Jurisdiction to the King County Regional Hazards Mitigation Plan. This process was elected because of the time constraints the County was operating under as a result of the potential flood issues surrounding the Howard Hanson Dam.

The November 12, 2009 Plan publication includes King County Government and a limited number of jurisdictions as Phase 1.

Phase 2 is anticipated to include all remaining jurisdictions who elect to be part of the regional plan, as well as any new jurisdictions who wish to add on to the base plan. Because of the issues involving Howard Hanson Dam as described in detail in Section 1, it is presently unclear how many jurisdictions will create stand-alone plans and not be part of the County's base plan, and how many will continue to be a part of the County's Regional Plan. Tables 2.1-2.4 demonstrated the anticipated involvement as of the date of publication of the Phase 1 Regional HMP.

King County OEM will continue regular outreach to all jurisdictions to ensure maximum participation in the RHMP. Jurisdictions will continue to be able to annex to the RHMP throughout the 5-year planning cycle as described in Section 2, Plan Maintenance and Plan Management.

(Historic King County 2003 / 2004 Planning Process Information has been removed from the body of the Base Plan and moved to Annex C to retain historical data and maintain ease in review of the RHMP.)

2009 Planning Partners and Participating Jurisdictions

In the 2004 Plan, the King County internal departments / agencies were named as demonstrated in the tables 2.1-2.5 below, and were included in the separate Annex B: King County Government Departments. For the 2009 update, the Annex B portion containing the King County internal departments / agencies has been updated and incorporated into the main body of the Plan in this Section 2, and referred to by updated names as shown in Table 2-1.1, below. The updated 2009 information is also used in Section 4, Participating King County Government and Jurisdiction Profiles.

2004 List
King County Facilities Management
King County Department of Transportation
King County Executive Services, Information and Telecommunications Services
Seattle-King County Department of Public Health
King County Department of Development and Environmental Services
King County Department of Natural Resources and Parks
King County Sheriff's Office

Table 2-1.1: *King County Government Departments /Agencies
(new Table in 2009)

	2004	2009
The departments below submitted either a Strategy and/or an Initiative in 2004		Status Updated in 2009
Dept. of Development and Environmental Services (DDES); Fire Marshal's Office	x	No update
Dept. of Natural Resources and Parks (DNRP) Four divisions below:		
Water and Land Resources Division	x	x
Wastewater Treatment Division		x
Solid Waste Division	x	x
Parks Division		x
Department of Transportation (DOT)		
Road Services Division		x
Metro King County Transit	x	x
Facilities Management Division (FMD)	x	x
King County Sheriff's Office (KCSO)	x	x
Office of Information Resources Management (OIRM)	x	x
Public Health – Seattle & King County (PHSKC) (Note: new name since 2004)	x	x

Source: RHMP Participating agencies; 2004 Plan
** King County agency participation is listed above.*
Note: The King County Flood Control District will develop their own All Hazards Mitigation Plan in 2010.
Note: The department names in Table 2-1.1 are shown as they currently exist in 2009.

2009 Phase 2 - Planning

Phase 2 will incorporate and include additional jurisdictions from within the County. Jurisdictions can include cities, fire districts, utility districts, school districts, special purpose districts, and others. Any jurisdiction can request to be incorporated into this Plan in a prescribed way as defined in Section 2, Plan Maintenance and Plan Management, Guidelines for Adding a Jurisdiction to the King County Regional Hazards Mitigation Plan.

Under Phase 2 of this planning process, the Base Plan will be reformatted to better support hazard mitigation efforts on a regional basis. While Phase 1 of this process established the foundation of the regional plan, Phase 2 will focus on reassembling the regional components of the Plan. The jurisdictions listed in tables 2-2 through 2-4 below, as well as other local governments within the planning area who have not been previous planning partners will be invited to join the King County Regional Hazard Mitigation Plan (RHMP) as a regional planning partner.

Key planning steps will be re-engaged to assure all planning partners are adequately addressed and supported by plan content and policy direction. Phase 2 will include, but are not limited to the following components:

- Organize Resources: the first task under Phase 2 will be to organize all eligible local governments within the planning area will be invited to link to the RHMP.
- Revise the Risk Assessment: The risk assessment of the base plan will be comprehensively revised to better support the ranking of risk associated with the hazards of concern for each participating jurisdiction.
- Re-engage the public: A comprehensive outreach strategy will be deployed that will provide the constituents of all planning partners an opportunity to comment on the Plan and its policies.
- Re-assemble the Plan: Once all planning phases of Phase 2 are complete, the regional plan will be reassembled into a format that clearly addresses each planning partner, and clearly illustrates compliance with section 201.644CFR for each planning partner. A key component of this step will be to clearly define a plan maintenance strategy that will assure the plan and its policies remain viable throughout the performance period for the plan.
- Plan Review and adoption: Since the scope of the RHMP base plan will be enhanced under Phase 2, all planning partners linking to the base plan will be required to formally adopt the RHMP as their hazard mitigation plan of record.

Additionally, this reformatted plan will be sent to the State and FEMA for their review and approval.

Planning Partners:

The Tables 2-1 through 2-4 represent the jurisdictions that participated in the 2004 Plan, and have either been current planning partners for the 2009 update, or are anticipated to participate in Phase 2 of the 2009 Plan.

Table 2-1 King County Cities
Phase 2, 2009 information added

	2004	2009 Phase 2
City of Auburn	X	pending
City of Bellevue	X	x
City of Bothell	X	x
City of Burien	X	x
City of Des Moines		X *NEW*
City of Duvall	X	
City of Federal Way	X	x
City of Issaquah	X	x
City of Kirkland	X	
City of Medina	X	x
City of Newcastle		X *NEW*
City of Normandy Park	X	
City of North Bend	X	
City of Pacific		X *NEW*
City of Redmond	X	
City of SeaTac	X	
City of Tukwila		Pending *NEW*
City of Woodinville	X	

Source: RHMP Participating agencies 2004

Table 2-2: Fire Districts

	2004	2009 Phase 2
KCFD #2 -- Burien/Normandy Park	X	
KCFD #11 -- North Highline Fire District	X	
KCFD #20 – Skyway/Bryn Mawr/Lakeridge		X *NEW*
KCFD #36 -- Woodinville Fire and Life Safety	X	

KCFD #39 South King Fire & Rescue *(annexed Federal Way and Des Moines)*	X	x
KCFD #40 – Spring Glen/Cascade/Fairwood	X	
KCFD #43 -- Maple Valley Fire and Life Safety	X	x
KCFD #44 -- Mountain View Fire and Rescue	X	
KCFD #45 – Duvall	X	
Source: RHMP Participating agencies; 2009 WA Fire Service Directory		

Table 2-3: Utility Districts

	2004	2009 Phase 2
Cedar River Water and Sewer District	X	
Coal Creek Utility District – Newcastle	X	
Covington Water District	X	x
Highline Water District		X *NEW*
KC Water District #19 – Vashon Island	X	x
KC Water District #20 – Burien/ Riverton/ McMicken Heights	X	
KC Water District #90 – Renton	X	x
KC Water District #111	X	x
Midway Sewer District, Kent/Des Moines	X	x
Northshore Utility District	X	
Ronald Waste Water District	X	
Sammamish Water and Sewer District		x
Shoreline Water District	X	
Soos Creek Water and Sewer	X	x
Southwest Suburban Sewer District	X	Pending
Val Vue Sewer District	X	
Woodinville Water District	X	
Source: RHMP Participating agencies 2004		

Table 2-4: School Districts

	2004	2009 Phase 2
Federal Way School District		Pending *NEW*
Lake Washington School District	x	
Vashon Island School District	x	
Source: RHMP Participating agencies 2004		

In addition to the jurisdictional planning partners, the following represents King County employees who were Planning Team Partners actively involved in the development of the King County Base Plan, serving either as subject matter experts,

or provided critical information which guided the development of all portions of the 2009 Plan.

Table 2-5: *King County Employees
(new Table in 2009)

Employee	Department
Chris Ricketts	King County Department of Development and Environmental Services
Joe Miles	King County Department of Development and Environmental Services
Paul Reitenbach	King County Department of Development and Environmental Services
Stephanie Warden	King County Department of Development and Environmental Services
Ameer Faquir	King County Department of Executive Services
Caroline Whalen	King County Department of Executive Services
Jim Burt	King County Department of Executive Services
Kelli Williams	King County Department of Executive Services
Marlys Davis	King County Department of Executive Services
Michael Strouse	King County Department of Executive Services
Dennis Higgins	King County Department of Natural Resouces and Parks
Jason Wilkinson	King County Department of Natural Resouces and Parks
Lauren Smith	King County Department of Natural Resouces and Parks
Allen Alston	King County Department of Natural Resources and Parks
Brian Murray	King County Department of Natural Resources and Parks
Larry Kimble	King County Department of Natural Resources and Parks
Mark Isaacson	King County Department of Natural Resources and Parks
Priscilla Kaufman	King County Department of Natural Resources and Parks
Steve Bleifuhs	King County Department of Natural Resources and Parks
Wendy Walkky	King County Department of Natural Resources and Parks
Leo Griffin	King County Department of Transportation
Mike DeCapua	King County Department of Transportation

Mike Wines	King County Department of Transportation
Deirdre Totten	King County Office of Emergency Management
Heather Kelly	King County Office of Emergency Management
Jeff Bowers	King County Office of Emergency Management
Lynne Miller	King County Office of Emergency Management
Rich Tokarzewski	King County Office of Emergency Management
Robin Friedman	King County Office of Emergency Management
Jeremy Grotbo	King County Office of Emergency Management (Americorps / Vista Volunteer)
Tony Calero	King County Office of Emergency Management (Americorps / Vista Volunteer)
John Heath	King County Office of Information Resource Management
John Klein	King County Office of Information Resource Management
Gwen Clemens	King County Office of Strategic Planning and Performance Management
Chandler Felt	King County Office of Strategic Planning and Performance Management
Ray Moser	King County Office of Strategic Planning and Performance Management
Amy Eiden	King County Prosecuting Attorney's Office
Carol Cummings	King County Sheriff's Office
Ali Jaffe-Doty	Public Health – Seattle & King County
Dennis Worsham	Public Health – Seattle & King County
Holly Rohr Tran	Public Health – Seattle & King County
Michael Loehr	Public Health – Seattle & King County

2009 Planning Process

(New for 2009)

A truncated planning schedule was necessitated by back-to-back disasters in January 2009 (flooding, DR - 1817) and March 2009 (snowstorms, DR - 1825) and in addition to the emergence of a significant threat of flooding in the Green River Valley. The Planning Team had to undertake various elements of the planning process concurrently, and the Phase 1 and Phase 2 approach to planning, described above, emerged as a viable alternative for the Plan's completion. Hence, jurisdictions updated their annexes while the Phase 1,

Base Plan (first 8 Sections of the Plan) was undergoing concurrent review and updates.

Commonalities in the plan development process which partner jurisdictions will rely on from the Base Plan are:

1) Goals and objectives;
2) Planning process;
3) Hazard Identification and Vulnerability Analysis (HIVA); (Section 5 & Section 6);
4) Capabilities (Section 6);
5) Mitigation Strategies;
6) Plan Maintenance; and
7) Plan Management.

2009 Planning Team Meeting Participation

The Regional Hazard Mitigation Planning Team for King County, comprised of representatives from all participating jurisdictions shown above, met five times as a group to coordinate this 2009 update of the Plan, one meeting was a conference call. Representatives from King County departments / agencies, partner jurisdictions, and the Office of Emergency Management (OEM), initially convened on May 18, 2009. Planning Team members met again on June 15, 2009 and July 13, 2009 to discuss regional goals and strategies for mitigation and report on progress in the preparation of jurisdictional annexes. A conference call was held on September 17, 2009 with participants and the State of Washington Emergency Management Division Mitigation Strategist to discuss the Plan guidelines and crosswalk requirements and provide feedback in the draft plans submitted for review. In addition, a FEMA and State EMD Plan review and technical assistance session was held at the KC OEM RCECC on September 29, 2009, to provide one-on-one guidance to participant jurisdictions. (See List and sign-in sheets from these meetings in Annex C).

In addition, the County's Planning Team met several times weekly commencing October through plan adoption, either in person or via telephone conferences to coordinate work, conduct risk assessment and complete Phase 1 of the Regional Plan.

2009 Planning Team Goals and Objectives

During the May 2009 kickoff meeting, partners elected to retain the regional goals and objectives expressed in the original 2004 Plan, shown in Section 1. These goals and objectives guided the updates of mitigation strategies and initiatives in jurisdictional annexes to the Base Plan. The Planning Team also

maintained the Base Plan structure of the RHMP, except as indicated otherwise, such as with the elimination of the King County Government Annex B portion of the plan. This document is comprised of a Base Plan (Sections 1 – 7, and Section 8, Annexes), including a statement of the regional goals and a generalized, central Hazard Identification and Vulnerability Analysis (HIVA), located in Section 5 and Section 6. The HIVA recognizes that there is a great deal of similarity across jurisdictions in regards to vulnerability and risk. More specific risk and vulnerability profiles are covered in each jurisdictional annex, where variations in geography, climate, hazards, and critical infrastructure may necessitate specialized mitigation strategies and initiatives to meet local jurisdictional needs.

While jurisdictions were updating their annexes, King County OEM took the lead on updating the Base Plan in 2009. This division of workload is consistent with the approach taken to develop the original Plan that began planning in 2003 with a FEMA approval and King County Council adoption in 2004. For this 2009 update, the Planning Team agreed that OEM should focus on updating historical information in the Plan, including general countywide changes to risk factors, specifically flooding, and the occurrences of major incidents and federally declared disasters in the history of events section of each hazard.

As partner jurisdictions completed drafts of their annexes, OEM staff reviewed the documents and provided comments and suggestions for improvement and provided information from the Base Plan while it was under development. Most annexes were completed in draft format by late August and provided to Washington State Emergency Management Division (EMD) Mitigation Strategist for advanced review. EMD provided comments back to the Planning Team in mid-September, held an hour conference call on September 17, 2009, and provided additional technical assistance to each partner jurisdiction during an all-day session on September 29, 2009 at the RC ECC. FEMA staff also participated in this effort to ensure consistency with federal regulations and mitigation planning guidance.

Additional Planning Process Procedures:

During the planning process, all planning partners, both County level and local jurisdictions, were required to conduct a review of not only the 2004 County's Base Plan, but also their own mitigation plan. During this review process, they were instructed to focus on several elements and gather updated information necessary to complete the plan. This review and update also included the following:

- Ensure the governing body of this jurisdiction adopts the Regional Mitigation Plan by local ordinance.

- Contribute available geographic data necessary in the development of the Hazard Identification and Vulnerability Analysis including, but not limited to:
    - land use data
    - development patterns
    - population figures
    - infrastructure systems
    - hazard data and history of incidents
- Develop a Hazard Analysis specific to their jurisdiction, utilizing the best available science, current studies, reports, newspaper articles and oral interviews
- Develop Local Mitigation Strategies (LMS) based on both the King County Hazard Identification and Vulnerability Analysis and their own analysis. The LMS include:
    - a set of mitigation goals specific to the jurisdiction aimed at reducing long term vulnerability to hazards
    - a list of mitigation projects and actions
    - a description of how projects and actions were prioritized and implemented
- Involvement in NIFP compliance, repetitive and severe repetitive loss information, where appropriate
- Develop a capabilities assessment
- Incorporate recommendations, policies, and strategies included in the LMS into other local planning tools and methods such as land use plans, Capital Improvements Plans, site review processes, zoning ordinances, and others.
- Develop an internal schedule (or adopt the County's schedule) for plan maintenance and updating of the local jurisdiction's plan maintenance, to include LMS and geographic data contained within the KC Regional Hazard Mitigation Plan guidelines, Section 2, Plan Maintenance and Plan Management section
- Continue Public Involvement through various methods, e.g., posting of Plan on website; providing hard copies for review at public locations; during on-going open public meetings; health and safety fairs, etc.

  During the planning meetings, the planning partners were instructed to review the entire Plan with their individual planning teams to determine where changes were needed respective to their jurisdiction. Jurisdictional annexes were completed in draft form, and then reviewed by State and FEMA representatives to advise of deficiencies. Thereafter, the jurisdictions completed their annexes and submitted to the State and FEMA for final review.

  NOTE: A select few jurisdictions were able to complete their plans in time for Phase 1, which will be provided to FEMA for review once the Base Plan has been approved and formally adopted, but prior to the completion of Phase 2. These jurisdictions developed individual mitigation strategies, some of which

are new and some of which are carry-overs from the previous 2004 edition. Criteria for priority ranking are defined within each individual plan, and do not necessarily follow the concept utilized in the Base Plan. These jurisdictions will continue to be part of the planning team for Phase 2, and will follow the same criteria established for rating and ranking of hazards and strategies/initiatives during the Phase 2 development period.

King County Government Related Public Involvement

For the 2009 Plan update, in addition to the Regional Hazard Mitigation Planning Team meetings as described above, the public has been afforded numerous opportunities to comment on the 2009 DRAFT King County Regional Hazard Mitigation Plan. The Plan has remained posted online at the current link: (http://www.kingcounty.gov/mitplan) since its initial drafting in 2003 / 2004 with a link to OEM staff contact emails. The public has also been notified through other formal means to view and provide input on the Plan online since 2004.

For the 2009 Plan update, King County OEM published public notices in the King County Journal newspaper on December 1, 2005, and in four community newspapers on August 5, 2009, and again on October 28, 2009, including the *Kent Reporter*, *Bothell/Kenmore Reporters*, and the *Snoqualmie Valley Record* to announce the availability of the 2009 Plan online for review and input by a posted Questionnaire feedback document. *The Seattle Times* newspaper announcement was also included in October 2009. Copies of these notices are attached in Annex E.

Other vehicles were also used for Public Involvement, such as a Public Announcement made on the evening of September 29, 2009 at the King County Library System (KCLS) Board Meeting. Also, copies of the DRAFT RHMP and selected Annexes were placed in 5 KCLS Libraries, Government Section, to include Bellevue, Bothell, Redmond, Auburn, and KCLS online. A Questionnaire was also posted on the website and survey results will be included by report in Annex E of this Plan documentation. Those comments will be reviewed and, if appropriate, will be included within the Phase 2 portion of the Plan development.

A list is provided for all the Public meetings held in Annex E. Due to the Howard Hanson Dam and Green River Flood Planning efforts, which were occurring simultaneously with the Hazard Mitigation Planning initiative, all public meetings held by OEM for the purpose of collecting public input for the Regional Hazard Mitigation were restricted to gathering comments related to the remaining hazards, and not Howard Hanson Dam and Green River Flooding.

In addition to the public meetings held for the Regional Hazard Mitigation Plan, Emergency Management staff attended in excess of 12 meetings related to flooding as the result of the Howard Hanson Dam and Green River potential for flooding for the next possible 3-5 years, or until the repairs necessitated are ascertained by the U. S. Army Corp of Engineers (USACE).

In addition to the above, Annex E, King County Public Involvement Table 2009, Phase 1, provides a synopsis of all King County Government related public involvement methods which occurred during the five years since Plan adoption.

Any comments received from the public requests for input will be documented and become part of Annex E summary of public input documentation for this update as well as for future annual and 5-year updates.

2009 Planning Team External Jurisdiction Public Involvement

The following demonstrates additional public involvement for the jurisdictions who have been involved in the planning process for this Plan update: Each jurisdiction's annex will also contain additional information concerning their public involvement.

City of Newcastle – Public Hearing, May 5, 2009.

City of Pacific – City Council Meeting, May 26, 2009.

Water District #19 – Board of Commissioners Meeting, June 9, 2009,

Highline Water District – Board of Commissioners Meetings, June 17 and August 19, 2009.

Maple Valley Fire and Life Safety – Board of Fire Commissioners Meeting, June 18, 2009.

Soos Creek Water and Sewer District – Board Of Commissioners Meeting, July 1, 2009.

Sammamish Plateau Water and Sewer District – Board of Commissioners Meeting, July 20, 2009.

City of Federal Way – City Council Meetings, July 21, September 15, 2009.

City of Bothell – City Council Meeting and Public Hearing, July 14 and July 21, 2009.

Water District #111 – Board of Commissioners Meeting, July 23, 2009.

City of Bellevue – City Council Meeting, August 3, 2009.

City of Des Moines – Public Comment Meeting, August 6, 2009.

City of Issaquah – Public Hearing, August 13, 2009.

Covington Water District – Board of Commissioners Meeting, September 16, 2009.

Plan Maintenance and Plan Management (New for 2009)

This plan maintenance and plan management process is consistent for all jurisdictions within King County who are part of the Regional Plan. The 2009 King County Regional Hazard Mitigation Plan will be managed and maintained by a designated King County Office of Emergency Management (OEM) Program Management staff person(s) who will monitor, evaluate and coordinate the update of the RHMP with "Planning Team" participants.

The King County Office of Emergency Management Director/ Program Manager is the designated keeper of the Regional Hazard Mitigation Plan (RHMP). The King County Office of Emergency Management will be responsible for administering changes to the Base Plan, facilitating the planning process for new partners, and forwarding annual revisions to Washington State Emergency Management for review.

Ongoing public involvement will continue to be part of this Plan. The plan will remain on the County's website, requesting input on an on-going basis. At the end of the 5-year plan cycle, State EMD and FEMA must again approve of the Plan "pending Plan adoption" by the King County Council. Plan maintenance will be the same for the Base Plan and for all jurisdictional annexes, unless the respective annex states otherwise.

Each update cycle will also include outreach to jurisdictions who may wish to join the Regional Plan, and to other partners such as businesses, academia, non-profits, or other interested parties who wish to be involved in the planning process.

All King County Departments or agencies, and any other external jurisdictions, special purpose districts, fire and utility districts, school district, or agencies intending to be planning partners in the King County Regional Hazard Mitigation Plan during the next five year planning cycle will maintain a designated point of contact, or liaison, to serve as Mitigation Lead

representative. These designated representative will become a member of the "Planning Team". Representatives will participate in and provide future Plan updates at Regional Hazard Mitigation Plan review intervals, will track and/or administer projects, or provide information on any future development ideas or proposals for Plan review and maintenance for the next five year Plan planning cycle. A new participant can join the County's Regional Plan at any time during the planning cycle in accordance with the guidelines stated herein. Planning meetings will be convened as stated in the table below.

The annual update meetings stipulated in the 2005 RHMP, did not occur, but will be re-instituted for the current plan cycle to facilitate the flow of information within the Planning Team. The Planning Team and potential new participants will convene commencing in the summer of 2010, dates dependent upon the Phase 2 planning cycle, but to occur on an annual basis to review, discuss and record updated information. The updates will be published on the county website each year. Each participant of the 2009 King County Regional Hazard Mitigation Plan will meet to review, coordinate and collaborate with each other on Plan updates and/or changes. Any changes in liaison will be reported to KC OEM as they occur. Any significant sudden hazard or potential impact will be liaised in the appropriate, expected way.

Changes or additions by all RHMP participant organizations will be documented and incorporated into the King County Regional Hazard Mitigation Plan as appropriate. Additional plan information in the following areas will be captured for incorporation in the next plan update:

- Disaster proclamation, disaster declaration, or hazard incident(s) and detailed documented impacts; additions to history of incidents section
- Changes to the functions or mission of the department, agency, or jurisdiction that impact hazard mitigation administration and any components of the Plan
- Changes, additions, or deletions in the types of project or services provided or changes in ordinances, codes, etc.
- Updates to hazard mitigation projects such as status, completion, or supporting functions and/or other programs
- Provide footnotes or endnotes updates and other documented sources
- Ongoing public involvement as described below

The table below identifies responsibilities for King County OEM Program Manager staff and generalized Plan update and Plan maintenance responsibilities for all participants.

King County Regional Hazard Mitigation Plan (RHMP) Responsibilities	Department, Agency, and / or Jurisdiction Participant RHMP Responsibilities	Meeting Frequency
Lead review process of **RHMP** and oversees Plan updates or changes; and next five year cycle Plan updates and/or timelines	KC OEM Program Manager	Meeting Convened by KC OEM. Annually starting Summer 2010; more often during the last year of the 5 year planning cycle/ or as needed
KC OEM will develop and lead internal and external **RHMP** communications related to any KC OEM **RHMP** Plan changes or known State or Federal guideline changes; meeting announcements, etc., other	KC OEM Program Manager	Ongoing
After each hazard, the Regional Hazard Mitigation Planning Team partners will convene to determine how the hazard has impacted the jurisdictions involved and to review the RHMP Plan strategies.	KC OEM Program Manager *and* all participants; continuing and new	Incident determined
Annually, the Regional Hazard Mitigation Planning Team partners will convene to review the RHMP Plan strategies.	KC OEM Program Manager *and* all participants; continuing and new	Incident determined
Participate in **KC OEM RHMP** Plan review process	All participants; continuing and new	Ongoing
Review individual department, agency, jurisdiction, fire district, special purpose district, or school district Plan, etc; **AND** incorporate components and elements and changes into Plan to reflect current circumstances	All participants; continuing and new	Annually

Provide a copy of the changes to KC OEM once a year by the annual meeting; (or if significant, such as a Liaison change, provide to KC OEM, as it occurs).	All participants; continuing and new	Annually
Public Involvement	All participants; continuing and new	Ongoing

Future Public Involvement

Ongoing Public involvement as part of the King County Regional Hazard Mitigation Plan planning process will be undertaken via five vehicles, but not limited to the following:

1. **Continued public involvement** will be through published annual announcements in selected newspapers soliciting the public's RHMP Plan review and public comments or input and will be posted on the County website. The public is invited to attend to provide oral or written feedback to the KC OEM designated Mitigation staff person, or to a designated King County email address.

2. **Notification of any future public meetings** on the update of the KC Regional Hazard Mitigation Plan will be advertised in local newspaper(s). The KC OEM designated Mitigation staff person will be responsible for providing prior notification of any King County Government meetings to the newspaper(s) with times and dates.

3. **Hard copy of Plan**. A hard copy of the DRAFT 2009 RHMP Plan, has been made available to the public on October 22, 2009 at five geographically dispersed King County Public Libraries, identified as Bellevue, Bothell, Redmond, Auburn, and KCLS online Libraries. The Plan is a Reference copy only found in the Library Government Section and cannot be taken off the premises. When Plan updates are available, the Plan "guts" will be provided to KCLS for redistribution into the hard copy, 3 ring binders A portion of this Plan, Annex G, is exempt from disclosure under RCW Section 42.17.310(1)(ww) of the Public Disclosure Act, RCW 42.17 250 et seq.

4. **A Web Version Copy of this Plan Document** The DRAFT 2009 RHMP also will be available for the public on the KC OEM's website, 10/02/09 version. A portion of this Plan, Annex G, is exempt from disclosure under

RCW Section 42.17.310(1)(ww) of the Public Disclosure Act, RCW 42.17 250 et seq.

5. **Ongoing feedback** will be requested from the public by the King County Office of Emergency Management, and participating jurisdictions. The public will be encouraged to provide feedback in a statement called Request for Input, placed where the Plan is posted on the City website, that includes contact information for KC OEM's designated staff Mitigation person(s).

Guidelines for Adding a Jurisdiction to the King County Hazard Mitigation Plan (**new for 2009).**

These guidelines were developed in cooperation with the Washington State Military Department, Emergency Management Division, Mitigation Section. This guideline has been incorporated into the Plan as part of the 2009 King County Plan update.

1. The jurisdiction wishing to join the Plan contacts the King County Office of Emergency Management with a request to become a participant of the Plan by filling out the RHMP Letter of Intent document in **Annex B, 1.1. Letter of Intent Signatory Form RHMP 09.**

2. The King County Office of Emergency Management provides the jurisdiction with a copy of the approved plan, planning requirements and any other pertinent data.

3. The jurisdiction reviews the Plan and develops the portions of the Plan that are specific to the jurisdiction as directed by King County Office of Emergency Management staff. This portion of the Plan must meet the requirements of the current FEMA Local Multi-Hazard Mitigation Planning Guidance including a public involvement process and documentation.

4. The new jurisdiction submits its portions of the Plan to the King County Office of Emergency Management and the new jurisdiction Plan is forwarded to the State Hazard Mitigation Strategist for review and compliance with current FEMA Local Multi-Hazard Mitigation Planning Guidance and amendments.

5. The State Hazard Mitigation Strategist reviews the new jurisdiction plan for compliance with current local hazard mitigation planning guidance in conjunction with the King County Regional Hazard Mitigation Plan**.** If the new jurisdiction Plan does not meet the required standard, the State Hazard Mitigation Strategist will work with the jurisdiction to resolve issues until it does.

6. The State Hazard Mitigation Strategist forwards the new jurisdiction plan to FEMA Region X for review and approval.

7. Upon approval from FEMA Region X and adoption by the governing authority, the new jurisdiction is considered part of the King County Regional Hazard Mitigation Plan and will comply with the update schedule of the Plan and the King County Regional Hazard Mitigation Plan.

2009 Adoption of Plan and Documentation

On November 12, 2009 the King County Administrative Team transmitted copies of the entire KC RHMP to the King County Council, which clears the way for King County to formally adopt the Plan. The King County Administrative Team also transmitted copies of the entire KC RHMP on November 12, 2009 to State EMD for review and submission to FEMA for concurrent review and approval. This 2009 King County Regional Hazard Mitigation Plan (RHMP) document will be adopted by the King County Council on November 23, 2009, by Ordinance # XX (See **Annex D**, Items XXX). The King County Council adoption dates and all documentation for the KC RHMP will be found in Annex D. State EMD and FEMA conditionally approved the Plan on November XX. A copy of the approval confirmation documentation of the Plan will be provided in **Annex D** after Plan approval is granted by State EMD and FEMA. As part of Phase 2, each specific partner jurisdiction adoption documentation will be found in each jurisdictional Plan located in **Annex B.**

2009 Incorporation of Plan Components into other Plans

Appropriate RHMP Plan elements and components will be referenced into the King County Comprehensive Plan appropriate sections, added into the next iteration of the Comprehensive Plan, the King County Countrywide Planning Policies (CPPS), Capital Improvement Plans, land use regulatory authority and any other appropriate King County Plan revisions.

Implementation of the Regional Hazard Mitigation Plan

The same implementation process was utilized in the 2009 Plan updates as with the 2004 Plan, as follows:

All signatory agencies to the King County Regional Hazard Mitigation Plan will implement their designated strategies through the following funding mechanisms unless otherwise designated in their individual annexes:

- Capital Improvement Program Budgets
- Operations Budgets

- Grant Proposals where available
- Expansion of Public Education program scope
- Proposals for bond levies where applicable

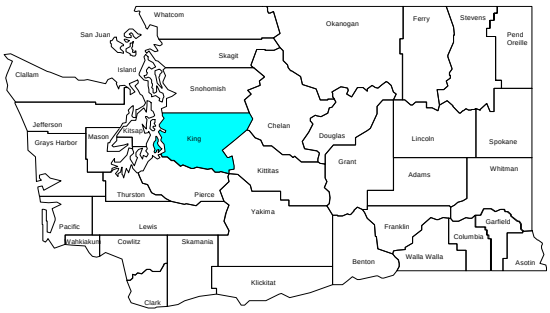
Most signatory agencies operate on annual budget cycles. Some large projects may require implementation over multiple budget cycles (pipeline replacement is an example). Progress and changes were addressed in the regular revisions of this Plan by all signatory agencies as noted under Plan Administration and Maintenance below.

Signatory jurisdictions, departments and agencies as part of the 2009 RHMP are responsible for the maintenance of their individual strategies, revision of incomplete mitigation initiative efforts, and submission of those changes to the King County Office of Emergency Management for review by the Regional Hazard Mitigation Plan Planning Team. RHMP amendments, revisions and additions are to be provided to the Regional Hazard Mitigation Plan Planning Team, annually, for review. Changes to RHMP Sections 1 through Section 8, Annexes, will be affirmed by the impacted King County internal government department managers.

Section 3: Regional Profile

*Information in reference to the **2000 U.S. Census Bureau,** or other publications previous to 2008-09, is the latest and most up to date information provided by the Local/State and Federal Governments, or individual private enterprises.*

Geography[1,2,3]



Located on Puget Sound in Washington State and covering 2,134 square miles, King County is nearly twice as large as the average County in the United States.

King County is geographically diverse, extending from Puget Sound in the west to 8,000-foot Mount Daniel at the Cascade crest to the east. Except for the northern boundary shared with Snohomish County, each of the County's borders reflects unique geographic contours. The eastern boundary closely follows the Pacific Crest National Scenic Trail, the crest of the Cascade Range. The White River delineates the County's southern boundary, while the western part of the County faces Puget Sound.

King County contains a wide variety of landforms including saltwater, coastline, river floodplains, plateaus, slopes and mountains, punctuated with lakes and salmon streams. Lake Washington, covering 35 square miles, and Lake Sammamish with eight square miles are the two largest bodies of fresh water. Vashon and Maury Islands in Puget Sound and Mercer Island in Lake Washington provide different island environments. Major rivers include the Snoqualmie, White, Green and Cedar Rivers, which all flow out of the Cascade Mountains through the County.

The western part of the County, where the vast majority of the population has settled, is an alluvial plain near sea level. In the east are the Cascade Mountains. The County only has three vehicular exits to the east: Stevens Pass, Stampede Pass and Snoqualmie Pass. A substantial portion of the eastern King County is in the Mount Baker-Snoqualmie National Forest.

Climate[4,5]

King County's climate is mild and moderately moist; winters are comparatively warm with mild, temperate summers. The average summer temperature is 64 degrees, and temperatures climb over 90 degrees only a few days per year. During the winter, temperatures rarely drop below freezing (only 15 days per year). The area's wet season extends from October through April, during which 82 percent of annual rainfall occurs (about 35 inches a year). Heavy rainfall is rather rare; instead the area experiences a stable level of light rain throughout the winter. Snow accumulations below the 2,000-foot level are uncommon and rarely remain two days after such storms. The average monthly snowfall is .98 inches over a five-month period in the winter, with the heaviest accumulations occurring in December and January.

Population and Demographics[1,3,6,7]

With a population of 1,909,300 and 29 percent of the state's population, King County is the largest county in Washington State, and the 14th largest in the nation. It is also the most densely populated area in the state, with an average of 895 people per square mile. As a populous large county with a major central city, King County comprises the majority of the "Seattle-Bellevue-Everett-Tacoma" metropolitan area.

Population Distribution[1,6,7]

Although the total land area of King County of 2,134 square miles, the majority of the population resides on only 400 square miles of incorporated land or 19 percent of the land base.

About 82 percent of King County residents, 1,566,120 people, live in the county's 39 incorporated cities and towns; about 32 percent live in Seattle alone, the largest City in the Pacific Northwest. The next three largest cities are Bellevue, Federal Way and Kent. During the 1990s there was a strong increase in incorporations and annexations. Among the new cities formed in the 1990s are Burien, Covington, Kenmore, Maple Valley, Newcastle, Sammamish, Shoreline, and Woodinville.

Unincorporated King County, the territory outside any city, is home to about 343,180 people or 18 percent of the County's population on 81 percent of its land area. Most of this population resides on the Seattle-sized portion within the Urban Growth Area designated by Growth Management. Unincorporated areas of King County range from urban communities such as White Center, Kingsgate

and Fairwood to small rural communities, farmland, commercial forest, national forest and wilderness area with almost no residents.

More than 92 percent of the population in the County lives in densely settled urbanized areas, with the remaining living in rural and resource areas. **See Map 3-1: Population Density**.

Population by Age and Sex[6]

King County has an aging population with a median age near 38. People ages 18-64 account for the majority of the population, about 62 percent. Young people age 18 and under account for 28 percent of the population. Approximately one in ten people living in King County is older than 65.

Table 3-1: Population by Age

Age Group	Population	%
0-4	118,445	6.3%
5-17	286,110	15.3%
18-64	1,267,922	67.6%
65+	203,042	10.8%
Total	1,875,519	100%

Source: U.S. Census Bureau – 2008 American Community Survey Estimates

The median age for both male and female are very close, age 36.1 for male and 37.91 for female. The number of males and females are proportionally the same, until age of 65 and older where the percentage of females increases significantly over that of males.

Table 3-2: Population by Sex

Age Group	Male Population	%	Female Population	%
0-19	222,752	25.8%	211,984	24.3%
20-54	496,004	57.4%	482,995	55.4%
55-64	70,432	8.1%	71,095	8.1%
65-84	67,962	7.9%	89,270	10.2%
85+	7,307	.8%	17,233	2.0%
Total-2000	**864,457**	**100%**	**872,577**	**100%**
Total-2009	**956,559**	**50.1%**	**952,741**	**49.9%**

Source: U.S. Census Bureau – 2008 Census
U.S. Census Bureau 2009 estimate of **total population*

Households[1]

As of 2006, King County is estimated to have about 752,000 households, an increase of 42,000 since the 2000 Census. The average household size is 2.38, and while household size in some Eastside communities continue to decline, it remains stable in Seattle and is actually increasing in some South County communities. The majority of households, about 707,000 (94%) are located within an urban area while the remaining 45,000 (6%) of households are located in rural areas.

The County has more single-person households than family households consisting of a married couple with children. The number of married couples without children exceeds the number of married couples with children. Single parent households represent a smaller percentage of the population in King County than nationally – and smaller in Seattle than in the suburbs.

Table 3-3: Household Types

Household Types	Number of Households	%
Married with children	156,800	20.9%
Married, no children	189,700	25.2%
Single Parents, other family	95,400	12.7%
Single-person households Other	245,900 64,100	32.7% 8.5%
Total	**751,900**	**100%**

AGR from 2008

Cultural Diversity[1,6]

King County exhibits growing diversity; its racial and ethnic characteristics shifting significantly in the last ten years. Over 30 percent of the County's population is now comprised of people of color or different ethnic groups. The County is more ethnically diverse than the state as a whole.

According to the 2000 Census, ethnic diversity increased from 16.7 to 27 percent during the preceding decade. As of 2008, the Hispanic or Latino population grew to 144,000 persons making up 7.7 percent of the population. The Asian population has increased to 251,000 persons, accounting for 13.4 percent of the population. The African-American population has been growing less rapidly, about 23 percent over the last ten years, and the Native American population has remained about the same. The Non-Hispanic White population is the slowest growing racial group.

Table 3-4: Cultural Diversity		
Ethnic Category	**Population**	**%**
Non-Hispanic White	1,288,482	68.7%
Asian	251,320	13.4%
Hispanic	144,415	7.7%
Black or African American	116,282	6.2%
Pacific Islander	11,253	0.6%
Native American	18,755	1.0%
Two or more races	45,012	2.4%
Total	**1,875,519***	**100%**
*Source: 2008 Census Bureau estimate**		

While Seattle is quite diverse, the dispersion of persons of color outside Seattle is the more profound trend. Bellevue has the highest percentage of Asian population. South King County is experiencing the most dramatic increase in diversity, with minority populations doubling and tripling in several communities. Tukwila has the largest percentage of minorities, 46 percent. Burien, Sea Tac and Federal Way have large Pacific Island communities as well as black, Latino and Asian populations. Countywide, the foreign-born population has nearly doubled to 268,000 people or 15 percent of the population. Immigrants to King County have come from all over the world, with Mexico, China, Vietnam, and the Philippines sending the most people in the last ten years. King County also has 7,200 residents from the Ukraine and 5,500 from Russia – both significant increases in the last decade.

Approximately 93,000 persons over the age of five (5.4 percent of the population) are non-Native English speakers. Almost half of this linguistically isolated population speaks Asian or Pacific Island languages, including Chinese, Vietnamese, Tagalog and Korean. The diversity of languages has also increased greatly, especially Russian and Spanish.

Nearly one in five King County residents does not speak English as their primary language at home, and about eight percent speak English less fluently.

People with Disabilities[6]

About 16.1 percent of the King County population over the age of five has a disability. The breakdown between males and females is relatively close, with males experiencing a slightly higher disability rate. People over the age of 65 account for 10.8 percent of the entire population, yet this age group represents the largest percentage of people with disabilities, almost 40 percent. About 15 percent of working-age adults have a disability that does not require them to be institutionalized, and about two in three are employed.

Table 3-5: Non-Institutionalized Disabled Population (people age 5 years and over)			
Age	**Total Population**	**Population with a Disability**	**%**
5-15	242,496	12,689	5.0%
16-64	1,199,800	177,507	14.8%
Over 65	175,083	69,647	39.8%
Total	**1,617,379***	**259,843**	**16.1%**
Source: U.S. Census Bureau – 2000 Census (Latest data available by State and Federal government agencies in October of 2009).			

Specific types and breakdowns of disabilities can be difficult to ascertain from Census reports since data is based on self-identification. Participants may not perceive and identify certain impairments or physical/mental challenges as a "disability." The statistics in the table below reflect general disability categories and reflect the possibility that more than one type of disability may apply to a single individual.

Table 3-6: Disability by Type (people 5 years and over)		
Type	**Population**	**%**
Sensory	52,388	3.2%
Physical	105,173	6.5%
Mental	72,457	4.5%
Self-Care	33,488	2.1%
Source: U.S. Census Bureau – 2000 Census (Latest data available by State and Federal government agencies in October of 2009).		

Population Growth and Future Trends[1,3,6,7]

King County has been growing less rapidly than other parts of the state. The County is a large and mature county that saw rapid growth during earlier periods. Since 2000, King County's population has grown by 10 percent, a modest rate compared to other areas and nearby Puget Sound counties. However, given the large population already here, the growth numbers are significant. The increase in population since 2000 – 172,000 people – is equivalent to the total current population of the cities of Bellevue and Auburn combined. The majority of King County's growth is due to natural increase – our own children. Just over one-third of our growth is due to people moving into the County – primarily as immigration from overseas.

South King County has experienced the biggest share of the County's growth, more than half, and the south remains the largest of three sub-areas with more than 650,000 residents. Rural areas of the County have grown at relatively slow rates.

Net population migration is a major contributor to population change, and typically varies as a result of changing economic conditions. King County is forecasted to grow by an additional 237,000 persons, twelve percent, to just over 2.1 million by 2020. The bulk of this growth is expected to occur within designated Urban Growth Areas as identified in the Countywide Planning Policies (CPPs).

Housing[1,3,6]

The vast majority of the King County population, 98 percent, lives in single-family, multi-family and other types of residential housing. About two percent live in group quarters.

There are approximately 812,000 housing units in King County as of the year 2008, an increase of more than 61,000 units from 2000. About 60 percent of the housing stock consists of single-family housing, including detached houses and attached town-homes. The number of multifamily units, apartments and condominiums is 302,000, or 38% of the housing stock. Home ownership accounts for 61.9 percent. Fully 465,000 households in the County own their own home. The median value of single family home was $394,000 in 2007. Average rents rose to $875.

Growth and Household Size[1]

The number of housing units in King County is growing as fast as the population. The increase in housing since 1990 is almost evenly divided between single family including mobile homes and multi-family. Household size has stabilized after declining in the 1970s and 1980s and slight declines are anticipated in coming years, to an estimated 2.30 persons by 2020.

Table 3-7: Housing Development

Single-Family	Multi-Family	Mobile Homes	Other
59.1%	38.4%	2.4%	0.1%

Source: 2008 King County Annual Growth Report

Age of Construction[1]

The age of King County's housing stock generally mirrors the state average, but is slightly older with a greater percentage of units built before 1960. About two-thirds of all homes were built prior to 1980.

TABLE 3-8: HOUSING – YEAR BUILT			
	Pre-1939 – 1959	**1960 – 1979**	**1980 – 2000**
King	33.5%	32.5%	33.9%
Washington State	*29.4%*	*32.7%*	*37.9%*
Source: U.S. Census Bureau, Profile of Housing Characteristics 2000 (Latest data available by State and Federal government agencies in October of 2009).			

Group Housing

Group housing consists of school dormitories, nursing homes, military quarters, and institutional-type facilities. In 2000, there were 37,619 people living in a group living arrangement.

Table 3-9: Group Housing Types		
Type of Quarters	**Group Housing Population**	**% Group Housing Population**
Correctional Facilities	4,402	11.7
Nursing Homes	6,849	18.2
Hospitals/wards, hospices and schools for chronically ill and disabled	714	1.9
Juvenile Institutions	560	1.5
College Dormitories	11,136	29.6
Military Quarters	232	.6
Group Homes/Quarters	5,570	14.8
Crews-Maritime Vessels	310	.8
Other	7,846	20.9
Total	**37,619**	**100.0%**
Source: U.S. Census Bureau – 2000 Group Quarters Population by Group Quarters Type (Latest data available by State and Federal government agencies in October of 2009).		

According to Washington State Department of Social and Health Services, there are currently 1,418 licensed family homes in King County with a capacity of 12,610 people. This equals 20 percent of the state's total. Based on 2002 data, vacancy rates are in the 13-15 percent range.

Homelessness[8]

City of Seattle Human Services Department estimates there are 6,000 homeless people in Seattle and King County on any given night. Of the 6,000 it is estimated that 1,000 are not sheltered. The number of estimated homeless youth (ages 12-24) range from up to 1,000 in Seattle and up to 2,000 or more in King County. King County and Seattle have an extensive network of emergency shelter facilities with total year-round capacity of over 2,700 slots. Additional emergency shelter is made available as a response to winter weather, October through March. Homeless individuals and families who are not housed in shelter facilities typically utilize benches, parking garages, vehicles, areas under roads and bridges, doorways, parks, greenbelts, bus stops, alleys and other locations.

Geopolitical Jurisdiction[1,7,9-14,18-22]

Governmentally, King County is divided into 40 jurisdictions including County and 39 cities. In addition to county government and cities, there are other public agencies and taxing districts that contribute the overall governmental infrastructure. They include the Port of Seattle, Native American Tribes, school districts, fire protection districts, public hospital districts, water districts, sewer districts, flood control zone districts, drainage districts, parks and recreation districts, and other miscellaneous districts. This section identifies all public agencies defined as a “taxing authority.”

King County Government[10,11]

King County operates under a Home Rule Charter adopted by a vote of the citizens of King County in 1968 and is organized under the Council-Executive form of county government. The Metropolitan King County Council is the policy-making legislative body of the County. The Council’s nine members are elected by district and serve on a full-time basis. The County Council sets tax levies, makes appropriations, and adopts and approves the annual operating and capital budgets for the County. The County Executive serves as the chief executive officer for the County. Other elected County officials include the Prosecuting Attorney, Sheriff, Elections Director, Judges and Assessor. Every eligible County resident, including those in cities, has an opportunity to vote for County elected officials.

King County provides regional services to all residents of the County, including people who live in cities. These include public transportation, courts and related legal services, property tax appraisals and collections, criminal detention, rehabilitative services, public health care, records and elections, emergency management, water quality, flood control, sewage treatment and disposal,

regional parks and facilities, and the King County International Airport (Boeing Field). In unincorporated communities, the County provides additional local services such as building and land use development, fire code enforcement, police protection, road construction and maintenance, fire investigation, local parks and animal control. In addition, the County has contracts with some cities to provide local services to incorporated areas of the County. Other local services in unincorporated communities are provided by fire, utility, library and hospital districts which operate independently of County government.

The majority of King County's funding is derived from taxes and charges for services. Other revenues include licenses and permits, intergovernmental revenue, federal grants (direct and indirect), federal shared revenues, state grants, state shared revenues, state entitlements, grants from local units, intergovernmental payment, fines and forfeits and miscellaneous revenue[11]. See **Map 3-2: Incorporated Cities & Towns.**

Cities and Towns [1,7,9]

There are 39 cities and towns in King County, the largest number of any county within Washington State. The largest city is Seattle with a population of 602,000 people. The next largest cities include Bellevue with 120,600 people, followed by Federal Way, Kent, Renton, all with populations over 50,000. In contrast, some of the smallest cities or towns like Skykomish, Beaux Arts and Hunts Point have populations less than 500. The Cities of Auburn and Algona are partially located in Pierce County to the south and a portion of Bothell is located in Snohomish County to the north. Cities and towns located in King County are identified on **Table 3-10.**

Cities and towns are governed either by a council/mayor or a council/city manager form of government.

Municipal government generally provides the same types of local services as county government. Depending on the size and needs of the jurisdiction, such services typically include: fire, police, building and land use development, public works (roads, transportation, and utilities), human services, parks and recreation, economic development, waste management, and municipal court services. Some cities and towns may contract with other agencies, such as fire districts or the King County Sheriff's Office, for services.

The majority of funding for municipalities comes from property and other taxes including sales, business and occupation, motor fuel, admission, leasehold excise, utility, gambling and lodging taxes. Additional funding is provided from special licensing fees, permit fees, grants, state-shared per capita distributions, fines and penalties, grants, EMS levies, franchise fees, charges for service, mitigation fees (fire, parks, transportation), parks fees, and investment interest.

See **Map 3.2: Unincorporated King County, Cities and Towns.**

Table 3-10: King County Cities

City	2000 Population	2009 Population	2008 Land Area (sq. miles)	2008 Assessed Value (in thousands)
Algona	2,460	2,760	1.31	410,821
Auburn (KC portion)	42,901	60,820	28.20	5,728,381
Beaux Arts	307	315	0.08	115,583
Bellevue	109,827	120,600	33.30	31,485,646
Black Diamond	3,970	4,180	6.72	579,160
Bothell (KC portion)	16,185	17,260	5.67	3,275,422
Burien	31,881	31,890	7.43	3,845,145
Carnation	1,893	1,910	1.17	202,888
Clyde Hill	2,890	2,815	1.06	1,579,857
Covington	13,783	17,530	5.85	1,885,074
Des Moines	29,267	29,270	6.54	2,936,128
Duvall	4,616	5,980	2.20	828,259
Enumclaw	11,116	11,460	4.15	1,068,154
Federal Way	83,259	88,580	22.54	9,010,356
Hunts Point	443	465	0.29	765,357
Issaquah	11,212	26,890	11.36	5,890,000
Kenmore	18,678	20,450	6.17	2,941,435
Kent	79,524	88,380	29.06	11,556,075
Kirkland	45,054	49,010	10.55	11,452,502
Lake Forest Park	13,142	12,820	3.59	2,162,443
Maple Valley	14,209	20,840	5.67	2,303,190
Medina	3,011	2,970	1.41	2,681,076
Mercer Island	22,036	22,720	6.32	8,900,540
Milton (KC portion)	814	830	0.56	82,373
Newcastle	7,737	9,925	4.46	2,051,576
Normandy Park	6,392	6,485	2.55	1,278,891
North Bend	4,746	4,760	2.96	679,244
Pacific (KC portion)	5,373	6,200	1.83	459,833
Redmond	45,256	51,890	16.23	12,774,174
Renton	50,052	83,650	22.31	9,659,678
Sammamish	34,104	40,670	18.22	8,739,143
Sea Tac	25,496	25,730	10.29	4,606,470
Seattle	563,374	602,000	86.06	121,621,131
Shoreline	53,025	54,320	11.59	7,293,134
Skykomish	214	210	0.33	24,535
Snoqualmie	1,631	9,730	6.45	1,725,359
Tukwila	17,181	18,170	9.17	4,450,244
Woodinville	9,194	10,670	5.66	2,555,579
Yarrow Point	1,008	965	0.36	716,576

Cities Total	**1,387,261**	**1,566,120**	**400.**	**$ 290,362,432**
Unincorporated King County	**349,234**	**343,180**	**1,734.**	**$50,633,008**
King County Total	**1,737,046**	**1,909,300**	**2134.**	**$360,995,440**
Source: 2000 U.S. Census, 2008 U.S. Census, 2008 King County Annual Grown Report, April 2009 Office of Financial Management Washington State ** (April 2009)*				

Port of Seattle[12]

The Port of Seattle is a municipal corporation created in 1911 by the voters of King County. They are charged with construction, maintenance and operation of harbor and airport facilities, including seaport cargo and vessel-handling terminals, Seattle-Tacoma International Airport, Fishermen's Terminal, and Bell Street Pier Cruise Terminal at Pier 66. Their services and facilities accommodate transportation of cargo and passengers by air, water and land; provide a home for the fishing industry; and foster economic vitality and quality of life for King County citizens. The Port operates its own police and fire departments. The port is governed by port commissioners elected by the citizens of King County. Their funding is obtained through property taxes, interest earnings, bond issues, grants, passenger facility charges, and other miscellaneous revenue.
See **Map 3-3: Port of Seattle Properties**.

Native American Tribes[13,14,15]

There are two Native American Tribes located within King County, the Muckleshoot and Snoqualmie Tribes.

The Muckleshoot Indian Tribe (MIT) was established in 1874 and is comprised of the descendants of the area's original Coast Salish peoples. The Tribe has lived in this area for thousands of years. As time passed, a number of people from other local Tribes, such as the Duwamish and Snoqualmie, were absorbed into the Muckleshoot Tribe, as well as other neighboring federally recognized Tribes including the Tulalip and Suquamish. The six square-mile Muckleshoot Reservation located near Auburn is laid out diagonally and has 20 miles of boundaries. Most of the reservation is surrounded by farms and rural lands, with urbanization encroaching on the western portion. The Muckleshoot Tribe is one of Washington State's larger tribes, with a population of about 3,300. Through the Indian Reorganization Act, the Tribe adopted its constitution in 1936. It provides for a nine-member council. With advice and input of the General Council comprised of all community members, the Muckleshoot Tribal Council provides a full range of government services to the reservation[13,14].
See **Map 3-4: Muckleshoot Indian Reservation.**

The Snoqualmie people have lived in the Snoqualmie River Valley from at least 1844 to the present. After 67 years of petitioning, the Snoqualmie Tribe was re-recognized by the Federal Government in 1999. This provided the Tribe with the right to acquire its initial reservation land. The Snoqualmie Tribe currently has approximately 1,000 members. Historically, the tribal members lived in the area of east King and Snohomish Counties that now contain the communities of Monroe, Carnation, Fall City, Snoqualmie, North Bend, Mercer Island and Issaquah. Tribal members continue to live in each of these communities. The Tribe is governed by a tribal constitution and elected council. The Tribe's governing structure includes building codes, health codes and other standard governmental functions[15].

School Districts[1,17,18]

There are 20 school districts within King County that provide an opportunity for education to all children. They include:

Table 3-11: School Districts

School District	2000 District Population	October 2008 Enrollment
Auburn #408	67,700	14,936
Bellevue #405	114,600	17,249
Enumclaw #216	25,500	4,536
Federal Way #210	123,000	22,440
Fife #800 (KC portion)	N/A	3,554
Highline #401	122,500	17,549
Issaquah #411	73,200	16,696
Kent #415	137,600	27,444
Lake Washington #414	153,500	23,937
Mercer Island	22,000	4,117
Northshore #417	72,000	19,818
Renton #403	95,500	14,024
Riverview #407	15,800	3,199
Seattle	564,200	45,968
Shoreline #412	66,000	9,168
Skykomish #404	600	66
Snoqualmie Valley #410	25,900	5,916
Tahoma #409	28,800	7,377
Tukwila #406	16,000	2,822
Vashon Island #402	10,100	1,553
Total	**1,737,000**	**262,369**

**(Latest data available by State and Federal government agencies in October of 2009).*

Source: 2008 King County Annual Growth Report
WA State Public School Building Count 2008-09

Under the constitutional framework and laws of the State of Washington, the governance structure for the state's public common school system is comprised of the following bodies: legislature, governor, superintendent of public instruction, state board of education, educational service district boards of directors, and local school district boards of directors (elected by voters). The respective policy and administrative roles of each body are determined by the State Constitution and statues. Local school districts are political subdivisions of the state[16]. The primary source of funding for grades K-12 comes from the state. About one-quarter of the State's distribution of operating expenditures goes to K-12 education. School districts obtain additional revenues from the federal government, local levies, Washington State Initiative 728 (education reform and improved student learning funding), capital improvement bonds, fees for service, local taxes, grants, school districts and other sources[17]. See **Map 3-5: School Districts**.

Fire Protection Districts[18]

There are 27 fire protection districts (in addition to municipal fire departments) whose role it is to eliminate fire hazards, protect life and property, and provide fire suppression and emergency medical services. **Table 3-12** reflects district data only; municipal fire department data (i.e. population, service area) is located in **Table 3-10.** A few municipalities contract with fire districts to provide fire service.

Table 3-12: Fire Districts

Fire District	Service Population	Service Area (sq. miles)
KCFD #2 -- Burien/Normandy Park	37,430	15.5
KCFD #4 -- Shoreline Fire Department	106,736	13.5
KCFD #10 -- Eastside Fire and Rescue *(merged with Issaquah Fire–district figures only)*	173,485	200.0
KCFD #11 -- North Highline Fire District	33,400	6.2
KCFD #13 -- Vashon Island Fire and Rescue	12,000	40.0
KCFD #14 – Bellevue*	?	4.0
KCFD #16 -- Northshore Fire Department	65,630	11.0
KCFD #17 – Black Diamond* *(merged with Mountain View KCFD #44)*		
KCFD #20 – Skyway/Bryn Mawr/Lakeridge	15,000	5.0
KCFD #24 – Angel Lake* (City of Sea Tac)	30	1.0
KCFD #25 – Renton*	7,000	4.5
KCFD #26 – Des Moines *(merged with Federal Way Fire Department)*		
KCFD #27 – Fall City	7,100	24.0
KCFD #28 – Enumclaw	13,500	9.0

KCFD #31 – Auburn*	350	4.0
KCFD #34 – Redmond	20,900	30.0
KCFD #36 -- Woodinville Fire and Life Safety	52,000	36.0
KCFD #37 – Kent*	32,382	18.0
KCFD #38 – North Bend / Snoqualmie	11,900	24.0
KCFD #39 South King Fire & Rescue *(annexed Federal Way and Des Moines)*	150,00	40.0
KCFD #40 – Spring Glen/Cascade/Fairwood	28,000	8.0
KCFD #41 – Kirkland*	30,000	20.0
KCFD #43 -- Maple Valley Fire and Life Safety	65,480	53.0
KCFD #44 -- Mountain View Fire and Rescue	23,456	59.8
KCFD #45 – Duvall	14,000	55.0
KCFD #47 – Kangley/Palmer	1,500	26.0
KCFD #49 – Snoqualmie Pass *(reorganized as KCFD #51)*		
KCFD #50 – Skykomish/Stevens Pass	1,000	140.0
KCFD #51 – Snoqualmie Pass	300-1,500	22.0

**Services provided by the city*
Source: RHMP Participating agencies; 2009 WA Fire Service Directory

Each fire district is governed by a board of fire commissioners elected by the voters living within the district. Fire Districts are primarily funded through property taxes. Additional revenues are obtained through benefit charges, capital improvement bonds, and grants.
See **Map 3-6: Fire Districts & City Depts**.

Public Hospital Districts[18,19]

There are three public hospital districts that own and operate hospitals and other health care facilities in King County. Hospital districts are community supported governmental entities charged with delivering health care to their communities. They fulfill a vital role in King County because without them many people would be unable to receive healthcare. The Washington State legislature granted local communities the ability to create their own hospital districts in 1945. Nearly half of all Washington's 90 hospitals are part of a public hospital district. Districts are authorized not only to operate a hospital, but to deliver any service to help people stay healthy – physically, socially and mentally. Hospital districts are located in areas considered to be rural in character. Public hospital districts within King County include:

District #1 - Valley Medical Center
(Kent, Renton and two-thirds of Tukwila)
District #2 - Evergreen Healthcare
(Bothell, Redmond and Woodinville)

District #4 - Snoqualmie Valley
(Snoqualmie, North Bend, Carnation, Fall City, Preston and Snoqualmie Pass)

Public hospitals are governed by hospital commissioners elected by the citizens living within their district. Levy funds typically provide a small portion of the hospital revenues. The majority of funding is obtained through inpatient and outpatient services, and other services.
See **Map 3-7: Hospitals & Hospital Districts**.

Utility Districts[18]

There are 22 water districts in King County that are responsible for acquiring and distributing water, construction and maintaining water storage and distribution facilities and infrastructures, and managing water resources.

Covington Water District
Fall City Water District
Highline Water District
King County Water District #1 – Yarrow Point
King County Water District #19 – Vashon Island
King County Water District #20 – Burien/Riverton/McMicken Heights
King County Water District #42
King County Water District #45 – Seattle
King County Water District #49 – Burien
King County Water District #54 – Des Moines/Normandy Park/ Burien
King County Water District #83
King County Water District #86
King County Water District #87
King County Water District #90 – Renton
King County Water District #94
King County Water District #105
King County Water District #111 – Kent
King County Water District #117 – Bellevue
King County Water District #119 – Carnation/Duvall
King County Water District #123 – Present
King County Water District #125 – Riverton Heights
Shoreline Water District

Water Districts are typically funded from water sales and base charges, fees such as water availability certificates, hydrant permits and street light fees. Restricted funds include general facilities and local facilities charges paid when customers hook-up to a system and G.O. bonds or revenue bonds.
See **Map 3-8 Water Service Utilities**.

There are seven sewer districts that are responsible for managing wastewater needs of the community. This includes construction, maintenance and operation of sewer system facilities and infrastructures. Sewer districts obtain their funding through fees and charges.
See **Map 3-9: Wastewater Service Agencies**.

Highlands Sewer District
Midway Sewer District
Ronald Wastewater
Snoqualmie Pass Sewer District
Southwest Suburban Sewer District
Stevens Pass Sewer District
Val Vue Sewer District

There are ten combination water/sewer utility districts in the County. They include:

Bryn Mawr-Lakeridge Water and Sewer District
Cedar River Water and Sewer District
Coal Creek Utility District
Lakehaven Utility District
Northeast Sammamish Sewer and Water District
Northshore Utility District
Sammamish Plateau Water and Sewer District
Skyway Water and Sewer District
Snoqualmie Pass Utility District
Soos Creek Water and Sewer District

Utility districts are governed by elected commissioners.

King County Flood Control Zone District (*new for 2009*)

This section was rewritten by the Department of Natural Resources and Parks, Water and Land Resources for the 2009 Plan update.

Flood control zone districts are authorized by Chapter 86.15 of the Revised Code of Washington to undertake, operate, or maintain flood control or storm water control projects that benefit the area contained within the district. King County has nearly five hundred aging flood protection facilities, as well as vast areas of land within the one hundred-year floodplain. In response to the need for an integrated and coordinated approach to effectively and efficiently reduce flooding risk on a countywide scale and to protect public safety, property, and the regional economy, the King County Flood Control District (District) was formed by Ordinance No. 15728 of the Metropolitan King County Council in April 2007. With the formation of a new countywide district and pursuant to state statute, the King

County Council dissolved ten previously-existing flood control zone districts spread across the County, only two of which were active at the time of the creation of the King County Flood Control District.

The King County Flood Control District is an independent special purpose district of the State of Washington. Under the authorizing ordinance and consistent with RCW 86.15, the King County Council was granted the authority to govern the District as its Board of Supervisors. Support is provided to the Board of Supervisors by committees comprised of local elected officials and other key stakeholders. The District also partners with numerous entities, from local tribes and watershed planning groups to state and federal agencies.

An inter-local agreement (ILA) between the District and King County specifies that the Water and Land Resources Division of King County's Department of Natural Resources and Parks provide floodplain management services to the District. Under the terms of the ILA, the District directs King County to implement the District's work program, thus drawing upon the County's long-standing expertise in floodplain management. The 2006 King County Flood Hazard Management Plan serves as the District's Comprehensive Plan.

Drainage Districts[9,20]

2004 Data: There are six drainage and diking districts in King County. They Include: #1 – Green River Valley, #2 – Military Road/Green River, #5, #6 – Enumclaw South, #7 – Farmland joining Cherry Creek-Duvall, and #13 – Farm area north of Enumclaw. Their funding comes from assessments for service (not a property tax).

2009 Drainage District data from the King County Assessor's Office, September 2009

See 2009 Map – 3.9.5 – Drainage Districts

The names and addresses of commissioners for each district are listed below. A map of the districts is provided.

Drainage District One: Morgan Llewellyn
P. O. Box 902
Kent, WA 98035
(253) 852-189

Drainage District Two: Thomas R. O'Connell
20449 Frager Road
Kent, WA 98032
253) 872-8687

Drainage District Five: Allan Thomas
123 E. Roosevelt Avenue
Enumclaw, WA 98022
(253) 261-7874 (cell)

Drainage District Six: John Koopman
46029 276th SE
Enumclaw, WA 98022
(360) 825-7705

Drainage District Seven: Ruth Coy Bellamy
26808 NE Cherry Valley Rd.
Duvall, WA 98019
(425) 788-1130

Drainage District 13: John Millarich
39926 264th SE
Enumclaw, WA 98022
(360) 825-3615

Parks and Recreation Districts[9,20]

There are five parks and recreation districts that provide for leisure activities and recreational facilities. They include: #076 Coalfield Park and Recreation, #555 Enumclaw Park and Recreation, #550 Northshore Park and Recreation, #548 Shoreline Park and Recreation, and #002 Vashon Park and Recreation. Park and recreation districts are governed by commissioners elected by voters in the district. Their funding is obtained through special levies.

King County Library System (Rural Library District)[21]

King County Library System (KCLS) is the third largest circulating library in the United States. The system includes 42 libraries and a traveling library center that serves over one million residents. The governance of the District is a Board of Trustees appointed by the King County Executive and confirmed by the County Council. Additional oversight is provided by library advisory boards in cities and other library support groups throughout the district. Their primary funding is obtained through levy taxes.

Puget Sound Clean Air Agency (King County Air Pollution Control)[22]

Puget Sound Clean Air Agency Control enforces federal, state and local air quality laws and regulations in King, Kitsap, Pierce and Snohomish counties. Their policies and programs are designed to meet and maintain air quality standards, protect human health, prevent injury to plant and animal life and protect Puget Sound's panoramic views. They are governed by a board of

directors. Their funding is obtained from fees and from federal, state, county and city governments.

Cemetery District #1

Cemetery District #1 is located on Vashon Island. It is governed by elected district commissioners. They receive their funding from tax levies.

Economy[1,2,4,6,7]

Employment[1,6,7]

King County is a nationally important market, with the ninth largest number of jobs among the nation's 3,100 counties, and a year 2005 payroll of $65 billion, ranking ninth in the nation.

Employment growth is a major driver of King County's population and housing growth. More than 1.1 million workers are employed within the borders of King County, with over 59,000 business establishments. With more than 40 percent of Washington State's jobs and payroll, the County is the economic engine of Washington and the Pacific Northwest. The County's economy is larger than that of several U.S. states.

In 2000, King County had 43 percent of Washington jobs, but only 29 percent of the population and 30 percent of the housing units. During the 1990s, the number of jobs grew faster than population and housing. Most of these workers live in King County, but an increasing number commute in from Snohomish, Pierce and other counties.

Although King County contains only three percent of the State's land area, it is large and diverse with many different job centers. Manufacturing and warehousing dominate in South Seattle and South King County. High-tech industries are located mostly in Seattle and the Eastside (Bellevue/Redmond/ Kirkland area) and services and retail are located throughout the County.

The economy of King County is diverse, though more heavily dependent on the services and trade sectors than the state as a whole. The table below provides a profile of employment in various economic segments in King County.

Table 3-13: Employment by Industry – 2007

Industry	Number of Workers	%
Professional and Business Services	190,400	15.9
Government and Education	163,300	13.6
Manufacturing	113,100	9.4
Leisure and Hospitality	111,700	9.3
Financial Activities	77,100	6.4
Educational and Health Services	127,700	6.5
Information	75,700	6.2
Construction	74,800	5.4
Trade, Transportation & Utilities	224,200	18.6
Other Services	41,700	3.3
Natural Resource and Mining	700	.1
Total Services Industry	**1,011,700**	**84.3**
Total	**1,200,400**	**100.0**

Source: 2007 King County Annual Growth Report – Washington State Security Employment Department 2007

Services producing industries, which include information technology, contribute 84.3% of non-agriculture employment in King County. Services have been the fastest growing sector since 1970. While services may be traditionally thought of as low-paying industries, some of the highest paid workers in the County are in service industries, In fact, the bulk of job growth in recent years has been in the higher paying jobs, primarily in the software industry and to a lesser extent professional business services. The county is ranked fifth in the nation for concentration of high-tech businesses.

About nine percent of the County's employment base is in manufacturing. Transportation equipment is the largest industry in this sector, with the bulk of manufacturing employment (about 40%) in aerospace products and parts. However, manufacturing is diversifying with advanced technology. Computer and electronic products account for about eight percent of manufacturing trade, most of which has occurred in the Interstate 5/Interstate 405 corridor. Non-durable goods, which include the production of food products, account for about 24 percent of all manufacturing.

About 19 percent of the County's jobs are in the transportation and public utilities industry. More than half of the State's jobs in this industry are in the County, primarily due to activities at the Port of Seattle and SeaTac International Airport. The County is also home to television media that serves most of western Washington.

As a regional finance and insurance hub, King County's employment in the finance, insurance, and real estate industry is larger than the rest of the State. King County accounts for over half all statewide employees in this industry sector. The state's banking and insurance industries are primarily headquartered in Seattle as are most security and commodity brokers, holding companies and investment firms.

About 14 percent of the jobs in King County are in the public sector. There are about 87,000 employees at the local government level, and primary employers are K-12 school districts. King County Government employs approximately 12,000 people. Cities, including Seattle, are the largest municipal employers. Seattle employs over 12,700 people. State Government provides another 41,000 jobs, with employment driven primarily by the University of Washington and eleven community colleges. The federal government employs over 21,000 people; almost one-third of its employment is in the postal service.

Major businesses and employers in King County include:

- Amazon
- Bank of America
- Boeing Company
- Macy's
- City of Seattle
- COSTCO
- Evergreen Healthcare
- Fred Meyer
- Group Health Co-Operative
- King County Government
- Microsoft Corporation
- Nordstrom
- Providence Health System
- QFC
- Qwest Communications
- Safeco
- Safeway Stores Inc.
- Seattle School District #1
- Swedish Hospital
- United States Postal Service
- University of Washington
- Weyerhaeuser

International Trade[1,4,6,7]

Washington State exceeded $54 billion in foreign exports in 2008. Nearly three-quarters of Washington exports are coming from the central Puget Sound region. Two-way trade through Seattle involves more than 100 countries and amounted to over $150 billion in 2006. As a result, the economy is extremely dependent upon foreign trade. International trade (directly and indirectly) supports 740,000 jobs annually. One in three jobs in Washington State is involved in foreign exports. While the State represents about two percent of the nation's population, its ports handle seven percent of all U.S. exports and receives a six percent share of the nation's imports.

King County has evolved from a resource-based economy centered principally in forest products manufacturing, into an increasing diversified export base with significant orientation in high-tech industry, services, and trade serving broad national and worldwide markets. An increasing number of finished goods and services originating in King County, such as commercial aircraft and computer software, are exported overseas, particularly to Europe and the Far East. In addition to the major employers, Boeing Aerospace and Microsoft, industries with the best possibilities for growth include information technology, clean technology (green jobs), logistics and international trade, and life sciences. King County has 14% of the global interactive media (video games) market. Other top exports include industrial machinery, electric machinery, cereals, medical and surgical equipment, grains/seeds/fruits, wood and wood products, paper products, fish and mineral fuel.

The top imports into Washington include high technology products, forest products, motor vehicles, motor vehicle parts, airplane engines, aircraft parts, petroleum gases, toys and office machine parts.

The county's top ten trading partners include Japan, South Korea, Singapore, Germany, China, Taiwan, UK, France, Canada and Saudi Arabia.

Income and Wages[1,6,7]

King County is the strongest driver of the statewide average income due to its large population and highly paid high-tech and aerospace industries. Seattle is the county's industrial and commercial hub; headquarter offices of a large number of firms are located here and workers tend to have higher wages than elsewhere in the state. Some of that difference reflects high-tech jobs on the Eastside and high-wage manufacturing jobs in South King County. All of King County's economic sectors have higher salaries than that of the state, on average 14 percent higher.

In 2007, the median household income was $85,828 the highest in the state and well above national medians. The median, however, does not portray the breadth of income distribution. More than one-third of King County households report an income of more than $75,000, and almost one-third report an income under $35,000. Every community and every ethnic group has households with high and low incomes. However, there is still some income disparity by race.

Unemployment[1,7]

Unemployment was at historic lows (near three percent) for several years, but the King County economy remains quite cyclical. Although unemployment has increased to about 8.8 percent as of September 2009, many businesses continue

to suffer from a labor shortage. This current level is slightly lower than the national unemployment rate of 9.7 and matches the State rate of 8.8 percent.

Poverty[1,2,6,7]

About 9.5 percent or 180,500 of the people in King County live in poverty, considerably less than the 12.5 percent national rate, and the 12.6 percent rate in Washington State. However, this percentage is substantially greater than the reported 8.4% in 2000, and 8.0% in 1990. An additional 221,500 people reported incomes below 200 percent of the official poverty thresholds. Approximately 9.4 percent of this group are children under the age of 18, and 7.4 percent are adults over age 65. These numbers likely increased during the recent recession; a recent U.S. Census survey estimated 9.5 percent now live below the poverty level.

Table 3-14: Poverty Rates

% of Total Population	Children under 18	Over age 65
9.5%*	9.4%	7.4%

Source: U.S. Census Bureau of Selected Economic Characteristics: 2007
**August 2009 U.S. Bureau of Labor Statistics*

Future Trends[1,7]

King County's economy remains strong despite severe shocks resulting from recent key events. In February 2001, a 6.8 magnitude earthquake hit the Puget Sound region, causing significant damage and related costs that are still being borne by the region. The following month, Boeing announced they would be moving their headquarters. As of mid-2002 Boeing laid off over 26,000 employees, many in the Puget Sound region. In early 2009, Microsoft announced the permanent layoff of 5,000 employees over the course of an 18-month period. This is the first major job cut since Microsoft's founding in 1975.

Manufacturing remains strong despite the ups and downs of the aerospace industry. Although the aerospace industry is well below its record employment levels, they continue to provide high wages to local workers. The computer services industry now employs almost as many as aerospace, although it too has lost ground. The composition of the economy continues to shift from the traditional manufacturing and resource bases to high-tech, services and trade, both local and international.

Long range prospects are mixed. The move of the Boeing headquarters provides some uncertainty in the aerospace industry. Sales tax and other government revenues are declining at a time when public investment is needed.

Tourism[4]

King County is a domestic and international tourism destination, featuring scenic beauty, temperate climate, both metropolitan and rural activities, and easy access by air, land and water. Tourism is the state's fourth largest industry and the Western Washington region accounts for over half of statewide tourism.

Over the years King County has gained a reputation for providing excellent venues for conferences and conventions with several large convention centers and approximately 80 hotels with conference or convention meeting space and over 30,000 hotel rooms.

Throughout the county there are a multitude of cultural, recreational and entertainment options including museums, theaters, historical landmarks, restaurants, tours by air, land and sea, shopping centers, major cruise lines, professional sports, community and countywide festivals, pleasure boating, camping, and many other outdoor recreation activities.

Transportation[4,12,23-46]

The King County is a hub for transportation on land, on water, and in the air. The extensive highway and railroad infrastructure supports the transport of people, commodities, and valuable resources. The water hosts a major international seaport, cruise ship facilities, and the largest ferry system in the world. Two major international airports, supported by aviation facilities unique to our geographical needs, play a key role in facilitating the economic vitality, tourism, and domestic and international trade. Our unique geographic diversity inspires a wide range of transportation alternatives for the everyday commuter, visitors and those involved in the movement of products and goods.

Air Service

King County has two major international airports as well as several other mid-size and small airports and airparks that accommodate different modes of air travel and business, pleasure and personal needs.

Sea-Tac International Airport [4,12,23]

Seattle-Tacoma International Airport (Sea-Tac) serves as the regional air hub for the Pacific Northwest, providing direct and regular service for passengers and cargo to major U.S. and international destinations. The airport is ranked among the five best U.S. airports by the International Airline Passengers Association and is consistently one of the top 20 busiest cargo airports in the United States.

Sea-Tac airport operates 24 hours a day, 365 days a year and is run by the Aviation Division of the Port of Seattle. Thirty airlines and six cargo-only carriers fly out of Sea-Tac. There are scheduled direct flights to 19 international and 74 domestic destinations. There are 40 non-stop flights to Asia and ten non-stop flights to London each day.

Sea-Tac is the 17th busiest U.S. airport in total annual passengers and the 24th busiest airport for aircraft operations. An average of 88,200 passengers passes through the airport each day with nearly 350,000 flights each year.

Sea-Tac Airport has a strong and steady air travel market base. Approximately 76 percent of the travelers using the airport are origin and destination passengers, meaning they begin or end their trip at Sea-Tac Airport; the remainder is on connecting flights. Airline service is diversified among many carriers and the airport is not dominated by a single hub carrier.

The total number of passengers in 2008 was 32,196,528. The majority, 91 percent, were domestic passengers, while the remaining nine percent were international passengers. A little over one-third of passenger travel is done for business-related purposes; about ten percent of this group is local residents and the rest come from other destinations. About two-thirds of all passenger air travel is non-business related, with a fairly equal mix of resident and non-resident passengers. Annual air passenger levels have steadily increased over the last 30 years from 4.7 million in 1972 to an all time high of 28.4 million in 2000. Since 2000 there has been a 6.4 percent decrease in air passenger travel.

About 290,500 total metric tons of cargo is transported at Sea-Tac Airport. Over half, 56 percent, is domestic freight, 29 percent is international freight, and 15 percent is air mail. Air cargo levels have also increased in the last 30 years from 137,270 tons in 1972 to the all time high of 456,920 tons in 2000. However, there's been a dramatic 8.9 percent decrease in cargo levels between 2007 and 2008.

Sea-Tac is a significant employer. There are approximately 18,000 airport employees and 42,000 airport-related jobs off-site. About $6.9 billion in business revenue is generated by the airport, airlines and related businesses. Sea-Tac and related businesses generate $209 million in state and local taxes.

The airport opened a third runway in November of 2008 and is making substantial improvements to the airport facility, including south terminal expansion, new central terminal, a LINK light rail station, underground satellite transit system upgrade, improved parking garage lighting, and seismic reinforcements.

King County International Airport[24]

King County International Airport (KCIA), commonly known as Boeing Field, is owned and operated by King County. It is one of the busiest general aviation airports in the country – used by aircraft of all sizes and types, and filling a wide range of commercial and recreational needs. KCIA receives no general tax dollars and is financed by rents, fees and some Federal Aviation Administration (FAA) resources.

KCIA is located five miles south of downtown Seattle in the Duwamish corridor. It serves multiple functions: a municipal airport, testing and delivery facility for the Boeing Company, and as a major air freight center for the county's industries. KCIA averages 290,000 operations annually. Boeing Field economic impact accounts for $3.2 billion in terms of local business sales supporting 12, 618 jobs, and a as result $804 million in labor income is contributed within the county. The airport is a base for about 150 businesses, including air cargo companies, flight schools, charter operations, and helicopter services. The airport's 150 tenants also provide 4,900 jobs to the local economy. Other tenants include hundreds of small aircraft owners who use planes for recreational and business purposes. There are approximately 480 aircraft based at the airport. KCIA is a United States airport of entry, with U.S. Customs, Immigration, and Public Health and Agricultural Inspection facilities.

Renton Airport[25,26]

The Renton Municipal Airport, owned by the City of Renton, is a general aviation airport that serves Renton and other nearby communities. The airport provides regional aviation services for air charter, air taxi, corporate, business and recreational flyers. It is also an FAA-designated "Reliever" airport, diverting general aviation aircraft traffic from Sea-Tac International Airport.

The Airport is used predominately by single-engine piston aircraft, and ranks among the top six airports in the State of Washington in terms of aircraft landings and takeoffs. The Boeing Commercial Airplane Company, located adjacent to the airport, manufactures Boeing 737 and 757 aircraft and uses the airport for their initial flights.

Seaplane (or floatplane) operations from the Will Rogers-Wiley Post Memorial Seaplane Base, located at the north end of the airport along the shore of Lake Washington, also comprise a significant level of activity (see "Seaplane Bases" section).

There are approximately 319 aircraft based at Renton Municipal Airport; most are single-engine airplanes. Aircraft operations average 262 a day. About 55 percent of the activity is local general aviation, 44 percent is transient general aviation,

one percent is air taxi services, and less than one percent is attributed to military and commercial activity. The Renton Municipal Airport is a Landing Rights Airport, with US Customs services available for both floatplane and wheeled aircraft arriving by water or by land.

Auburn Municipal Airport[26,27]

Auburn Municipal Airport is owned by the City of Auburn and is also one of the busiest general aviation airports in the state of Washington. There are approximately 241 aircraft based at Auburn and about 164,250 operations (takeoffs & landings) occur annually. The majority of aircraft located at the airport are single-engine planes. About 60 percent of airport activity is attributed to general transient aviation, 36 percent is local general aviation, four percent is air traffic services, and less than one percent is military activity. The airport provides hanger and tie-down rental, aircraft charter, aircraft rental, repair stations, and pilot training.

Vashon Municipal Airport[26]

Vashon Municipal Airport located on Vashon Island is owned by King County Airport District #1. There are 36 aircraft based on the field and aircraft operations average 189 per week. The majority of traffic, about 75 percent, is transient and 25 percent is local general aviation.

Crest Airpark[28]

Crest Airpark is a small airport located near the City of Kent. It is private with 332 base aircraft, mostly single engine with some multi-engine and two helicopters. Latest available data indicates the airpark has a total of over 98,000 annual operations. The airport provides flight instruction, rentals and fuel services.

Skykomish State Airport[26,29]

Skykomish State Airport services Skykomish and King County and is owned by Washington State Department of Transportation. Skykomish has a turf runway and the airport caters to transient general aviation. Fly-ins and glider operations are also common, and are frequently used by the Forest Service. Aircraft operations average 25 per month.

Kenmore Air Harbor Seaplane Base[26,30,31]

Privately-owned Kenmore Air Harbor Seaplane Base serves Seattle and King County. Today Kenmore Air is the largest purveyor and flyer of floatplanes in the Unites States and for 57 years has been flying, building and selling a variety of seaplanes from its headquarters in Kenmore and its terminal on Lake Union near

downtown Seattle. Last year, the airline division of the company flew 70,000 people north to the San Juan Islands, Vancouver Island and various points beyond. They have two terminals, one at Lake Union and the other in Kenmore on the north end of Lake Washington. At the Lake Union location, they average 97 aircraft operations per day, 72 percent in air taxi services, 21 percent in general local aviation, and seven percent in general transient aviation. In Kenmore they average 132 aircraft operations a day, with 83 percent in air taxi services, 16 percent in local general aviation and two percent in general transient aviation. Both seaplane terminals are open to the public.

Seattle Seaplanes Seaplane Base[26]

Seattle Seaplanes is located on Lake Union. They average 50 aircraft operations a week; 96 percent in air taxi services, two percent in general transient aviation and 2 percent in local general aviation. They have four aircraft based there. The seaplane base is open to the general public.

Will Rogers Wiley Post Memorial Seaplane Base[25,26]

Seaplane (or floatplane) operations from the Will Rogers-Wiley Post Memorial Seaplane Base, located at the north end of the Renton Municipal Airport along the shore of Lake Washington, also comprise a significant level of activity at the airport. The seaplane facilities include a floating dock and launching ramp, which make the Renton Municipal Airport one of the few airports in the Pacific Northwest where aircraft can land on wheels, be equipped with floats and depart from the water, or vice versa. Seaplane aircraft operations average 46 per week. About 73 percent of seaplane activity is local general aviation and the remainder is transient.

Heliports[26]

There are at least 45 heliports located throughout the King County. Heliports can be situated in an array of environments and utilized by many different entities including hospitals, major corporations, businesses, governmental agencies, emergency services, and the news media. There are also several private individuals who have their own heliport for personal use.

Railroads and Rail Service[4]

The BNSF Railway Company and Union Pacific Railroad Company serve the King County area. Both railroads have spur lines that span King County, making it possible to deliver almost any type of load. International cargo and cargo originating in Seattle travels quickly over these two rail networks to inland U.S. markets, including the Midwest, South and East. These lines are also used by other rail service providers, including Amtrak and Sound Transit.

See **Map 3-10: Railway Network**.

BNSF Railroad[32]

The BNSF Railway Company operates one of the largest railroad networks in North America, with 33,000 route miles covering 28 states and two Canadian provinces. This network covers the western two-thirds of the United States, stretching from major Pacific Northwest and Southern California ports to the Midwest, Southeast and Southwest, and from the Gulf of Mexico to Canada.

The railway moves more intermodal traffic than any other rail system in the world. It is America's largest grain-hauling railroad and transports the mineral components of many of the products we depend on daily, including enough coal to generate more than 10 percent of the electricity produced in the United States. Revenues are generated primarily from the transportation of coal, grain, intermodal containers and trailers, chemicals, metals and minerals, forest products, automobiles and consumer goods.

BNSF NW Division

The King County portion of the BNSF is located in their Northwest Division. Rail lines extend north to south, paralleling Puget Sound and traversing the major cities of Auburn, Kent, Tukwila, Seattle and Edmonds. Another line extends off the main line and goes through Renton and north to Woodinville and Snohomish. A main east-west line extends from Auburn to Stampede Pass heading towards Ellensburg.

Union Pacific Railroad[33]

The Union Pacific Railroad serves Washington State with two north-south main lines. In western Washington, the Union Pacific connects Portland with important ports of Seattle, Tacoma and Kalama. Major commodities handled by the Union Pacific Railroad include lumber, fruit, automobiles and trucks, manufactured products, grain, chemicals and import-export consumer products on double-stack

trains from Seattle and Tacoma. The railroad also transports solid waste from Seattle to a landfill in Oregon. Terminal facilities within King County are located in Seattle.

Amtrak[34]

Amtrak passengers utilize service in more than 500 communities in 46 states throughout a 22,000-mile route system. Amtrak's "Pacific Northwest Rail Corridor" extends from Eugene, Oregon through King County as far north as Vancouver, British Columbia. Over 774,000 passengers rode Amtrak within the corridor in 2008. Three daily round trips are provided between Seattle and Portland with two of these trips extending south to Eugene. Amtrak also offers two daily round trips between Seattle and Bellingham with both trains extending north to Vancouver, B.C.

There are currently two Amtrak long-distance trains that serve Washington State, both originating in Seattle – the *Empire Builder* offers daily round-trip service between Seattle and Chicago while the *Coast Starlight* offers daily round-trip between Seattle and Los Angeles.[37]

Sounder Commuter Rail[35]

Sound Transit currently offers commuter rail service between downtown Seattle and Tacoma (South line), as well as Seattle and Everett (North Line). There are nine rail stations, with four stops in King County (Auburn, Kent, Tukwila and Seattle). The commuter rail currently serves about 9,979 passengers per day with four round-trips each weekday on the North Line, and eight round-trips on the South Line. Sounder also provides service for special events such as Seahawks Football and Mariner Baseball games.

The trains run on freight tracks owned by BNSF. While Sound Transit owns the stations and provides security and ambassadors, Sounder trains are operated by Sound Transit in conjunction with BNSF and maintained by Amtrak.

Commuter rail service started in 2000. When track and signal work was completed in 2005, commuter rail service between Tacoma and Seattle was expanded to eight round trips daily. Due to voter-approved expansion of light rail service in November 2008, Sound Transit plans to add four additional daily round trips between Seattle and Tacoma. There are also plans to extend the rail line to south Tacoma and Lakewood. Once in full operation, twelve daily roundtrips will serve the Lakewood-Tacoma-Seattle segment, while the Everett-Seattle segment will be served with four daily roundtrips. Sounder will eventually serve at least a dozen stations. (See Public Transit, Sound Transit section, next page).

Ballard Terminal Railroad (BT)[36]

The Ballard Terminal (BT) railroad is a three-mile stretch of short line rail in the Ballard area. The rail line transports consumer commodities and minerals.

Highway Infrastructure

The highway system in the county is comprised of interstate highways, state highways and local arterials. The intersections of Interstate-90, Interstate-5 and Interstate-405 provide critical links north-south and east-west, as well as access between the Seattle metropolitan area and the eastside of Lake Washington, including the communities of Renton, Bellevue, Kirkland and Redmond. Major state highways terminating or providing critical linkages in the county include state highways 99, 18, 509 and 520. Washington State Department of Transportation, King County Department of Transportation and local municipalities construct and maintain the highways, roads and bridges that make up the county's transportation system.
See **Map 3-11: Roads by Classification Type**.

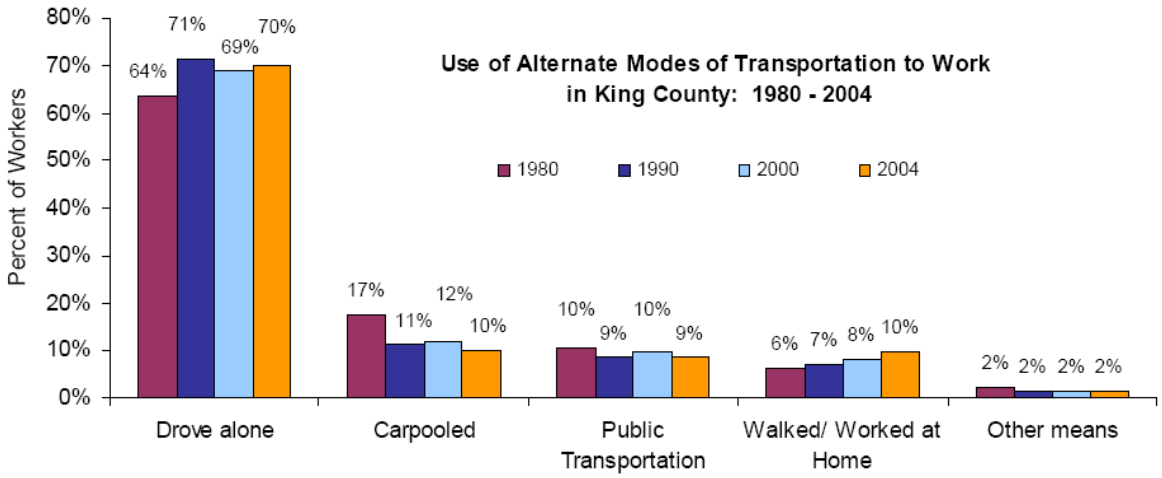
Commuting Trends[1,37,38,39]

More than 900,000 King County residents commute to work. Two-thirds of these commuters drive to work alone. Almost ten percent take public transportation. Bus ridership has increased nearly 25 percent over the last decade. Nevertheless, the majority of commuters opt to drive their own vehicles. The majority of King County households have two or more vehicles, but 66,000 households (almost one-tenth) have no vehicle available.

A substantial number of people – more than 250,000 commute into King County for work. The largest number comes from Snohomish County, about 132,500, followed by Pierce County, 82,500, and Kitsap County, 12,500.

Figure 3.1, below, shows modes of transportation used by commuters. The primary mode of transportation is driving alone. Metro Transit, the public bus system in King County carried over 110 million riders in 2007, a new record[40]. Vanpools carried another 2.3 million passengers in 2007. Sound Transit's Sounder commuter rail line carried an average of over 9900 daily in 2009. The state ferry system carried 12.9 million passengers and 4.6 million vehicles between Seattle, Vashon Island, Bainbridge Island, and Bremerton in 2002.

Figure 3.1: Commuting Patterns



Source: City-Data.com, King County WA; 2008

Public Transit[40,41]

King County Metro Transit operates a fleet of about 1,300 vehicles, including standard and articulated coaches, electric trolleys, diesel-electric hybrid buses, and streetcars that serve an annual ridership of 100 million within a 2,134 square mile area. Metro also serves riders who are disabled with accessible fixed route service (all Metro buses have wheelchair lifts and all routes and trips are accessible), as well as paratransit van service and a taxi scrip program.

Metro operates the largest publicly-owned vanpool program in the country with more than 700 vans making more than 2.9 million trips per year. More than 5,000 people use those vans every day, eliminating a least 4,500 vehicles from area roads.

See **Map 3-12: Metro Transit Routes**.

To help meet future needs and ease severe downtown traffic congestion, Metro operates a 1.3-mile bus and light rail transit tunnel underneath downtown Seattle, making stops at several locations within the downtown Seattle area.

King County's Six-Year Plan for Public Transportation set forth objectives and strategies for transit, paratransit, rideshare services, transportation demand management and supporting facilities. The plan proposed that transit services and facilities be focused in the urban areas of King County. The plan also established a strong link between land use and transit actions in order to make development, as well as transit services and facilities, more efficient. The continued development and support of King County's designated Urban Growth

Area with higher levels of transit service is a central component of the county's growth strategy.

Sound Transit was formed in 1993 by King, Pierce, and Snohomish counties. The agency oversees an express transit bus fleet throughout 53 cities within the three counties, which are operated and funded by King County Metro, Pierce Transit, and Community Transit. The Sounder Commuter Rail line between Everett, Seattle, and Tacoma is operated by Sound Transit in conjunction with BNSF, beginning service in 2000.

The voter approval of expanded light rail in 2008 set into motion an additional 36 miles of light rail through King and Snohomish counties, including a extension of the Central Link north to Lynnwood via the University of Washington, an additional two stations south of SeaTac into Federal Way, and an Eastern Link into Bellevue and Overlake via Mercer Island. In July of 2009 Sound Transit opened its Central Link light rail line connecting SeaTac with the downtown Seattle transit tunnel via a 15.6 mile right of way. In 2016 an extension to the Central Link to the University of Washington via Capitol Hill is planned to open.

Trucking Services[42]

Truck transportation is a major commercial function of the county, being the nexus of the northwest highway system, as well as the location of the Port of Seattle. Approximately 3,700 interstate truck companies operate in Washington, most of which operate King County.

Water Transportation and Shipping[43,44]

Washington State Ferries

Washington State Ferries (WSF) is owned and operated by the Washington State Department of Transportation. WSF is the largest ferry system in the United States, serving eight counties within Washington and the Province of British Columbia in Canada. More than 24 million people rode the ferries and over 30,000 vehicles a day were transported in 2007, making it the second largest transit system in the state.

The ferry system is an essential part of western Washington's and King County's highway network, providing a critical link between the urban areas on the

east side of Puget Sound the growing communities to the West. For the King County community of Vashon Island,
Washington State Ferries provides the only link for automobile travel with the mainland. The State ferry system has 28 vessels, predominantly passenger/vehicle types and several passenger-only ferries. In total there are 20 ports of call (terminals) and 10 routes; four of these routes and three terminals, including Seattle, are located within King County. Routes in the County provide service between Seattle-Bainbridge Island, Seattle-Bremerton, and Fauntleroy (West Seattle)-Vashon Island-Southworth.

Commercial Freight Transportation[45,46]

Commercial freight transportation in and out of Puget Sound is dominated by the Port of Seattle and Port of Tacoma. The Port of Seattle, the fifth largest container port in the United States, is served by 25 regularly scheduled shipping lines and provides services such as on-dock intermodal rail yard, five container terminals, four breakbulk terminals, 25 cranes, on-dock freezer facilities and a 4.2 million bushel capacity grain terminal. Total tonnages handled average 14,000,000 metric tons annually, comprised of about 68 percent containers, 31 percent petroleum, grain and breakbulk, and 50-80,000 autos.[46] Numerous shipping and barge companies operate out of Seattle.

Emergency Service[4,47-59,79]

King County is the home to numerous local, regional and state professional emergency service organizations. These services include fire service, law enforcement, emergency medical services (EMS), emergency communications, emergency management, search and rescue, public health, emergency health care, and other critical resources. The operations and standards to which these agencies perform are dictated by State and Federal Laws, national standards and local agreements.

Fire Service[47-,81]

There are 36 public fire agencies in King County. These fire services are organized into three zones. In general, fire Zone 1 consists of the area north of Interstate-90 to the Snohomish County line; Zone 3 includes Vashon Island and the area south of Interstate-90; and Zone 5 is the City of Seattle. See **Map 3-13: Emergency Response Zones**.

Operationally, there are two different types of fire organizations: departments that provide services as part of municipal governments and districts governed by their own elected commissioners. There are 15 city fire departments and 28 fire districts in King County. Fire agencies are responsible for providing essential

services such as emergency medical aid (basic life support), fire suppression and disaster response. Many fire departments also specialize in prevention-related activities including hazardous materials mitigation, fire prevention, code enforcement, public education, fire inspection and fire investigation. The King County Fire Marshal's Office is responsible for some of the activities relating to code enforcement and fire investigation in unincorporated areas of the County.

Many fire agencies within King County provide specialty services and have firefighters who are trained technicians that serve their jurisdiction; some also participate on countywide teams. Specialties can include hazardous materials, trench rescue, confined space rescue, technical rope – low and high angle, swift water rescue, surface water rescue, dive, and wildland firefighting. Many jurisdictions have joined forces to develop countywide teams. Seattle, Zone 1 and Zone 3 all have "regional response teams" for hazardous materials. Other specialty groups are in the process of developing regional response teams.

In King County, there are approximately 1,500 full-time firefighters and 700 volunteers (excluding Seattle). There are over 1,000 firefighters in Seattle, making it the largest fire department in King County. Additional staff include administrative support, civilian employees, community volunteer specialists and fire explorers.

Washington State fire statistics indicate that the majority of all fire department response, over 70 percent, is related to emergency medical service and rescue; significantly smaller numbers of calls are due to fire-related incidents. These percentages also reflect the activity occurring within the County. However, not all fire departments report their incident data to the Office of the State Fire Marshal, so a truly accurate measure is not available.

Table 3-15: 2008 Washington Fire Response

Response Type	% of Calls
Rescue and Emergency Medical Service	70.8%
Good Intent Calls	8.3%
Fire	4.1%
Service Calls	6.5%
Hazardous Conditions (no fire)	2.1%
False Alarm/False Call (including malicious)	7.0%
Other – overpressure, ruptures, explosion, overheating; Sever weather and natural disasters; and undetermined.	1.2%
Total	**100%**

Source: 2008 Washington State NFIRS 5.0 Data – Washington State Patrol, Office of the State Fire Marshal

The fire services in Washington State and King County have long operated under mutual aid agreements between agencies. These agreements provide for rapid assistance from neighboring fire jurisdictions to meet the immediate need requirements of an emergency situation. Rapid intervention by mutual aid resources can secure control over an emergency incident that may otherwise continue to escalate.

Added for 2009, The King County Fire Marshal Division, in the Department of Development and Environmental Services (DDES), transferred the Fire Investigation Unit (FIU) to the King County Sheriff's Office on January 1, 2008 after a King County ordinance went into effect.

Washington State Fire Services Resources Mobilization Plan[47]

In response to major events, the Washington State Fire Services Resource Mobilization Plan provides a process to quickly notify, assemble, and deploy fire service personnel and equipment to any local fire jurisdiction in the state that has depleted all local and mutual aid resources in attempting to manage, mitigate and control an emergency incident or situation. This plan is typically utilized to respond to major wildland fires, however it is also designed to address all hazards and provide resources to any emergency situation required to protect life and property. The main criterion for initiating fire mobilization is exhaustion of local resources. Activation of the State Mobilization plan is coordinated through the Washington State Patrol – Office of the Fire Marshal.

Other fire agencies include:

Fire Protection Bureau – Office of the State Fire Marshal[48]*:* The Bureau is an integral agency supporting fire agencies in King County. The Bureau, located within the Washington State Patrol, provides assistance to fire districts, government agencies, and the general public. These services include fire investigation, fire incident reporting and data collection, fire code review and adoption, construction plan review for fire protection systems, and fire inspections of high risk occupancies housing elderly and vulnerable populations. In addition, the bureau regulates the fireworks and sprinkler industry through a licensing program. They operate the State Fire Training Academy which provides firefighter training certification program through a standards and accreditation process, and on-going specialized training on terrorism, hazardous materials and fire-related issues. The Bureau also coordinates Washington State fire service resources for mobilization during natural or human-caused disasters.

The Department of Natural Resources (DNR)[49]*:* DNR protects and manages valuable assets within the State of Washington, including more than five million acres of land – forests, farms, commercial properties and underwater lands. Two

of their largest and most important responsibilities in resource protection are fire prevention and suppression and regulating forest practices (or timber harvest). They are responsible for wildfire protection on 12 million acres of private and state forest land. They have the state's largest on-call fire department with 1,200 temporary and permanent employees who fight fires on private and state-owned forest lands. DNR offers local fire districts support with fire protection and safety equipment requirements.

Boeing Fire Department (private)[50]*:* Boeing Fire provides vital emergency service resources within the county. Company-wide, they provide fire service to more than 59,000 employees and protect approximately 45 million square feet of floor space that is a combination of manufacturing, hazardous operations, design, flight test and aviation support. In King County, they operate three fire stations, two located adjacent to airfields (Renton Municipal Airport and King County Airport) and a structural/hazmat fire station in Auburn. Boeing Fire employs 135 personnel in Puget Sound, with 91 located in King County. Their fire department structure is essentially the same as for public fire agencies with fire suppression/EMS personnel and staff specializing in hazardous materials, code enforcement, training and safety, fire protection, and firefighting operations specific to aviation. Boeing also provides mutual aid to surrounding public agencies and participates in regional hazardous materials response. Their marine rescue unit in Renton is utilized by the Renton Fire Department. They provide a special resource with their ability to mobilize large quantities of foam for flammable liquid fires and their 5,000 gallon tenders are requested each summer to assist with freeway brush fires. Boeing Fire Department's training division is utilized throughout the county and the world for their expertise in aircraft firefighting, hazardous materials training (including drug labs and explosives) and disaster preparedness.

Fire service trends[51]

For economic and operational reasons, the fire departments, fire districts and fire zones in King County have continued to consolidate. Fire Zones 1 and 2 consolidated in 1997 to form Zone 1, and fire zones 3 and 4 consolidated in 2003 to form Zone 3. There are also examples of fire departments and fire districts consolidating administrative and operational functions. It's likely, given probable future funding constraints, that there will be additional fire district mergers in an effort to control costs.

Regional hazardous materials and special operations teams will be more common in the future. The fire service is evaluating partnerships in emergency medical services and will likely expand those roles as well. This may include an increase in transporting patients from the emergency scene to the hospital and

perhaps more paramedics in the fire service. There has been increased cooperation between fire districts with funding issues at recent elections.

The future will also likely see an increase in joint training, purchasing and a sharing of other resources. The Zone 3 training officers are a good example of what the future holds for the fire service. The training officers have joined together to offer regional training classes, reducing the cost of providing quality simulations for individual fire departments and districts. There will also be more coalitions formed for public education and prevention in the future. Teaching our senior citizens how to prevent falls and working with hospitals to provide low cost and properly fitting bicycle helmets are examples of the partnership services provided.

Emergency Medical Services (EMS)[52]

The Medic One system is a critical part of our regional emergency medical service system. It operates in a coordinated partnership between King County, cities, fire districts, private ambulance companies, hospitals and others to provide pre-hospital emergency medical care. The tiered response system assures that patients receive effective medical care by the most appropriate health care provider. Basic Life Support (BLS) services are provided by first response firefighters trained as Emergency Medical Technicians (EMTs). Advanced Life Support (ALS) or paramedic services are provided by six paramedic agencies that respond to patients with more serious life-threatening illnesses or injuries.

Paramedic providers in the Seattle-King County include Seattle Medic One, Shoreline Medic One, Evergreen Medic One, Bellevue Medic One, King County Medic One, and Vashon-Maury Medic One. These agencies operate a total of 23 paramedic units, with several variations in paramedic service. BLS services are provided by 34 fire departments and fire districts.

The regional Medic One program employs over 250 paramedics and about 4,000 EMTs to provide emergency response to patients in the Seattle-King County area. The EMS Medic One System in King County is managed by Public Health – Seattle & King, a King County government Department Division. In 2007, the Medic One program served over 172,000 patients, of which over 51,000 required a paramedic level response.

Law Enforcement

There are 25 law enforcement agencies in King County: 23 departments associated with cities, one with the University of Washington, and the King County Sheriff's Office. There are approximately 1,954 full-time law enforcement officers in King County, and 1,352 volunteer personnel (600-700 of which are search and rescue). Seattle has an additional 1,100 law enforcement officers.

Basic services provided by police departments include patrol services, crime investigation, narcotics enforcement, public education, crime prevention, school resource officers, animal control and parking enforcement. Most departments have their own jail or holding facility; some have consolidated with other jurisdictions. Many departments also have their own specialty teams. Special Weapons and Tactics (SWAT) teams are available through the King County Sheriff's Office, Seattle Police, Valley SWAT (multi-agency cooperative), and Bellevue/Eastside Police. Bomb disposal units are provided by King County Sheriff's Office, Port of Seattle, Federal Way, Bellevue and the City of Seattle. Seattle Police, Mercer Island Police Services, and King County Sheriff's Office maintain Marine Units. Several agencies use K-9 units and the King County Sheriff's Office has the only helicopter unit in service. Both Seattle Police and the King County Sheriff's Office Special Operations Units provide dignitary protection for significant government officials.

The following table identifies the *overall* crime statistics for all of King County as reported by the Washington Association of Sheriffs and Police to the Washington Office of Financial Management. This data is based on information collected only from reporting agencies.

Table 3-16: Reported Index Crimes – 2007

Crime	2007	%
Theft	53,643	59.2%
Motor Vehicle Theft	13,979	15.4%
Burglary	15,565	17.2%
Aggravated Assault	3,560	3.9%
Robbery	2,738	3.0%
Arson	583	.6%
Forcible Rape	556	.6%
Murder	59	.0%
Total	**90,683**	**100.0%**

Source: Washington State Office of Financial Management – Washington Association of Sheriffs and Police Chiefs

Until recently, police agencies did not have an operational mechanism similar to the mutual aid concept used by the fire service. Efforts to draft a law enforcement mobilization plan at the state level are being developed. Typically, police mutual aid has been informally conducted by small units in what is called automatic aid.

King County Sheriff's Office[53,54]

The King County Sheriff's Office (KCSO) directly serves over 575,000 people in unincorporated areas and thirteen cities for which they provide contract police services including Beaux Arts Village, Burien, Carnation, Covington, Kenmore,

Maple Valley, Newcastle, North Bend, Sammamish, SeaTac, Shoreline, Skykomish and Woodinville, with one proposed, City of Fairwood, to make 14 cities. They also serve as the Metro Transit Police and the King County International Airport Police.

KCSO operates from nearly 25 locations across the county: four police precincts, five stations or substations, and eighteen storefront locations. Over 640 commissioned deputies and 350 civilian employees serve the community in various capacities. In addition to the general services they provide such as traffic enforcement, accident investigation, criminal investigation, emergency communications (911), and community and crime prevention they also offer an array of specialty services including major accident response and reconstruction (M.A.R.R.), air support (Guardian One), automated fingerprint identification (A.F.I.S), fraud and computer forensics, bomb disposal, hostage negotiations, K-9, search and rescue (SAR), Tactical Team 30 (SWAT), marine unit, Metro Transit Police, Child Find Unit, community service officers, vice control, drug enforcement, and court security.

According to state law, the Sheriff's Office has jurisdiction throughout the County; this obliges them to be ready to provide service to other cities in the County if they request it. Sometimes the cities that use the service are asked to pay a fee. Other services are provided countywide, so there is no fee involved.

Table 3-17: King County Crime Summary – 2008

Part 1 Offenses	2008	Crime Rate
Larceny, over $250	4,462	7.75
Larceny, under $250	3,713	6.45
Vehicle Theft	1,843	3.20
Burglary, Residential	3,354	5.82
Burglary, Commercial	790	1.37
Aggravated Assault	511	0.89
Arson	182	0.32
Robbery	425	0.74
Forcible Rape (incl. Attempts)	194	0.34
Criminal Homicide	17	0.03
Part 1 Offenses – Total	**15,491**	**26.90**
Part 2 Offenses – Total*	**20,332**	**35.30**

Source: King County Sheriff's Office – 2008 Annual Report. Includes data for unincorporated King County and contracted cities. The crime rate is calculated on the basis of 1,000 people (i.e., number of crimes per 1,000 people), based on a population of 575,970.

**Summary total of all Part II offenses - crimes committed to a lesser degree than Part 1 Offenses.*

Table 3-18 indicates the majority of activity in 2008 was calls for service, followed by traffic enforcement. Data indicates there is a decrease in activity in all areas, other than the change in gang-related incidents which saw a 40.3 percent increase from 2007.

Table 3-18: King County Police Activity Summary – 2008

Category	Number of Incidents	% Change from 2007
Dispatched calls for service	102,360	-12.7%
Adult charges/arrests	11,215	-10.1%
Juvenile charges/arrests	1,661	-13.2%
Officers assaulted	41	-18.0%
Gang related incidents	1,341	40.3%
Domestic violence*	3,484	-6.7%
Hate crimes/malicious harassment	17	-43.3%

Source: King County Sheriff's Office – 2008 Annual Report. Includes data for unincorporated King County and contracted cities.

Washington State Patrol[55]

The Washington State Patrol is divided into seven Bureaus that administer the activities of nearly 1,000 commissioned officers and more than 1,000 non-commissioned personnel. They include: Field Operations, Fire Protection, Forensic Laboratory Services, Investigative Services, Management Services, Technical Services, and Office of the Chief.

The Fields Operations bureau is primarily responsible for enforcing traffic laws, investigating collisions, and assisting motorists on 17,524 miles of the State's highways. The state is divided into eight districts. District #2, serving King County and northern Pierce County, operates six detachments, with offices located Bellevue (headquarters), North Bend, North Seattle, South Seattle and Enumclaw. The Special Operations Division within the bureau also operates an Aviation Section and Vessel and Terminal Security (VATS). The Aviation Section provides aerial traffic enforcement, traffic congestion management, aerial surveillance, assistance to other agencies, transport of donor organs and blood supplies in medical emergencies, and other governmental services. The Vessel and Terminal Security provides traffic control and law enforcement services on Washington State ferry routes. The Explosives Unit (or bomb squad) provides assistance to agencies and individuals in the rendering safe of identified explosives or suspected explosive devices and materials.

The Investigative Services Bureau (ISB) consists of five divisions that provide various public services, including weighing and inspection of commercial vehicles

and school buses; narcotics investigation and dismantling of clandestine labs; fatality, criminal and missing children investigations; computer forensics; organized crime intelligence; and public records and records retention.

The Technical Services Bureau provides many diverse services to the entire department, other law enforcement and government agencies, and members of the general public. These services include information technology, employee training and development, emergency communications, and criminal history.

The Office of the State Fire Marshal – Fire Protection Bureau, is highlighted in the "Fire Service" section of the Emergency Services profile.

Emergency Communications

9-1-1[56]

There are 12 Public Safety Answer Points (PSAPs) or emergency dispatch centers in King County. The largest of these include Bellevue Eastside Communications, the King County Sheriff's Office Communications, Northeast King County Regional Public Safety Agency, Seattle Police Department Communications, Valley Communications, and Washington State Patrol Communications.

The King County Sheriff's Office, Seattle Police Department and Washington State Patrol dispatch centers answer 911 calls and dispatch for police service only. Northeast King County Regional Public Safety Agency and Valley Communications answer 911 calls for multiple jurisdictions and provide police, fire and emergency medical services dispatch. Many smaller 911 centers answer calls and dispatch for single jurisdictions. The PSAPs offer 24-hour coverage for emergencies and dissemination of Emergency Alert System (EAS) messages.

The County-wide enhanced 911 system consists of the dedicated 911 network, redundant selective routers, and public safety answering points. The 911 trunks between each telephone company central office and the selective routers is maintained at double the number of trunks (lines) needed to ensure that no more than one caller out of 100 will get a busy signal. The 911 trunks between the selective routers and the five largest dispatch centers are on a self-healing network service to minimize the chance of a service outage. Redundant selective routers ensure that if one router is disabled and unable to provide service, the E-911 system would continue to function at half capacity.

Each dispatch center has a back-up system established where 911 calls can be answered if they are unable to provide service. All back-up systems are located at other communication centers within the King County Enhanced 911 system. Each PSAP is required to have an emergency power source that is capable of

supplying power to meet their basic operational needs. Additionally, each PSAP has implemented security procedures to limit access to their facilities.

Funding for the Enhanced 911 system is provided through dedicated 911 excise taxes on wireline and wireless phones. A portion of these funds are distributed to the PSAPs to assist in funding and operational costs of answering 911 calls. The majority of funding for the PSAPs is provided by local jurisdiction general funds or user agency fees.

Only once was the King County Sheriff's Office 911 center directly impacted by an event; as a result of the Nisqually earthquake there was a temporary relocation of the Sheriff's dispatch operations to Precinct Based Emergency Communications (PBECs). During the World Trade Organization meetings held in Seattle there was some impairment of operations for staff coming and going to their work locations.

There is the potential that funding constraints will continue to motivate the consolidation of PSAPs into fewer operations.

Emergency Management

State Law requires every political jurisdiction in Washington State to have a designated emergency manager and a plan on file with the Washington State Emergency Management Division. In many cases, the fire chief or police chief has the added duties of emergency manager. In some cases, the emergency manager is the public works director (Federal Way). Larger cities (Seattle, Bellevue, Redmond, Mercer Island, and Kent) have full-time emergency management professionals and more cities are following suit. In 2007, a consolidated Emergency Planner was assigned to work for four autonomous jurisdictions; the Cities of Sea Tac, Normandy Park, Burien, and Des Moines. Very few cities have dedicated locations for the coordination and management of emergency operations. Most convert existing space and existing resources for emergency uses.

King County Office of Emergency Management

The King County Office of Emergency Management has its roots in civil defenses as an office in the King County Sheriff's Department. In 1991, the office became a civilian organization with a broader, all-hazards mission. The initial staff consisted of a manager, two professional staff and administrative staff with offices co-located with the Sheriff's Communications Center in the King County Courthouse.

Organizationally, the office is now part of the Department of Executive Services. The current 2009 staff includes a director, assistant director, eight full-time professional staff, three AmeriCorps VISTA Volunteers, one accountant, one administrative staff, and two term-limited employees. Program assignments include operations of the King County Emergency Coordination Center (KC RCECC), regional planning, logistics, exercises, training, public education, Green River flood planning, and homeland security. Since 1991, the office has provided support to first responders and citizens of King County during ten presidentially-declared disasters and numerous other local emergencies.

All municipalities in Washington State are required to have an emergency management program as defined in the Revised Code of Washington 38.52. King County Emergency Management has an obligation to the citizens and responders of unincorporated King County. The office also supports the cities of King County and coordinates resources between jurisdictions during emergencies. Increasingly, the office works toward regional solutions to disaster, pre-disaster mitigation, preparedness, and response and recovery issues.

Some small cities have formed cooperative arrangements for Emergency Services Coordinating Agency (ESCA) – cooperative employment of emergency management support for seven cities on both sides of the King County/Snohomish County borders.

The vision for the King County Office of Emergency Management is to produce "disaster resistant communities."

King County Emergency Coordination Center (*ECC) Support Team* *56.1*
(new for 2009)

The King County Emergency Coordination Center (ECC) Support Team was formed in 1995 to provide support services to the King County Office of Emergency Management (OEM) during disasters and emergency events. The ECC Support Team is a non-profit, all volunteer, community service organization that exists under the Washington Administrative Code (WAC) 118-04 guidelines of the Emergency Worker Program. Membership is open to individuals with an interest in providing vital emergency operations support to the community during a disaster or emergency situation. Members must be registered as State Emergency Workers and submit to a criminal history and driving record background checks before participation. Currently, KC OEM has approximately 25 ECC Support Team members, and continues to recruit qualified new members via an application on their website.

ECC Support Team Profile

The ECC Support Team is made-up of professionals who volunteer their time to support the ECC during activations and other activities. Support Team members come from a variety of sectors, including local businesses such as Microsoft and Boeing, the health care field, fire departments and communication centers. Some members are retired and simply wish to share their skills during disasters. All members bring special talents to the ECC and participate in a broad spectrum of activities to:

- Work closely with ECC Program and Operation Managers.
- Fill leadership and support roles during ECC activations.
- Participate in ECC projects, programs and activities.
- Support "Communications Room" activities and communication capabilities.
- Assist in training, curriculum development and instruction.
- Develop recruitment strategies and promote ECC Support Team growth.
- Coordinate the application, review and approval process for volunteers.
- Provide a mentoring program for new ECC Support Team new members.
- Maintain membership data and training records.

Regional Catastrophic Preparedness Program (new in 2009) *56.2*

In response to direction by Congress to develop "all-hazard regional catastrophic event plans and preparedness," FEMA and the Department of Homeland Security have established the Regional Catastrophic Preparedness Grant Program (RCPGP), and released grants to the ten largest urban areas in the country. To implement this Program, the City of Seattle Office of Emergency Management has stepped into a new leadership role with the larger Puget Sound region that surrounds and is partner to the City of Seattle.

The Puget Sound Regional Catastrophic Preparedness Planning Program (RCPPP) is intended to enhance regional catastrophic preparedness and continuity of operations efforts, with the aim of strengthening the region against risks associated with catastrophic events. As a county, planners will work to:

- Fix shortcomings in existing plans;
- Build regional planning processes and planning communities;
- Link operational and capabilities-based planning to resource allocation.

To accomplish these tasks, a collection of local, state, federal and tribal government agencies, private sector partners, subject matter experts and others within the Puget Sound region must work collaboratively and innovatively.

As the name of the grant implies, the main principle of this planning grant is that the scenarios being planned for are catastrophic in nature: truly debilitating disaster events. Given this, the assumption is that local and state resources will be overwhelmed and that outside assistance via Emergency Management Assistance Compacts and the federal government will be both necessary and critical.

King County Emergency Management is on the planning team as a primary representative. Regional planners at the local, state and federal levels, alongside private sector and associated response communities, will work together to develop integrated plans to coordinate, respond to and recover from catastrophic events.

The Puget Sound Region, defined for the purposes of this RCPG, is the Seattle Urban Area (UA)/Combined Statistical Area (CSA), and includes the seven Puget Sound counties and select major cities located therein. The region is home to a population of approximately 3.3 million. The governmental jurisdictions involved with the Puget Sound RCPPP Region are shown on the map below.

Local Emergency Planning Committee

WAC 118-40 requires every county to have a Local Emergency Planning Committee for hazardous materials release planning.

Washington State Emergency Management Division[57]

Washington State Emergency Management Division (EMD) coordinates emergency management programs and activities with local governments, public agencies, private organizations, businesses and communities. EMD is a division of the Washington State Military Department that includes the Washington Army and Air National Guard. In addition to the Emergency Management Division's Director's Office, there are four units within the division: Enhanced 911; Mitigation, Analysis and Planning; Response and Recovery; and Policy, Programs and Training.

Emergency Management Trends

Emergency Management has experienced radical shifts in priorities over the last decade. Following the end of the Cold War in the early 1990s the Federal Emergency Management Agency (FEMA) began an era of emphasis on natural disasters. This was followed by a period of particular emphasis on disaster mitigation. Both King County and neighboring Pierce County joined forces to do regional mitigation projects under the Project Impact umbrella that was the focus of FEMA's efforts at pre-disaster mitigation programs.

Following the attacks of September 11, 2001 emergency managers experienced a radical shift in priorities. FEMA is no longer the lead for counter terrorism efforts and has been replaced by the Office of Domestic Programs which controls the Homeland Security funding for state and local jurisdictions. Tens of millions of dollars in Homeland Security funding has been allocated to programs in King County. There are a limited number of personnel in emergency management organizations. Given this significant distribution of funding, it compelled emergency management programs to focus almost entirely on Homeland Security issues for a number of years. The forecast is for this trend to continue as long as funding remains plentiful and natural disaster events do not eclipse the hazard of terrorism. Towards the end of this decade, the funding is gradually being reduced and natural disaster planning is again a priority given the emerging man made and natural disaster risks in King County in 2009, and State of Washington overall.

Search and Rescue[79]

King County Search and Rescue (SAR)

Under state law, the King County Sheriff's Office is the agency designated with Search and Rescue (SAR) responsibilities. In King County, the SAR unit is managed by one full-time uniformed deputy and 18 deputies for whom SAR is an ancillary duty, but is largely supported by 9 volunteer units. Over 760 volunteers participate in search and rescue activities. Groups include 4 x 4, trackers, search dogs, and the Ski Patrol and Rescue Team (SPART). Members of several SAR units have participated in numerous evidence searches, including the Green River killer investigation. In 2002, they conducted 132 searches for missing skiers, aircraft, persons, and injured or lost hikers. Volunteers operating on SAR missions are registered emergency workers (per WAC 118-04).

The King County Sheriff's Office provides search and rescue services throughout the entire County, including incorporated areas. They also provide mutual aid to adjacent counties in the State. While the County funds a full-time sheriff deputy to oversee SAR volunteer units and operations, much of the funding for this programs comes from private donations.

Washington State Urban Search and Rescue (USAR)

The Washington State Urban Search and Rescue Taskforce #1 is comprised of fire, police, emergency medical services (EMS) and hospital professionals from the City of Seattle, King County and Pierce County. The taskforce has three platoons that are available for deployment at anytime. They respond to major incidents that require extensive search and rescue operations. The Washington State Task Force has been deployed to the Atlanta bombing, Salt Lake City Olympics, Northridge Earthquake, World Trade Center, Oklahoma City bombing and hurricanes impacting the Gulf States. The group maintains a supply of materials and equipment to support self-sufficient operations anywhere in the world. It is able to organize its members and load and depart within 72 hours of notification. The local USAR Task Force gets its funding from FEMA and from local contributions.

Public Health

Public Health – Seattle & King County (PHSKC) is a jointly operated agency covering cities and unincorporated areas of King County. A wide range of services are provided to citizens of King County, from food service inspections and health clinics including Jail Health Services in King County, environmental services, to epidemiological and medical examiner's office responsibilities. Medic One (Advanced Life Support – ALS) and the Medical Examiner's Office are both operated under the health department.

The top official in the PHSKC is empowered by state law as the lead authority for health-related emergencies that extend from water supply issues and outbreaks of the flu to immunization and biological terrorist agents.

PHSKC has greatly increased its commitment to emergency operations relating to public health emergencies with the addition of the Preparedness Section within the Office of the Director for emergency management and planning personnel. Grants and priorities are commonly being directed at planning for response to health emergencies and protecting the public's confidence in the health care system. A continuation of this trend is expected for the near future with the swine flu epidemic and planning for vaccination and dispensing protocols, and possible use of Medical Shelter that could be used under a number of potential hazards.

Hospitals – Emergency Care[4]

As a healthcare center for Alaska, Idaho, Montana and Washington, King County offers a comprehensive selection of high quality healthcare facilities, services and personnel. The region's medical and nursing services feature sixteen special centers for Children's diseases, drug abuse and alcoholism, burns, cancer, pain and other traumas, kidney ailments and transplants, psychiatry and disability rehabilitation.

The Puget Sound region has 45 general acute hospitals with 9,400 beds, staffed by over 38,000 employees. Sixteen special purpose centers serve the area. Over 15,000 medical personnel staff these facilities. The University of Washington's medical facilities together handle more than 450,000 patient visits each year.

There are 22 licensed hospitals in King County. Of these, three are public hospitals and the others are private or nonprofit institutions. Of the 22 hospitals, Harborview is listed as a Level 1 Trauma Care facility, three are listed as Level 3 Trauma Care Facilities and four are listed as Level 4 Trauma Care Facilities.

Local hospitals have their own system for managing hospital resources during emergencies. For local emergencies, Harborview, operated by the University of Washington, acts as central "hospital control" for the distribution of patients during a mass casualty incident or health emergency. Hospital Control monitors unusual numbers of symptomatic patients, bed counts (occupancy), and the distribution of patients transported by aid units. The region has a mass casualty plan (MCI). Evergreen Hospital, Overlake Hospital and Harborview Hospital have advanced life support (ALS) programs.

Other Emergency Services-Related Organizations

Private Ambulance

Private ambulance companies provide transport services of non-critical care patients to hospitals and other health care providers. This essential service allows emergency service workers to get back into service more quickly. Private ambulance companies are also a critical resource during major incidents. They provide many other services including hospital-to-hospital transport and transport of private non-emergency related patients. There are two major ambulance companies serving the King County area – American Med Tech and Tri-med.

Airlift Northwest[58]

Seattle-based Airlift Northwest provides rapid emergency air-transport service to critically ill or injured patients throughout Washington, Alaska, Montana, Idaho and Western Canada. When responding to emergencies in the Western Washington area, Airlift Northwest uses one of four fully-dedicated Agusta A109/Mark II helicopters based in Seattle, Bellingham, Arlington and Puyallup. Flight teams consist of two registered nurses with extensive critical care trauma experience. The Seattle, Arlington and Puyallup flight teams include one neonatal/pediatric critical care specialist.

Civil Air Patrol[59]

Civil Air Patrol (CAP) is a nonprofit organization that has long been associated with search and rescue missions. They have over 64,000 members nationally and cover eight geographic regions, including all 50 states. Its work also includes disaster relief and communications, as well as counter-drug and homeland security missions. CAP members fly 95 percent of all federal inland search and rescue missions, as directed by the Air Force Rescue Coordination Center at Langley Air Force Base, Virginia. On the average they help save 100 lives a year. CAP also provides air and ground support for disaster relief, flying officials to remote locations, transporting blood or live tissue to critical care sites and performing aerial damage assessment. King County is in the CAP "Pacific Region" and is served by the "Washington Wing."

Education[1,2,4,6,60,62-3]

Education in King County is a major factor in the county's economic success. The educated labor force capability spans traditional skills from basic manufacturing to new technologies, including software and biotechnology research. The ability of the workforce to develop and adapt to changing business,

public and commercial needs is supported in large part by the educational infrastructure and systems based in the county.

King County is a highly educated community in which more than 90 percent of the adult population has graduated from high school and 40 percent, or 475,000 people, have a college education with a Bachelor's degree or higher. In the United States as a whole, just 80 percent have high school diplomas, and 24 percent of adults have college degrees. In the County, of those adults who do not have a college degree, at least 280,000 have some level of college experience.

Child Care and Early Learning[4]

There are 643 licensed child care centers in King County, or 30 percent of the state's total. Total capacity for child care centers equals 39,874 children, or 33 percent of the State's total capacity. These facilities have an average of 62 children per licensed facility.

Public preschool programs provided by school districts enroll approximately 2,503 students, about 25 percent of the State's public preschool total. Preschool enrollment in private schools is much larger; 3,883 students are enrolled, representing nearly half (48 percent) of the state's private pre-school enrollment.

Public Primary and Secondary Education[1,60]

About 26 percent of all children attending school in Washington State live in King County. King County has 20 school districts serving over 250,000 students in grades K through 12. The County's largest school districts include Seattle, Kent, and Lake Washington. The Seattle school district enrolls 45,968 students; Kent has 27,444 and Lake Washington has 23,937 students.

The majority, about 56 percent, of public school students in the County are in elementary grades. Younger students, pre-school and kindergarten age, make up approximately 17 percent of the total public school student population.

Table 3-19: School Enrollment – Pre-school through High School

Pre-school	Kindergarten	Elementary	High School	Total
31,153	21,552	178,889	87,382	259,269*

Source: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000
**2008 AGR*

According to the Office of Superintendent of Public Instruction, as of 2005 the graduation rate for King County was 76.5 percent.

Across the county there are nearly 500 buildings that comprise physical educational facilities. The majority of structures house elementary grade students.

Table 3-20: Types of Educational Buildings

School Level	Number of Buildings
Alternative School	68
Complete School	2
Elementary School	271
High School	56
Institutional	6
Junior High School	28
Middle School	41
Special Education	24
Vocational School	1
Total	**497**

Source: WA State Office of Superintendent of Public Instruction – WA State Public School Building Count by County and District, 2002-2003

Private Education[1,60]

Private schools in the county are numerous, accounting for approximately 38,500 students or 46 percent of the state's private school population. Data is not readily available for the types and age of private school structures.

Home Schooling[1,4,60]

There are 3,697 registered home-school students in King County, representing 19 percent of the state's total. These students are typically home-schooled in a family education setting. There are 2,178 such home schools, which averages 1.7 students per school environment.

Post - Secondary Education[62-3]

King County offers an extensive network of schools for post-secondary education, including the University of Washington, eight private colleges and universities, eight community colleges and two technical colleges.

Table 3-21: Post-Secondary School Enrollment		
Type of School	**Enrollment**	**%**
University of Washington	44,812*	29.1
Private Colleges and Universities	17,799	11.5
Community Colleges	62,030	40.1
Technical Colleges	30,066	19.3
Total	**154,707**	**100.0%**
Source: Economic Development Council of Seattle & King County **December 2007, includes Bothell and Tacoma campuses*		

The University of Washington (UW) is a recognized leader in aerospace engineering, fisheries, oceanography, forestry, nuclear engineering, medical technology and bioengineering. The UW Medical School is a world-class facility serving the western states of Alaska, Idaho, Montana and Washington. There are nearly 45,000 students enrolled at the UW; the majority, over 40,000 is located at the main Seattle campus and about 1,870 are located at the campus in Bothell and 2,700 at the campus in Tacoma. The university owns and/or leases a significant amount of property, numbering over 400 buildings.

Private colleges and universities account for about 12 percent of the total post-secondary school enrollment in King County. The four major private universities, along with other private institutes, enroll 17,799 students. Major private colleges and universities include:

Antioch University – Seattle
City University – Renton, Bellevue
Seattle Pacific University – Seattle
Seattle University – Seattle

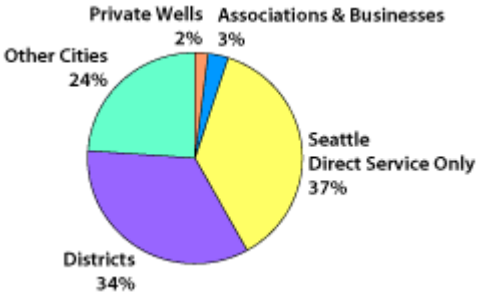
Nearly one-third of the state's community and technical colleges are based in King County. They account for the majority of post-secondary school enrollment. These schools play a pivotal role in providing alternative post-secondary education opportunities to individuals who wish to either transition to a university via community college, or pursue specialized training or trades. These types of colleges have become increasingly important due to the influx of people involved in retraining or changing career paths. Technical colleges in King County account for about 35 percent of the state's total enrollment in this type of post-secondary school. Community and technical colleges in King County include:

Bellevue Community College - Bellevue
Cascadia Community College – Bothell
Green River Community College – Auburn
Highline Community College – Des Moines
Lake Washington Technical College – Kirkland

North Seattle Community College – Seattle
Renton Technical College – Renton
Seattle Central Community College – Seattle
Seattle Vocational Institute – Seattle
Shoreline Community College – Seattle
South Seattle Community College – Seattle

Resources[4,64,66,67,71]

Water[64]



County citizens receive potable water from a variety of sources. These sources are classified as either private or public water systems. Private water systems serve only a single connection and usually consist of a well used for a single home. There are approximately 12,000 private water systems in King County.

Public water systems contain more than one connection. The majority of public systems are managed by municipalities and utility districts; homeowners, private nonprofit organizations, and private for-profit companies manage the rest, about five percent.

Public water systems are further classified by size. A public water system is classified as a Group B system if, in general, it serves from two to 214 connections. About 1,700 Group B public water systems currently operate in King County. In general, Group A systems serve 15 or more connections. There are 217 Group A public water systems in the County.

Seattle Public Utilities (City of Seattle) provides the majority (about 90 percent) of potable water for County residents, about 1,300,000 people, either through direct service or the sale of water to 27 other water utilities.[65] The remaining King County population, about 400,000, obtains water from approximately 14,000 other public and private systems.

Water and combination utility districts provide about one-third of water service to the county residents. They own and operate the infrastructure that stores and distributes water for both consumption and fire suppression activities. Similar to the emergency services sector, utility departments also operate under mutual aid agreements.

Municipalities other than Seattle provide water service for their communities. They also own and operate utility infrastructures. Some municipalities contract for water services through other agencies.

About 60-70 percent of the County's water comes from the Tolt Reservoir and 20-30 percent comes from the Cedar River Drainage Basin. Pierce County/Tacoma receives 90 percent of its water from the Palmer facility located in South King County[65].

Our supply of potable water is dependent on the area's watersheds. The watersheds located within King County are: Central Puget Sound Watershed, Sammamish Watershed, Snoqualmie – Skykomish River Watershed, Cedar River – Lake Washington Watershed, Green River Watershed and White River Watershed.

The rain, rivers, lakes, wetlands and even our drinking water are all parts of an intricate cycle. Everything that washes into a storm drain ends up in a stream, lake or wetland. Conversely, activities occurring within our watersheds can impact this valuable natural resource. Watershed boundaries are determined by the land and not city limits, so watersheds in one community can extend into neighboring jurisdictions, making this a regional priority

A watershed in King County is the land area draining to a nearby river or lake, or directly into Puget Sound. 2009 map.

In general, most of the time the region has plenty of water available. During the summer, however, water use increases from 50 to 250 percent because of irrigation of lawns, golf courses, and parks. Accommodating this peak demand can impact human water needs and migrating salmon in the fall. Managing summer peak demand and in-stream flows during the early fall period are issues driving current multi-county discussions.

Waste Water Treatment[66]

King County Department of Natural Resources and Parks – Wastewater Treatment Division provides wholesale wastewater treatment to 17 cities and 17 sewer districts (including Vashon Island Sewer District) in the central Puget Sound region. The King County system serves approximately 1.5 million people, including most urban areas of King County and parts of south Snohomish County and North Pierce County. The service area is 420 square miles (including 250 acres on Vashon Island). The County has four treatment plants located in Seattle, Renton, the city of Carnation, and on Vashon Island. This system is connected by 350 miles of conveyance lines (pipes) with 42 pump stations and 19 regulator stations.

In 2011, a fifth plant (Brightwater) serving north King and south Snohomish Counties will open. There are six other wastewater utilities in King County that do not participate in the regional system.

Solid Waste[67]

King County is responsible for planning, transfer and disposal of solid waste from its unincorporated area, and through interlocal agreements for 37 of its cities, not including Seattle and Milton. The King County system provides service to about 1.3 million residents over a service area of approximately 2,050 square miles. Washington State Law prohibits King County from providing collection services.

Seattle operates an independent system and Milton is part of the Pierce County solid waste system. Seattle Public Utilities provides waste collection and disposal services for more than 500,000 customers. Enumclaw and Skykomish also provide their own solid waste collection services, delivering solid waste to King County facilities.

There are eight King County Solid Waste Transfer and Recycling stations and two Drop Box stations, where hauling companies, businesses and King County residents can dispose of solid waste. These facilities accept solid waste and

consolidate it into fewer, larger loads which are transported to the Cedar Hills Regional Landfill. Some of these facilities have the ability to accept separated recyclable materials and yard waste for processing by the private sector. Cedar Hills occupies 920 acres with approximately 400 acres available for landfill and support functions.

The County is currently developing a Solid Waste Comprehensive Management Plan, and is considering alternatives that would extend the life of the Cedar Hills Regional landfill from three to approximately thirteen years beyond its current estimated closure date of 2018. Once Cedar Hills has reached capacity, the County will need to examine other alternatives for solid waste disposal. Seattle ships their solid waste, via rail, to eastern Washington and Oregon.

Electricity

Two major electric utilities serve King County customers: Puget Sound Energy and Seattle City Light.

Puget Sound Energy (PSE) is the largest combination natural gas and electric utility in the Pacific Northwest. Serving more than 1 million electric customers and 750 natural gas customers in 11 Washington State counties, its 6,000 square mile service territory covers the largest metropolitan region north of San Francisco and west of Chicago. PSE purchases 65 percent of its electricity primarily from plants on the mid-Columbia River; Bonneville Power is one of its major power providers. The remainder is produced at their own generating facilities located in Washington and Montana, including the Baker River Hydro Project, White River Hydro Project, and Snoqualmie Falls Hydro Plant. Almost half, about 47 percent, of electrical energy consumption is residential; 37 percent is commercial; and 17 percent is used by the industrial and transportation sectors[69].

Seattle City Light is the seventh largest public power system in the United States. It transmits and distributes electricity to more than 348,000 residential customers and more than 39,000 non-residential customers. At 82 percent of its generation, City Light has the highest percentage of hydropower in the region. It obtains most of the remaining power from the Bonneville Power Administration[70].

Natural Gas[4,71]

Puget Sound Energy (PSE) is the sole distributor of natural gas to consumers in King County. PSE purchases gas from Canada and the Western United States. About 61 percent of its gas supply comes from Alberta and British Columbia.

Washington State is served by major transmission pipelines from Wyoming, Colorado and Utah. About 39 percent of our natural gas comes from the western United States. About half the natural gas consumed is for residential purposes; 27 percent is for commercial uses; and 25 percent is used by the industrial and transportation sectors.

Fuel Transmission Systems

Williams produces and delivers about 12 percent of the natural gas consumed in the United States. It has three interstate pipelines that serve major markets around the country, including the Seattle and Portland areas. The Williams' Northwest Pipeline system transmission system is a primary artery for the transmission of natural gas to the Pacific Northwest and Intermountain region. The 4,000-mile bi-directional transmission system crosses the states of Washington, Oregon, Idaho, Wyoming, Utah and Colorado. It also provides access to British Columbia, Alberta, Rock Mountain, and San Juan Basin gas supplies. Within King County, the pipeline parallels the Interstate-5 corridor[71].

The Olympic Pipe Line Company, operated by BP Pipelines, North America, is a 400-mile interstate pipeline system that runs along a 299-mile corridor from Blaine, Washington to Portland, Oregon. The system transports gasoline, diesel, and jet fuel. This fuel originates at four Puget Sound refineries, two in Whatcom County and two in Skagit County, and is delivered to Seattle's Harbor Island, Seattle-Tacoma International Airport, Olympia and Vancouver, Washington, and Portland, Oregon. BP Pipelines (North America) is the second largest liquids pipeline company in the U.S., transporting over 450 million barrel-miles of oil, refined products, natural gas liquids, carbon dioxide, and chemicals daily - about nine percent of the U.S. liquids pipeline market[73].

Telecommunications[4]

King County's telecommunications sector is one of the fastest-growing service industries. In addition to regular telephone or cable copper, telecommunications encompasses fiber optics, wireless (cellular and satellite) technology, and now laser/microwave transmission in urban parts of the region. High-tech companies, such as data centers, "e-tailers," Internet service providers, and even industrial/distribution companies are in a rush to gain access to fiber optic nodes (or "pipes") to transmit necessary data at quick and uninterrupted speed. Virtually all metropolitan, suburban and many rural areas in King County are served by digital switching technology to ensure unencumbered access to quick data transmission.

The backbone of this advanced telecommunications system is fiber optic cable, which allows improved data transmission. More than 1,000 route miles of fiber optic cable allow lightwave transmission throughout King County's busiest

exchanges. Virtually all metropolitan areas in the Northwest are served by digital switching technology ensuring faster data transmission, increased capacity and maximum clarity.

In King County, consumers have access to modern cellular/wireless networks that are ahead of many parts of the country. The major carriers have widespread coverage throughout the state of Washington and are connected to national networks.

Land Use, Development and Growth[1,74,75,76,77]

This section was reviewed and updated by DDES for the 2009 update.

In 1990 the Washington State Legislature passed the Growth Management Act (GMA). For the first time in the State's history, all urban counties and cities were required to develop and adopt comprehensive plans designed for a 20-year growth period, and regulations to implement the plans. To achieve an inter-jurisdictional coordinated countywide plan, GMA further required that King County and its 39 cities first develop framework policies – the King County Countywide Planning Policies (CPPs).

Designated Urban Growth Areas

Designated Urban Growth Areas (UGAs) originated as a result of the Washington State Growth Management Act which encourages a greater share of growth in urban areas and limits growth in rural and resource areas. King County's Urban Growth Area covers 460 square miles of the County's total land area of 2,134 square miles; the unincorporated portion of the UGA is now about 60 square miles. Within King County, the designated Rural Area and Resource Lands are unincorporated; there are six urban-designated cities within the rural areas: Duvall, Carnation, Snoqualmie, North Bend, Enumclaw and Skykomish.

Urban centers in King County are areas with concentrated housing and employment, supported by high capacity transportation systems and retail, recreational, public facilities, parks and open space. Much of the growth in employment, and a significant share of new housing, is occurring in urban centers. The Urban Centers are linked by the high-capacity transit system, with transit stations located within walking distance. Each center has its own unique character, and they are designed for livability and pedestrian orientation. Smaller concentrations of businesses are distributed throughout the urban area and focus on providing goods and services to surrounding residential areas. They are linked to Urban Centers by an effective local transit system.

The King County Urban Growth Area contains nearly 22,000 acres of vacant or potential redevelopable residential land. The largest acreages of land supply are

in unincorporated South King County (3500 acres) and in the county's 39 cities themselves (17,250 acres).

Vacant land accounts for 35 percent of the land supply in urban King County while 65 percent of the land supply is potentially redevelopable. More than 80 percent of the land supply is in single family zones, but more than two-thirds of the capacity on residential land is in mixed-use and multi-family zones. Today, there is ample room for new development within the Urban Area.
See **Map 3-15: Urban Growth Boundaries** and see **Map 3-16: Land Use**.

Annexations

Since 2004 36,000 residents have annexed into cities. In 2008 residents of the Benson Hill Communities, Lea Hill and Auburn West Hill potential annexation areas annexed to the cities of Renton and Auburn. Residents of the North Highline and Panther Lake annexation areas will annex to Burien and Kent in 2010; residents of Juanita, Finn Hill and Kingsgate annexation area will annex to Kirkland in 2011. The 2010 and 2011 annexations will affect approximately 72,100 residents. All annexations noted above represent over 16,000 acres moving from unincorporated to incorporated status.

Rural and Natural Resource Lands

The rural areas first formally identified in 1985 King County Comprehensive Plan and again designated under the Growth Management Act in 1994 remain preserved on a long-term basis with a clear boundary between rural and urban areas.

King County's rural area, including communities such as Hobart Plateau, Vashon Island, Snoqualmie Valley and Enumclaw Plateau, contains predominantly low-density residential development with a wide variety of homes found in rural cities, small historic towns, and scattered on lots in a broad range of sizes. Rural resource areas are characterized by extensive forests, small-scale farms, free-flowing rivers and streams that provide high-quality habitat for fish and wildlife, and watersheds crucial for both fisheries and flood control. Large-scale commercial forestry and mining have been traditional land uses in the eastern half of the County where soils are thick and rocky, while farming continues in primate soils found in river valleys. Many rural residential communities are focused on scenic resources such as lakes, rivers and territorial views, or lifestyle activities such as keeping horses. There are numerous historical sites, archaeological sites and regionally important recreation areas.

The glacial soils and terrain in the rural resource areas also create significant environmentally sensitive areas such as steep, erodible slopes, wetlands and ground water recharge areas. Maintenance of tree cover, natural vegetation and

wetlands are critical to prevention of erosion, flooding, property and habitat damage, the continued function of the ecosystem and preservation of rural character.

Land Use Trends and Growth Targets

An additional 200,000 people will live in King County by the year 2020 bringing the total population to just over 2,100,000[7]. King County is continuing to develop land primarily in urban areas. The County is nearing its goal of 25 percent growth occurring in urban centers and the percent of rural development has stabilized at around four percent. There is adequate land supply and capacity to meet both housing and job targets through 2022 and beyond. The County has an inventory of regional parks and trails, and 25,000 acres of open space.

Policies, Regulations, and Codes

There are numerous policies, regulations and codes that govern our environment and way of life in King County. Some are federal requirements and others are directed by the state, regional and local agencies. Components of these documents can relate to or impact hazard mitigation activities. Examples include building and construction codes, fire codes, growth management plans, land use plans, flood management, shoreline regulations, environmental regulations, endangered species legislation, waste and land management, and disaster response plans. A complete listing of policies, regulations and codes, along with specific references applicable to hazard mitigation, are identified in **Annex F: Policy and Program Analysis** and in the **Capabilities Table (Section 6)**.

Regional Profile Endnotes:

[1] 2008 King County Annual Growth Report
[2] Washington State Hazard Mitigation Plan – Regional 6 Profile, Sept 2003 Draft
[3] King County Website – http://www.kingcounty.gov
[4] enterpriseSeattle – http://www.enterpriseSeattle.org
[5] Western Regional Climate Center – http://www.wrcc.dri.edu/
[6] U.S. Census Bureau, 2000, 2008 Census Data - www.census.gov
2008 Census estimates - http://quickfacts.census.gov/qfd/states/53/53033.html
[7] Washington State Office of Financial Management, *April 2009 King County Report* - http://www.ofm.wa.gov/localdata/king.asp
[8] One Night Count of Homeless People, June 2000; and Data on Homeless Youth in King County, Oct 2001, City of Seattle Human Services - www.cityofseattle.net/humanservices
[9] King County Taxing District Summary 2008 Property Taxes, King County Assessor's Office.
[10] King County Website, Ron Sims Background Information, and Operation of the Council, About King County Government - http://your.kingcounty.gov/exec/about.aspx, http://www.metrokc.gov/mkcc/mkccresp.htm, http://www.metrokc.gov/mkcc/newabout.htm
[11] King County Executive Proposed 2008 Budget – Economic and Revenue Forecast.

[12] Port of Seattle website – www.portseattle.org
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Section 3 Maps

Attachment A
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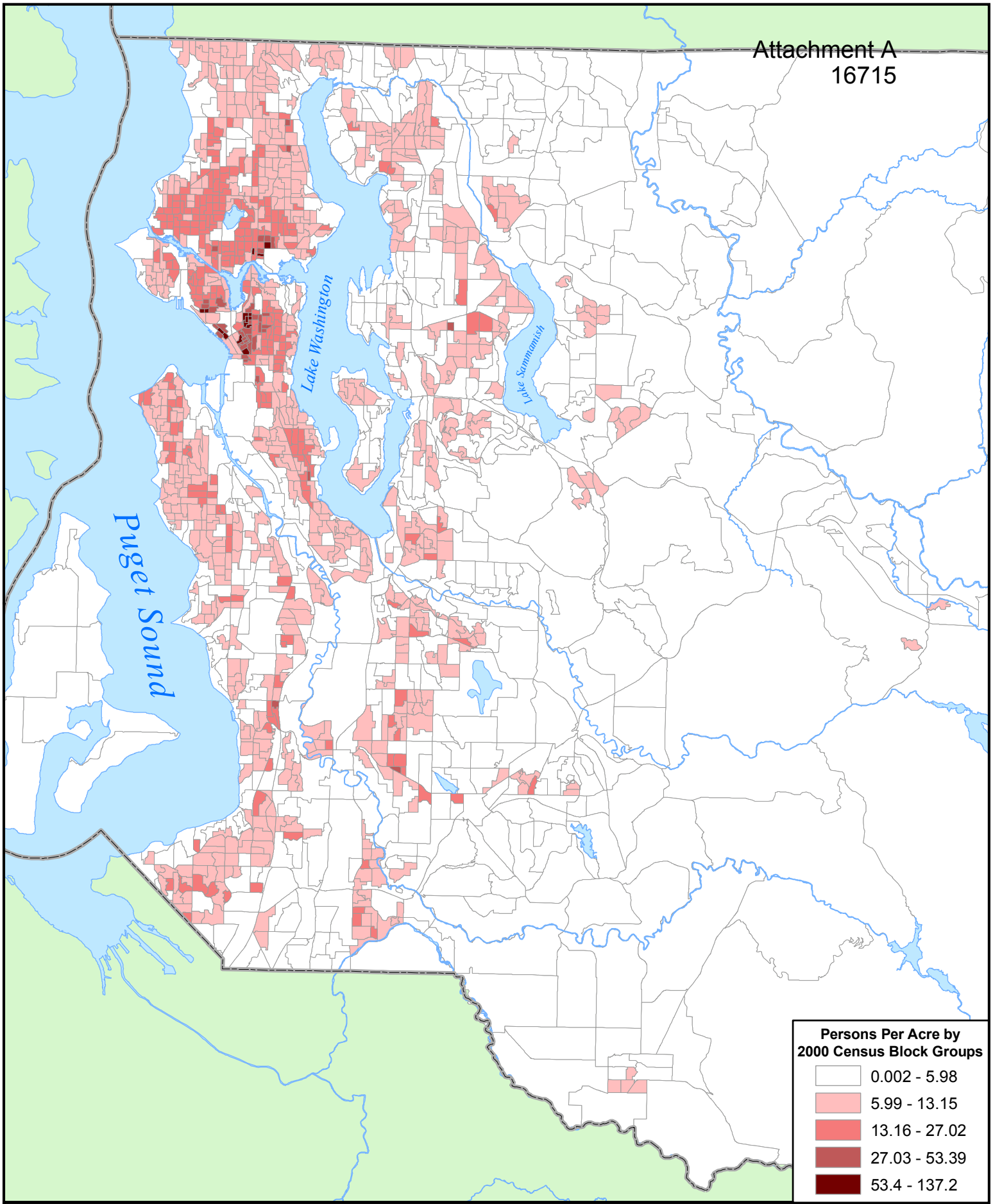

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2009 King County Regional Hazard Mitigation Plan

Population Density

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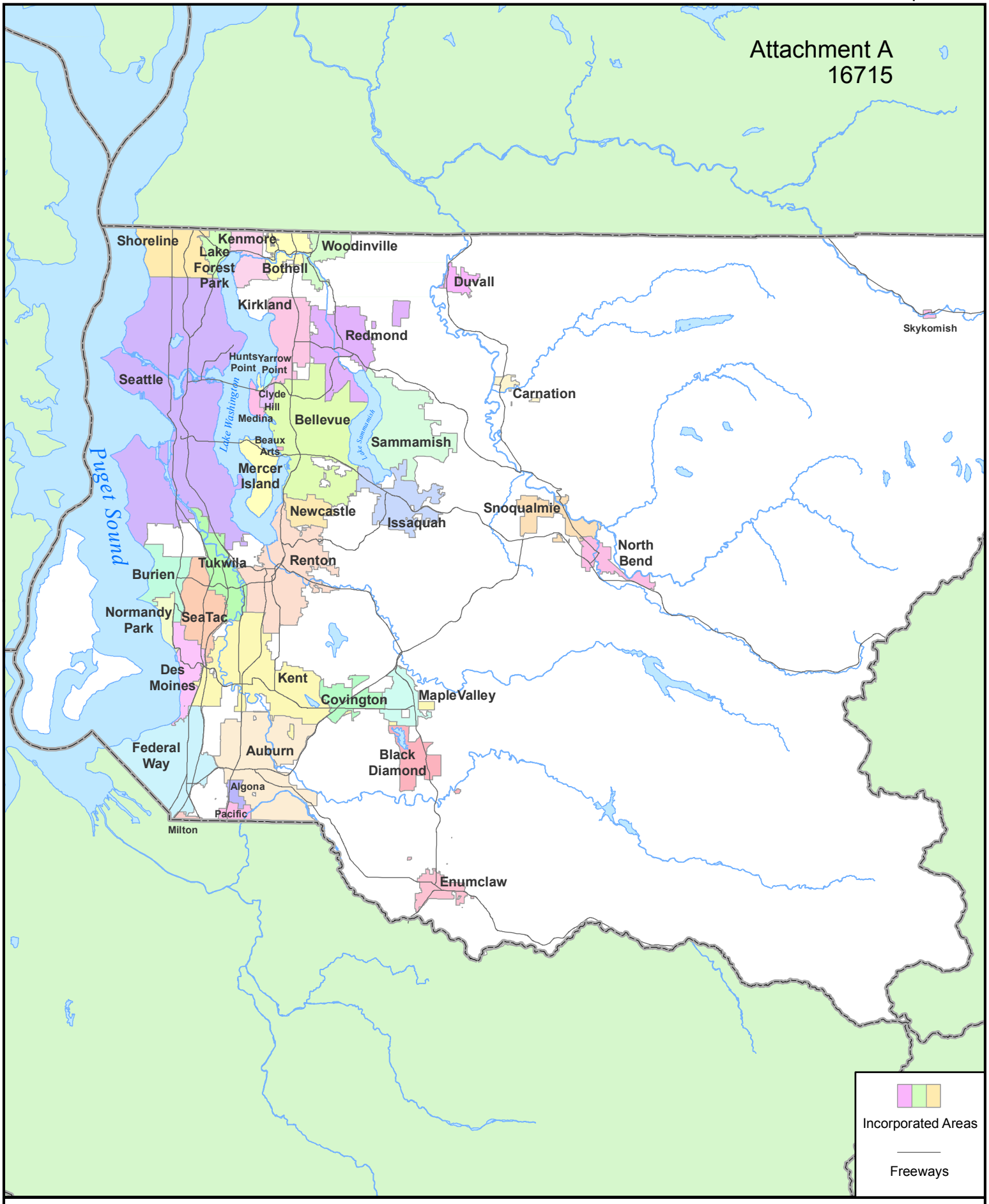

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2009 King County Regional Hazard Mitigation Plan

Incorporated Cities & Towns

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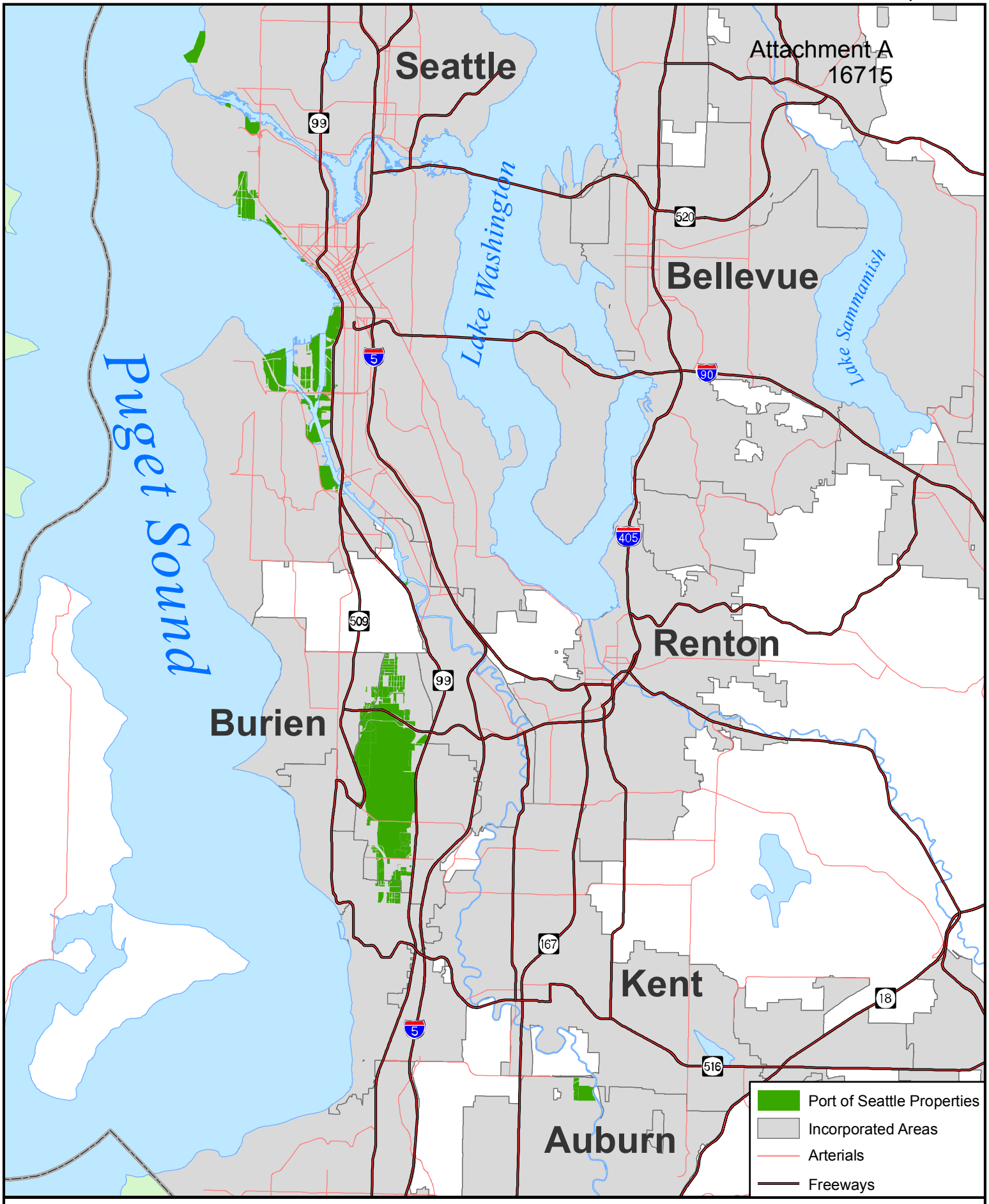

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2009 King County Regional Hazard Mitigation Plan

Port of Seattle Properties

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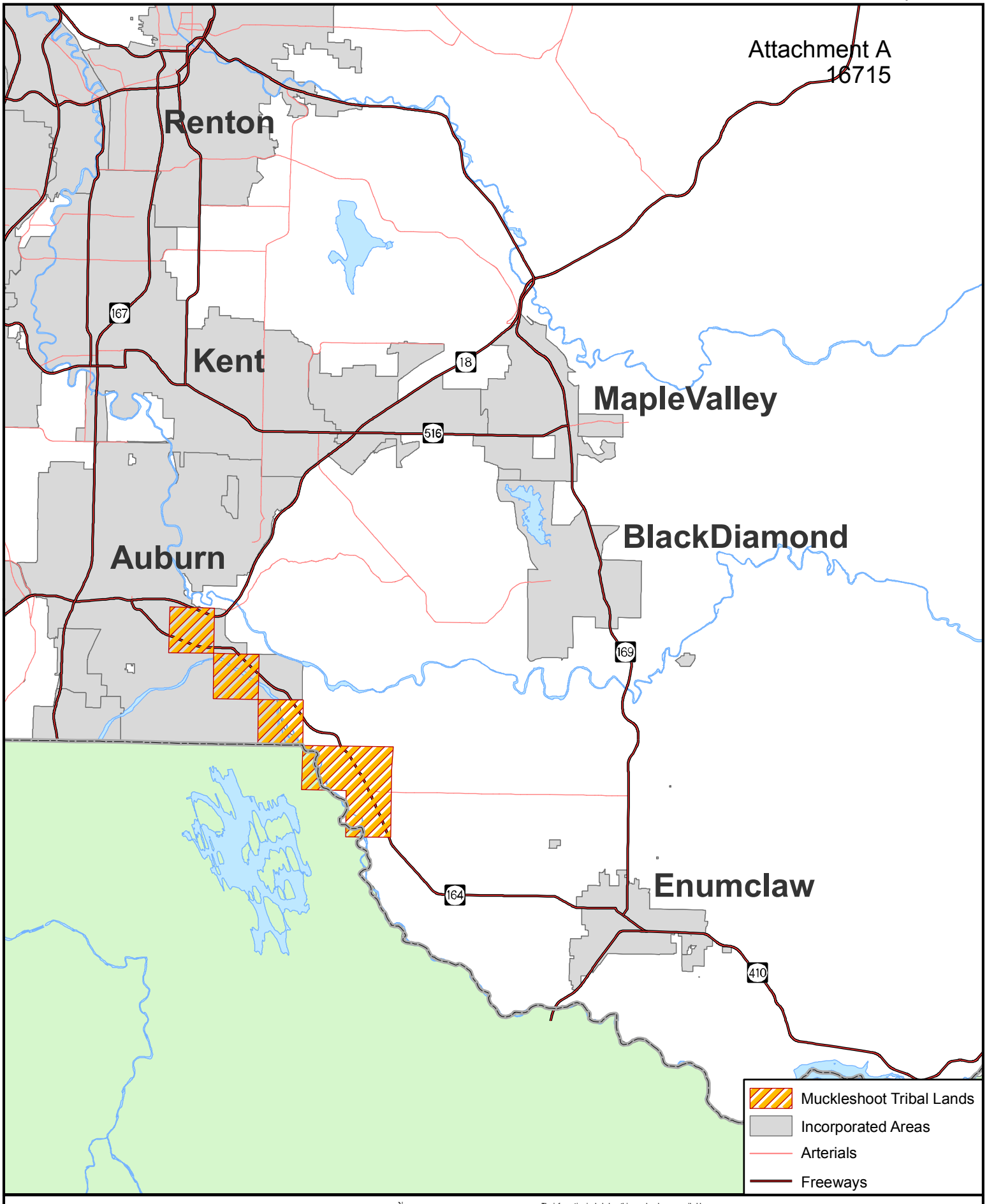

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2009 King County Regional Hazard Mitigation Plan

Muckleshoot Indian Reservation

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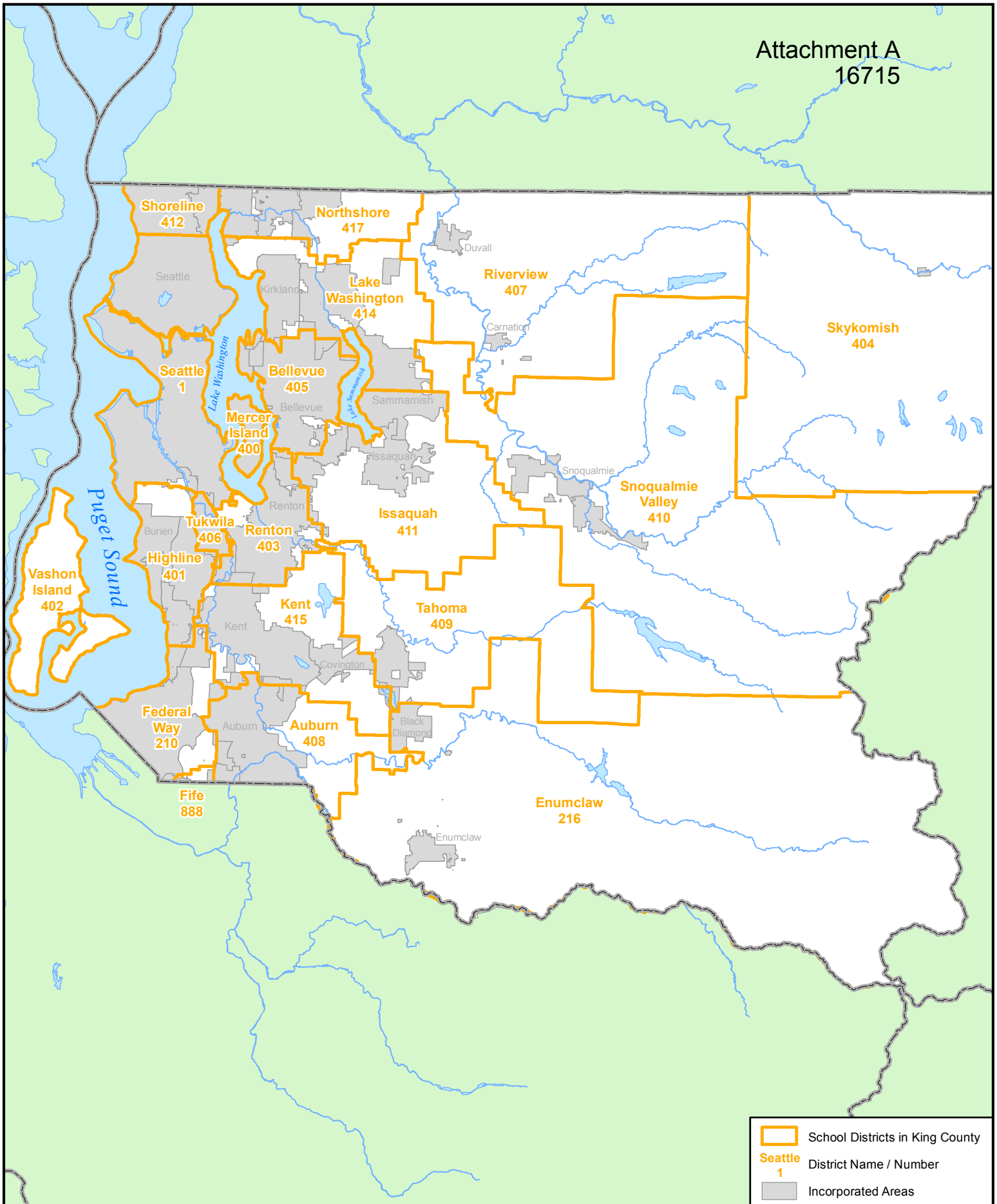

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2009 King County Regional Hazard Mitigation Plan

School Districts

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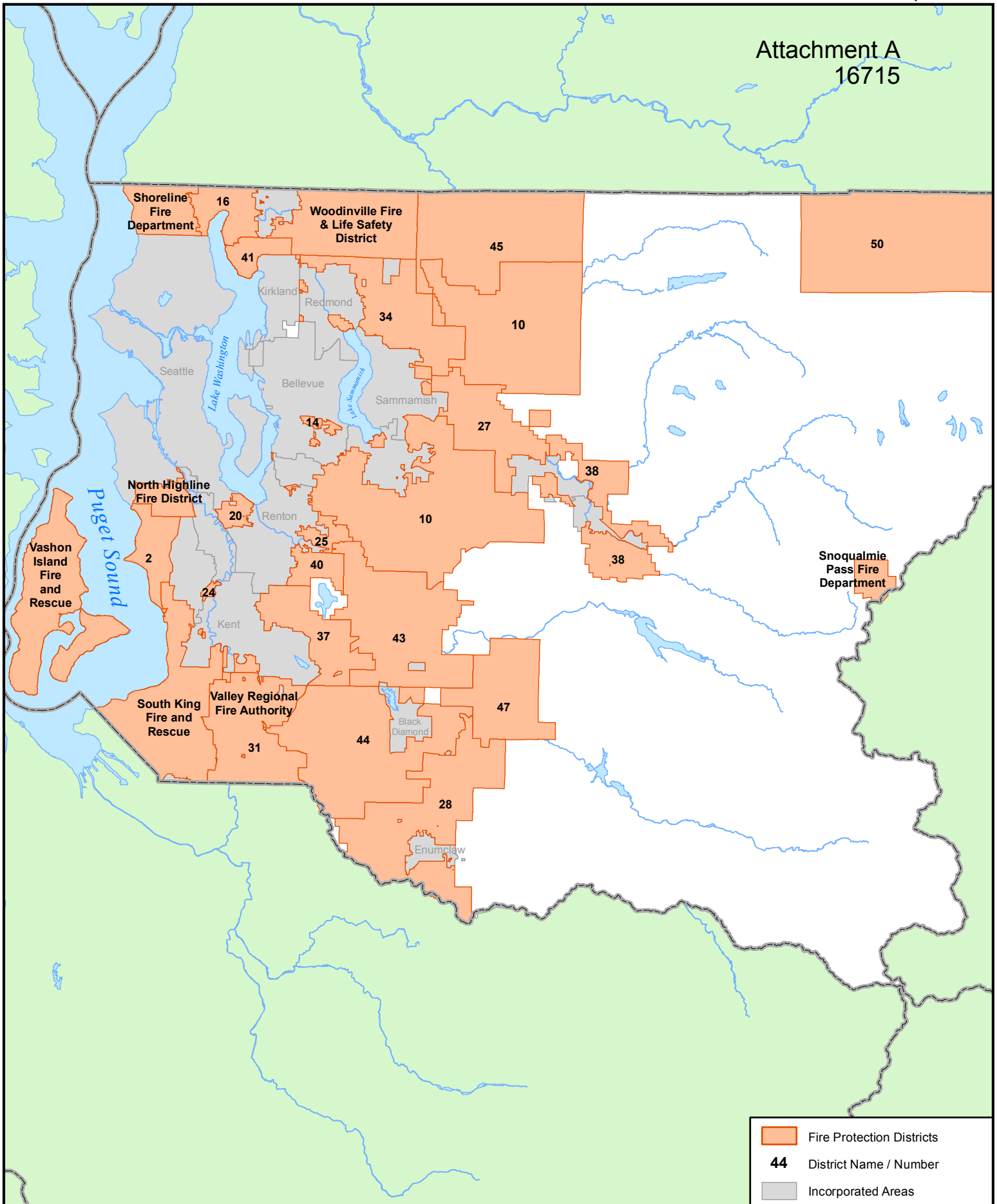

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Fire Districts & City Depts.

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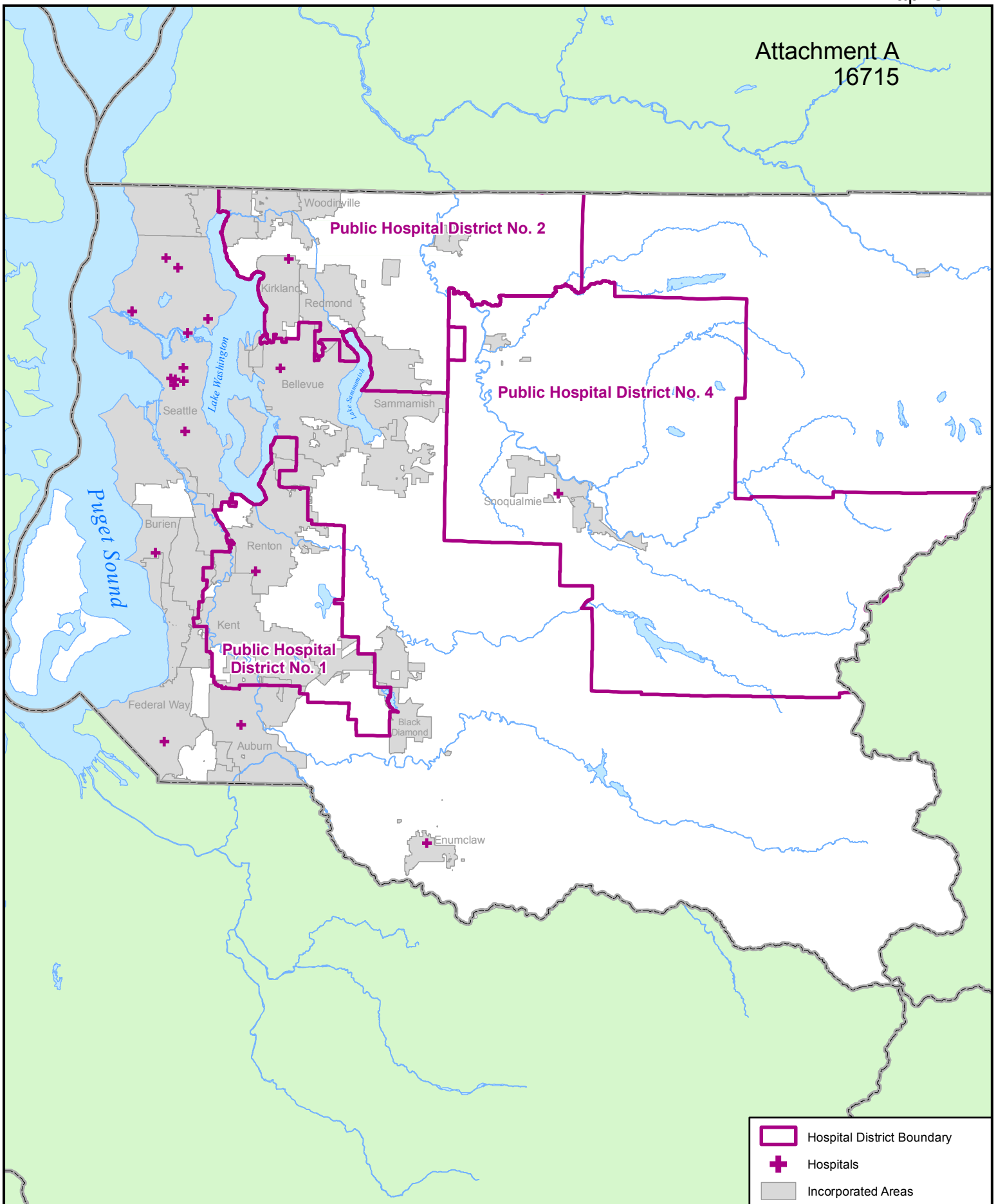

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2009 King County Regional Hazard Mitigation Plan

Hospitals & Hospital Districts


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Lake Forest Park WD
Bothell
Shoreline WD
Northshore Utility District
Woodinville Water District
Lake Margaret Community Purposes Club
Duvall
King County Water District 119
Kirkland
Redmond
Union Hill WA
Nestle Regional Training Center
KCWD 1
Northeast Sammamish SWD
Ames Lake WA
Carnation
Seattle
Lake Washington
Bellevue
Lake Sammamish
Sammamish Plateau WSD
Beaux Arts
Fall City WD
Mercer Island
KCWD 117
Overdale WA
Spring Glen
Edgehill WA
Coal Creek UD
Issaquah
KCWD 45
Bryn Mawr WSD
KCWD 123
Snoqualmie
KCWD 20
KCWD 90
North Bend
Heights WS
KCWD 125
Upper Preston WA
Renton
Mirrormont Services
River Bend
Westside WA
KCWD 49
Tukwila
Four Lakes
Wilderness Rim
Sallal Water Association
KCWD 19
Highline WD
Soos Creek WSD
Cedar River Water and Sewer District
Burton WC
Maury Mutual WC
KCWD 54
Kent
Gold Beach WC
Dockton WA
KCWD 111
Covington Water District
Tacoma
Lakehaven Utility District
Auburn
Black Diamond
Algona
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2009 King County Regional Hazard Mitigation Plan
Water Service Utilities

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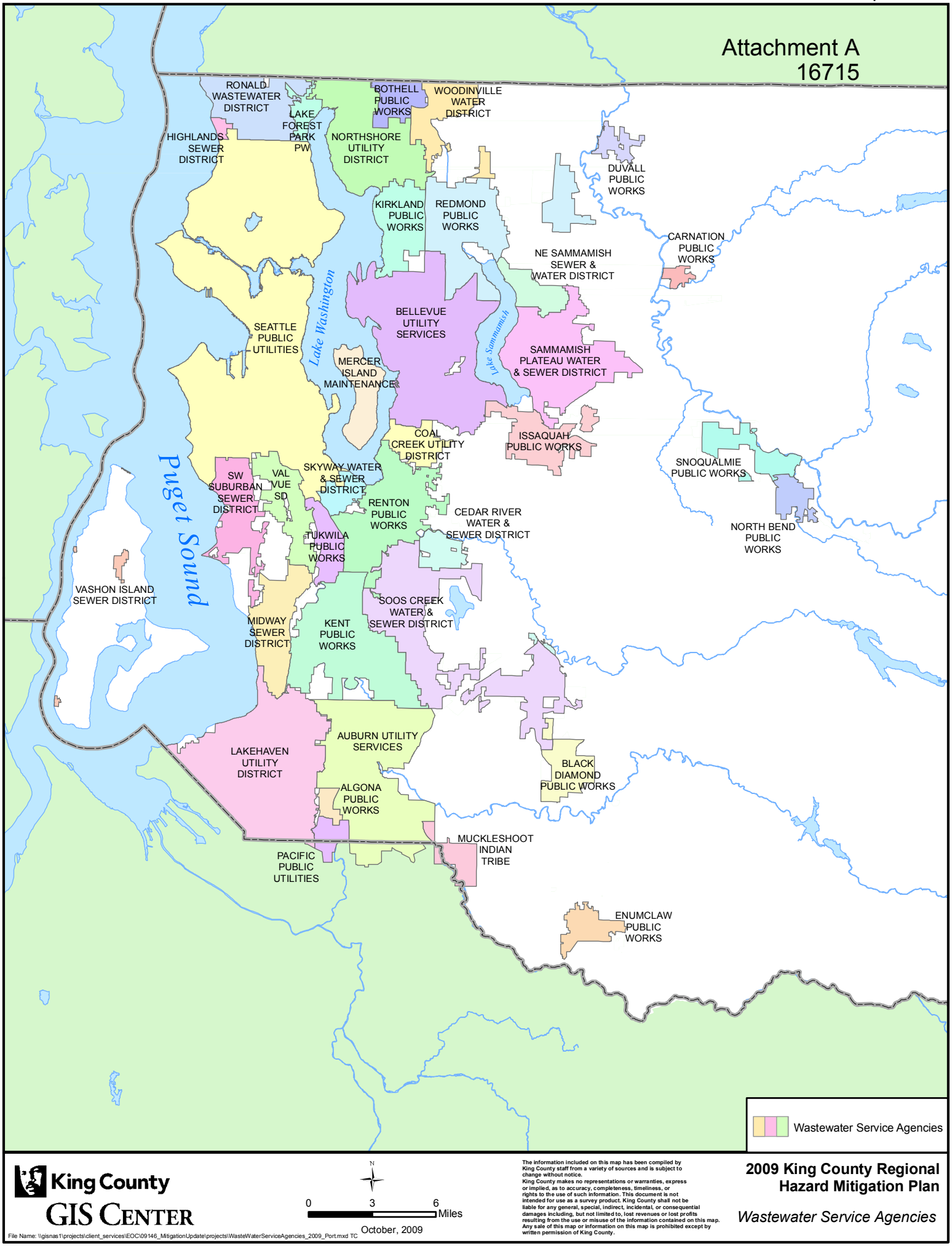

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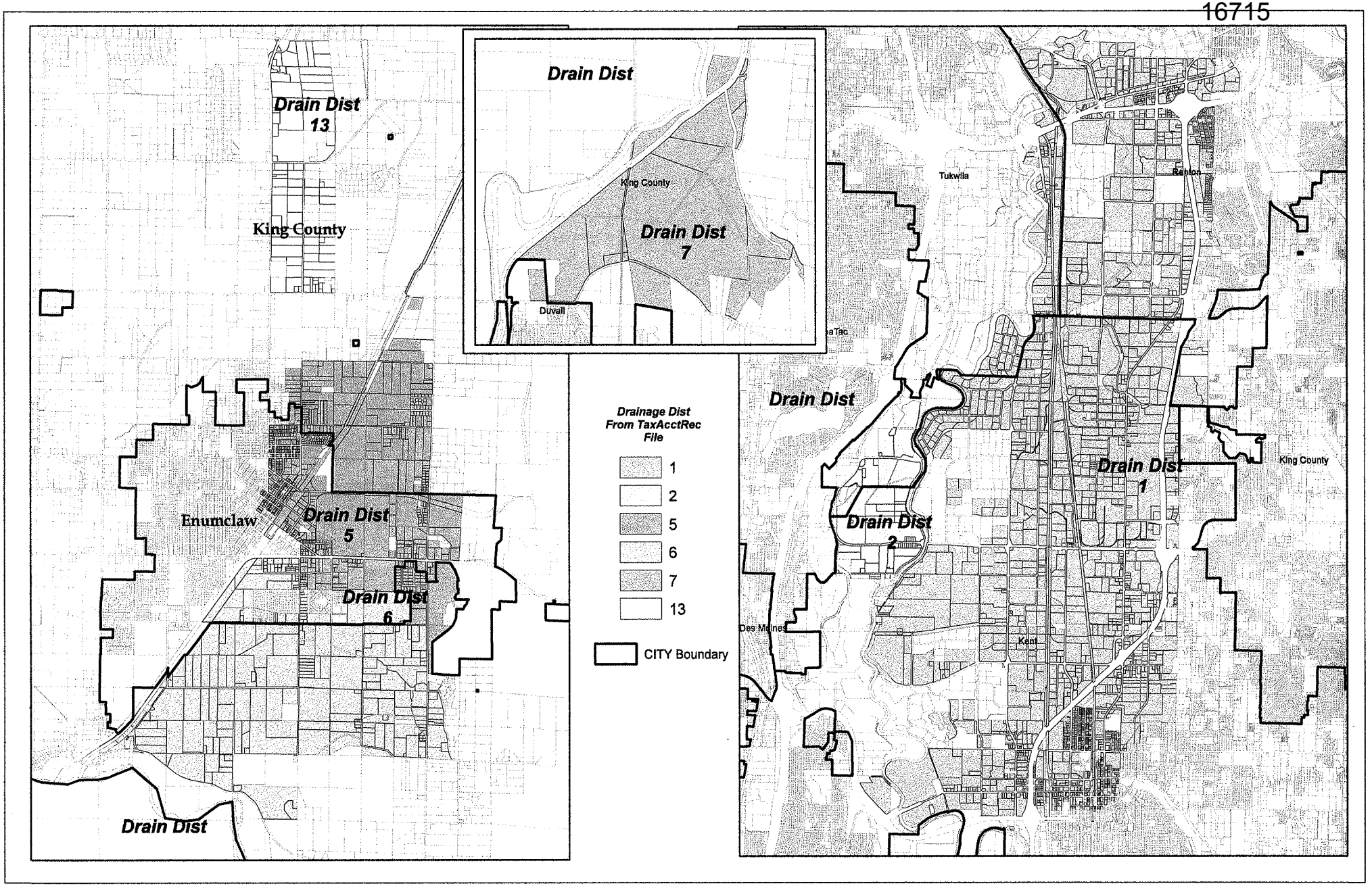
2009 King County Regional Hazard Mitigation Plan

Wastewater Service Agencies



Map 3.9.5 - Drainage Districts 2009

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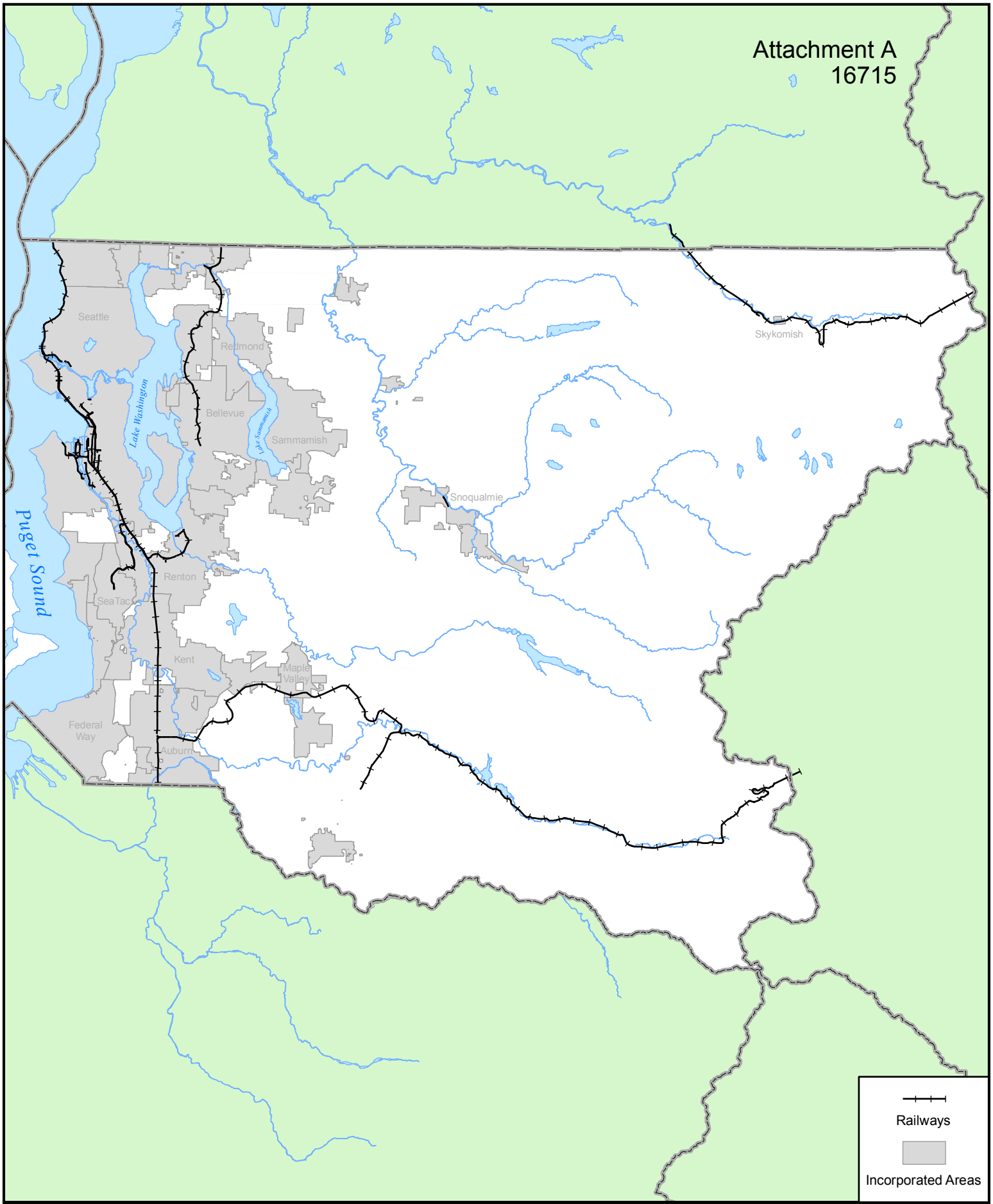

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2009 King County Regional Hazard Mitigation Plan

Railway Network

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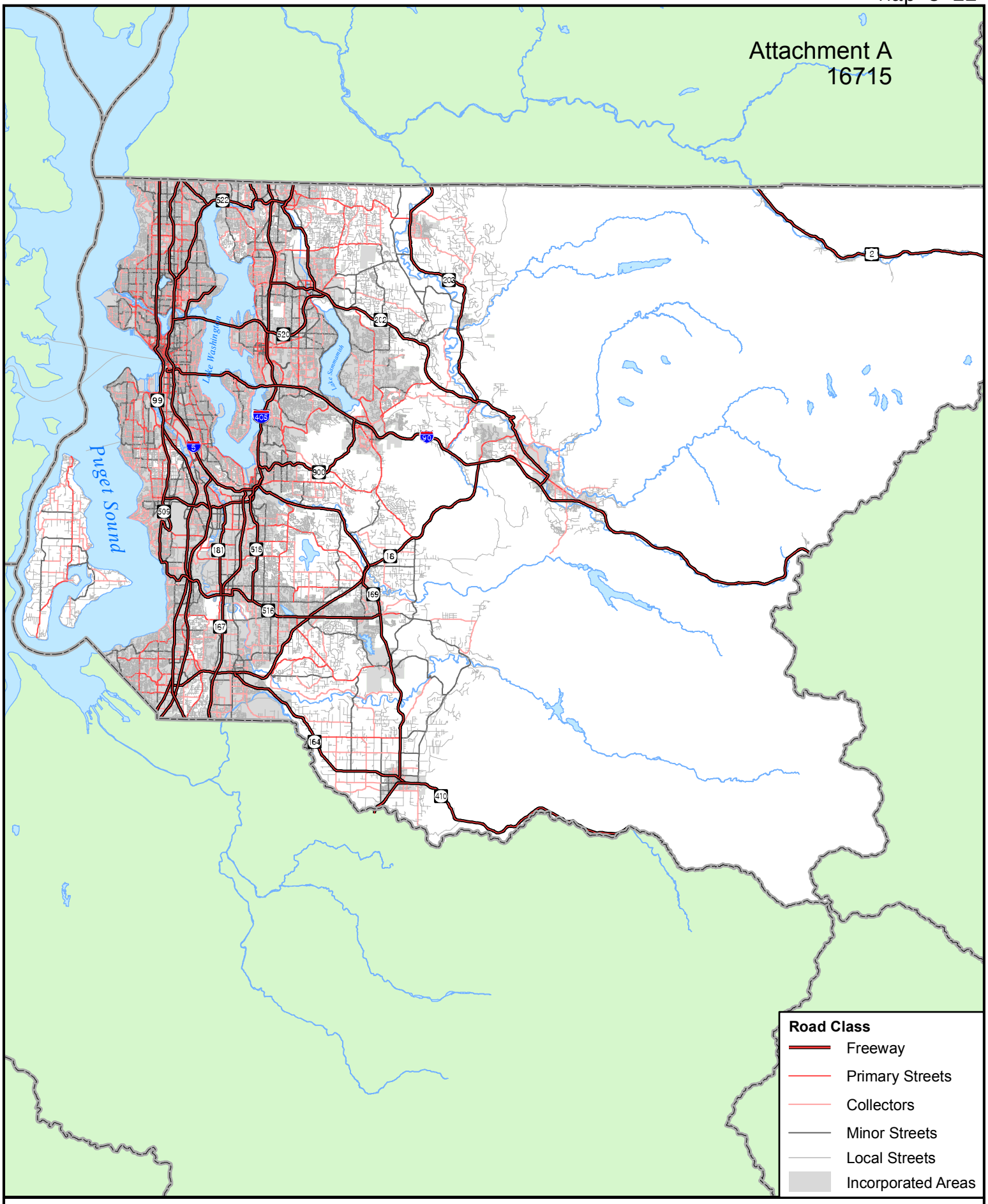

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2009 King County Regional Hazard Mitigation Plan

Roads By Classification Type

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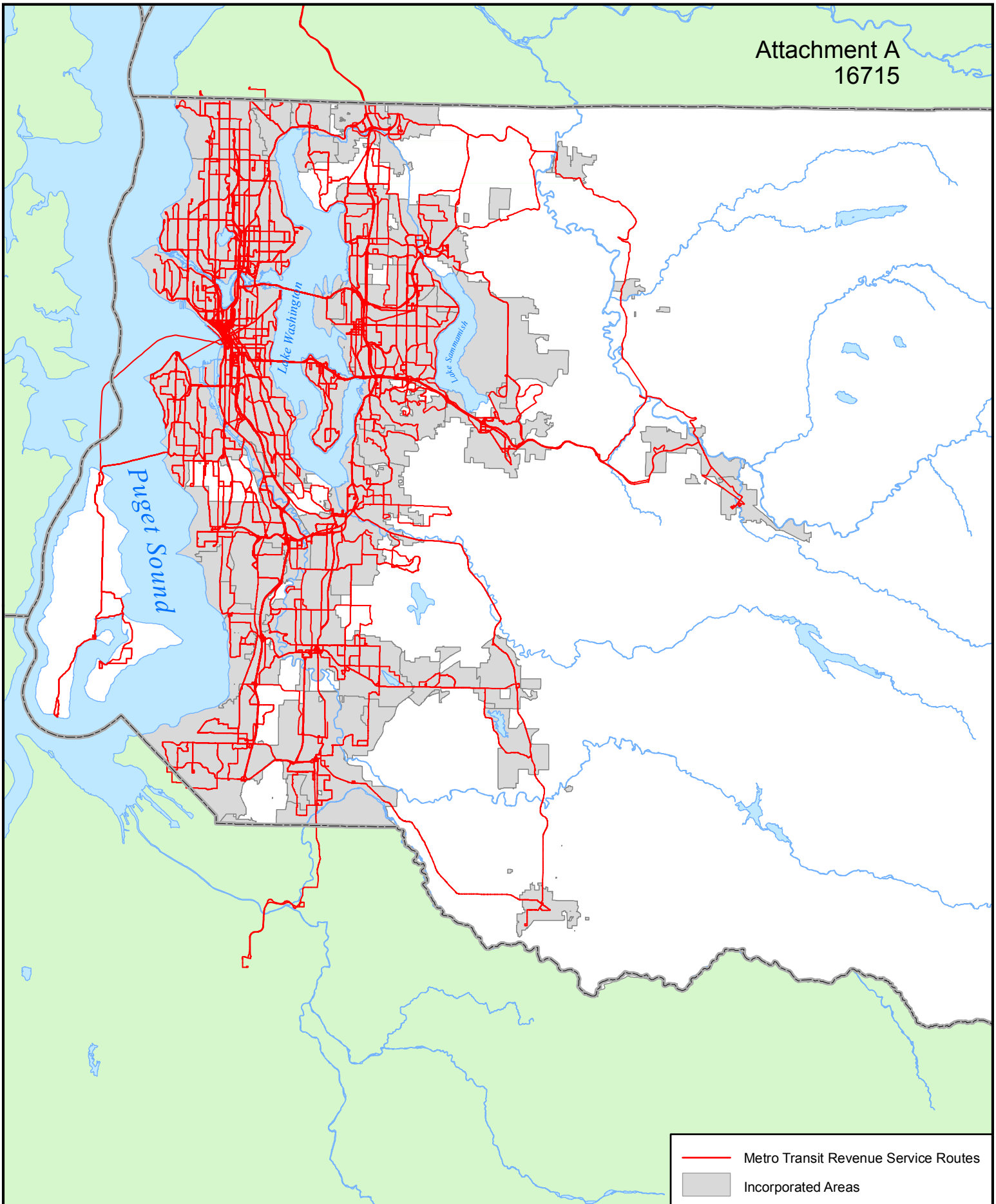

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2009 King County Regional Hazard Mitigation Plan

Metro Transit Routes

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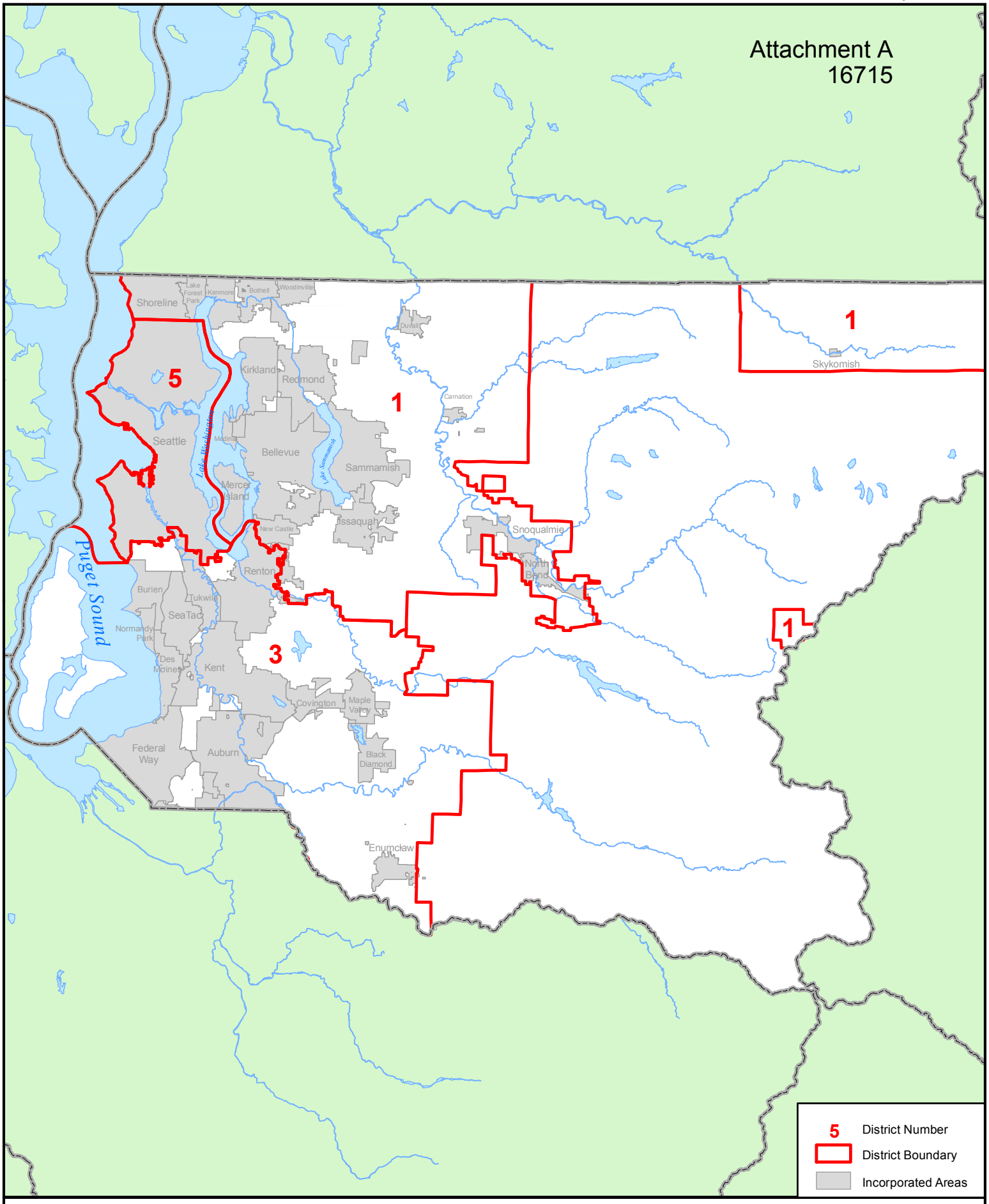

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2009 King County Regional Hazard Mitigation Plan

Emergency Response Zones

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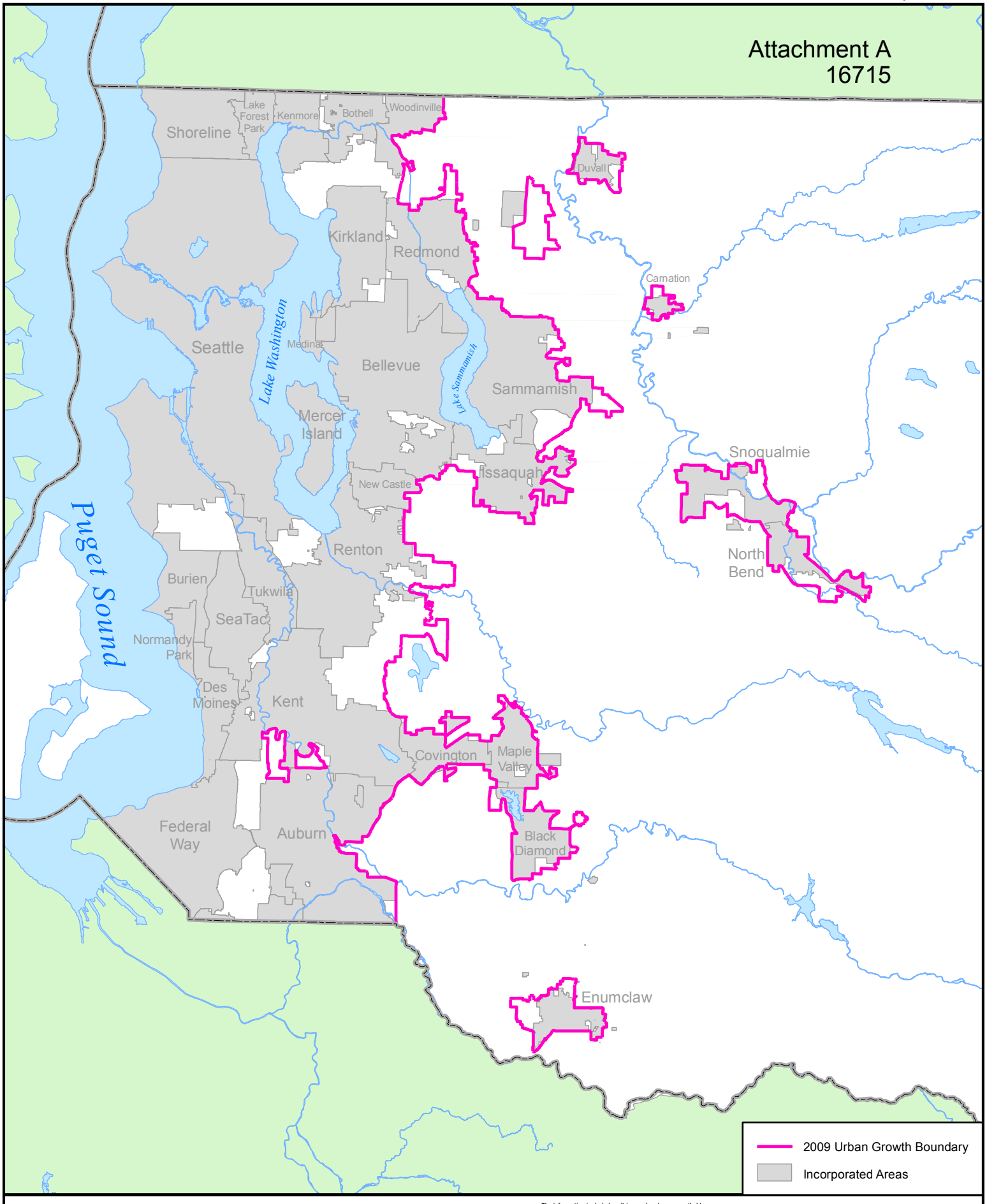

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2009 King County Regional Hazard Mitigation Plan

Urban Growth Boundaries

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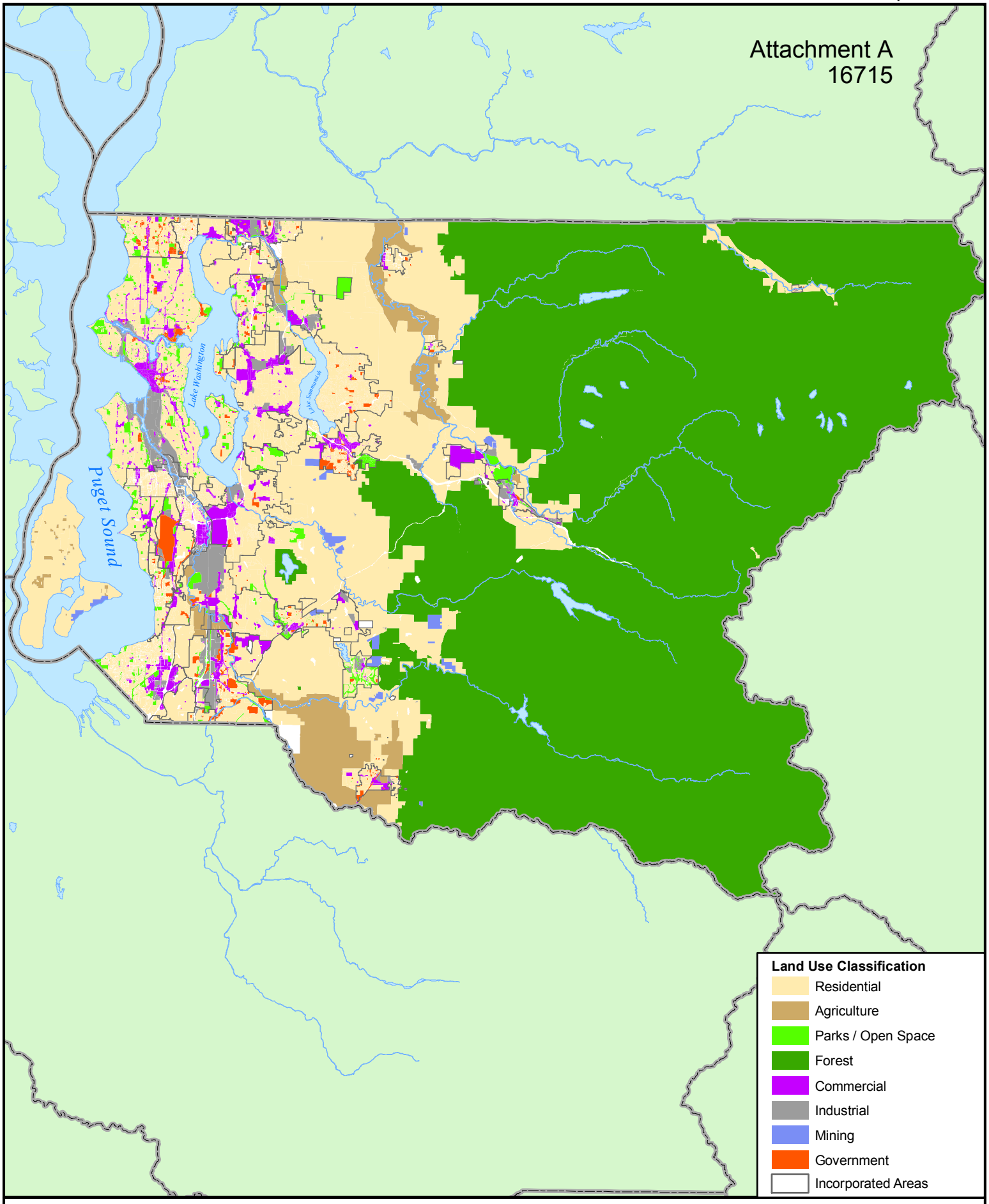

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2009 King County Regional Hazard Mitigation Plan

Land Use

Section 4: Participating King County Government and Jurisdiction Profiles

Planning for the 2009 King County Regional Hazard Mitigation Plan (RHMP) update is occurring in two phases. Phase 1 is a King County Plan – Base Plan, and Phase 2 will incorporate and include other participating jurisdictions from within the County. Jurisdictions can include cities, fire districts, utility districts, school districts, special purpose districts, and others. Any jurisdiction can request to be incorporated into this Plan in a prescribed way as defined in Section 2, Plan Maintenance and Plan Management, Guidelines for Adding a Jurisdiction to the King County Regional Hazards Mitigation Plan. The following represents participating agencies and jurisdictions.

King County Participating Agencies and Jurisdictions [1,2,3]

Table 4-1 King County Government Departments / Agencies and Cities

	2004	2009
King County Government * (See new 2009 Table 4.1.1 below)	x	x
City of Auburn	x	pending
City of Bellevue	x	x
City of Bothell	x	x
City of Burien	x	x
City of Des Moines		x
City of Duvall	x	
City of Federal Way	x	x
City of Issaquah	x	x
City of Kirkland	x	
City of Medina	x	x
City of Newcastle		x
City of Normandy Park	x	
City of North Bend	x	
City of Pacific		x
City of Redmond	x	
City of SeaTac	x	
City of Tukwila		pending
City of Woodinville	x	

Source: RHMP Participating departments /agencies; 2008 King County Annual Growth Report documentation in the detailed sections below.

**King County internal government department / agency participation is listed in Phase 1 Planning, below, Table 4-1.1.*

Phase 1 - Planning

King County Government Departments / Agencies* [1,2,3]

In the 2004 Plan, the King County internal departments / agencies were named as demonstrated in the list below, and were included in a separate Annex B: King County Government Departments. For the 2009 update, the Annex B portion containing the King County internal departments /agencies has been updated and incorporated into the main body of the Plan in this Section 4, and referred to by updated names as shown in Table 4-1.1, below. The updated 2009 information is also used in Section 2, Plan Development.

2004 List
King County Facilities Management
King County Department of Transportation
King County Executive Services, Information and Telecommunications Services
Seattle-King County Department of Public Health
King County Department of Development and Environmental Services
King County Department of Natural Resources and Parks
King County Sheriff's Office

The following illustrates the 2004 and 2009 planning partners for King County Government. These participating King County departments will be further detailed in Section 7 Regional Mitigation Strategies, in this 2009 Plan update.

Table 4-1.1: King County Government Departments
(new Table in 2009)

	2004	2009
The departments below submitted either a Strategy and/or an Initiative in 2004		Status: Updated in 2009
Dept. of Development and Environmental Services (DDES); Fire Marshal's Office	x	No update
Dept. of Natural Resources and Parks (DNRP) Four divisions below:		
Water and Land Resources Division	x	x
Wastewater Treatment Division		x
Solid Waste Division	x	x
Parks Division		x
Department of Transportation (DOT)		
Road Services Division		x
Metro King County Transit	x	x
Facilities Management Division (FMD)	x	x

King County Sheriff's Office (KCSO)	**x**	**x**
Office of Information Resources Management (OIRM)	**x**	**x**
Public Health – Seattle & King County (PHSKC) (Note: new name since 2004)	**x**	**x**

Source: RHMP Participating agencies; 2004 Plan
Note: The department names in Table 4-1.1 are shown as known in 2009

*Phase 2 – Planning **(new in 2009)***

Phase 2 will incorporate and include additional jurisdictions from within the County. Jurisdictions can include cities, fire districts, utility districts, school districts, special purpose districts, and others. Any jurisdiction can request to be incorporated into this Plan in a prescribed way as defined in Section 2, Plan Maintenance and Plan Management, Guidelines for Adding a Jurisdiction to the King County Regional Hazards Mitigation Plan.

Under Phase 2 of this planning process, the Base Plan will be reformatted to better support hazard mitigation efforts on a regional basis. While Phase 1 of this process established the foundation of the regional plan, Phase 2 will focus on reassembling the regional components of the Plan. The jurisdictions listed in tables 2-2 through 2-4 below, as well as other local governments within the planning area who have not been previous planning partners will be invited to join the King County Regional Hazard Mitigation Plan (RHMP) as a regional planning partner.

Key planning steps will be re-engaged to assure all planning partners are adequately addressed and supported by plan content and policy direction. Phase 2 will include, but are not limited to the following components:

- Organize Resources: the first task under Phase 2 will be to organize all eligible local governments within the planning area will be invited to link to the RHMP.
- Revise the Risk Assessment: The risk assessment of the Base Plan will be comprehensively revised to better support the ranking of risk associated with the hazards of concern for each participating jurisdiction.
- Re-engage the public: A comprehensive outreach strategy will be deployed that will provide the constituents of all planning partners an opportunity to comment on the Plan and its policies.
- Re-assemble the Plan: Once all planning phases of Phase 2 are complete, the regional plan will be reassembled into a format that clearly addresses each planning partner, and clearly illustrates compliance with section 201.644CFR for each planning partner. A key component of this step will be to clearly define a Plan maintenance strategy that will assure the Plan and its policies remain viable throughout the performance period for the Plan.

- Plan Review and adoption: Since the scope of the RHMP Base Plan will be enhanced under Phase 2, all planning partners linking to the Base Plan will be required to formally adopt the RHMP as their hazard mitigation plan of record. Additionally, this reformatted Plan will be sent to the State and FEMA for their review and approval.

The following represents the profiles of eligible local governments within the planning area that may become part of the Regional Plan.

Cities[1,2,3]

City of Auburn

The City of Auburn is located in King County in the southern Puget Sound area of western Washington between Seattle and Tacoma. It lies at the south end of Highway 18, in the Green River Valley. Settled in 1855, the town was plotted in 1886. The community was incorporated in 1891. Auburn has a total land area of 28.20 square miles. The City's population numbers 60,400 according to the 2008 King County Growth Report. This is a significant growth over the 2000 US Census population of 40,314, and the trend is expected to continue for the foreseeable future.

The community economy includes The Boeing Company's Auburn plant, a Super Mall, Emerald Downs Race track, the Muckleshoot Casino, a U.S. Government Agency warehouse, and light industrial companies.

The City maintains its own fire and police departments, and coordinates with the King County Office of Emergency Management for emergency management services.

A Mayor and seven council members serve the City of Auburn, and this body is responsible for setting City policies as well as reviewing and approving Auburn's Mitigation Plan.

City of Bellevue

The City of Bellevue, encompassing 33.30 square miles, incorporated on March 31, 1953. The current population sits at 119,200. The City operates under the City Council/City Manager form of government. A city council comprised of seven elected members governs the City of Bellevue. The mayor and deputy mayor are both council members, elected by the others to serve four-year terms. The City Manager is the chief executive of the city.

Bellevue provides essential services to a number of nearby communities:

Fire Services:
Provided to the City of Medina and communities of Beaux Arts, Clyde Hill, Hunts Point, Newcastle, and Yarrow Point.

Sewer Services:
Provided to Beaux Arts, Clyde Hill, Hunts Point, Issaquah, King County, Medina, Redmond, Yarrow Point.

Water Services:
Provided to the city of Medina and communities of Clyde Hill, Hunts Point, Yarrow Point, Cor-Sun Ranch in Kirkland, Greenwood Point & South Cove in Issaquah, and several areas of unincorporated King County south of I-90 (including Eastgate).

Bellevue has an unusually diverse and comparatively affluent population. Languages other than English are spoken in 26.9% of its 46,000 households and only 5.7% of Bellevue citizens are below the poverty line.

The British Petroleum Pipeline/Olympic Pipeline Company manage two fuel pipelines that traverse a right of way through the city from north to south. No pump stations or terminals are located in Bellevue.

City of Bothell

The City of Bothell was incorporated in 1909 and consists of 5.67 square miles with a population of 17,130 within in King County. Bothell's economy consists of small and moderate size retail and services businesses as well as multiple business parks which consist of many large businesses and corporations.

Bothell is located on I-405, 12 miles north of Seattle, Washington. A residential community that has been able to expand its business park areas to offer great incentives to outside businesses. Although it is limited in space, the downtown area is home of the Bothell City Hall, Bothell Police Department, and Bothell Downtown Fire Station.

The Bothell City Council, a seven-member elected board, is responsible for adopting the Hazard Mitigation Plan. The Emergency Preparedness Coordinator will assist the City departments in the development and implementation of the Hazard Mitigation Plan Annex.

City of Burien

The City of Burien was incorporated in 1993. It consists of 7.43 square miles with a population of 31,540. Largely a residential community, the City of Burien economy consists of small and moderate sized retail and service businesses.

City of Des Moines

The city of Des Moines was incorporated in 1959. Today is covers an area of 6.54 square miles and has an estimated 29,180 residents. Des Moines is located on the east shore of the Puget Sound approximately halfway between Seattle to the north, and Tacoma to the South. Its location on the shoreline of the lake situates Des Moines as an ideal location for boat launching and moorage.

City of Federal Way

Situated 25 miles south of Seattle and eight miles north of Tacoma, the City of Federal Way occupies 22.54 square miles on a plateau between the Puget Sound and the Green River. The name “Federal Way” was first used in 1929 to identify a school district and was officially adopted in the early 1950s by the Chamber of Commerce. Incorporated in 1990, Federal Way is a rapidly growing community of 88,040 people, which includes a diverse population. The economy of Federal Way includes major employers like the Weyerhaeuser Company, World Vision, and other companies with headquarters in Federal Way. The largest US Mail bulk sorting facility in Washington State and the King County Aquatic Center are also located in Federal Way.

The Federal Way Fire Department and the Federal Way Public School District serve Federal Way. Federal Way has its own police department.

City of Issaquah

The City of Issaquah is located at the Southern end of Lake Sammamish fifteen miles East of Seattle. Occupying 11.36 square miles and bisected by Interstate 90; Issaquah covers portions of three mountains, two valleys and a plateau, and includes four major stream systems. Incorporated in 1892 with a coal mining history, Issaquah has become a diverse, rapidly growing community of 26,360. A significant amount of Issaquah’s residential community resides on Squak Mountain and Cougar Mountain, which is subject to coalmine subsidence and slide hazards. The streamside residential and commercial areas in Issaquah and Tibbetts Creek Valleys are subject to flooding, and the areas adjacent to Interstate-90 and SR-900 are vulnerable to hazardous materials spills. Issaquah’s mountainous terrain and heavy tree cover make it particularly susceptible to winter storms. The economy of Issaquah includes a mix of retail, office, commercial and some light industry with a number of major employers like

Microsoft and Costco Corporate Headquarters. The City of Issaquah is a full service city with a seven-member council and elected mayor. Issaquah has its own police department and water, sewer and storm water utilities. Eastside Fire and Rescue provide fire and medical services.

City of Medina

The City of Medina was incorporated in 1955. This 1.41 square mile residential community is located approximately two miles west of Interstate 405 along State Route 520 and north of Interstate 90, on the east side of and bordering Lake Washington. Medina's 2,955 residents consist of professionals, many of whom are high profile. The city has its own police department who also serves the Town of Hunts Point. Medina contracts with the City of Bellevue for water, sewer and fire protection services. Puget Sound Energy is the provider of gas and electric services. The seven-member, elected Medina City Council is responsible for adopting the Hazard Mitigation Plan.

City of New Castle

Located between Bellevue, Renton, and the Cougar Mountain area of Issaquah, Newcastle is a new city since 1994 with a rich history. In the 1800's, Newcastle had a larger population than Seattle. It was the richness of Newcastle's coal mining industry that played an important role in transforming Seattle into a major port. Newcastle was incorporated in September 1994. It is a residential community of 4.46 square miles and a population of 9,720. The city includes only one major industrial site within the corporate limits. The City does have a significant amount of home occupation business, as well as a retail core providing neighborhood-type commercial activity. A major golf course resides in the City with incredible views of downtown Seattle and surrounds, on a clear day.

City of Pacific

The City of Pacific is located in both King and Pierce counties, with the King county portion home to 6,210 over an area of 1.83 square miles. The City was official incorporated in 1909. Pacific is located on the lower White River, downstream of the Mud Mountain reservoir.

City of Tukwila

Located on the Duwamish River, Tukwila was built around the former site of Fort Dent. Tukwila's proximity to Seattle to the north and Renton to the east situated Tukwila as a prime thoroughfare for goods and people, first with the opening of the Interurban Railroad and later with Washington's first paved road. Shortly thereafter, Tukwila was incorporated as a city in 1908. Today, Tukwila occupies an area of 9.17 square miles with a population of 18,080. Tukwila is the home to

the Pacific Northwest's largest shopping center, Westfield Southcenter, just southeast on the junction of Interstates 5 and 405.

Fire Districts[1]

Table 4-2: Fire Districts		
	2004	**2009**
KCFD #2 -- Burien/Normandy Park	x	
KCFD #11 -- North Highline Fire District	x	
KCFD #20 – Skyway/Bryn Mawr/Lakeridge		x
KCFD #36 -- Woodinville Fire and Life Safety	x	
KCFD #39 South King Fire & Rescue *(annexed Federal Way and Des Moines)*	x	x
KCFD #40 – Spring Glen/Cascade/Fairwood	x	
KCFD #43 -- Maple Valley Fire and Life Safety	x	x
KCFD #44 -- Mountain View Fire and Rescue	x	
KCFD #45 – Duvall	x	
Source: RHMP Participating agencies; 2009 WA Fire Service Directory		

King County Fire District #20 – Skyway, Byrn Mawr, Lakeridge

Located in Unincorporated King County, King County Fire District #20 consists of the neighborhoods of Skyway, Bryn Mawr, Lakeridge, Campbell Hill, Earlington, Hill Top, Panorama View, and Skycrest. Geographically the District in situated between Seattle to the North, Tukwila to the west, Renton to the east and south, and Lake Washington directly to the east. The district serves 15,000 people over an area of 5 square miles.

King County Fire District #39 - Federal Way Fire Department / South King County Fire and Rescue

Federal Way Fire Department is a fire district serving the greater Federal Way area within Fire Zone 3. Formed in 1949, the district covers 34 square miles and serves 125,000 people. A board of commissioners governs it as a junior taxing district. The district is proud of its fire prevention, public education, and mitigation efforts. Other services provided include fire suppression, hazardous materials response, and basic life support – medical services.

Maple Valley Fire and Life Safety District #43

Maple Valley Fire and Life Safety (King County Fire District #43) was established as a fire district in 1953 and consists of 55 square miles and a population of

45,000 according to 2002 District projections. Maple Valley Fire and Life Safety has a three member Board of Commissioners that are elected by registered voters of the district for 6 year terms. The economy for the district is primarily small to moderate retail sales and service businesses. Geographically, the district is located in southeast King County where SR 516 and SR 169 intersect. State Route 18 also travels through portion of the district. Highway 18 is considered a major transportation route for commercial traffic. The City of Maple Valley is located within the boundaries for the Fire District. The Board of Commissioners for the Fire District are responsible for adoption of the Hazard Mitigation Plan, when completed.

Utility Districts[1]

Table 4-3: Utility Districts

	2004	2009
Cedar River Water and Sewer District	x	
Coal Creek Utility District – Newcastle	x	
Covington Water District	x	x
Highline Water District		x
KC Water District #19 – Vashon Island	x	x
KC Water District #20 – Burien/ Riverton/ McMicken Heights	x	
KC Water District #90 – Renton	x	x
KC Water District #111	x	x
Midway Sewer District, Kent/Des Moines	x	x
Northshore Utility District	x	
Ronald Waste Water District	x	
Sammamish Water and Sewer District		x
Shoreline Water District	x	
Soos Creek Water and Sewer	x	x
Southwest Suburban Sewer District	x	pending
Val Vue Sewer District	x	
Woodinville Water District	x	

Source: RHMP Participating agencies

Covington Water District

The Covington Water District was formed in southeast King County in 1960 with less than 100 customers. Over the years, a number of small districts merged into the Covington Water District and more customers were added as development occurred. Currently the Covington Water District serves a population of approximately 33,000 with 13,000 connections in a 53 square mile area that borders the city of Kent to the west and the Green River to the south. The District encompasses portions of the cities of Covington, Maple Valley and Black

Diamond as well as unincorporated King County. The District's service area contains residential, commercial and institutional/educational development. The Covington Water District is governed by a five member Board of Commissioners who will adopt the plan by resolution.

Highline Water District

Formerly known as King County Water District #75 upon incorporation in 1946, Highline Water District reorganized in 1991. Covering an area of 18 square miles, the district serves mostly Des Moines and Normandy Park, but also portions of Burien, Kent, Federal Way, Sea Tac, and Tukwila, as well as area within unincorporated King County. Today the District serves a population of 68,500 people through 18,050 connections, averaging 6.3 million gallons daily. The District operates as a Special Purpose District, governed by five elected commissioners.

King County Water District #19 – Vashon Island

Water District 19 was established in 1925 and consists of 3945 acres with a population of approximately 3100 according to the estimates projected from the 2000 Census. The District is governed by a three member Board that are elected by the registered voters of the District for 6-year terms. The Board sets policy and hires a General Manager to run the day-to-day operations of the District. The District service area is composed of a mix of retail sales and services, restaurants, financial and real estate companies, building suppliers, professional offices, medical clinics, entertainment and civic functions, social services, multi and single-family residences. Geographically, the District is located in south west King County, Washington west of Seattle on Vashon Island in Puget Sound and contained in the east central portion of the island. Vashon Highway (a.k.a. 99th Ave SW) runs north and south through the east center of the island and of the District. The District is served by Vashon Island Fire Protection District (King County Fire District #13), King County Wastewater Treatment Division for sewer service, Puget Sound Energy for electricity, and lies wholly within the Vashon School District.

King County Water District #90 – Renton

King County Water District #90 is a district formed in 1952. It serves 5,569 households and businesses near Renton with their water needs. The district is governed by a board of commissioners.

King County Water District #111

King County Water District #111 (KCWD111) originally formed in 1962 to bring water service to the Lake Meridian area. KCWD111 provides water service to a population of approximately 19,000, covering approximately 7 square miles.

KCWD111 serves primarily residential customers within the City of Kent, a portion of the City of Covington and unincorporated King County. Other water purveyors bound KCWD111's service area including, the City of Kent, Covington Water District, Soos Creek Water & Sewer District, and the City of Auburn. A three-member Board of Commissioners governs the District and is responsible for adopting the Hazard Mitigation Plan.

Midway Sewer District, Kent, and Des Moines

Midway Sewer District is located near the border between Kent and Des Moines and was formed in 1946. It serves 7,500 households and businesses within a 13 square mile area and is governed by a board of commissioners.

Sammamish Plateau Water and Sewer District

Sammamish Plateau Water and Sewer Distinct is located east of Lake Sammamish, just north of the City of Issaquah, serving areas of the cities of Sammamish, Issaquah, and areas of unincorporated King County. The District encompasses a base of 15,700 waters customers, 9,300 sewer customers with a population base of 50,000.

Soos Creek Water and Sewer District

Soos Creek Water & Sewer District was formed in 1939 and serves 35 square miles with an approximate population of 80,000. The District provides both water and sewer services generally in South King County. Specifically, the District's corporate boundary generally lies directly east of and adjacent to the City of Kent and south of, and adjacent to, the City of Renton. The District extends east to Maple Valley and south to Black Diamond and Auburn. In addition to serving these areas in whole or in part, the District serves the entire area of the City of Covington and portions of unincorporated King County. The District is governed by a Board of Commissioners.

Southwest Suburban Sewer District

The Southwestern Suburban Sewer District provides wastewater services to 23,198 customers from unincorporated King County, the Cities of Burien, Normandy Park, SeaTac Seattle and Des Moines. The coverage area includes 13.15 square miles. The district was formed in 1945 and is governed by a board of commissioners.

School District[1]

Table 4-4: School Districts		
	2004	**2009**
Federal Way School District		pending
Lake Washington School District	x	
Vashon Island School District	x	
Source: RHMP Participating agencies		

Federal Way School District

The 36 Federal Way Public Schools are home to 22,462 students, including 2,780 disabled students; a 74% minority population speaking 78 different languages; 220 pre-school special needs students and 3,983 full or part time staff. With heavy dependence on roadways, 9,680 students are transported daily to and from school on 145 radio-equipped busses traveling 1,371,021 miles annually. The School District encompasses 35 square miles, is bordered by 8 miles of Puget Sound and is intersected by 9 miles of Interstate 5. The District's northern boundary is 3 ½ miles south of SeaTac International Airport and approximately one third of the District's buildings are in the flight path. The District's Central Kitchen prepares about 13,000 lunches daily. The District's boundaries include all or part of 4 municipal and 4 public utility jurisdictions, with all energy services supplied by Puget Sound Energy. Founded in 1929, a five member elected Board of Directors governs the District. The District is a participant in the Greater Federal Way Emergency Operations Center.

Participating Agency Profile Endnotes:

[1] 2008 King County Annual Growth Report
[2] Washington State Office of Financial Management, *April 2009 King County Report* - http://www.ofm.wa.gov/localdata/king.asp
[3] Agency Websites

Section 5: Hazard Identification and Vulnerability Analysis (HIVA)

2009 Plan Review Crosswalk, Sections 5-7

This introduction section has been significantly enhanced in 2009. All Section 5 elements of the 2004 Plan have retained its integrity in the 2009 Plan. Updates to documented FEMA declarations, other significant hazard incidents and hazard history have been updated and included from years 2004 – September 2009. All footnotes have been reviewed and updated as needed or possible.

Section 5 identifies and profiles hazards with assessment of vulnerability in terms of probability and potential hazard vulnerability, or impact in King County. When King County is referenced it also includes King County Government, its unincorporated areas, and all of its jurisdictions and special purpose districts which are part of this Plan.

Hazard Identification

The first step toward a mitigation program is the identification of the hazards a community may face. First hand information can be obtained from interviews of businesses, local employees, first responders, and residents; or gathered from newspaper archives, National Weather Service, FEMA documents, state and local government records, and the Internet. Largely, local hazards can be categorized as either natural or technological/manmade events. While the local climate changes rather slowly, our manmade environment can change rapidly, especially in terms of the local economic base.

Profiles of Hazards (Update for 2009)

To make the hazard analysis more helpful, adjective descriptors (high, moderate, and low) are established for each hazard's probability of occurrence and the county's vulnerability, or impact, in the event of a hazard. The risk rating is assigned on the probability of a hazard occurring at intervals, as mentioned above. A final risk rating is assigned based on a subjective estimate of their combination, and the risk rating will ultimately help focus the emergency management and hazard mitigation programs on the incidents with the greatest potential risk.

Some hazard incidents occur on an almost annual basis while others may not happen once within our lifetime. Additionally, not every hazardous incident or event occurs with notable damage or loss of life. For this reason, hazards are assessed by comparing the experienced frequency and probability of the event and the potential vulnerability / impact that may result.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Probability and Hazard Impact

The 2004 Plan wording: probability vs. hazard impact, has been changed to: probability *and* hazard impact, in the 2009 Plan.

Planning begins with events that are expected to occur often and have potentially high impacts on life and property followed by those with more moderate or low probabilities or moderate or low impacts. Jurisdictional strategies are dependant on the philosophy and experiences of local officials. Largely, the priorities addressed in the HIVA identified hazard development. Updates or expansions are a reflection of this assessment and local philosophical priorities.

For the purpose of this document, the criteria for high, moderate, and low probability are:

High Probability: once a year
Moderate Probability: once every two to ten years
Low Probability: once every ten to fifty years

Events occurring once every 50 to 1,000 years will are treated as “low probability” for the purpose of this document.

Cause and Impact Effect

Disaster incidents can be categorized as the cause of an impact or the effect/impact itself, or caused by a secondary hazard contributing to the disaster incident. Winter storms bring heavy rains, high winds, snow, and cold temperatures (causes) that may result in property damage, local flooding, power outages, injuries and deaths (effects). Earthquakes can also bring landslides (lahars), fire hazards, hazardous materials spills or releases. Despite flooding being an effect of severe weather conditions, it can also be considered to be an event with its own unique effects to roadways, structures, building sites, hazardous materials spills and releases, and bridges. Power outages can be associated with a variety of natural or manmade events. Power interruptions are addressed as effects of both natural and technological (man-made)

incidents in the King County Regional Hazard Mitigation Plan (RHMP). Washington State Emergency Management has included nine FEMA identified natural hazards in the 2008 State Hazard Mitigation Plan. The King County RHMP will follow that model for the 2009 Plan update to include eight out of nine natural hazards, and include additional natural and technological, or manmade, hazards.

Understanding Risk Ratings, Terminology Defined (*new for 2009*)

High Risk Rating: warrants major program effort to prepare for, respond to, recover from, and mitigate against the hazard. A high risk rating for a hazard means that the hazard has a high probability of occurrence and possibly a significant and larger portion of the population is vulnerable to the hazard.

Moderate Risk Rating: warrants moderate program effort to prepare for, respond to recover from, and mitigate against the hazard. A moderate risk rating for a hazard means that a hazard has a moderate probability of occurrence, and only a part of the population is vulnerable to the hazard.

Low Risk Rating: warrants more modest program effort to prepare for, respond to, recover from, or mitigate against the hazard beyond general awareness, training, and exercises. A low risk rating means that for a hazard means that the hazard has a low probability of occurrence, and a smaller segment of the population is vulnerable to the hazard.

Probability of Occurrence: An adjective (high, medium, low) of a hazard impacting King County within the next year, two to ten years, or every ten to 50 years, respectively. Probability is based on a limited objective appraisal of a hazard's frequency using information provided by relevant sources observations and trends.

High Probability: there is a great likelihood that a hazardous event will occur within the next year.

Moderate Probability: there is a moderate likelihood that a hazardous event will occur within the next two to ten years.

Low Probability: there is a lower likelihood that a hazardous event will occur within the next ten to fifty years.

Vulnerability / Impact : An adjective description (high, moderate, low) of the potential impact a hazard could have on King County. It is the ratio of population, property, commerce, infrastructure and services at risk, relative to the entire city. Vulnerability is an estimate generally based on a hazard's characteristics.

Summary of Results (new for 2009)
The following table is a summary of the results for all the hazards that are evaluated in this document, as indicated.

Recap in 2009 of Summary of Results Table of RHMP 2004

Hazard	Hazard Risk Severity + Location Frequency/Probability	Vulnerability Assessment Risk Natural + Manmade Impact	Total Risk Hazard Probability+ Vulnerability Impact (not captured in 2004)
Severe Weather	High	Moderate	
Avalanche	Low	Moderate	
Flooding	High	Moderate	
Landslide	Moderate	High	
Earthquake	Moderate	High	
Civil Disorder	Moderate	High	
Terrorism	Moderate	High	
Drought	Moderate	Moderate	
Fire Hazards	Moderate	Low	
Hazards Materials/ Release	High	Moderate	
Transportation	Low	High	
Tsunami & Seiches	Low	Moderate	
Cyberterrorism	Moderate	Moderate	

2009 Summary of Results Table (new in 2009)

****BOLD HIGH: Indicates Vulnerability Risk update from 2004 RHMP**

Hazard (In new 2009 ranked order of Total Risk)	Hazard Risk Profile Severity + Location Frequency/Probability	Vulnerability Risk Natural + Manmade Impact	Total Risk Hazard Probability+ Vulnerability Impact (new in 2009)
**Severe Weather	High	Moderate	High
Flooding	High	**HIGH	High
Earthquake	Moderate	High	High

**Landslide	Moderate	High	High
**Hazards Materials/ Release	High	Moderate	Moderate
**Fire Hazards	Moderate	Low	Moderate
**Transportation System	Low	High	Moderate
Drought	Moderate	Moderate	Moderate
Terrorism	Moderate	High	Moderate
Civil Disorder	Moderate	High	Moderate
Avalanche	Low	Moderate	Moderate
Tsunami & Seiches	Low	Moderate	Moderate
Cyberterrorism	Moderate	Moderate	Moderate
NEW in 2009			
Dams / Dam Safety	Moderate	High	High

Note: **The 2009 Flooding hazard vulnerability, or impact, has been upgraded to high/high, from high/moderate in 2004 because of the increased Green River Valley risk of potential flooding in the next three to five year period starting 2009 and beyond. **If severe weather contributes to a flooding incident(s), these additional hazard rankings may be suddenly upgraded because flooding impacts increases the risk of possible increased frequency of secondary hazards such as landslide, hazardous material spills or releases, fire hazards, and transportation system impacts.**

Five Year Plan Cycle

Hazard mitigation planning is based on a five year planning cycle. Research and planning for all the hazards a community may be vulnerable to is a time-consuming process. For this reason, the 2004 RHMP contained only certain identified hazards and other additional identified hazards are included in the 2009 RHMP. This five year time period also includes a process to continually review HIVA documents in order to maintain current hazard information and to accurately evaluate vulnerabilities and planning priorities.

The Pacific Northwest has experienced specific notable natural hazards listed below for thousands of years. These hazards were included in the 2004 RHMP. The topics listed below were identified as a higher priority based on past hazard history, frequency and likelihood of occurrences, and potential catastrophic losses. On the strength of recent national and local incidents and other concurrent planning processes, it seemed logical to add terrorism and civil disorder (unrest) to the first RHMP 2004 and HIVA focus.

The following hazards were addressed as priority as part of the first 2004 RHMP planning cycle:

Severe Weather
Avalanche
Flooding
Landslide
Earthquake
Civil Disorder (unrest)
Terrorism

The 2004 RHMP also included expansion and further development of other identified hazard topics including:

Drought
Fire Hazards
Hazardous Materials
Transportation
Tsunami / Seiche
Cyberterrorism

Any new data regarding these hazards has been incorporated into their respective sections for this 2009 update, especially flooding hazards, which has a higher risk rating in vulnerability and total risk. Flooding hazard is the priority for 2009 and beyond due to the Howard Hanson Dam situational awareness and potential Green River Valley flooding increased risk. The 2009 RHMP will include pertinent updates to the above mentioned hazards as they apply and incident dates will be added to the respective tables from 2004 onward.

Development of an important identified emerging hazard topic for 2009 RHMP is based on a change of priority of hazard probability and potential impact, new current situational awareness and the FEMA Hazard Mitigation Plan guidance. The identified technological hazard that addresses new and emerging conditions is:

Dam / Dam Safety

The 2004 RHMP initially identified very specific separate hazards that were either subsets of other identified hazards or too narrow in focus to be developed towards incorporation into the current 2009 RHMP. Examples from 2004 are industrial, erosion, urban economy, agricultural economy, air and water quality, and food contamination. These topics will not be included as a separate title in the 2009 RHMP. They may, however, be mentioned and referenced in the documentation of the other listed hazards if impacted by those elements.

Future hazard topics are identified for the next RHMP planning iteration to be incorporated into the Plan, two natural and two technological, or manmade, are:

Pandemics (Epidemics)
Volcanoes / Volcanic activities
Extreme Heat
Pipeline (Utility Energy Shortage)

Sources of Data

Information supporting the hazard identification and vulnerability assessment update for the 2009 Regional Hazard Mitigation Plan (RHMP) was obtained from a variety of sources (this is an expanded list from 2004):

- King County Office of Emergency Management - Duty Officer Log Activations 1996 to present
- Presidential Disaster Declarations 1990 to present
- Review of past incidents and declared disasters
- Media, Newspapers and Internet Website searches
- Jurisdiction and agency experience and documentation
- Special reports, papers, or new projects
- King County Geographic Information System (GIS)
- King County Department of Natural Resources and Parks (DNRP)
- King County's Flood Control Center and Flood Control District data
- University of Washington Seismology Department
- Seattle King County Public Health (PHSKC)
- Review of the State HMP and other State Plans
- WA Department of Natural Resources, WA Geological Survey
- National Weather Service (NWS)
- Federal Emergency Management Agency (FEMA) website
- FEMA Risk Analysis HAZUS HM runs completed for Howard Hanson Dam
- U. S. Army Corps of Engineers (USACE) reports
- Other local or county department plans

Several substantive changes made for 2009

Introduction

With a substantial marine influence, the climate of King County is well known for its moderation. Despite this, severe weather in King County can happen at any time of year but usually occurs between October and April but can occur in summer months. Severe weather can include unseasonable rain, snow, ice, extreme cold, and high winds. (Wind speed itself does not predict damage due to different tempering effects of variable landscapes; 45 mph tends to be the threshold at which damages occur.)

The effects of severe weather in the County can include flooding, power outages, land and mudslides, and road, rail and airport closures. There is little snow removal equipment or budget associated for such service in King County. Vehicles and drivers are often poorly equipped to travel roadways under such conditions. For this reason, impacts from unusually heavy snowfalls and severe winter tend to be dramatic though short-lived, and typically occurs annually.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Severe Weather Probability and Severe Weather Impacts

Hazard Identification

Precipitation

The geographical location of northwestern Washington subjects it to several climatic controls: the effects of terrain, the Pacific Ocean, and semi-permanent high and low pressure regions located over the North Pacific Ocean combine to produce significantly different weather conditions within short distances.[1] Accordingly, rainfall in King County varies widely from city to city and area to area. The City of Seattle has an average of 37 inches annually;[2,3] while Enumclaw has an annual average of 55 inches[4,5] and Snoqualmie/North Bend has 61 inches[6,7] of precipitation. The majority of this precipitation occurs as rain in the lowlands between October and early May with substantial snow packs in the Cascades during the same time frames.

Snow accumulations in King County at elevations below 2,000 feet are uncommon. On average, Seattle will have one or two snow storms during a winter season with appreciable accumulations. Snow accumulation rarely remains two days after such a storm. Heavy local snows and associated cold conditions have resulted in power outages, transportation restrictions, and adverse impacts to the regional economy.

Table 5-1: Precipitation in Inches by Month[8,9]
(Snow and Rain for Seattle)

Month	Average Snowfall[8]	Average Snow Pack[8]	Average Rainfall[8]	Average Precipitation 07-08 / 06-09[9]
July	0	0	.76	0.77
August	0	0	1.10	0.87
September	0	0	1.72	0.78
October	0	0	3.44	2.17
November	0.9	0	6.10	6.52
December	1.8	0	5.86	4.10
January	12.0	0	5.76	5.40
February	1.7	0	3.97	1.47
March	1.4	0	3.73	4.16
April	0.1	0	2.51	3.36
May	0	0	1.69	3.61
June	0	0	1.45	0.18

Wind

High wind events in King County are fairly common and are usually experienced as part of a winter weather pattern.

*Tornado – (*new in 2009)

Though rare, King County and the sound region does experience tornado activity. Tornados have reached F3 designation within the region, but the slower F0 and F1 class tornados are more common. In September of 2009 the Enumclaw area experienced a class F1 tornado. Though wind speeds of up to 110 mph were estimated, the most substantive damage recorded was the uprooting of trees and damage to roofs, much of which could be attributed to the preceding storm[13]. Tornados are a result of strong weather systems and often times accompany serve wind, rain, and hail.

Ice and Extreme Cold

King County's marine climate results in very few extreme cold/ice events. Typically, the area experiences below freezing temperatures for 10-14 consecutive days in January or February.

Flooding

Severe weather is often accompanied by heavy rains and flooding conditions, See "Flooding" section.

Power Outages

Power outages are commonly experienced in association with high winds, rain and flooding conditions.

History of Events

The table below represents damages to public property from severe weather events since 1972. Damages occurred to roadway, school roofs, reservoirs, vehicles (from falling trees), and public buildings were caused directly or indirectly by wind, rain, snow load, or flying debris.

Table 5-2: Severe Weather History

FEMA No.	Dates	KC Public Damages (FEMA Approved)
328	1972 – Flooding	Prior to FEMA
492	1975 - Flooding	Prior to FEMA
545	1977 – Flooding, landslide	Prior to FEMA
612	1979 – Flooding	Figures not available
757	1986 – Flooding, landslide	Figures not available
784	1986 – Flooding	Figures not available
852	1990, Jan – Flooding	$5,246,411
883	1990, Nov – Flooding	$3,694,824
896	1990, Dec – Flooding	$ 477,737
981	1993, Jan – Inaugural Day Wind Storm	$1,927,837
1079	1996, Jan – Winter Storm	$3,031,519
1100	1996, Feb - Flooding	$4,226,719
1159	1997, Jan – Winter Storm	$3,576,309
1172	1997, April – Flooding	$1,266,446
1499	2003, Nov – Flooding	$4,400,000*
1671	2006, Nov – Flooding	$16,000,000*
1682	2006, Dec – Wind Storm	$29,000,000*
1734	2007, Dec -- Winter Storm	$72,500,000*

1817	2009, Jan – Winter Storm	$17,000,000*
1825	2009, Mar – Winter Storm	$5,500,000*
		**estimate*
2009 Total		**$167,847,802**

Hazard Impacts

Precipitation

Heavy local snows and associated cold conditions have resulted in power outages, transportation restrictions, and adverse impacts to the regional economy.

Wind

Winds in excess of 45 miles per hour can cause road closures, significant damages to public and private property, and injuries to public safety, utility workers and private citizens. One of the best known of these was the Inaugural Day Windstorm on January 19, 1993.[10] Winds began mid-morning, lasted five hours and reached over 90 miles per hour in downtown Seattle. The Hanukkah Eve Windstorm of December 15, 2006 heavily damaged the Seattle area power grid, affecting hundreds of thousands in the subsequent weeks.[12] Widespread power outages resulted from downed trees and many suburban and rural roads were made impassible. Usually, these winds are from the south.

Ice and Extreme Cold

Extended temperatures of less than 20 degrees can burst residential water pipes. The population is vulnerable to the effects of extreme cold and associated power outages. In some cases, shelters are opened for the homeless, senior citizens and people without heat/power.

Power Outages

Downed trees caused by high winds and rain saturated soils damaged transmission lines and cause power outages in local areas for hours to days when multiple occurrences are experienced. Utility crews from Puget Sound Energy, Bonneville Power and Seattle City Light work around the clock to restore services. The Inaugural Day Windstorm left 750,000 customers without power.[11] The Hanukkah Eve Windstorm winds and subsequent heavy rains cut electricity to more than 1.8 million customers, hundreds of thousand remained without power for days.[12] Downed power lines pose an electrocution hazard to motorist, pedestrians and any unsuspecting by-standers.

Transportation Impacts

High winds sometimes result in the closure of the floating bridges (Highway 520 and Interstate 90) over Lake Washington, although rare. Wind-driven waves often break over the roadway under those conditions.

Trees uprooted by wind regularly sever power lines and/or block vehicular access. Together, these conditions make roadways impassable.

Past Mitigation Efforts

One of the most common impacts from severe weather is the loss of commercial power. Since many other services rely on power for critical functions, providing contingency backup power capabilities has long been a favored strategy for mitigating damages from winter storms. Many more police precincts, fire stations, emergency operations centers, hospitals, information technology data centers, service providers and major employers have already introduced this capability.

Severe Weather Endnotes:

[1] *Climate of Washington*. Western Regional Climate Center. Sept. 2009 www.wrcc.dri.edu/narratives/WASHINGTON.htm
[2] *In Town, Out-of-Doors facts*. Seattle's Convention and Visitors Bureau. Sept. 2009 http://www.visitseattle.org/
[3] *Seattle Visitor Information – Weather*. 26 Jul. 2003. GoNorthwest Travel Guide. Sept. 2009 www.gonorthwest.com/Washington/seattle/weather.htm
[4] *Enumclaw – Climate & Weather*. Key to the City. Sept. 2009 http://www.usacitiesonline.com/wacountyenumclaw.htm
[5] *Enumclaw Area Chamber of Commerce.* Sept. 2009 http://www.enumclawchamber.com/chamber.htm
[6] *Snoqualmie Falls, Washington – Period of Record Monthly Climate Summary*. Western Regional Climate Center. Sept. 2009 www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?wasnoq
[7] *Weather*. Snoqualmie Valley Chamber of Commerce. Sept. 2009 www.snovalley.org/vn_weather.html
[8] Western Regional Climate Center - *Seattle Urban Site, Washington – Period of Record Monthly Climate Summary*. Western Regional Climate Center. 31 Dec. 2008 http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?wa7473
[9] *Seattle Climate Data Monthly Summary*. Beautiful Seattle. Sept . 2009 www.beautifulseattle.com/clisumm.htm
[10] *"400,000 Lose Power – But Storm Not as Bad as Had Been Feared*." Seattle Times 13 Dec. 1995: A.1.
[11] *"Storms Leave 4 Dead, 1M Without Power."* KIROtv.com 15 Dec, 2006 http://www.kirotv.com/weather/10544585/detail.html?rss=sea&psp=eastsidenews
[12] *"Storm death toll reaches 8 as 200,000 still without power."* KOMONews.com 16 Dec, 2006 http://www.komonews.com/news/4935976.html
[13] *"Barn-Buster Windstorm Really Was a Tornado."* Seattle Times 8 Sept, 2009: A.1.

Several substantive additions made for 2009

Introduction

Avalanche hazards in the Northwest are associated with winter storms in the Cascade and Olympic Mountain ranges. Avalanches occur when a snow pack loses its grip on a slope and slides downhill. Typically, slopes of between 20 to 30 degrees and snow packs of 34 inches or more may produce avalanches.[1]

There are two kinds of avalanches, loose and slab. Loose avalanches occur when light-grained snow exceeds its angle of repose, collapses a snow drift or bank and fans out as it slides downhill. A slab avalanche occurs when heavy or melting snow resting on top of looser snow breaks away from the slope and moves in a mass. The latter often occurs when rains soak the top layer of snow on moderately sloped terrain.

The factors that cause avalanches are numerous and complex. Scott Kruse lists twelve common factors: old snow depth, old snow surface, new snow depth, new snow type, snow density, snow fall intensity, precipitation intensity, settlement, wind direction and wind speed, temperature, subsurface snow crystal structure, and tidal effect.[2] Research done at Snoqualmie Pass indicates that most natural avalanches occur within one hour after the onset of rain over a weakened snow pack.[3]

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Avalanche Probability and Avalanche Impact

A variety of mitigation efforts have significantly reduced the potential impact on humans and property. See Past Mitigation Efforts of this hazard.

Hazard Identification

Avalanche danger is highest during severe winter weather. It is also true that most natural avalanches occur in back country little used by humans during such weather conditions. This tends to minimize exposure to avalanche impacts. Most at risk are travelers and winter recreation enthusiasts using Steven's Pass in northern King County, Snoqualmie Pass in central King County, and Crystal Mountain Ski Area near Chinook Pass in southern King

County. Recreational areas that support snowshoeing, alpine and cross-country skiing, snowmobile areas, and winter hikers and campers are most at risk from avalanche events. Typically, injuries to recreational hikers, skiers, snow boarders, and climbers occur outside managed areas.

Several stretches of Interstate 90 and Highway 2 in King County are vulnerable to avalanches between November and May each year, depending on snow packs and weather conditions.

Both Snoqualmie and Steven's Pass are significant commercial routes. Cargos are carried between the Ports of Tacoma and Seattle, and eastern Washington. When Stevens and Snoqualmie Passes are closed, air travel is the only practical way to travel between Spokane and Seattle.

History of Events

The most significant avalanche event in Washington State occurred in 1910 near Steven's Pass. A train carrying passengers was hit by an avalanche killing 96 people.[4] In early 2008, heavy rain associated with snowfall has accounted for the closure of Interstate 90 at Snoqualmie Pass, resulting in delays of over 24 hours.[9] The table below represents recent and significant avalanche events in King County.

Table 5-3: Avalanche History

Year	Location	Impact
1910	Steven's Pass[5]	96 killed
1962	Steven's Pass	2 buried
1966	Snoqualmie Pass	1 buried
1971	Snoqualmie Pass	1 killed
1993	Snoqualmie Pass	5 injured
1994	Steven's Pass	11 injured
1996	Snoqualmie Pass	2 buried
1996	Alpental (Snoqualmie Pass)	2 dead
1996-97	Snoqualmie Pass, I-90	Repeated closure of Pass, stranding travelers several days
2001	Steven's Pass	2 killed
2002	Snoqualmie	I-90 road closures lasting multiple days
2002	Steven's Pass	3 injured
2003	Alpental	1 killed
2003	Snoqualmie Pass	1killed, 1 injured
2005	Alpental	1 killed
2007	Snoqualmie	2 killed, 1 injured

Source: Washington State Emergency Management Division, Hazard Identification and Vulnerability Analysis, Sept. 2009.
http://www.nwac.us/accidents.htm

Periodically each winter season, Snoqualmie and Stevens Passes both close for several hours for avalanche control measures. During the 2002-03 winter season, there were 30 deaths from avalanches in Washington State. Un-inhabited alpine areas in the Cascades north and south of Interstate-90 experience hundreds of avalanches annually.[6]

Hazard Impacts

Impacts on King County from avalanche closures of Snoqualmie Pass include economic impacts to the Port of Seattle, ski areas, and the cities of Snoqualmie, North Bend, Skykomish, and Issaquah. Motorists and truckers are often re-routed through Interstate 84 in Portland.[7] Stranded motorists occupied shelters and hotel space in Snoqualmie, North Bend, Issaquah and Bellevue. During the winter of 1996-97, I-90 was closed for 276 hours. The later closures cost the State of Washington an estimated 144 million dollars (2002).[8]

Avalanches pose a hazard for ski resorts in the eastern edge of King County within the Cascade Range. Warm temperatures and severe snowstorms account for trapped or buried skiers in particular the Snoqualmie area where activity is the highest. In the winter of 2007 there were two recorded incidences of skiers trapped or killed by avalanches, following similar trends from the previous winters of 2003-04 and 2005. [10]

In late January of 2008, severe winter storms and warm temperatures caused the closure of I-90 due to avalanches. For nearly 4 days WSDOT crews worked non-stop to clear a series of avalanches on Snoqualmie Pass following a declared State of Emergency by Governor Gregoire. [11]

Past Mitigation Efforts

Avalanche research began in the mid-1940s. By 1952 Stevens Pass was one of three research stations in the United States. The use of artillery for avalanche control was one of the developments of that research. Washington State Department of Transportation (WSDOT) is responsible for avalanche control. The WS DOT snow and ice removal budget was $20,000,000 in 1996, the most recent available data provided.[8] This money has been used to control avalanche hazards along major roadways. The roadway covering along I-90 near Snoqualmie and the 7.8 mile tunnel at Stevens Pass was constructed to protect rail lines from avalanches in 1929.[3] The National Weather Service Avalanche Center provides reports on avalanche conditions and issues advisories.

Avalanche Endnotes

[1] Washington State Department of Transportation, Prediction of Snow and Avalanches in Maritime Climates: Final Report, WA-RD 203.1, December 1989, p.3.
[2] Avalanche Evaluation Check List by Scott M. Kruse in the Avalanche Review vol. 8, No 4, February 1990
[3] Washington State Department of Transportation, Prediction of Snow and Avalanches in Maritime Climates: Final Report, WA-RD 203.1, December 1989, p.1.
[4] Description of the Wellington (Stevens Pass) avalanche, http://www.cisackson.com/Skykomish/
[5] "In mountains, experience sometimes isn't enough" by Joe Nabbefeld, Seattle Times, December 27, 1996, p. B1
[6] *"Cold Snap May Help Situation in Passes"* by Richard Seven, Seattle Times, February 11, 1990, p. A1
[7] Washington State Emergency Management Division, Hazard Identification and Vulnerability Analysis, draft, May 2003
[8] Washington State Emergency Management Division, Hazard Identification and Vulnerability Analysis, June 1996, P. A2
[9] "*I-90 at Snoqualmie Pass closed until Friday"* King/King5.com, 31 Jan, 2008
http://www.king5.com/localnews/stories/NW_013108WXB_avalanche_snoqualmie_LJ.7728aace.html
[10] Recent Accident Summaries, Avalanche Accident Data
http://www.nwac.us/accidents.htm
[11] -Storm-Related Closures of I-5 and I-90: Freight Transportation, Economic Impact Assessment Report, Winter 2007-08, Sept. 2008
http://www.wsdot.wa.gov/NR/rdonlyres/8FCFF2CF-4ACC-461A-96A6-AA310CCF6050/0/WSDOT_I5_90ClosuresFinalReport.pdf

Flooding

Substantive additions made for 2009

Introduction

Typically, snow accumulation melting runoff waterflow is towards Eastern Washington rivers and tributaries, not western Washington. Flooding in King County occurs primarily when large wet and warm weather systems, usually known as a "Pineapple Express", occur in the Cascade Mountains and after large snow packs have accumulated. The combination of warmer temperatures, quickly melting snow runoff and added precipitation can fill rivers within hours but usually build over one to three days. For this reason most flooding occurs in the winter months.

Rainfall in geographic King County varies widely from city to city and area to area. The City of Seattle has an average of 37 inches annually,[1,2] while Enumclaw has an annual average of 55 inches[3,4] and Snoqualmie/North Bend has 62 inches[5,6] of precipitation. The majority of this precipitation occurs as rain in the lowlands between October and early May with substantial snow packs in the Cascades during the same time frames.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Flooding Probability and Flooding Impacts

Note: The 2009 hazard vulnerability, or impact, for the next 3 -5 years has been changed to high/high, from high/moderate in 2004. This is because of the Green River Valley risk of potential flooding in the next three to five year period due to the Howard Hanson Dam situational awareness.

Hazard Identification

These first three paragraphs were added for the 2009 Plan update by the King County Department of Natural Resources and Parks, Water and Land Resources Division.

Major flood events along King County's rivers result in two primary types of flood hazards: inundation and channel migration. Inundation is defined as floodwater and debris flowing through an area that is not normally under water.

Such events can cause minor to severe damage, depending on the velocity and depth of flows, the duration of the flood event, the quantity of logs and other debris carried by flows, and the amount and type of development and personal property in the floodwater's path.

Channel migration results from erosion, which is the wearing away of a riverbank by flowing water. Ongoing erosion of one riverbank coupled with sediment deposition along the opposite bank results in the lateral movement, or migration, of a channel across its floodplain. A channel can also move by abrupt change in location, called avulsion, which can shift the channel location a large distance in as short a time as one flood event.

King County identifies areas that are at risk from flooding and channel migration using a variety of mapping, analytic, and property tracking approaches. Flooding due to channel migration has been mapped in four areas of the major King County rivers and tributaries, covering a total of 49 river miles. Major flood events in King County have resulted in significant property damage. King County has been declared a federal disaster eleven times since 1990 with damages well over $350 million. The most severe recent flood event was the January 2009 flood.

In 2004, King County had identified several low-lying areas that are susceptible to flooding on an annual basis to varying degrees. Neal Road, Southeast Reinig Road and Northeast Walker Road may flood at Phase II on the Snoqualmie River while at Flood Phase III water covers the lower Mill Creek basin roadways. Cities that have experienced significant river flood impacts include Auburn, Bothell, Carnation, Duvall, Issaquah, Kent, North Bend, Renton, Snoqualmie, and Tukwila.

Flood Level Phases and Precipitation

Flooding incidents in King County are described in Flood Phases for individual river systems.[8]

Flood Phase I:	Rivers running bank full
Flood Phase II:	Some minor flooding and water over roadways
Flood Phase III:	Some homes inaccessible, roadways overtopped, water velocities may be dangerous with some debris
Flood Phase IV:	Homes in low-lying areas flooding with significant damage and threat to life and safety

Table 5-4 shows there is am annual buildup of snow pack in December through March with a rapid melt-off of that snow pack while spring rains continue. Heavy

rains in November and December, when accompanied by fluctuating temperatures, can trigger events similar to spring melts. Thanksgiving weekend has often been noted as the beginning of flood season in King County.

Table 5-4: Precipitation in Inches

Month	Average Snowfall[7]	Average Snow Pack[7]	Average Rainfall[5,6]
January	109.04	70	8.50
February	73.78	91	6.14
March	71.42	96	6.09
April	25.87	76	4.44
May	3.47	32	3.45
June	Nil	2	3.01
July	Nil	0	1.43
August	Nil	0	1.54
September	Nil	0	3.01
October	5.30	0	5.56
November	51.08	10	8.84
December	96.93	37	9.09

Note: Measurements for snow was taken at Snoqualmie Pass and rain taken at the City of Snoqualmie Falls.

Major Rivers that are susceptible to flooding inhabited communities and roadways are (in cubic feet per second – cfs).[8]

Table 5-5: Flood Phase Levels Used By King County Flood Warning Center

River System	Phase I	Phase II	Phase III	Phase IV
Snoqualmie River – Sum of the Forks	6,000 cfs	12,000 cfs	20,000 cfs	38,000 cfs
Cedar River	1,000 cfs	2,800 cfs	3,500 cfs	4,200 cfs
Tolt River	1,500 cfs	2,500 cfs	4,500 cfs	7,000 cfs
Green River	5,000 cfs	7,000 cfs	9,000 cfs	12,000 cfs
White River	5,000 cfs	8,000 cfs	10,000 cfs	12,000 cfs
Issaquah Creek	6.5 ft	7.5 ft	8.5 ft	9.0 ft

For the 2009 Plan update, the King County Department of Natural Resources and Parks, Water and Land Resources Division has provided a very detailed analysis of the 6 major King County river basins. The analysis is located Section 6 of the Plan, after Table 6.1, titled King County Major River Basins. This documentation includes land use, structures, estimating potential losses, development trends, and repetitive loss properties.

Table 5-5A: Major King County River Basins, detailed in Section 6**, a new table in 2009**
South Fork Skykomish River
Snoqualmie River
Sammamish River
Cedar River
Green River
White River

Flood Forecasting (new in 2009)

For the 2009 Plan update, the King County Department of Natural Resources and Parks, Water and Land Resources Division (DNRP) has provided this following information about flood forecasting: 11.5

King County's current ability to provide flood flow forecasts is limited. Flow measurements taken in the upstream portions of a watershed are used by flow forecasters to generate short-term predictions for downstream areas. By comparing the relationships between conditions at the upstream and downstream locations during previous flood events, the travel time of a flood peak can be roughly estimated. However, because both the weather and the river systems are dynamic, each flood is different. Weather variations include the timing and intensity of precipitation, the temperature and snow level, the wind speed and direction, and the storm cell's location, speed, and direction of travel. River system variations include local factors such as log jams, bank erosion, landslide and gravel bar formation, as well as upstream flow control factors, such as dam operations. Antecedent conditions, which include previous rain and snow pack conditions, also affect the amount and timing of storm runoff. Because these dynamic variations influence the relationships between flood conditions at different locations, any predictive use of those relationships will always include a degree of uncertainty.

The National Weather Service's River Forecasting Center in Portland, Oregon issues short-term predictions of flows on rivers in Washington, Oregon, Idaho, and western Montana. These short-term flow predictions are based on two computer models: the National Weather Service River Forecast System and the Streamflow Simulation and Reservoir Regulation. Each of these models simulates soil, snow, stream channel and reservoir conditions in order to estimate resulting river flow conditions. Daily forecasts are made using observations of temperature and precipitation. Forecast of meteorological parameters are included in the river forecast model. These National Weather Service predictions are issued for several forecast points in King County, including Middle Fork Snoqualmie River near Tanner, North Fork Snoqualmie near Snoqualmie Falls, South Fork Snoqualmie River near Garcia, Snoqualmie River at Snoqualmie Falls and at Carnation, Tolt

River near Carnation, Cedar River at Landsburg and Renton, Green River at Auburn, White River near Buckley and Issaquah Creek near Issaquah.

The Seattle office of the National Weather Service provides additional forecast detail when flooding is likely, and throughout flood events, with flood watch and flood warning statements. While the National Weather Service forecast information is valuable and widely used, an additional independent model would be beneficial. A model designed specifically for King County and adjacent watersheds would improve the ability of Flood Warning Center staff to interpret incoming gage and National Weather Service data, and to give meaningful forecasts to others. 11.5

History of Events

This is a new Table 5-5B in 2009, this section has been updated from the 2004 Plan, history of events list, to provide more complete information.

Table 5-5B: Gage Information Data from Past Floods [14]				
	Date	**Feet**	**Flows**	**100-Year Flow or Regulated Flows**
Skykomish River Near Gold Bar Gage (1)				
	11/06/2006	24.51 ft	129,999 cfs	119,300 cfs
	11/24/1990	22.49 ft	102,000 cfs	119,300 cfs
	12/26/1980	21.34 ft	90,100 cfs	119,300 cfs
North Fork Snoqualmie River Near Snoqualmie Falls Gage (2)				
	1/07/2009	13.42 ft	17,100 cfs	18,000 cfs
	2/26/1932	17.50 ft	15,800 cfs	18,000 cfs
	11/29/1995	12.82 ft	14,500 cfs	18,000 cfs
Middle Fork Snoqualmie River Near Tanner Gage (3)				
	11/06/2006	15.32 ft	31,700 cfs	37,100 cfs
	1/07/2009	15.22 ft	31,200 cfs	37,100 cfs
	12/02/1977	14.93 ft	30,200 cfs	37,100 cfs
South Fork Snoqualmie River Above Alice Creek Near Garcia Gage (4)				
	11/06/2006	18.68 ft	8,910 cfs	11,000 cfs
	11/23/1986	8.33	8,450 cfs	11,000 cfs
	11/24/1990	18.26 ft	8,000 cfs	11,000 cfs
Snoqualmie River Near Snoqualmie Gage (5)				
	11/24/1990	21.55 ft	78,800 cfs	79,100 cfs
	11/23/1959	19.78 ft	61,000 cfs	79,100 cfs
	1/07/2009	20.97 ft	60,700 cfs	79,100 cfs
Snoqualmie River Near Carnation Gage (6)				
	1/08/1990	62.65 ft	83,400 cfs	91,800 cfs
	11/07/2006	61.28 ft	71,800 cfs	91,800 cfs
	11/24/1990	60.70 ft	65,200 cfs	91,800 cfs
Snoqualmie River at Duvall Gage (7)				
	1/08/2009	45.18 ft	See note 7	See note 7
	11/30/1995	44.36 ft	See note 7	See note 7
	11/08/2006	42.89 ft	See note 7	See note 7

Raging River Near Fall City Gage (8)				
	11/24/1990	6.56 ft	6,220 cfs	6,970 cfs
	11/23/1986	6.27 ft	5,330 cfs	6,970 cfs
	1/9/1990	6.02 ft	4,640 cfs	6,970 cfs
Tolt River Near Carnation Gage (9)				
	1/08/2009	12.58 ft	17,900 cfs	18,800 cfs
Before the dam	12/15/1959	13.04 ft	17,400 cfs	18,800 cfs
Before the dam	2/09/1951	12.92 ft	16,800 cfs	18,800 cfs
Cedar River Near Landsburg Gage (10)				
	11/19/1911	Unknown	14,200 cfs	10,300 cfs
	11/15/2006	Unknown	12,400 cfs	10,300 cfs
	11/24/1990	10.38 ft	10,800 cfs	10,300 cfs
Cedar River at Renton Gage (11)				
	11/24/1990	17.13 ft	10,600 cfs	12,000 cfs
	1/08/2009	16.27 ft	9,400 cfs	12,000 cfs
	12/04/1975	14.14 ft	8,800 cfs	12,000 cfs
Green River Below Howard Hanson Dam Gage (12)				
Before the dam	2/21/1961	14.40 ft	12,200 cfs	
	1/05/1984	14.22 ft	11,100 cfs	12,000 cfs regulated
	2/17/1981	13.89 ft	10,800 cfs	12,000 cfs regulated
Green River Near Auburn Gage (13)				
Before the dam	11/23/1959	69.75	28,100 cfs	
Before the dam	12/11/1946	68.16 ft	22,000 cfs	
Before the dam	12/12/1955	67.73 ft	20,300 cfs	
White river Near Buckley Gage (14)				
Before the dam	12/02/1933	Unavailable	28,000 cfs	
Before the dam	2/26/1932	Unavailable	17,000 cfs	
Before the dam	11/30/1995	Unavailable	16,500 cfs	
	11/24/1986	Unavailable	15,200 cfs	12,000 cfs regulated
White River Near Auburn (15)				
	2/10/1996	83.15 ft	15,000 cfs	15,500 cfs
	11/09/2006	85.79 ft	14,700 cfs	15,500 cfs
	1/09/1990	82.07 ft	14,500 cfs	15,500 cfs

(1) USGS Station 12134500 located at RM 43.0, roughly 6.6 miles below South Fork & North Fork confluence
(2) USGS Station 12142000 located at RM 9.2 roughly 0.6 miles above Calligan Creek
(3) USGS Station 12141300 located at RM 55.6 roughly 0.7 miles below Granite Creek
(4) USGS Station 12143400 located at RM 17.3 roughly 0.4 miles above Alice Creek
(5) USGS Station 12144500 located at RM 40.0 near the base of Snoqualmie Falls
(6) USGS Station 12149000 located at RM 23.0 beside the Carnation Farms Road Bridge
(7) USGS Station 12150400 located South of Woodinville-Duvall Bridge in Duvall. Because of hydraulic conditions, this gage records only flood states without flow estimates.
(8) USGS Station 12145500 located at RM 2.75 near the old concrete arch bridge (68th Street)
(9) USGS Station 12148500 located at RM 8.7 roughly 0.4 miles above Stossel Creek
(10) USGS Station 12117500 located at RM 23.4 roughly 1.8 miles above the water supply intake
(11) USGS Station 12119000 located at RM 1.6 near the Mill Avenue Bridge
(12) USGS Station 12105900 located at RM 63.8 roughly 0.7 miles below the dam
(13) USGS Station 12113000 located at RM 32.0 near the base of Lea Hill
(14) USGS Station 12098500 located at RM 27.9 roughly 1.7 miles downstream of Mud Mountain Dam
(15) USGS Station 12100496 located at RM 6.30 near A Street Bridge

Not all flooding incidents are eligible to receive federal assistance for public agencies. For this reason alone, mitigation efforts to minimize the impacts of flooding in King County can save a considerable amount of public monies needed to repair damages from modest-sized events. The following list of presidential disaster declarations were associated with listed King County flooding events listed above.

Often, Small Business Administration (SBA) loans are available to individuals and businesses that qualify without a presidential declaration of disaster.

Table 5-6: FEMA Flooding Disasters in King County Identified in 2004 Plan		
No.	Dates	KC Public Damages (FEMA Approved)
185	December 1964	Figures not available
328	February 1972	Figures not available
492	December 1975	Figures not available
545	December 1977	Figures not available
612	December 1979	Figures not available
757	January 1986	Figures not available
784	November 1986	Figures not available

The following were provided in 2009 from the King County Flood Control District for the 2009 Plan Update. 11.5

Table 5.7 2009 Update to FEMA Flooding Disasters in King County

Date of Flood	Declaration #	Type of Damage	Estimated Damages
January 1990	#852	Overbank flooding causing damage to both public and private property. Channel avulsion.	$17.8 million
November 1990	#883	Overbank flooding causing damage to both public and private property. Stream bank erosion.	$57 million
December 1990	#896	Overbank flooding causing damage to both public and private property. Levee damage.	$5.1 million
November 1995	#1079	Overbank flooding causing damage to both public and private property. Levee damage.	$45.9 million
February 1996	#1100	Overbank flooding causing damage to both public and private property. Stream bank erosion. Levee damage.	$113 million
December 1996	#1159	Overbank flooding causing damage to both public and private property. Channel avulsion.	$83 million

Date of Flood	Declaration #	Type of Damage	Estimated Damages
March 1997	#1172	Overbank flooding causing damage to both public and private property. Channel avulsion.	$6.5 million
November 2003	#1499	Overbank flooding causing damage to both public and private property.	$30 million
December 2006	#1671	Overbank flooding causing damage to both public and private property. Channel avulsion	Information not available
December 2007	#1734	Overbank flooding causing damage to both public and private property. Channel avulsion. Levee damage.	Information not available
January 2009	#1817	Overbank flooding causing damage to both public and private property. Channel avulsion. Levee damage.	Information not available

Hazard Impacts

Flooding impacts to the community include injuries to citizens and public safety officials, damage to property, lost revenue and economic damages, an increased demand on public safety and infrastructure related services. The King County Emergency Coordination Center (ECC) activates for flooding events of Phase III level or greater to coordinate resources, information, and response activities.

Response activities include unanticipated overtime for ECC activations and first responders, evacuations, sheltering of displaced people, rerouting traffic destined for impassible roads, bridge and road damage repairs, and rescue or medical missions related to motorists and isolated families. The Cities of Carnation, Duvall, and Pacific have been isolated as an entire community. Private property damages to homes and vehicles as well as land erosion, river channel changes, agricultural damages and livestock losses result in significant rural economic impacts to local residents and businesses.

The economic impacts as a result of flooding events are a significant hazard to regional commerce. The areas prone to flooding, the lower-lying banks and valleys near rivers, are densely developed with industrial and commercial activity. Though only 2% (32,000) of King County's residents are directly impacted, the employment of area citizens is greatly affected. Since the floodplain vicinities employ nearly 6% (65,000) of King County, the economy of the area at large is impacted far beyond the zones of flood risk. Of the industries specifically at higher risk, 30% of King County's manufacturing employment and 30% of its aerospace industry are located in floodplains. Nearly 7% of King County's total annual wages and salary income is created from businesses within flood zones. The consequences of a single day of economic shut-down within the floodplains would result in $46 million loss of county wide revenue. An estimated $3 million reduction of economic output would result from the areas of King County outside the flooded areas. [10.5]

Past / Present Mitigation Efforts

National Flood Insurance Program (NFIP) (*new for 2009*)

King County is nationally known for its work on flooding mitigation. In 1978 unincorporated King County entered the National Flood Insurance Program (NFIP).[9] The most recent review of King County's participation in the NFIP was conducted on January 15, 2009. The review, called a Community Assistance Visit, identified amendments needed to King County's flood regulations and through a field investigation found approximately 20 properties that had outstanding code violations for construction within the floodplain. The King County Council has approved an ordinance making the changes in the flood regulations and King County has made significant progress in resolving the code violations as of the date of this Plan update.

The Community Rating System (CRS), administered by the Insurance Services Office, enables residents in participating communities to purchase discounted flood insurance. The amount of discount each community receives is contingent upon its Community Rating System (CRS) rating corresponding to the extent of its floodplain management efforts.[10] For its extensive services in this respect – the implementation of programs such as buyouts for properties experiencing repeated flooding, maintenance of levees along pertinent rivers, and annual public meetings with affected communities, the County has earned a Class 2 rating, making it the highest rated community of any county in the nation. The result of this has been a 40 percent annual savings to flood insurance policy holders in unincorporated King County.[11]

King County Flood Warning Center *11.5* (*new for 2009*)

The purpose of King County's Flood Warning System is to warn residents and agencies of impending floodwaters on major rivers so they can take action and prepare themselves before serious flooding occurs. The Flood Warning Center is operated and staffed by King County through an interlocal agreement between King County and the King County Flood Control District for the County to provide the services to the District. The County monitors conditions in its six major river systems and their major tributaries 24 hours a day. When floods are imminent, King County activates its Flood Warning Center. King County personnel staff the operation, issuing warnings directly to police, fire departments, schools, cities, first response agencies, and citizen phone trees. Personnel at the Center are available to answer questions and help interpret gage readings during a flood event. There is also an automated voice message system that provides real time river flow information and other flood information. King County has developed and started testing a system that automatically sends out e-mail and pager alerts when real-time gage data exceeds flood

phase thresholds. This service is expected to be available to the public in time for the 2009-20010 flood season.

The County works closely with the National Weather Service to obtain forecast information used to make flood predictions. Close coordination occurs with the Office of Emergency Management, Roads Division, and other agencies in order to obtain up-to-date information about major flood problems, road closures, evacuations, and other emergency services. Coordination also occurs with the US Army Corps of Engineers and Seattle Water Department regarding dam operations.

Operation of the Flood Warning Center is based on a four-phased warning system, issued independently for each river. The thresholds for each phase are based on river gages, which measure the flood flow and stage (depth) of the major rivers in various locations. At Phase III or greater, flood patrol crews are sent out in the field to monitor flood protection facilities and respond to flood emergencies and reported problems around the clock. Significant information about flood conditions in the field, such as road and flood protection facility damages or overtopping, are reported back to the Flood Warning Center, to be shared with the public and emergency responders. The Flood Warning Center maintains communication with the King County Emergency Coordination Center (KC ECC) to coordinate emergency response and recovery. 11.5

Green River Valley Potential Flooding (*new for 2009*)

The U.S. Army Corps of Engineers (USACE) has discovered damage to a portion of the Howard Hanson Dam right abutment in early 2009. This dam has controlled flooding in the Green River Valley since 1962. However the dam will only operate at 30% capacity this winter, 2009, and possibly for an additional 3-5 years. Therefore, there is a much greater risk of significant flooding during periods of heavy rain throughout the lower Green River Valley, affecting the cities of Auburn, Kent, Renton, Tukwila, and south Seattle and surrounding infrastructure. 13

The USACE is actively testing and investigating the source of the problems and trying to identify solutions. The USACE has significantly reduced the water storage levels at the Dam and is taking a number of steps to try and minimize the flood risk. However, the USACE does not anticipate a full solution to the problems with the Dam by this flood season. 13

The Army Corps of Engineers is constructing a grout curtain within the abutment of the dam to reduce seepage through a critical area of concern, as well as performing drainage improvement work to route water into the drainage tunnel. Work is expected to be done by Nov. 1, 2009.12

In September 2009, the U.S. Army Corps of Engineers (USACE) announced that it will purchase and pre-position flood fighting supplies and materials for the Green River Valley in preparation of the upcoming flood season.[12]

More information is detailed in the 2009 Dam / Dam Safety hazard identified in Section 5 about the Howard Hanson Dam and potential impacts to the Green River Valley for 2009, and for possibly 3-5 more years until the repairs or solution(s) can be in place.

Flooding Endnotes:

[1] GoNorthwest Travel Guide, www.gonorthwest.com
[2] Seattle's Convention and Visitors Bureau, www.seeseattle.org
[3] Key to the City, www.usacitiesonline.com/
[4] Enumclaw Area Chamber of Commerce, http://www.enumclawchamber.com/chamber.htm
[5] Western Region Climate Center, www.wrcc.dri.edu
[6] Sno valley Chamber of Commerce, http://www.snovalley.org/index.html
[7] Snoqualmie Pass Monthly and Seasonal Totals and Averages 2007-08, http://www.wsdot.wa.gov/NR/rdonlyres/7C5D5B02-0237-46DD-8AD2-3F3C0226485D/51434/111008HistoricalSnowfallthrough0708season.pdf
[8] King County Dept of Natural Resources and Parks, brochure - Flood Warning Information, http://www.kingcounty.gov/environment/waterandland/flooding/flood-control-zone-district.aspx
[9] FEMA Federal Insurance Administration, http://www.fema.gov/business/nfip/
[10] FEMA – Flood Insurance, http://www.fema.gov/library/viewRecord.do?id=3323
[10.5] *Economic Connections Between the King County Floodplains and the Greater County Economy,* King County Water and Land Resources Division, ECONorthwest, Oct 2007
[11] KC Department of Development and Environmental Services - News Release, http://www.kingcounty.gov/property/permits.aspx
11.5 King Department of Natural Resources and Parks, Water and Land Resources Division, River and Floodplain Management, September 2009
[12] USACE (United States Army Corps of Engineers), Press Release, September 22, 2009
[13] Public Health Seattle & King County (PHSKC) September 3, 2009, Bulletin http://www.kingcounty.gov/healthservices/health/preparedness/greenriverbasin.aspx
[14] 2009-2010 Flood Warning Instruction Book, October 2009, King County Department Of Natural Resources and Parks, Water and Land Resources Division.

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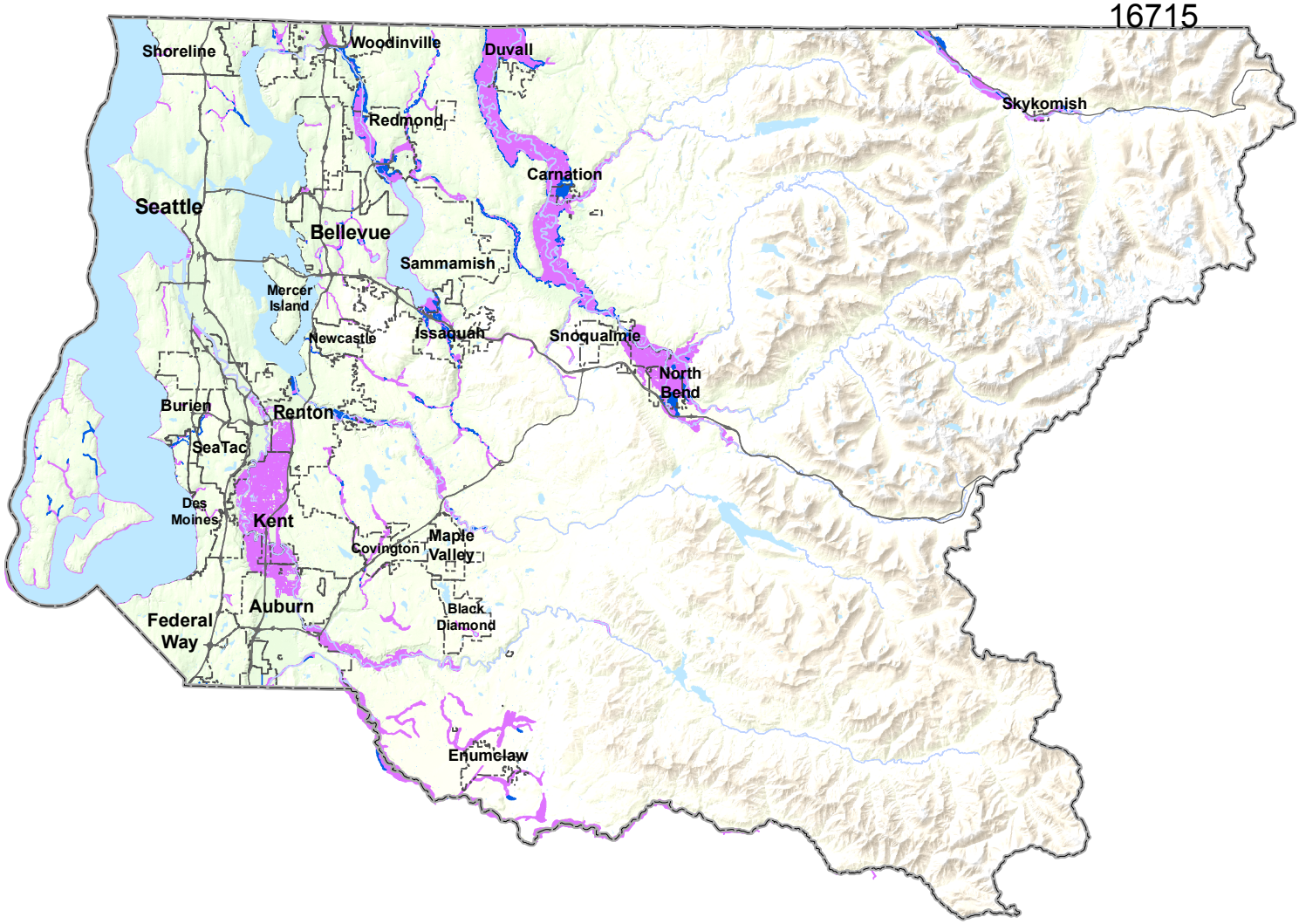

Flood Hazard Areas

100 Year Flood Zone

500 Year Flood Zone

King County GIS
US Geological Survey
Washington State Department of Natural Resources, Division of Geology and Earth Resources

October 2009
Tetra Tech, Inc.

0 5 10 20 Kilometers

0 5 10 20 Miles

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King County

Substantive additions made for 2009

Introduction

Landslides are a common problem within King County. Landslide events in King County are most often associated with either unusually heavy seasonal rains or local earthquake activity. Urban areas of western King County have been developed for residential structures in many places. The vistas provided by the Olympic Mountains and Puget Sound are breathtaking backdrops to the Seattle skyline. Despite the possibility of landslide events, property values continue to rise disproportionately and development of available properties continues.

View homes and property values can reach and even exceed $500,000 in some landslide areas, making even the loss of only a few homes significantly costly.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Landslide Probability and Landslide Impacts

Hazard Identification

The slopes of Magnolia, West Seattle, Burien, Des Moines, Vashon Island, Newcastle, Federal Way and many areas of Bellevue have long been developed for their magnificent views of Mount Rainier, the Cascade and Olympic Mountains, and Puget Sound. Three major factors that contribute to landslide activity and possible impacts to structures include soil type, slope angle, and precipitation levels.

Soil conditions vary widely in King County. In geological terms, King County's landscape is very young. As recently as 14,000 years ago, the region was covered by up to 3,000 feet of ice. The Vashon Glacier, which extended from Canada to south of Olympia carved valleys as it expanded and left soil deposits and rock as it retreated. Evidence of this activity is still observed in the "U" shaped valleys and stony soils common to Puget Sound. Seas rose 300 feet worldwide from the global melting following that ice age, creating Puget Sound as we know it today.[1]

The top layer of soil in King County is referred to as Vashon till, a stable mixture of rocks, dirt, clay, and sand that reaches depths of up to 30 feet. The next

layer, Esperance sand, is a permeable mixture of sand and gravel. This layer sits upon an impermeable layer of Lawton clay, made up of fine sediments and large boulders. Often, slides occur at this boundary interface when water runs laterally on top of this boundary.[2]

In some ways, landslide areas are similar to avalanche terrain. Characteristics of landslide hazard areas include:[3]

1. A slope greater than 15 percent
2. Landslide activity or movement in the last 10,000 years
3. Steam or wave action with erosion or bank undercutting
4. The presence or potential for snow avalanches
5. The presence of an alluvial fan that indicates vulnerability to the flow of debris or sediments
6. The presence of impermeable soils, such as silt or clay, which are mixed with granular soils such as sand and gravel

History of Events

Landslides have been a significant problem in the Puget lowland areas for many years, and several landslides occur every year during the rainy season. Storms have triggered significant numbers of landslides in 1972, 1986, 1990, 1996, 1997, early 2006, 2007, and 2009. Comparison of the locations of (more) recent landslides with those mapped by “Tubbs” reveals that many of the 1997 landslides are in the same general areas as the 1972 landslides.[9]

Very heavy rains in King County resulted in significant slides and associated damages in 1972.[6] Seventy percent of the slides occurred during the two following days.[7]

The most widespread landslide activity was secondary to the severe winter storm events that hit the Puget Sound region during December 1996 through March 1997. Unusually heavy snow and rain in King County resulted in slides that damaged or destroyed 8,000 homes. Over 100 slides were recorded in King County over a two-month period. Particularly hard hit areas were slopes on Magnolia Hill (Seattle), areas along Interstate-5, and Vashon Island.[2,4]

A January 15, 1997 slide at Woodward in southern Snohomish County derailed five cars of a freight train. Passenger and cargo rail traffic was interrupted for nine days. Cargo traffic resumed first. Amtrak remained concerned for passenger safety and did not travel on this section of track for several weeks.[5]

Two weather events in November and December of 1998 caused a number of small slides in King County. Landslides along Interstate-5 near SeaTac Airport briefly closed portions of that northbound roadway.[8]

Heavy rains are not the only cause of landslides. The Nisqually earthquake caused a secondary hazard in February 2001, a landslide/mudslide causing a portion of hillside near Jones Road to slide into the riverbed of the Cedar River. The flow of the river was partially blocked for many hours resulting in several homes along the river being damaged by the dammed waters.

Evidence of slide activity can still be seen along the eastern side of Interstate-5 from King County Airport all the way to the Interstate-90 interchange where portions of hillside collapsed carrying trees and debris downhill, but just short of impacting Interestate-5.

In 2009, Washington State Department of Natural Resources, Division of Geology and Earth Resources, identified recent landslide numbers as provided in the Table 5-7, below. A landslide map distribution for years 2007 and 2009 is included at the end of Section 5. See **Map 5.1 Landslide locations for Jan. 2009 and Dec. 2007 Storms**. 13.5

Table 5-7: Landslide History

Event Date(s) & FEMA Event	Area	KC Public Damages
1972 Severe Weather	King County	$1.8 million
1996-97 Severe Weather (#1100, #1159, #1172)	King County	$9.0 million
2001 Nisqually Earthquake[13] (#1361)	Maple Valley/Cedar River	$1.71 million
2006 Winter, heavy rains for a month in January/February	Mercer Island	34 slides or more documented by Maintenance Director; $ unknown
2007 December Storm 13.5	King County	5 recorded $ unknown
2009 January Storm Landslides 13.5	King County	51 recorded, preliminary data, $ unknown

Source: FEMA Disaster Declaration, USGS[13]
Source: WA Department of Natural Resources; for both of the 2007 and 2009 events, the precipitation was fairy low compared to other parts of western Washington,13.5. Map 5.1 was created showing the distribution of the landslide locations and is located in the back of Section 5.

Hazard Impacts

Slides have resulted in direct damages to structures, roadways, rail lines, bridges, severed lifelines, and the blockage of the Cedar River (see “History of Landslide Events”). Indirect impacts included the isolation of small communities

or areas on Mercer Island, Vashon Island and Magnolia Hill, cost of debris clearance, personal injuries, and economic loses from rail and roadway closures, and debris clean up. The main impacts are disruption and economic.

Past / Future Mitigation Efforts

Efforts to reduce landslide-related losses have been ongoing for at least 20 years. Relative-slope-stability maps at several scales were developed in the 1970s for many of the urbanized areas surrounding Puget Sound (Miller, 1973; Artim, 1976; Smith, 1976; and Laprade, 1989). Most cities and many counties in the area regulate development of steep hillsides (Laprade, 1989). Despite these efforts, losses continue to mount because (1) economic growth continues to exert pressure to develop in or near landslide-prone areas; (2) increased erosion and consequent downcutting caused by urban runoff has locally reduced slope stability (Booth, 1989); and (3) new or previously unidentified landslides damage structures that were built in unstable areas before regulations existed.[10]

King County Surface Water Management maintains a response program related to landslides. The Emergency and Rapid Response Program funds efforts to prevent and recover from such events.[11]

In addition to the efforts at zoning and land use regulations initiated by the government, local citizen groups sometimes work to set aside environmentally sensitive or unstable areas as urban buffers. Such an action is being undertaken by the Denny Creek Neighborhood Alliance toward the purchase of property in the Juanita area near northern Lake Washington.[12] The area is well timbered and is being considered as an environmental buffer to prevent landslides.

An extensive list of codes related to land use and building restrictions for King County has been developed over many decades. For a complete list of codes governing building in King County, go to http://www.kingcounty.gov/property/permits/info/PermitTypes.aspx

In 2009, Washington State Department of Natural Resources, Division of Geology and Earth Resources, is in the process of creating a statewide landslide forecasting system, similar to the urban model in Seattle created by USGS, which will eventually have warnings issued from NOAA/NWS. 13.5

Land Slide Endnotes:

[1]Crozier, Michael J., Landslides: Causes, Consequences, and Environment, Croom Helm, Australia, 1986, p 195.
[2]Carter, Don and Scott Maier, "Slide-Wise, Danger Remains Real as Soggy Slopes are still unstable", Seattle Times, January 17, 1997, p A8.
[3]King County Planning and Community Development Division, "Landslide Hazard Areas", Sensitive Areas: Map Polio, Seattle Washington, 1990, p1.
[4] "It's Been a Winter of Mudslides on Area's Slopes', Seattle Times, January 20, 1997, p A2
[5]Washington State HIVA Draft May 2003
[6]McDoanld, Terrance J., "Landslides", Seattle: A Hazard Vulnerability Analysis, Master's Thesis, Cornell University, 1995, p 147
[7]Tubbs, Donald W., "Landslides in Seattle", Washington State Department of Natural Resources, Information Circular No 52, 1974, p4
[8]REex L. Baum and Aln F. Chleborad, Landslides triggered by Pacific Northwest Storms, November and December 1998, http://landslides.usgs.gov/recent/archives/pnw/table.php , January 14, 1999
[9]Rex L. Baum and Alan F. Chleborad, Geosettings and Landslides, Landslides triggered by the Winter 1997-1998 Storms in Puget Lowland, Washington, http://landslides.usgs.gov/docs/faq/significantls_508.pdf , Jul 13, 1998
[10]ibid
[11]Donald Althaueser, Emergency and Rapid Response, King County Department of Natural Resources and Parks, Surface Water Management Division, http://directory.metrokc.gov/ServiceDetail.asp?ServiceID=6659, July 2002
[12]Tony Dondero, Group Seeks to Buy Woodlands, Eastside Journal, July
[13] An Account of preliminary Landslide Damages and Losses Resulting from the February 28, 2001, Nisqually, Washington, Earthquake; Lynn M. Highland, USGS 2003; http://pubs.usgs.gov/of/2003/ofr-03-211/ofr-03-211.pdf
13.5 Isabelle Y. Sarikhan, Washington State Department of Natural Resources, Division of Geology and Earth Resources, Washington Geological Survey, Hazards Geologist & GIS Analyst, September 2009.

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

Landslide locations for Jan. 2009 and Dec. 2007 storms

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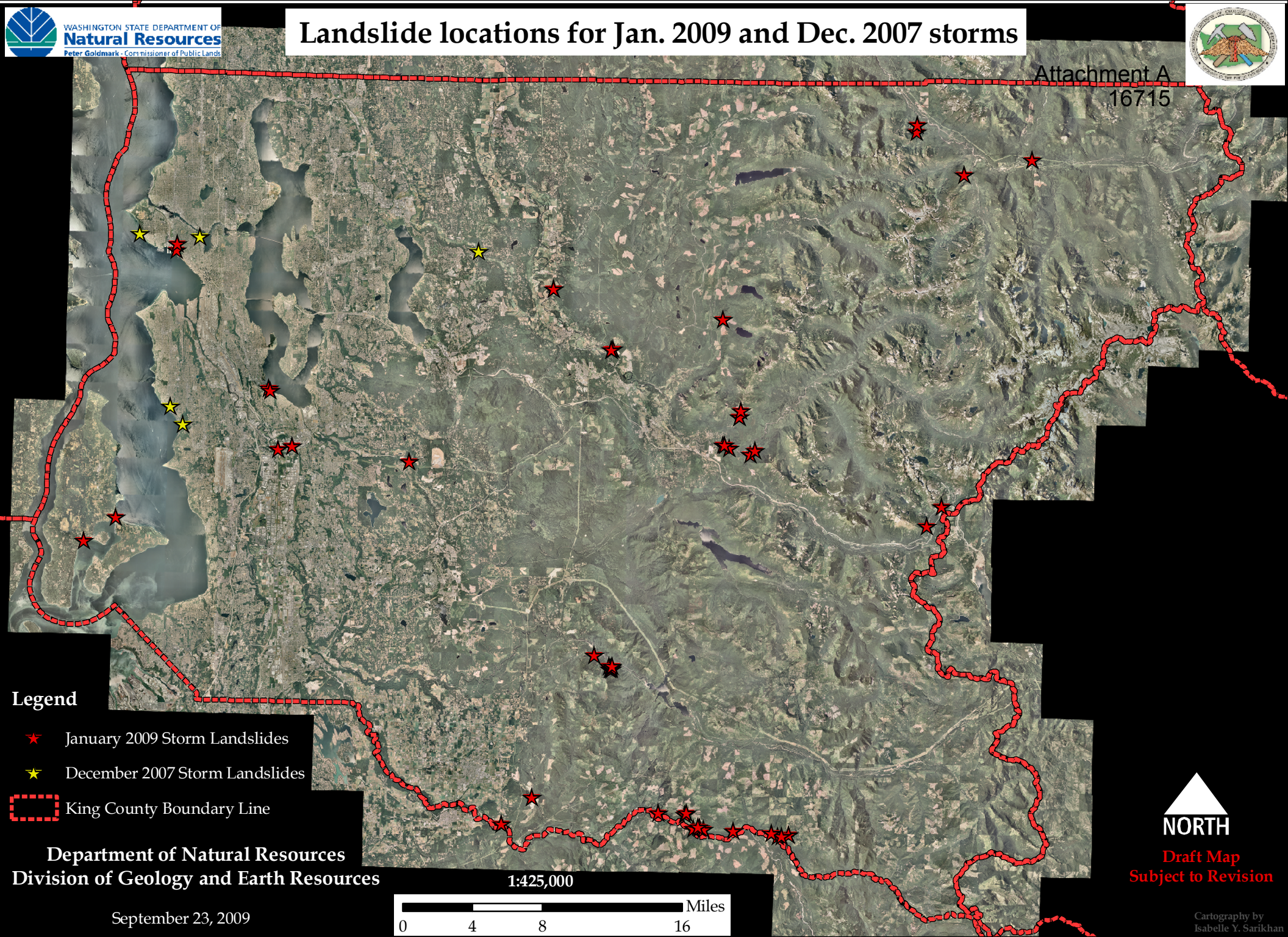

Legend

- January 2009 Storm Landslides
- December 2007 Storm Landslides
- King County Boundary Line

Department of Natural Resources
Division of Geology and Earth Resources

September 23, 2009

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NORTH

Draft Map
Subject to Revision

Cartography by
Isabelle Y. Sarikhan

Attachment A
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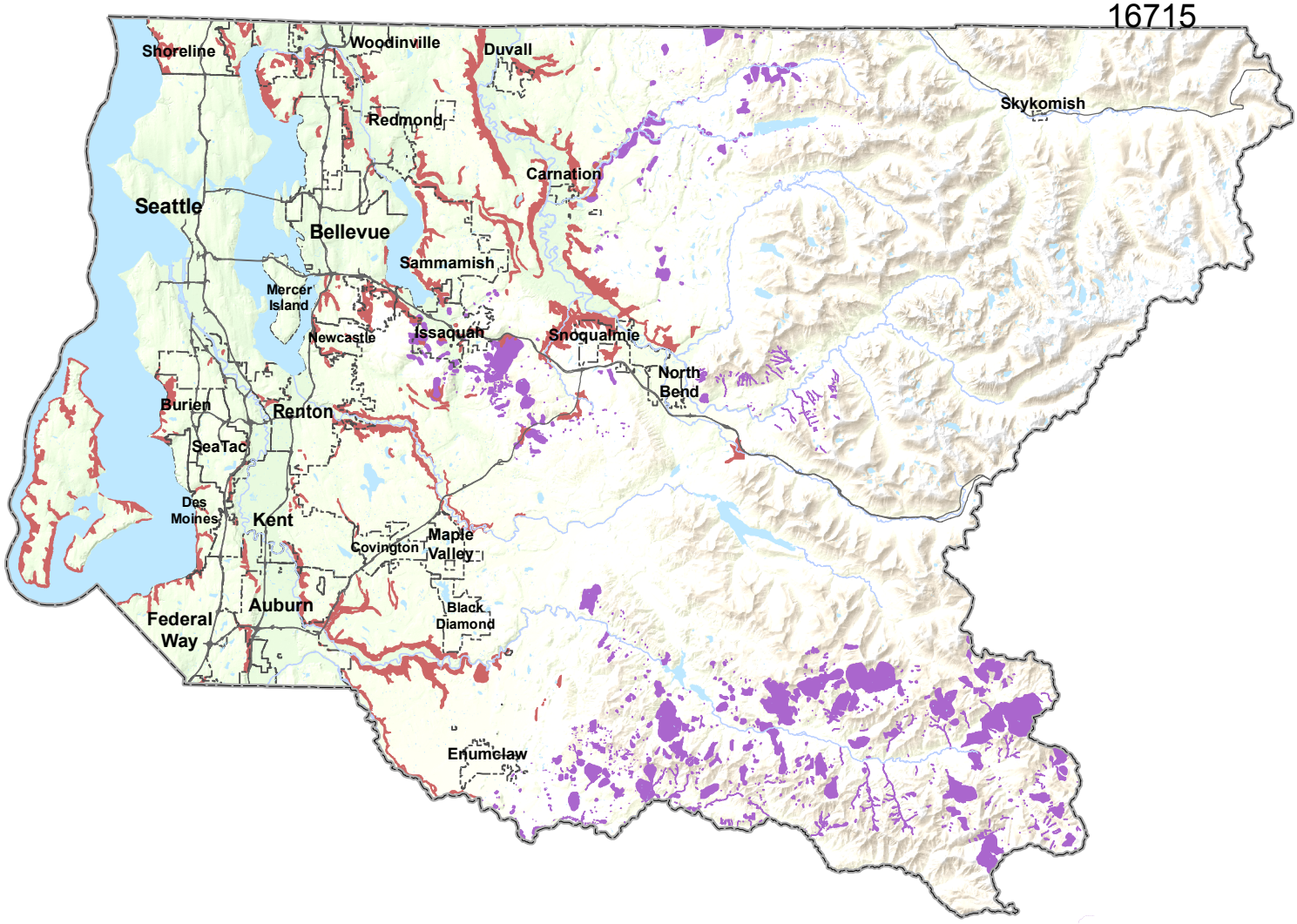

Landslide Hazard Areas

King County Landslide Hazard Areas

King County Landslide Hazard Areas are areas subject to severe landslide risk identified in the Sensitive Areas Ordinance.

DNR Landslide Hazard Areas

The Department of Natural Resources, Geology and Earth Resources Division (DGER) Landslide dataset is a compilation of landslide data previously mapped by a variety of sources at all scales, and is assessed for reliability by the DGER.

King County GIS
US Geological Survey
Washington State Department of Natural Resources, Division of Geology and Earth Resources

October 2009
Tetra Tech, Inc.

0 5 10 20 Kilometers

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King County

Several additions made for 2009

Introduction

Earthquakes can be the most destructive hazard King County can face if we have a moderate event on the Seattle Fault Zone. Earthquakes are described as the sudden release of energy occurring from the collision of crustal plates on the earth's surface or from the fracture of stressed rock formations in that crust. Though it can be said that there are many technical differences in the rocking, rolling, jarring and jolting felt during an earthquake, they can be devastatingly damaging and seriously unnerving.

King County is geographically located in an area known as the Pacific Ring of Fire. The same geological events that result in volcanic activity also generate notable earthquakes. Washington State is framed by the Pacific, North American, and Juan de Fuca plates, segments of the earth's crust. A significant number of active fault lines or cracks in that crust have been identified in the central Puget Sound area including Seattle and King County. On an annual basis, thousands of minor earthquake events occur in the greater Puget Sound Region.[1]

King County has a long history of documented earthquake activity. The most recent significant activity was the Nisqually Earthquake of February 28, 2001. This earthquake, 10 miles northeast of Olympia in Thurston County (over 40 miles from Seattle), resulted in statewide losses exceeding $1 billion and injured 700 people, many in King County.[2]

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Earthquake Probability and Earthquake Impacts

Hazard Identification

Most earthquakes go unnoticed by the residents of King County; significant numbers of 'dish rattlers' occur on a regular basis to remind people of their vulnerability. Over a thousand earthquakes occur in Washington State every year, most below magnitude 3.0. Some people and animals are more sensitive to these minor events than others. Usually, it requires a magnitude of 2.5-3.0 for a local shaker to be noticed. These happen on a fairly frequent basis (see

"History of Events"). Direct impacts from earthquakes may include damages to structures like buildings, pipelines, roadways, and bridges. Secondary impacts from earthquakes are common, and are known as secondary hazards. These can include tsunamis, seiches, and landslides. A slide in King County generated from the 2001 Nisqually Earthquake partially blocked the Cedar River – flooding several homes. Evidence of tsunami/seiche activity and major landslides has been identified from a 7.0 earthquake in Puget Sound around 900 A.D.

There are at least five active fault lines (crustal cracks) in the Puget Sound lowlands, any of which may impact King County. These are the Tacoma fault, Seattle fault, Darrington-Devil's Mountain fault, Utsalady Point fault, and southern Whidbey Island fault.[3] Many of these faults run east-west and extend for over 20 miles in length.

There are three technically distinct types of earthquakes: interplate or benioff zone earthquakes, subduction or interplate zone, and shallow crustal earthquakes. Each can generate powerful damaging motion in the greater Puget Sound area.[4]

Interplate or Benioff Zone Events[2]

These earthquakes occur at depths of 15 to 60 miles from the subducting Juan de Fuca plate. Examples of this type of damaging event include the Olympia earthquake in 1949, 1965 Seattle/Tacoma earthquake, 1999 Satsop earthquake and 2001 Nisqually earthquake. Depending on your location shaking could be felt for 15-50 seconds.

Subduction Zone Events[2]

Subduction zone events occur along the interface between tectonic plates. The energy generated from the collision of the Juan de Fuca, Pacific, and North American plates is considerable. These great magnitude events can reach 8.0 to 9.0 on the Richter scale, and the shaking could last for up to six minutes.

Shallow Crustal Earthquakes[2]

Shallow earthquake events occur within 20 miles of the earth's surface. These are fairly common events with typical magnitudes of up to 5.5, though there is some evidence that a number of shallow events have exceeded this figure.

History of Events

The State of Washington has experienced 20 damaging earthquake events in the last 125 years. Most of these have been in western Washington[5]. The 1965 Seattle-Tacoma earthquake and the 2001 recent Nisqually earthquake type of

events seem to reoccur about every 30 to 35 years, while a 1949 Olympia type event occurs about once every 110 years.

Subduction earthquakes do not recur based on anticipated time frames; events can be spaced anywhere from 100 to 1,100 years apart. The latest recorded subduction earthquake event in Washington State occurred in 1700.[6]

Table 5-8: Earthquake Events Felt or Impacting King County[7]

Date	Magnitude	Location
April 1945	5.7	12.5 km SSE of North Bend
February 1949	**7.1**	**12.3 km ENE of Olympia**
April 1965	**6.5**	**18.3 km N of Tacoma**
January 1995	5.0	17.5 km NNE Tacoma
July 1996	5.4	8.5 km ENE of Duvall
November 1996	2.9	Puget Sound
February 1997	3.0	SE of Seattle
April 1997	4.9	Puget Sound off Vashon Island
June 1997	2.7	Puget Sound
July 1997	3.1	Duvall
February 1998	2.9	NE of Seattle
March 1998	3.1	Pierce County
June 2000	3.4	Friday Harbor, San Juan Islands
February 2001	**6.8**	***Nisqually* – Olympia**
March 2001	3.4	Tacoma
May 2002	4.2	Friday Harbor, San Juan Islands
July 2002	3.1	North Bend
January 2009	4.5	Bremerton

Several small earthquakes over 4.0 were added to list in 2009 because of the proximity to Seattle.

Olympia Earthquake – April 1949[8]

The 7.1 magnitude earthquake was centered along the southern edge of Puget Sound. Eight people were killed and property damage in Olympia-Tacoma-Seattle amounted to about $25 Million in 1949 dollars. In Seattle, a sixty-inch water main ruptured, a radio tower collapsed, power lines and gas lines were broken in over 100 places. Three damaged schools needed to be demolished and one rebuilt.

Seattle-Tacoma Earthquake – April 1965[2]

At magnitude 6.5, the earthquake killed seven people and caused $12.5 Million in damage (1965 dollars). Severe shaking was felt in Seattle and as far east as Issaquah and beyond. Most damage was in the Pioneer Square area and waterfront. Older masonry buildings were most impacted. Damage patterns

experienced in 1949 were repeated. Eight schools were closed for inspections and repairs; two were severely damaged. Areas along the Duwamish River experienced severe settling. Three water mains failed in Seattle.

Nisqually Earthquake – February 2001[9,10]

The 6.8 magnitude earthquake was centered under Anderson Island in south Puget Sound. Soil geology resulted in the most extensive damage occurring along the Interstate-5 corridor, not around the epicenter. This pattern was the result of soft river bottom sediments (heavier damage) and improvements in building standards (lesser damage). Some damage was experienced in 300,000 households, many from settling foundations. Buildings built prior to 1950 located in the south downtown area and Pioneer Square in Seattle were the most impacted; structural damage to chimneys, walls, foundations and non-structural elements accounted for two-thirds of all damage reported.

Damages to airport runways and towers were significant and there were temporary closures of the SeaTac International and King County Airports as a result for several days for inspection and repairs. The Alaskan Way viaduct and Magnolia bridges were both closed until inspection and repairs were done. Of the 290 dams inspected by state engineers, only five had earthquake-related damage. A hillside collapse blocked the flow of the Cedar River; this resulted in flooding that impacted several homes along the river that were otherwise untouched by the earthquake shaking.

Hazard Impacts

The impacts to a community from earthquake events include injuries to citizens and public safety officials, damage to property, lost revenue and economic damages, increased demand on public safety and infrastructure related services. Added to the list for 2009 are critical infrastructure interruption, lifeline failures, building collapse, landslides, fires, tsunami / seiche (a large oscillation in an enclosed body of water). Utilizing a May 2005 HAZUS run, damage projections for a 6.7 magnitude earthquake centered in King County might damage more than 58,000 structures, displace 55,000 households, and result in up to 2,400 deaths and 800 injuries. These damages and impacts to the economy could reach $36 Billion.[11] Washington State ranks second only to California among states susceptible to earthquake damages.[12] Nationally, Seattle might incur the seventh largest potential dollar damages/losses.[2]

Populations and Economy at Risk

According to the 2000 US Census, King, Snohomish, Pierce, and Kitsap Counties are home to more than 60 percent of the state's population and much of its economic base.[13] Most vulnerable of these are non-English speaking individuals, people with disabilities, senior citizens, and people living in poverty,

and school-age children. Older brick homes and unreinforced masonry buildings without retrofitting are also at greater risk of incurring damage from an earthquake.

Table 5-9: Vulnerable Population Groups

Jurisdiction	Non-English Speaking	Disabled	Over Age 65	Poverty	K-12 Students	Homes Over 40 Years Old
King County	5.4%	16.1%	10.7%	6.4%	16.6%	33.5%
Washington State	14.0%	17.7%	11.2%	10.6%	19.1%	29.4%

Sources: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000, and Profile of Housing Characteristics: 2000.(Washington State figures)
2007 Census Bureau
2008 King County Annual Growth Report

The King County Emergency Coordination Center (ECC) becomes activated for earthquake events to coordinate damage assessment, information, response activities, and to insure continuity of government operations. Response activities include unanticipated overtime for ECC activations, evacuations, sheltering of displaced people, rerouting traffic destined for impassible roads, bridge and road damage repairs, and rescue or medical missions.

Not all earthquake events are eligible for federal assistance to public agencies. For this reason alone, mitigation efforts to minimize the impacts of earthquakes in King County can save a considerable amount of public monies needed to repair damage from modest-sized events. The following list of presidential disaster declarations were associated with listed King County earthquake events above.

Table 5-10: FEMA Earthquake Disasters in King County

FEMA No.	Dates	King County Public Damage (FEMA or Congress Approved)
*	April 1949	$25 Million (1949 dollars)
*	April 1965	$12.5 Million (1965 dollars)
1361	February 2001, Nisqually	$155.9 Million FEMA $84.3 Million SBA $93.8 Million US DOT

**FEMA was established in 1978*

Often, Small Business Administration (SBA) loans are available to individuals and businesses that qualify without a presidential declaration of disaster.

Past Mitigation Efforts

The United States has been a world front-runner in mitigation efforts related to natural disasters. The advent of United States building codes, zoning codes, research on liquefaction areas and ground shaking, building retrofitting, non-structural mitigation/tie-downs, public education, drop-cover-and-hold exercises, and public television specials have dramatically reduced the impact to property, injuries and economic damage. When the United States is compared to countries that do not have these codes and standards (e.g., Turkey, Iran, China, and Pakistan) the earthquake disaster results are dramatically different.

Earthquake Endnotes:

[1] *Washington State 2001 Hazard Identification and Vulnerability Assessment*, Washington State Military Department, Emergency Management Division, April 2001.
[2] Ibid.
[3] *Late Holocene displacement on the Southern Whidbey Island fault zone, northern Puget lowland, Washington*. 2001. U.S. Department of the Interior, U.S. Geological Survey. 2 Oct. 2003 http://earthquake.usgs.gov/research/external/reports/00HQGR0067.pdf
[4] *Earthquake Hazards in Washington and Oregon – Three Source Zones*. U.S. Department of the Interior, U.S. Geological Survey. 2 Oct. 2003 http://www.ess.washington.edu/SEIS/PNSN/CascadiaEQs.pdf.
[5] *Earthquakes in Washington*. 13 Jul. 2001. Washington State Department of Natural Resources Division of Geology and Earth Resources. 5 Oct. 2003 http://www.dnr.wa.gov/ResearchScience/GeologyEarthSciences/Pages/Home.aspx
[6] *Earthquake Hazards in Washington and Oregon – Three Source Zones.* U.S. Department of the Interior, U.S. Geological Survey. 2 Oct. 2003 http://www.ess.washington.edu/SEIS/PNSN/CascadiaEQs.pdf.
[7] *Map and List of selected significant quakes in WA and OR*. 27 Mar. 2003. The Pacific Northwest Seismograph Network, University of Washington Department of Earth and Space Sciences. 5 Oct. 2003 http://www.ess.washington.edu/SEIS/PNSN/INFO_GENERAL/hist.html.
[8] *Earthquake History of Washington*. 5 Aug. 2003. U.S. Department of the Interior, U.S. Geological Survey. 5 Oct. 2003 http://neic.usgs.gov/neis/states/washington/washington_history.html.
[9] *Hazard Mitigation Survey Team Report, Nisqually Earthquake, February 28, 2001, DR-1361-WA*, Federal Emergency Management Agency and Washington Military Department, Emergency Management Division
[10] *The Nisqually Earthquake of 28 February 2001, Preliminary Reconnaissance Report*, Nisqually Earthquake Clearinghouse Group, University of Washington, March 2001.
[11] Preliminary Estimates of Damages and Loss from a run of HAZUS 99-SR2 by Kircher Associates Consulting Engineers for the Seattle Fault Scenario project funded in part by the EERI Foundation, May 2003. The figures developed from a Level 1 analysis of HAZUS default data adjusted for the year 2005 for a five county region – King, Kitsap, Pierce, Snohomish, and Thurston Counties.
[12] *HAZUS 99 Estimated Annualized Earthquake Losses for the United States*. Feb. 2001. Federal Emergency Management Agency. 5 Oct. 2003 http://74.125.153.132/search?q=cache:zaAkt9vt_A8J:www.fema.gov/library/file%3Bjsessionid%3D525D76909AFEB6B3BE783797F93F38E6.WorkerLibrary%3Ftype%3DpublishedFile%26file%3Dfema_366.pdf%26fileid%3D4a624f30-2162-11db-85a2-000bdba87d5b+HAZUS+99+Estimated+Annualized+Earthquake+Losses+for+the+United+States&cd=2&hl=en&ct=clnk&gl=us&client=firefox-a
[13] *2000 Census P.L. 94-171 Restricting Data*. Aug. 2001. Puget Sound Regional Council. 5 Oct. 2003

Attachment A
16715

Earthquake
Peak Ground Acceleration
100-year Probabilistic Scenario

Mercalli Scale - Potential Damage

- VI - None to Slight
- VII - Slight to Moderate

Note: The scenarios represented in the following maps represent the best available data at the time of this plan update. These are estimates of the impacts of a scenario event that include many assumptions. Scenario maps are constantly being updated by experts in the field of seismology. All future updates of this plan will take into consideration any new data that becomes available that accurately reflect the risk associated with in the planning area.

King County GIS
US Geological Survey
Washington State Department of Natural Resources, Division of Geology and Earth Resources
HAZUS-MH MR3

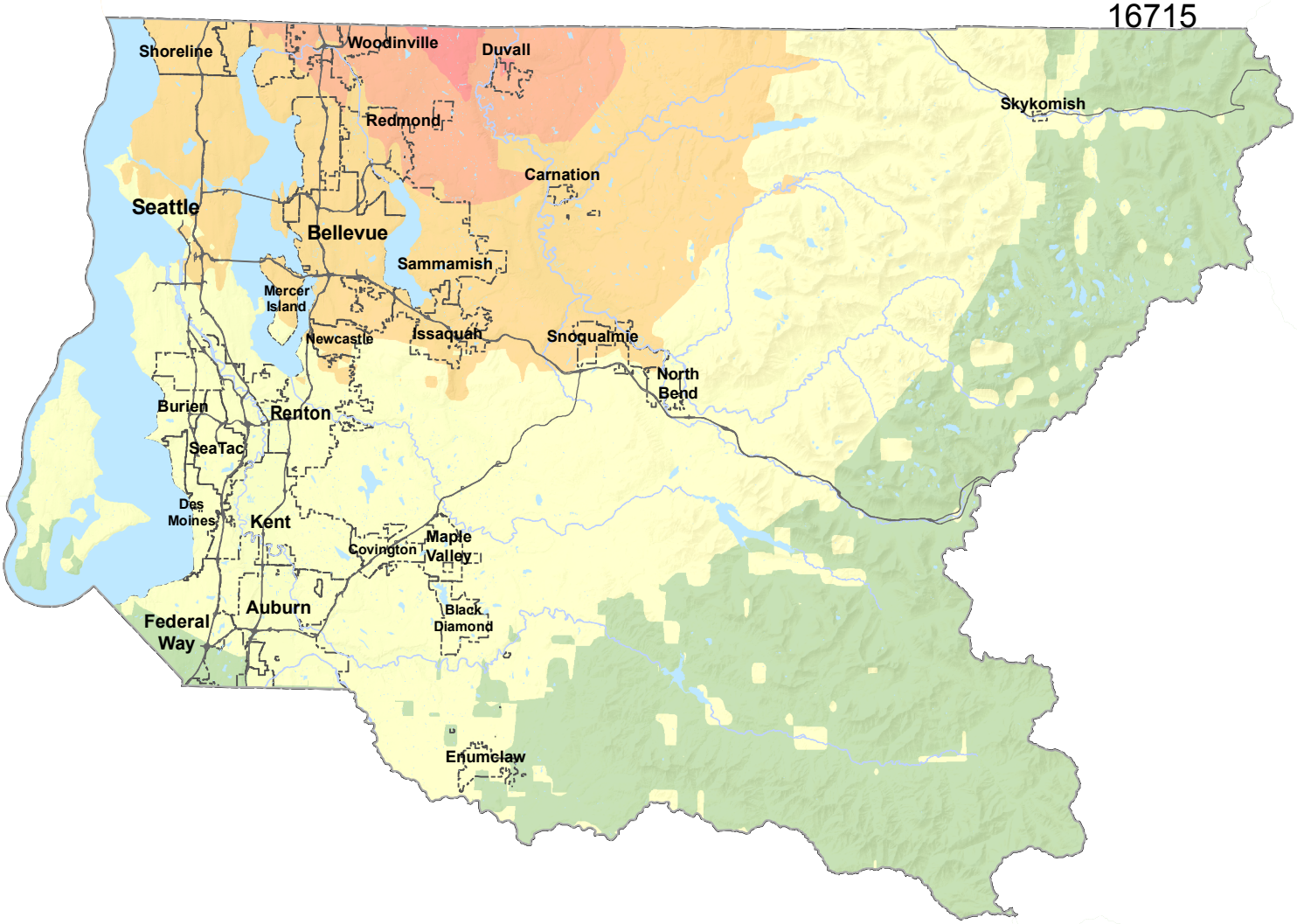
October 2009
Tetra Tech, Inc.

0 5 10 20 Kilometers
0 5 10 20 Miles

N W E S

King County

Attachment A
16715



South Whidbey Fault
Peak Ground Acceleration
7.4 Magnitude Scenario Shakemap

Mercalli Scale, Potential Damage

- IV, None
- V, Very Light
- VI, None to Slight
- VII, Slight to Moderate
- VIII, Moderate to Extensive
- IX, Extensive to Complete

Magnitude: 7.4
Depth: 0.0km
Epicenter: N48.05 W122.47
Appx. 2mi NE of Langley, WA

The South Whidbey Fault extends from Victoria BC southeast towards south Whidbey Island. It crosses through Mukilteo and north Woodinville, and possibly extends into eastern Washington.

King County GIS
USGS April 2009 South Whidbey Fault Planning Scenario
Washington State Department of Natural Resources, Division of Geology and Earth Resources

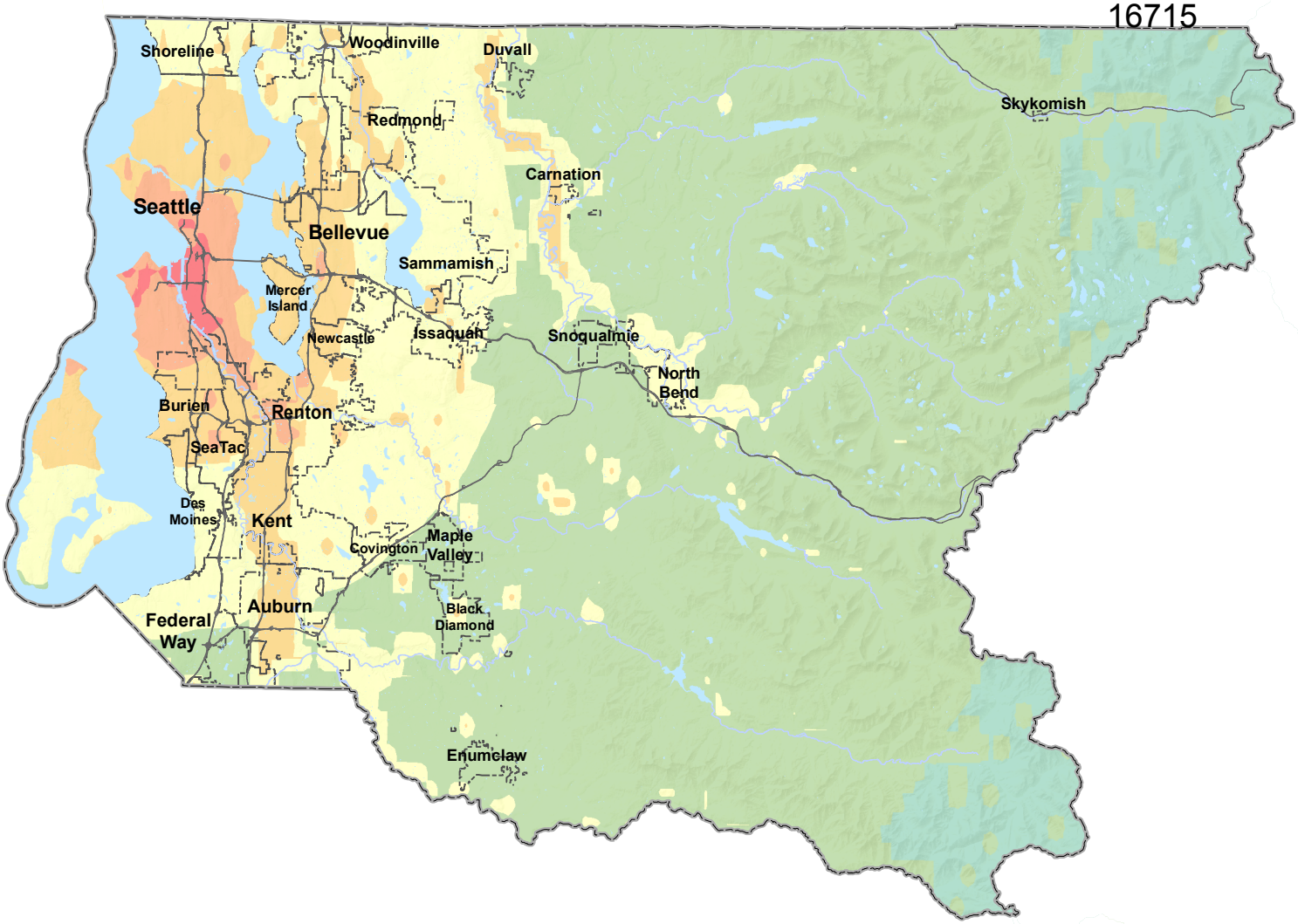
October 2009
Tetra Tech, Inc.

0 5 10 20 Kilometers
0 5 10 20 Miles

N W E S

King County

Attachment A
16715



Seattle Fault
Peak Ground Acceleration
6.8 Magnitude Scenario Shakemap

Mercalli Scale - Potential Damage

- IV - None
- V - Very Light
- VI - None to Slight
- VII - Slight to Moderate
- VIII - Moderate to Extensive
- IX - Extensive to Complete

King County GIS
USGS January 2000 Seattle Fault Planning Scenario
Washington State Department of Natural Resources, Division of Geology and Earth Resources

October 2009
Tetra Tech, Inc.

0 5 10 20 Kilometers
0 5 10 20 Miles

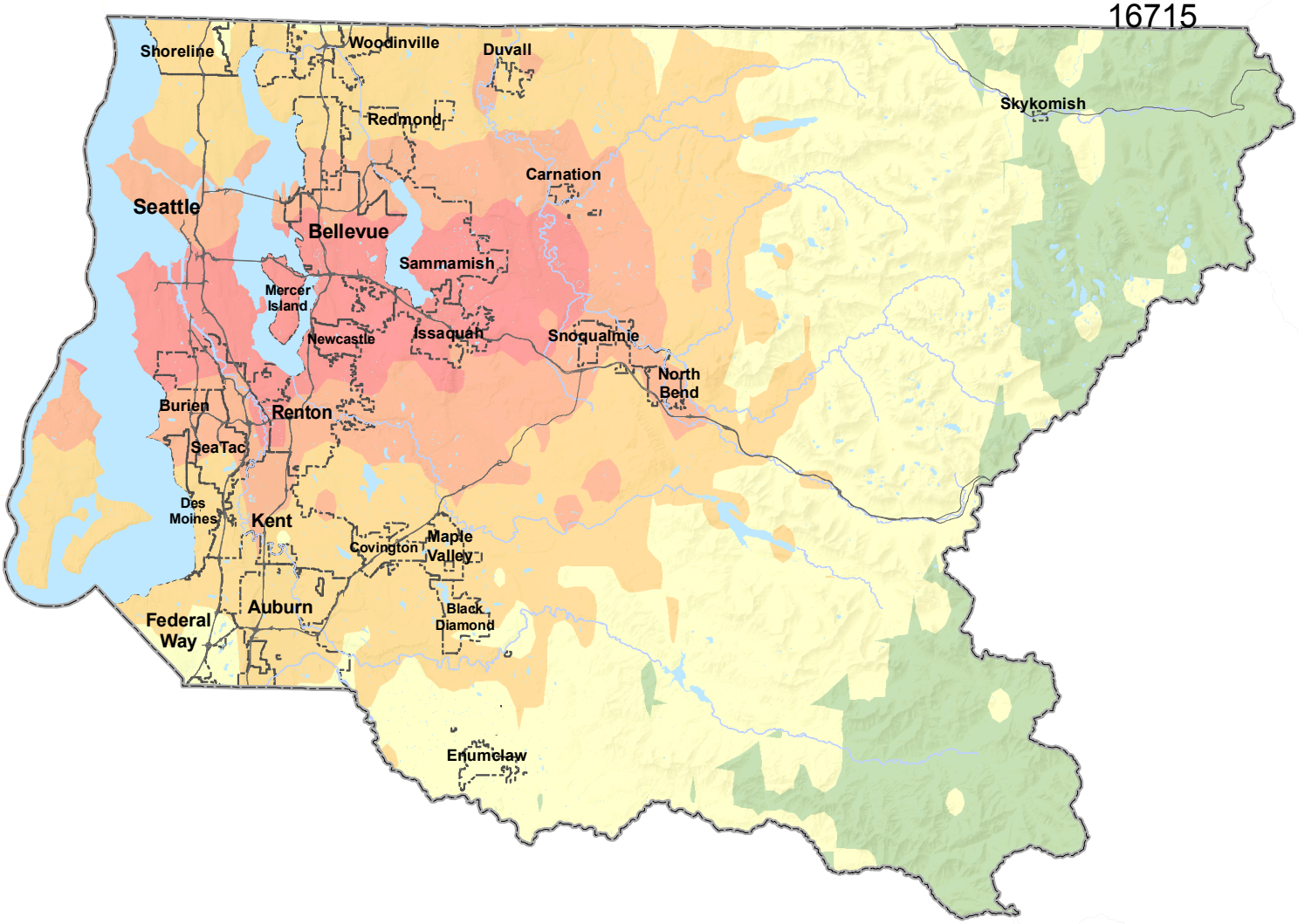
N W E S

Magnitude: 6.8
Depth: 10.0km
Epicenter: N47.60 W122.57
Appx. 10mi W of Seattle, WA

The Seattle fault is a zone of thrust or reverse faults that strikes through downtown Seattle in the densely populated Puget Lowland of western Washington. Analysis of seismic profiles extending 50 km across the Puget Lowland from Lake Washington to Hood Canal indicates that the west-trending Seattle fault comprises a broad (4-6 km) zone of three or more south-dipping reverse faults.

King County

Attachment A
16715



Seattle Art Scenario
Peak Ground Acceleration
7.2 Magnitude Scenario Shakemap

Mercalli Scale, Potential Damage

- V, Very Light
- VI, None to Slight
- VII, Slight to Moderate
- VIII, Moderate to Extensive
- IX, Extensive to Complete

Magnitude: 7.2
Depth: 10.0km
Epicenter: N47.60 W122.57
Appx. 10mi W of Seattle, WA

King County

King County GIS
US Geological Survey Jan. 2000 Seattle Art Shakemap Scenario
Washington State Department of Natural Resources,
Division of Geology and Earth Resources

October 2009
Tetra Tech, Inc.

0 5 10 20 Kilometers

0 5 10 20 Miles

N W E S

Attachment A
16715

National Earthquake Hazard Reduction Program (NEHRP) Soil Site Classes

- Site Class F - Requires site-specific investigation
- Site Class E - Soft Soil
- Site Class D - Stiff Soil
- Site Class C - Very Dense Soil and Soft Rock
- Site Class B - Rock
- Water
- Ice

King County GIS
US Geological Survey
Washington State Department of Natural Resources, Division of Geology and Earth Resources

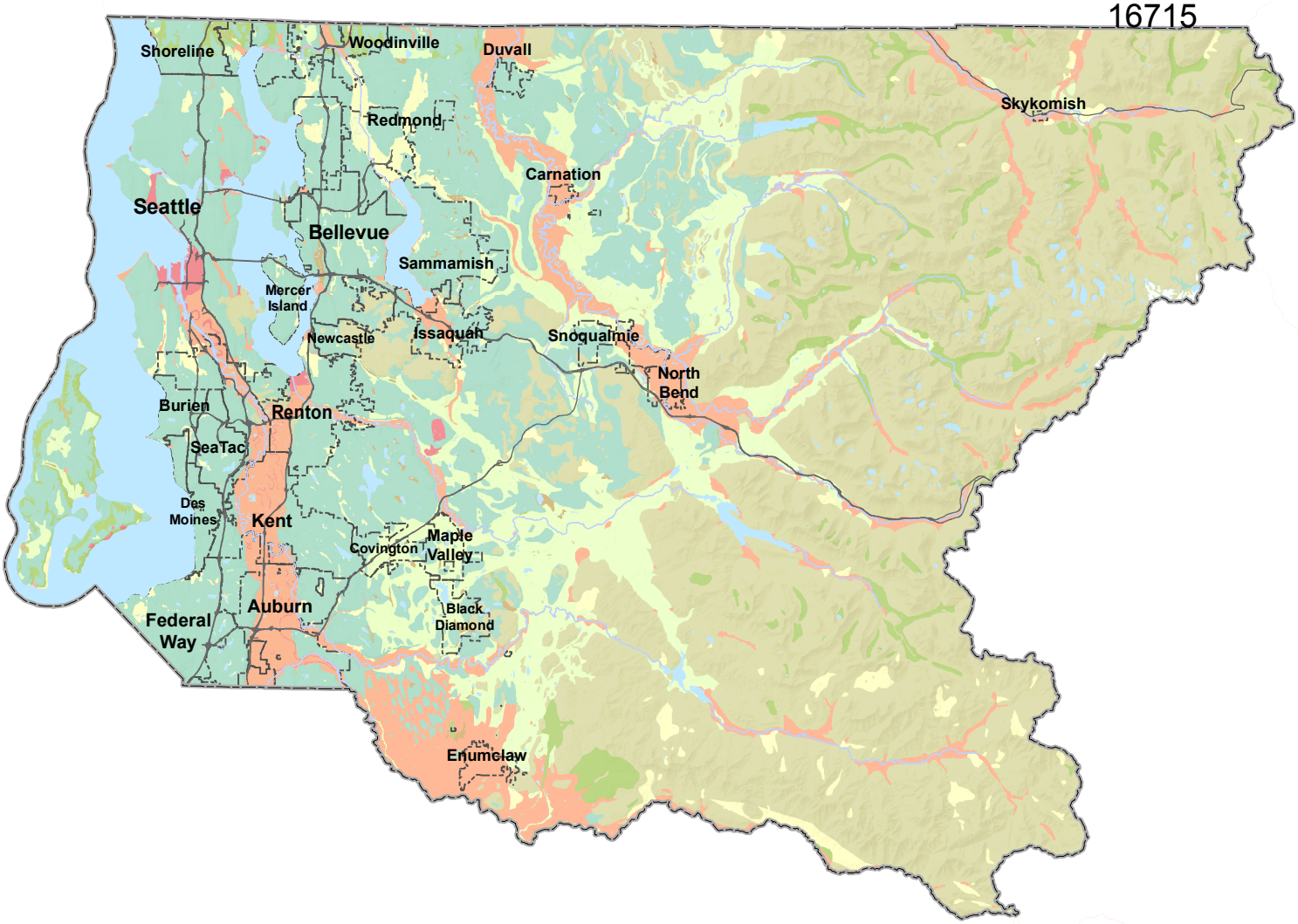
October 2009
Tetra Tech, Inc.

0 5 10 20 Kilometers
0 5 10 20 Miles

N W E S

King County

Attachment A
16715



Liquefaction Susceptibility

Liquefaction Susceptibility

- High
- Moderate to High
- Moderate
- Low to Moderate
- Low
- Very Low to Low
- Very Low

Not Susceptible to Liquefaction

- Bedrock
- Peat
- Water
- Ice

King County GIS
US Geological Survey
Washington State Department of Natural Resources, Division of Geology and Earth Resources

October 2009
Tetra Tech, Inc.

0 5 10 20 Kilometers

0 5 10 20 Miles

N W E S

King County

One substantive addition for 2009

Introduction

Our country's history has many examples of civil disorder (unrest) associated with demands for political reform. The modern civil disturbance has become increasingly associated with sports events and issues unrelated to political positions. Civil disorders have become a part of the urban environment in Washington State. "Riots" can now generally be classified as either being politically motivated or spontaneously erupting around another event. The most important characteristic of civil disorders is an association with property damage and clashes with law enforcement and authorities.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Civil Disorder Probability and Civil Disorder Impacts

Hazard Identification

In the 1960's civil unrest was focused on civil rights. The Watts riots in Los Angeles left 34 people dead. Similar events occurred in Newark New Jersey with similar results.

In recent years, civil disorder typically begins as nonviolent gatherings. Injuries are usually restricted to police and individuals observed to be breaking the law. Crowds throwing bottles, rocks, and other projectiles are usually responsible for the majority of law enforcement injuries. Injuries to protestors, demonstrators, or law breakers are often the result of efforts to resist arrest, exposure to tear gas or mace, attempts to strike a police officer or from other civilians and law breakers.

Political demonstrations that become civil disorders or riots have specific targets for their attention. Examples would be protests outside a national embassy, city hall, or federal building. These incidents are typically marked by efforts by organizers to obtain permits to demonstrate and are nonviolent in nature. Occasionally, these demonstrations become violent when triggered by some other event. Often, out-of-town agitators are the catalyst for these violent

outbreaks. In the Pacific Northwest, groups with such notoriety are the Skinheads, White Supremacists, and Anarchists.

Celebrations resulting from outcomes of sporting events and annual holiday celebrations occasionally evolve into violence. The central characteristic of these "riots" have been related to substance abuse and consumption of alcohol. Incidents of this type are common in other parts of the world following soccer matches. In the United States, civil disturbances have come to be anticipated following basketball championships (Chicago Bulls, 1991 and 1992; Detroit Pistons, 1990; and recently the LA Lakers, 2001).

Police continue to use variations of riot tactics common for over a hundred years: horse-mounted police and officers on foot with riot shields and batons. Arrests are made of key violent individuals. The 1960s saw the advent of the use of tear gas, also known as CS. There has been an evolution of tactics used by demonstrators and agitators that has resulted in an increasingly complex confrontation/interface between local officials and civilians.

Sophisticated communications capabilities are now available for retail purchase. Radios and "police scanners" have made it possible for demonstrators to organize their efforts and counter law enforcement tactics. This was seen during the World Trade Organization (WTO) disturbances in Seattle, 1999. Members of one group intercepted police tactical communications and broadcast the information over the Internet. One group transmitted over an illegal FM station. The result has been an increase in the integration of efforts between federal agency officials from the Federal Communications Commission and the Federal Bureau of Investigation with local law enforcement.

History of Events

Rodney King Verdict

Following the 1992 Rodney King verdict in California, some local disturbances occurred in Seattle. The night of the verdict, small groups of people roamed the downtown streets smashing windows, lighting dumpsters on fire, and overturning cars. The next day, there was a rally at the Jackson Federal Building in Seattle. Many people feared violence and avoided the downtown area. After the rally broke up, small groups moved around downtown, eventually attacking the Seattle West Precinct on Capitol Hill. Another protest occurred in the University District of Seattle. This event, though peaceful, shut down Interstate-5 to traffic for some time.

WTO and N30, and other World Summits

The best known civil disturbance in King County occurred in conjunction with the World Trade Organization's (WTO) meeting in Seattle during November of

1999. The week-long event found Seattle as the meeting place for world economic leaders and political figures. The world stage event provided an opportunity for activists to gain media attention for their multiple causes ranging from labor reform to environmental exploitation concerns. Similar WTO meetings have occurred in other places around the world with demonstrations that sometimes became violent. Preparations made by local officials proved inadequate to contend with the civil unrest that followed. This event was marked by the presence of many Oregon-based antagonist groups, most notably the "Anarchists."

"N30" was the first anniversary of the WTO riots. Some protestors did appear, but improvements in intelligence, police staffing and staging, use of secure radio frequencies, and briefing of elected officials resulted in a considerably more subdued event.

World summits such as G-8 or APEC have been recognized as world stage international events that can bring in large numbers of protesters.

Mardi Gras Melee[1,2]

This annual Mardi Gras celebration event in Seattle's Pioneer Square has become problematic over the years. In 2001, Mardi Gras celebrations became violent with one man being beaten to death during a violent confrontation involving intoxicated young people in the Pioneer Square area of Seattle. There was some indication the beating may have been racially motivated and gang-related. There were 43 arrest, seven officers injured, and thousands of dollars of damage done to six businesses. There was considerable news coverage of the event and subsequent legal proceedings. Following the incident however, the Supreme Court ruled in 2002 that people could not be found guilty of murder having not intended to kill an individual they've assaulted. The ruling left over 300 suspects in the 2001 riots free from murder convictions, including Jerell Thomas whom was convicted of killing Kristopher Kime during the unrest.[7]

For the 2009 Mardi Gras event, Seattle's police department employed the usage of wireless live video feed to monitor several public locations, in hopes of more timely response and more efficient utilization of police personal.[8]

Additional Interstate-5 Closures

The closure of Interstate-5 to traffic by illegal protest marchers has become somewhat of a traditional expression by individuals opposing social or political events. In April 2002, a King County Deputy shot a suspect. That month protestors caused temporary closure of Interstate-5.[3] Again on September 30, 2002, street marchers mingled peacefully with sports enthusiasts in downtown

Seattle. At the outbreak of hostilities regarding the war in Iraq in February 2003, this same disruption of I-5 transportation and commerce was repeated.

University of Washington Violence

In 2003, a recent outburst by drunken youths in the University of Washington fraternity district resulted in overturned burning vehicles and injured people. While only one person was arrested, non-college outside agitators were suspected of instigating the incident.

Hazard Impacts

The economic impact to urban areas during civil unrest and following such events can be profound. Direct impacts include looting and smashed windows as well as endangering shop owners and customers. Indirect economic impacts result from the loss of business when potential customers do not approach businesses for extended periods of time. Customer impressions and habits can change from the experience of a single threatening event. In Seattle, WTO resulted in the closure of several small businesses in the downtown core, resulting in a cry from shop owners to visibly increase protection of their properties. Largely, Mayor Paul Schell lost his re-election bid because of the City's handling of the event.

Thousands of political demonstrations occur each year nationally without major incidents, injuries, property damage or arrests. The right to protest peacefully is a hallmark of our nation's liberties handed down to us from the 18th century.

Table 5-11: Civil Disorder Costs

Event Date(s)	Area	King County Damage Dollars
Rodney King Verdict[3]	Seattle/King County	150 arrests 5 major fires Looting, property damage
WTO-N30 Nov 1999, 2000[4]	Downtown Seattle & Capital Hill	$1.5 M police costs, $7 M in lost retail sales 250+ arrests 120+ injuries
Mardi Gras- February 28, 2002[1]	Pioneer Square – Seattle	1 person killed 6 police injured, 69 people 43 arrests
A20 Event – April 2002[5]	Capitol Hill, Westlake Mall, Seattle Central Community College	19 arrests Nominal property damage

I-5 closures – protest marches[6]	University of Washington to Downtown – Seattle	Nominal damage
University of Washington Campus 10/03	University of Washington Campus Fraternities	Police cruisers and civilian vehicles damaged and burned
Mardi Gras events annually 2003 - 2006	Pioneer Square – Seattle	2002, 2009 Legislation imposed because of annual events [7,8]

Past Mitigation Efforts

Law enforcement surveillance and counter intelligence units are becoming common place in major cities around the United States. Intelligence sharing efforts between national agencies and local officials is improving. The controversial Patriot Act and civil rights issues have become part of the landscape of police efforts to minimize exposure to violent civil disturbances. Police in urban areas continue to explore training opportunities and consider tactical changes in their planning for such expected and unscheduled events.

Local merchants have installed monitoring cameras in the Pioneer Square area to reduce the attraction to anonymous violence and illegal activity.

Civil Disorder (Unrest) Endnotes:

[1] Tracey Johnson, "Police charges won't be filed against teen arrested in melee", Seattle Post Intelligencer, May 26th, 2001, www.Seattle PI.NWsource.com/specials/mardigras
[2] Candy Hatcher, "Thousand of dollars claimed by 6 Businesses", Seattle Post Intelligencer, February 28th, 2001
[3] Vanessa Ho and Hector Castro, "10 years after Rodney King, the issues very much with us", Seattle Post Intelligencer, April 29th, 2002
[4] Murakami, Kerry. "Seattle Saddled with Millions in WTO Bills." Seattle PI, NW Source (200) October 14, 2003
[5] Mike Roarke & Lewis Kamb, "Police Arrests as hundreds march on downtown streets", Seattle Post Intelligencer, April 20th, 2002
[6] Jeffrey Barker, "Thomas Rally intrigues some, puzzles others", Seattle Post Intelligencer, September 30, 2002
[7] Tracy Johnson, "10 years for 2001 Mardi Gras riot killing", Seattle Post Intelligencer, Feb 28, 2009 http://www.seattlepi.com/local/261101_thomas28.html
[8] "Seattle Police Department Monitors Mardi Gras Festivities With Wireless Video Surveillance" Reuters, March 24, 2009 http://www.reuters.com/article/pressRelease/idUS140618+24-Mar-2009+PRN20090324

No substantive changes made for 2009

Introduction

Terrorism has been defined by the Federal Bureau of Investigation as "the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment of it in furtherance of political or social objectives." More importantly, it is necessary to understand that the objective of terrorism is not destruction or death – it is the psychological impact to the targeted population and world opinion. Disruption to public services, economies, and social patterns or a feeling of insecurity is the desired goal.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Terrorism Probability and Terrorism Impacts

Hazard Identification

Terrorism can be categorized as either domestic or international. Domestic terrorism incidents are acts conceived of and carried out by U.S. citizens within the U.S. borders. Examples of domestic terrorism include environmental groups like the Animal Liberation Front (ALF), groups opposing abortion, animal rights groups opposing the fur trade, or the Oklahoma City bombing of the Murrah Building.[1] Each year King County Police receives calls related to hundreds of bomb threats. International terrorism originates from groups based outside the U.S.A. and may be perpetrated against U.S. interests abroad or within the territorial boundaries of the U.S.A. Examples would be Al Quada and sympathizer groups.

Terrorist targets tend to be located in urban areas. Seats of government, stadiums and public meeting places are high-value targets that produce substantial news coverage. Contrary to this, there is some evidence that terrorist organizations prefer rural safe houses from which to operate. The rural environment offers an environment that is more difficult to observe.

On a worldwide basis, explosive and small arms remain the primary method of aggression. Domestically, this theme was evident in the shoe bomber incident (Richard Reid),[2] Washington, D.C. shootings,[3] Twin Trade Towers, University of

Washington School of Horticulture bombing, Atlanta Olympics bombing,[4] and Atlanta abortion clinic bombing. Officials are increasingly concerned about the use of weapons of mass destruction on U.S. soil. Concern for this possibility began to grow with the disintegration of the Soviet Union. At that time the Soviet military acknowledged it could not account for many "suitcase" or portable nuclear devices.

Weapons of Mass Destruction (WMD) can be categorized as belonging to one or more of the following groups: chemical, biological, radiological, nuclear or explosive. Incendiary devices and cyber terrorism can also be added to this list. Title 18, U.S.C. 2332a, includes the accepted definition for weapons of mass destruction in the United States:

> "(1) any destructive device as defined in section 921 of this title [which reads] any explosive, incendiary, or bomb, grenade, rocket having a propellant charge of more than one quarter ounce, mine or device similar to the above; (2) poison gas; (3) any weapon involving a disease organism; or (4) any weapon that is designed to release radiation or radioactivity at a level dangerous to human life."

The concept of using chemical weapons is based on the field of toxicology. As such, chemical weapons are comprised of a fairly large, growing and creative list of materials that can kill humans or pollute the environment. While listed as a weapon of mass destruction, typical chemical weapons do not destroy property – rather, they deny the use of the area of distribution or scatter through persistence of a difficult to clean up chemical. In this way, chemical, radiological and biological terrorist weapons are similar. Military chemical weapons are designed to be used in battlefield conditions against combatants. Their persistence or impact is of short duration (hours or days) to allow occupation of some strategic area by friendly forces.

In many ways the common components used to make chemical weapons are similar to those used for industrial, commercial and agricultural purposes, although with a destructive intent and outcome involved. Chemical weapons began as industrial materials with military applications. They have been used in organized military programs since the Germans used chlorine and arsine in World War I. The list expanded to the use of nerve agents like sarin and tabin when it was realized that insecticides could effectively be used against human targets.

Radiological materials are very similar to chemical materials. They usually do not kill humans outright. Exposure to such a dose would require very large amounts of radioactive material at fairly close range. While the time required for a material to decay and render itself inert varies widely, many materials can

persist in the environment for years to centuries at levels that can impact humans and the environment.

The usefulness of radioactive materials to the terrorist is derived from long-term exposures to moderate amounts of radiation and the difficulty in cleanup of the impacted area. Like chemical and biological agents, radioactive materials can not be observed by a civilian. For this reason they instill a significant psychological impact to the public.

The Federal Bureau of Investigation defines biological agents as micro organisms or their toxins. The U.S. Code Title 18, Section 178 also provides a broad definition to biological agents. This definition would include viruses, bacteria, spores, and toxic materials given off by these organisms. Commonly, these include the plague, anthrax, smallpox, and other disease organisms.

Natural materials with toxicity to humans are also being used for terrorist activities. Ricin, a toxin derived from Castor beans, has been used as a direct contact poison for assassinations. Another known natural poison is curare. Used for hundreds of years by South American tribes, this material (in smaller doses) has taken a beneficial roll in medicine. The medical profession has a fairly substantial list of these natural occurring materials.

Explosives have been defined by a variety of sources ranging from the fire service to the United States Code. Commonly, these definitions focus on chemical reactions that produce a shock wave and heat. This definition allows the inclusion of nuclear fission devices. These and incendiary devices are truly weapons of mass destruction, their purpose being to cause damage to property as well as injury to people. Definitions of explosives include black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, and igniters. Incendiary devices include chemicals that may accelerate or initiate fire.

Any individual or combination of the WMD classes listed can be used as booby traps, mines and bombs and can be directly or remotely detonated or initiated.

Increasingly, experts are putting efforts into countermeasures related to cyber terrorism. The global economy's reliance on transactions and communications presents an inviting target to terrorists that can operate in almost any corner of the globe. Terrorists are also likely to use cyber attacks as a force multiplier in a physical incident to impede first responders, spread misinformation, and promote panic in the general populations.

Presidential Decision Directive #39 designates the Federal Bureau of Investigation as the lead agency responsible for terrorism investigations within the borders of the United States and its territories. This lead designation has required a new partnership and increased cooperation between local law

enforcement, federal officials and hazardous materials teams in Washington State.

History of Events and Hazard Impacts

The U.S. population has largely been spared the impacts of international terrorism until recently. The devastation which occurred at the World Trade Center in New York and the Alfred Murray building in Oklahoma City illustrates the need to plan for potential threats within our own communities. Domestically, the distribution of anthrax spores using the United States Postal System as a delivery mechanism caused concern nationwide for several weeks. The bomb detonated at the Atlanta Olympics in (1996) resulted in an investigation/manhunt that lasted years. The Richard Reid (a.k.a. the Shoe Bomber) disrupted air travel and changed security measures in airports; he was sentenced to life in prison.

Washington State and King County locations have witnessed multiple examples of terrorist activity over the last decade. One East Coast incident involved a Tacoma gun shop connection. See the table below for a list of events over the past decade:

Table 5-12: Recent Washington Terrorism-related Events

Type Event	Date	Group	City/ Location	No. of Incidents	Damage or Injuries
Explosive	1993	Skinheads[6]	Tacoma	2	Figures not available
Chemical-Explosive	1995	Unknown[7]	Burien District Court	1	No damage reported
Explosive	Dec 14, 1999	Ahmed Ressam[8]	Port Angeles	1	none
Incendiary	May 2001	ALF	University of Washington	2	$5 M
Biological White Powder	Jan 2000 to Dec 2002	Miscellaneous individuals[9]	Seattle, Federal Way, Tukwila, Port of Seattle, other cities	208	Overtime and service disruption
Fire Arms	Oct 2002	John Allen Muhammad & John Lee Malvo[3]	Washington, DC & Tacoma	13	10 killed, 3 wounded

Past Mitigation Efforts

While some legislation and operational countermeasures have existed for some time, the events of September 11, 2001 have accelerated terrorism mitigation efforts. Broadly, grants have been awarded to local first responders since 1998 for the purchase of important response equipment; national and local exercises of plans a procedures conducted; powers given or broadened for law

enforcement regarding surveillance; and the consolidation of several agencies into the U.S. Department of Homeland Security have been completed. Capabilities related to bioterrrorism have received increasing attention.

Equipment grants for decontamination, detection, and protective gear for first responders have been available to local first responders since 1998. These grants and supplemental grants have provided millions of dollars in increased capabilities. As these capabilities have improved, the definition of first responder has been broadened from fire and police to now include hospital personnel and facilities, public works and emergency medical responders.

In 2000, the U.S. Department of Justice and Office of Domestic Preparedness began a national exercise program to integrate federal, state, and local terrorism response capabilities and elected official preparedness for such events. The TOPOFF (top officials) series began with an exercise involving Portsmouth, New Hampshire and Denver, Colorado. In 2002, this exercise opportunity presented itself to Seattle, King County, and Washington State as well as Chicago, Illinois. Cities and counties in Washington State continue to pursue opportunities to improve response capabilities by conducting additional local exercises and training. It is worth noting that TOPOFF 2 included a multi-jurisdiction cyber exercise involving King County, the City of Seattle, and Washington state business leaders and senior technologists. This forum provided an excellent learning opportunity and helped underscore how dependent business operations are on technology and some of the key vulnerabilities jurisdictions typically face with their technology infrastructure and cyber incident response capabilities.

Beginning in 2002, grants became available from several federal agencies for local jurisdictions to initiate and continue planning, training, equipment purchase, and exercise efforts. Federal funding agencies include Department of Justice, Office of Domestic Preparedness, Centers for Disease Control and Prevention, Transportation Security Administration, Federal Transit Administration and others.

An important step in the efforts to counter terrorism in the U.S. was made with the issue of Presidential Decision Directive #39[10] on June 21, 1995. This directive identified the FBI as the lead agency for terrorism investigation. Subsequent to the events of September 11th, 2001 the U.S. Congress consolidated elements of the U.S. Department of Justice, U.S. Coast Guard, U.S. Immigration, and other agencies into the Department of Homeland Security. The Aviation and Transportation Security Act was passed by Congress on November 19, 2001 giving responsibility for items like airport security to the Transportation Safety Administration.

The USA PATRIOT Act [11,12] contains provisions appreciably expanding government investigative authority, especially with respect to the Internet. The USA PATRIOT Act introduced sweeping changes to U.S. law, including amendments to:

- Wiretap Statute
- Electronic Communications Privacy Act
- Computer Fraud and Abuse Act
- Family Education Rights and Privacy Act
- Pen Register and Trap and Trace Statute
- Money Laundering Control Act
- Bank Secrecy Act
- Right to Financial Privacy Act
- Fair Credit Reporting Act

Other important federal acts and directives include:

- Homeland Security Presidential Directives 1-5

    1. Organization and Operation of the Homeland Security Council
    2. Combating Terrorism Through Immigration Policies
    3. Homeland Security Advisory System
    4. National Strategy to Combat Weapons of Mass Destruction
    5. Management of Domestic Incidents (NIMS-National Incident Management System)

- Presidential Directive #62, Protection against Unconventional Threats to Homeland and Americans Overseas.
- Title 18, USC Section 2332a Weapons of Mass Destruction
- Title 18, USC, Sections 175-178, Biological Weapons Anti-terrorism Act
- H.R. 5005, the Homeland Security Act of 2002

Federal, State, and local cooperation continues to improve relationships, capabilities and innovative methods to mitigate terrorism in the U.S. and impacts to its interests.

Some details of grants, exercises, plans and procedures are not subject to Freedom of Information Act release due to their sensitive or national/domestic security protection.

Terrorism Endnotes:

[1] CNN News, "Oklahoma City Bombing" April 19th, 1995, www.cnn.com/us/okc/bombing.html
[2] BBC News, "Shoebomber Jailed for Life", January 30th, 2003
[3] CNN.com, "Ballistics match rifle to sniper attacks", http://www.cnn.com/2002/US/South/10/24/sniper.shootings/
[4] CNN.com, "Atlanta Olympic Bombing Suspect Arrested", May 31st, 2003
[5] Presidential Decision Directive #39, June 21, 1995, http://www.fas.org/irp/offdocs/pdd39.htm
[6] Washington State Emergency Management Hazard Vulnerability Analysis, 1996
[7] King County Emergency Management, Duty Officer Log, May 1995
[8] Sam Skolink & Paul Shukovsky, "Ressam- Seattle no Target", Seattle PI, May 31st, 2001
[9] Washington State Joint Committee on Terrorism figures, 2003
[10] Presidential Decision Directive #39, http://www.fas.org/irp/offdocs/pdd39.htm
[11] "Uniting and strengthening America by providing appropriate tools to intercept and Obstruct Terrorism Act of 2001", aka the Patriot Act (HR 3162), http://www.epic.org/privacy/terrorism/hr3162.html
[12] Electronic Privacy Information Center, the US Patriot Act (Summary/Brief & Commentary), http://www.epic.org/privacy/terrorism/usapatriot/

2005 History Updated for 2009

Introduction

Western Washington is typically associated with rain, green trees, and healthy environments, making the idea of drought in King County a far-fetched notion. There is a possibility for drought conditions in our area, as exemplified most recently in 2001. As a result, King County residents and employers need to be aware of the hazards presented by drought to our area.

Drought can be a result of multiple causes including "global weather patterns that produce persistent, upper-level high-pressure systems along the West Coast with warm, dry air resulting in less precipitation."[1] Drought may be defined as a prolonged period of dryness severe enough to reduce soil moisture, water and snow levels below the minimum necessary for sustaining plant, animal, and economic systems.[2] While drought isn't typically thought of as a King County hazard, the historical record demonstrates that it is important to consider drought conditions as a potential impact to the region.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Drought Probability and Drought Impacts

Hazard Identification

The National Oceanic and Atmospheric Administration (NOAA) defines drought as less than 60% normal precipitation over a prolonged period of time.[3] However, in Washington State, the statutory criteria for drought is a water supply below 75% of normal and a shortage expected to create undue hardship for some water users.[4]

[1] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf
[2] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf
[3] Pierce County Hazard Identification and Vulnerability Assessment, http://www.co.pierce.wa.us/xml/abtus/ourorg/dem/EMDiv/HIVA/DROUGHT.pdf
[4] Washington State Comprehensive Emergency Management Plan Annex Z2, Drought Contingency Plan, http://www.drought.unl.edu/plan/state%20plans/WAplan.pdf

Assessing the probability of drought conditions in King County can be challenging, due to the temperate weather nature of our region. As a result, current long-range forecasts of drought have limited reliability. Meteorologists do not believe that reliable forecasts are attainable any more than a season in advance.[5] If historic patterns repeat themselves, dry conditions occur approximately every decade. Probability of Drought conditions is Moderate – the potential Impact from Drought conditions is Moderate. See table 5 – 13.

Drought conditions can be described in the following four ways:

Meteorological: a measure of departure of precipitation from normal. Due to climate differences what is considered a drought in one location may not be a drought in another.

Agricultural: refers to a situation when the amount of moisture in the soil no longer meets the needs of a particular crop.

Hydrological: occurs when surface and subsurface water supplies are below normal.

Socioeconomic: refers to the situation that occurs when physical water shortage begins to impact people's jobs, incomes, recreational capabilities and other such factors.

The severity of drought is measured by the Palmer Drought Severity Index in a range of 4 (extremely wet) to –4 (extremely dry), and incorporates temperature, precipitation, evaporation and transpiration, runoff and soil moisture when designating the degree of drought.[6]

Table 5-13: Palmer Drought Severity Index Classifications

4.0 or more	Extremely Wet
3.0 to 3.99	Very Wet
2.0 to 2.99	Moderately Wet
1.0 to1.99	Slightly Wet
0.5 to 0.99	Incipient Wet Spell
0.49 to -0.49	Near Normal
-0.5 to 0.99	Incipient Dry Spell
-1.0 to –1.99	Mild Drought
-2.0 to –2.99	Moderate Drought
-3.0 to –3.99	Severe Drought
-4.0 or less	Extreme Drought

Source: Pierce County Emergency Management Hazard Identification and Vulnerability Assessment 2002

[5] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf

[6] Governor's Ad Hoc Executive Water Emergency Committee Staff, "History of Drought in Washington State", State of Washington, December 1977, p 7.

In 1989, the Washington State Legislature gave permanent drought relief authority to the Department of Ecology and enabled them to issue orders declaring drought emergencies. (RCW 43.83B.400-430 and Chapter 173-166 WAC).[7]

In comparison to other natural disasters that may occur in Western Washington, drought doesn't usually result in property damage or loss of life, although it can have substantial negative impact on the environment and economy.

History of Events

Every few years in Washington State, drought conditions are present with an inherent impact of moderate on the Palmer Drought Severity Index. In the last century in Washington State, there have been a number of drought episodes, including several that have lasted for more that a single season, including dry periods occurring between 1928-1932 and 1992-1994.

However, King County experiences drought conditions of at least moderate severity in classification from 5 to 10 percent of the time, evidenced most prominently during our most recent severe drought periods in 1977 and 2001. The 1977 event set records for low precipitation, snow-pack, and stream flow totals that still stand today, while the 2001 event was the second-worst drought year in state recorded history.[8]

1977 Drought: King County experienced severe or extreme drought conditions between 10-20 percent of the time.

2001 Drought: At the height of this event in March 2001, King County experienced moderate to severe drought conditions.[9]

Rainfall for Western Washington during the 2001 water year was approximately 30% below normal. On March 14, 2001, after several months of record low precipitation, Governor Gary Locke authorized the Department of Ecology to declare a statewide drought emergency. Washington was the first Northwest state to make a drought declaration. Due to above-average precipitation during the final two months of the year, the drought emergency formally expired on December 31,

[7] Skagit County Natural Hazards Identification Plan, http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/3%20HIVA%20Skagit%20Drought.pdf
[8] Skagit County Natural Hazards Identification Plan, http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/3%20HIVA%20Skagit%20Drought.pdf
[9] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf

2001. The National Weather Service reported that the winter of 2000-01 was the driest since 1976-1977, and was one of the top five driest in the past 100 years.[10]

Table 5-14: Drought History

Year	Conditions	Causes
2005	Water Shortage, March March 21, County Executive News Release; KC Drought Response Plan Activated	Record Low Precipitation, low snowpack, low river levels
2001	Moderate to Severe Drought, Statewide	Low precipitation
1988	Water Shortage; Water Shortage	Level of Chester Morse Lake fell below outlet; Tolt Pipeline broke during peak usage
1987	Water Shortage; Water Shortage	Tolt Pipeline broke Hot, dry summer weather increased water demands beyond limits
1977	Severe to Extreme Drought	Low precipitation
1967	Water Shortage	Dry summer
1965-66	Water Shortage	Dry throughout state
1952-53	Water Shortage	Lack of winter precipitation
1928-30	Statewide Drought	Rainfall was 20% of normal
1919	Water Shortage	Dry summer

Source: City of Seattle Emergency Management Disaster History

Hazard Impacts

Drought conditions occurring in King County can have an impact on the economic viability of agriculture and power-related industries as well as water and snow-related recreational activities. Drought conditions would impact the amount of water available for crops grown for commercial and domestic use, and could also reduce the snow pack available in our local mountain passes, which could have a negative result on area winter sports tourism.

Additionally, due to the prevalence of hydroelectric dams in King County, drought conditions could also have a negative impact on the availability and cost of electric power for local businesses and industries. When water levels drop, electric

[10] Skagit County Natural Hazards Identification Plan, http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/3%20HIVA%20Skagit%20Drought.pdf

companies cannot produce enough power to meet demand and are forced to buy electricity from other sources.[11]

Additional impacts to King County industry may include a negative impact on the capabilities of firefighters in the area, as water shortages may result in reduced water flow and pressure available to combat wild land and structural fires that may take place in our region.

Past Mitigation Efforts

Efforts to mitigate the effects of drought conditions in our area include consistent vigilance of forecasted conditions like the prevalence of rainfall, or the amount of snow pack present in the mountain passes.

Additional efforts include King County's Regional Wastewater Services Plan, a 30-year operating plan for our wastewater system that calls for expanding the production and use of reclaimed water as a valuable resource. Reclaimed water is wastewater that gets treated to such a high level that it can be used safely and effectively for non-drinking water purposes such as landscape and agricultural irrigation, heating and cooling, and industrial processing. Reclaimed water has been used successfully and safely in other areas of the country and world for decades, and is a viable tool to utilize when combating drought in King County.[12]

Other mitigation efforts include sustainable landscaping, a low maintenance method of outdoor design featuring native plants that promotes healthy soil, minimizes water use, and doesn't need excessive fertilizer or pesticides.[13]

[11] King County Office of Emergency Management Drought Resource Section, http://www.kingcounty.gov/safety/prepare/residents_business/Hazards_Disasters/Droughts.aspx
[12] King County Water Reuse Program, http://www.kingcounty.gov/environment/wastewater/ReclaimedWater.aspx
[13] King County Solid Waste Division, Sustainable Landscaping, http://www.metrokc.gov/dnrp/swd/sustainable-landscaping/index.asp

One substantive addition made for 2009

Introduction

Fires don't generally call for region wide attention unless the fire migrates to adjoining buildings, homes, or property or is determined to have the potential to do so. Fast-spreading structure fires can quickly threaten a large amount of people, as well as tax the resources of local fire-fighting jurisdictions

King County is at risk for three types of fire threats: structure, wildland, and wildland-urban interface fires. These threats are typically defined as:

Structure Fire**:** a fire of natural or human-caused origin that results in the uncontrolled destruction of homes, businesses, and other structures in populated, urban or suburban areas.

Wildland Fire**:** a fire of natural or human-caused origin that results in the uncontrolled destruction of forests, field crops and grasslands.[14]

Wildland-Urban Interface**:** a fire of natural or human-caused origin that occurs in or near forest or grassland areas where isolated homes, subdivisions, and small communities are also located. [15]

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Fire Hazards Probability and Fire Hazards Impacts

The Washington Department of Natural Resources and its federal and local partners found that 181 communities were at high risk for fire threats, including some communities housed within the jurisdiction of King County. Communities were evaluated based on fire behavior potential, fire protection capability, and risk to social, cultural and community resources. Assigned risk factors included area fire history, type and density of vegetative fuels, extreme weather conditions,

[14] Sinnett, George M, Meteorologist, Fire Weather Summary, 1983-1991, Department of Natural Resources, Division of Fire Control, Washington State, 1992.
[15] Skagit County Natural Hazards Mitigation Plan http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/5%20HIVA%20Skagit%20Fire.pdf

topography, number and density of structures and their distance from fuels, location of municipal watershed, and likely loss of housing or business. The evaluation used the criteria in the wildfire hazard severity analysis of the National Fire Protection Association's NFPA 299 Standard for Protection of Life and Property from Wildfire, 1997 Edition.[16]

As a result, fire hazards are a very real risk for King County residents and businesses and must be vigilantly prepared for and mitigated against in efforts to keep our region and surrounding counties and communities safer.

Hazard Identification

A fire needs three elements in the right combination to ignite and grow – a heat source, fuel, and oxygen. How a fire behaves primarily depends on the characteristics of available fuel, weather conditions, and terrain. Fuels can include ignition sources like poor wiring or unattended candles, lighter fuels like grasses and leaves, heavier fuels like tree branches and logs, and hazard trees that may be diseased or dying.[17]

Weather also plays a role in the forms of wind, low precipitation, and lightening. As a result, strong, dry east winds in late summer and early fall can produce extreme fire conditions west of the Cascades. Drought, snow pack, and local weather conditions can also expand the length of the fire season.[18] Additionally, according to data from 1992-2001, lightening ignited 135 wildland fires annually and burned more state-protected acreage than any other cause, an average of about 10,866 acres annually.[19]

Terrain is an additional factor, as the topography of a region or local area influences the amount and moisture of available fuel. Other elements like barriers and land elevation also need to be taken into account as highways and lakes can affect spread of fire, as can an uphill/downhill orientation, as fire spreads more easily as it moves uphill. [20]

In addition to natural conditions for fire viability, humans also play a role. From 1992 to 2001, people, on average, caused more than 500 wildland fires each year

[16] Washington State Hazard Mitigation Plan, Hazard Identification and Vulnerability Assessment on Wildland Fire, http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/Tab%207.1.9%20Wildland%20Fire%20final.pdf
[17] Washington State Hazard Mitigation Plan, Hazard Identification and Vulnerability Assessment on Wildland Fire, http://www.emd.wa.gov/plans/documents/Tab_7_Risk_Assessment_Introduction.pdf
[18] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf
[19] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf
[20] Washington State Hazard Mitigation Plan, Hazard Identification and Vulnerability Assessment on Wildland Fire, http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/Tab%207.1.9%20Wildland%20Fire%20final.pdf

on state protected lands. Human caused fires burn an average of 4,404 state-protected acres each year.[21]

Hazard Impacts

Most wildland fires are usually extinguished in their initial stages being less than one acre in area.[22] In fact, Western Washington is less prone to the danger of large or catastrophic wildland fires than the Eastern half of the state. The Western slopes have a shorter fire season, receive more rainfall, have wetter and cooler spring seasons, and are more urbanized.[23] However, these conditions don't make wildland fires any less dangerous, as statistics show that on an annual basis, an average of 905 wildland fires burn 6,488 acres resulting in a resource loss of $2,103,884 in Washington State. [24]

Depending upon temperature, wind, topography, and other factors, wildland fires can spread rapidly and may require thousands of firefighters working several weeks to extinguish.[25] Wildland fires can create their own winds and weather, and generating hurricane force winds of up to 120 miles per hour. Fires can also heat fuels in their path, drying them out, and making them easier to ignite and burn.[26]

With the increasing urbanization of King County, the threat of wildland/urban interface fire grows, due to a rise in the building of vacation homes and the prevalence of more comprehensive transportation systems. King County residents can live outside of crowded city centers while commuting or telecommuting to work. As a result, wildfires can encroach onto residential properties and structure fires can invade wooded areas. These fires are also quite difficult to fight, as the remote locations of residential properties in wooded areas make fire-fighting response times to those areas take longer than normal residential responses. In addition, most fire fighters are trained to fight either wildfires or structure fires, and with only

[21] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf
[22] Skagit County Natural Hazards Mitigation Plan http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/5%20HIVA%20Skagit%20Fire.pdf
[23] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf
[24] Skagit County Natural Hazards Mitigation Plan http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/5%20HIVA%20Skagit%20Fire.pdf
[25] Skagit County Natural Hazards Mitigation Plan http://www.skagitcounty.net/EmergencyManagement/Documents/2003HazMitFinal/Section%20II%20Final%20Documents/5%20HIVA%20Skagit%20Fire.pdf
[26] Washington State Hazard Mitigation Plan, Hazard Identification and Vulnerability Assessment on Wildland Fire, http://emd.wa.gov/3-map/mit/mit-pubs-forms/hazmit-plan/Tab%207.1.9%20Wildland%20Fire%20final.pdf

the personal protective equipment (PPEs) for structure fires; and interface fires require both skills, making it difficult to balance the two. [27]

Structure Fires**:** In addition to typical methods of occurrence, structure fires are a potential secondary hazard of earthquakes and riots. One study estimated that 80-100 fires would occur from a large earthquake in the Seattle area.[28] Building codes requiring fire detectors and sprinkler systems are in effect for most large structures, therefore reducing some vulnerability. However, injuries and causalities to structure occupants are the primary concern. These events can also cause the release of hazardous materials as well as disconnect utility lines.

Wildland/Urban Interface Fires: King County is becoming more vulnerable to the effects of wildland/urban interface fires due to increased building, living and recreating in forested areas. The effects of interface fires can be the combined affects of both structure and wildland fires.

History of Events

The largest fire in King County history remains the 1889 Seattle fire, which was estimated to have consumed 60 acres of the downtown area.[29] Also notable was the Blackstock lumberyard fire in 1989 which took the life of one fire fighter and the Mary Pang warehouse fire in 1995 which killed four fire fighters.

In contrast, wildland fires historically, were not considered a hazard, as fire is a normal part of most forest and range ecosystems in the temperate regions of the world, including King County. Fires historically burn on a fairly regular cycle, recycling carbon and nutrients stored in the ecosystem, and strongly affecting the species within the ecosystem. The burning cycle in western Washington is every 100 – 150 years.[30] Controlled burns have also been conducted because the fire cycle is an important aspect of management for many ecosystems. These are not considered hazards unless they were to get out of control. [31]

None of Washington State's most significant wildland fires have occurred in King County, although smaller wildland fires have occurred in the region. All but the Snoqualmie Pass area of King County is part of the South Puget Sound fire protection region of the Washington Department of Natural Resources. During

[27] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf
[28] McDonald, Terrence J, "Conflagration and Other Large Urban Fires", Seattle: A Hazard Identification and Vulnerability Analysis, Masters Thesis, Cornell University, 1995, p 82.
[29] McDonald, Terrence J, "Conflagration and Other Large Urban Fires", Seattle: A Hazard Identification and Vulnerability Analysis, Masters Thesis, Cornell University, 1995, p 82.
[30] Pierce County Department of Emergency Management Hazard Identification and Vulnerability Assessment Urban/Wildland Interface Fires Section, http://www.co.pierce.wa.us/pc/abtus/ourorg/dem/EMDiv/NaturalHaz.htm
[31] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf

1992-2001, the South Puget Sound region averaged 182 fires a year that burned an average of 81 acres of state-protected lands.[32]

Past Mitigation Efforts

The Blackstock lumberyard fire fatality resulted in the development of an accountability system called the passport system. This system works with the Incident Command System for tracking the assignments and locations of fire fighters during a response. The system worked so well, that it has been adopted on a national basis for safety improvement on the fire ground. Similarly, the fatalities at the Mary Pang fire have reinforced the continuing need for accountability and safety at a fire scene.

Public education programs are key elements of educating King County residents on indoor and outdoor fire safety, including the importance of fire alarms, extinguishers, fire insurance, and knowledge and understanding of building codes. In efforts to avoid injury or death, residents must plan how to safely exit their home and workplace in the event of a structure fire.

Additionally, effective early fire detection programs and emergency communications systems are essential. Wildland fire prevention education and enforcement programs can reduce the number of wildland fires Washington State faces each year. As a result, the importance of immediately reporting any wildland fire must be impressed upon local residents and visitors utilizing wooded areas. An effective warning system is crucial when needing to notify local residents and visitors in the fire risk area, as well as an evacuation plan detailing primary and alternate escape routes. [33]

The prevention of wildland/urban interface fires, fire-safe development planning requires coordination between county building and transportation planners, to ensure adequate fire escape routes for new sections of development in forested areas. Road closures may also be increased during peak fire periods to reduce access to fire-prone areas. [34] Land use, building codes, mandated sprinkler system installation, vegetation management, survivable materials used in construction of homes, highly trained and equipped fire services and accessibility are all methods used to assist in mitigating urban/wildland fire risk.[35]

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[32] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf

[33] King County Office of Emergency Management Fire Resource Section, http://www.metrokc.gov/prepare/prepareerespond/hazardsdisasters/firehazards.aspx

[34] King County Office of Emergency Management Fire Resource Section, http://www.metrokc.gov/prepare/prepareerespond/hazardsdisasters/firehazards.aspx

[35] Pierce County Department of Emergency Management Hazard Identification and Vulnerability Assessment Urban/Wildland Interface Fires Section, http://www.co.pierce.wa.us/pc/abtus/ourorg/dem/EMDiv/NaturalHaz.htm

Attachment A
16715

DNR Wildland Urban Interface (WUI) Wildfire High Risk Communities

Wildfire Hazard -
Wildland Urban Interface (WUI)
High Risk Communities

Wildland Urban Interface Areas (WUIs) are shown as defined by the Washington State DNR. Published September 2004, this theme is based on data from the current National Fire Protection Association (NFPA 299) risk assessment, and includes one or several communities with similar wildfire risks.

King County GIS
US Geological Survey
Washington State Department of Natural Resources, Division of Geology and Earth Resources

October 2009
Tetra Tech, Inc.

0 5 10 20 Kilometers
0 5 10 20 Miles

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S

King County

Two substantive additions made for 2009

Introduction

Hazardous chemicals are prevalent throughout our society. While industry is the primary user and maintainer of hazardous chemicals, we also have them in our homes, in our cars, at our places of work and recreation. Hazardous materials move through our region on highways, rail lines, pipelines, and by ship and barge through Puget Sound. These major transportation routes are utilized by our trucking industry to transport chemicals not only to local manufacturing plants, but also to businesses and retail outlets. [36]

The geographic and economic characteristics of King County make it likely that hazardous materials releases will occur. Our diverse industrial facilities and transportation routes share space with numerous bodies of waters, wetlands, environmentally sensitive areas, and a multitude of densely populated centers, creating areas of great potential risk for a hazardous materials release.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Hazardous Materials Probability and Hazardous Materials Impacts

Hazard Identification

King County hosts a variety of unique transportation and geographic conditions, including one of the largest deepwater seaports on the west coast, an International Airport in SeaTac that handles cargo from all over the world, as well as fuel pipelines running south from Whatcom County through King County and down into Portland carrying jet fuels, diesel, gasoline, etc. Additionally, local highways like Intertate-5, Interstate-90, US Highway 2, State Route (SR) 18, SR 516, SR 167, US Highway 99 and others transport hazardous materials throughout the region.

In the City of Seattle, there are over 3000 facilities with hazardous materials regulated under the fire code. Other areas with high concentrations of hazardous materials usage include Harbor Island, the Duwamish Corridor, Redmond and the

[36] Pierce County Department of Emergency Management Hazard Identification and Vulnerability Assessment, Technological Hazards Section: Hazardous Materials, http://www.co.pierce.wa.us/xml/abtus/ourorg/dem/EMDiv/HIVA/hazmat.pdf

Kent Valley. Business types that commonly use hazardous materials locally include: hospitals, schools, metal plating and finishing, the aircraft industry, public utilities, cold storage companies, the fuel industries, the communication industry, chemical distributors, research, and high technology firms. Each of these facilities is required to maintain plans for warning, notification, evacuation and site security under various regulations. The majority of releases that occur during the course of regular commerce happen at fixed facilities.

While the majority of incidents tend to involve petroleum products, a significant number involve extremely hazardous materials. Approximately 200 local facilities with extremely hazardous materials report their inventories to the county under SARA Title III provisions. Efforts continue to increase the compliance rate and education level of local facilities. In excess of 300 hazardous materials events require response in King County annually; however, many events are not reported or go undetected.

Hazardous materials may also be released as a secondary result of a natural disaster like earthquakes or floods. In either case, buildings or vehicles can release their hazardous materials inventories when structurally compromised or involved in traffic accidents. Pipelines can be exposed or ruptured from collapsed embankments, road washouts, bridge collapses, and fractures in roadways, and as nearly every neighborhood in urban King county includes a natural gas pipeline, this is a very possible risk. Examples of areas at risk for a secondary incident are Harbor Island, a western Washington facility with a large fuel storage area. Earthquake damage to Harbor Island could result in subsequent fuel spills that may impact the Duwamish River and Elliot Bay. These potential spills may occur from above ground storage, pipelines or fuel transfers from tankers. Events resulting from a spill would produce severe fire hazards and enormous environmental damages to fish, wildlife and commerce.

Additional potential causes of hazardous materials releases may include terrorist incidents and illegal drug labs or dumping. Illegal drug labs present a special concern due to the fact that each must be treated as a chemical hazard site and decontaminated before the property can be used again. Illegal drug labs can be set up in homes, apartments, vacant buildings, shacks in the forest or even in a van parked on the street.[37] Exposure of King County's sizable population to a hazardous materials release presents a complex problem to responders, since it is difficult to find a home, school, hospital or place of business in our modern society that isn't vulnerable to the possibility.

The chemical, physical and biological properties of hazardous materials pose a potential risk to life, health, the environment, and property when not properly contained. Hazardous materials may be explosive, flammable, combustible,

[37] Pierce County Department of Emergency Management Hazard Identification and Vulnerability Assessment, Technological Hazards Section: Hazardous Materials, http://www.co.pierce.wa.us/xml/abtus/ourorg/dem/EMDiv/HIVA/hazmat.pdf

corrosive, reactive, poisonous, biological or radioactive, as well as solid, liquid or gaseous. Hazardous materials incidents may be either generated from a fixed site or the result of a transportation-related accident or release.[38] Hazardous substances are subject to regulation by a variety of state and federal agencies through an assortment of labor, environmental and transportation laws.[39]

The types of materials that can cause a hazardous materials release are wide ranging in nature and may include chlorine, sodium hydroxide, sulfuric acid, radioactive isotopes, anhydrous ammonia, gasoline and other hydrocarbons, as well as medical/biological waste from hospitals or clinics. Hazardous materials subject to reporting under the Emergency Planning and Community Right-to-Know Act (EPCRA) or Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) include these four groups:

Extremely Hazardous Substances: These are materials with acutely toxic properties that may do irreversible damage or cause death to people or harm the environment when released or used outside their intended use. Examples include: ammonia, chlorine, and sulfuric acid. Includes 366 US EPA listed chemicals.

Hazardous Substances: These are any materials posing a threat to human health and/or the environment, or any substance designated by the Environmental Protection Agency (EPA) to be reported if a designated quantity of the substance is spilled into the waters of the United States or is otherwise released into the environment.[40] Includes 720 chemicals listed by the US EPA.

Hazardous Chemicals: If present at a chemical facility in certain amounts, these substances require a Material Safety Data Sheet (MSDS) under the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard. Such substances are capable of producing fires and explosions or adverse health effects such as cancer, burns, or dermatitis.[41]

Toxic Chemicals: Chemicals or chemical categories that appear on the list because of their chronic or long-term toxicity. Includes 325 chemicals. [42]

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[38] Pierce County Department of Emergency Management Hazard Identification and Vulnerability Assessment, Technological Hazards Section: Hazardous Materials, http://www.co.pierce.wa.us/xml/abtus/ourorg/dem/EMDiv/HIVA/hazmat.pdf

[39] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment: Hazardous Materials Section, http://www.snodem.org/HIVA.pdf

[40] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment: Hazardous Materials Section, http://www.snodem.org/HIVA.pdf

[41] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment: Hazardous Materials Section, http://www.snodem.org/HIVA.pdf

[42] Pierce County Department of Emergency Management Hazard Identification and Vulnerability Assessment, Technological Hazards Section: Hazardous Materials, http://www.co.pierce.wa.us/xml/abtus/ourorg/dem/EMDiv/HIVA/hazmat.pdf

Other hazardous materials include hazardous wastes, by-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed, and possess at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appear on special EPA lists.[43]

Hazardous Materials Impacts

The industrial and geographic characteristics of our region continue to place King County at risk for probably hazardous materials releases. Many factors determine the impact of a potential incident including quick and solid decision-making by emergency officials, location and type of release, evacuation and shelter-in-place needs, public health concerns, and relevant economic considerations. Additionally, while most incidents are generally brief, the resulting recovery and cleanup may take time to exact.

If evacuation is necessary due to a chemical emergency road closures and traffic jams may result. If a large-scale evacuation is deemed necessary, it can pose serious long term economic consequences to the involved population area.[44] A delay in the resumption of industry commerce may cause economic losses for both business owners and employees. In addition, an evacuation ordered on short-notice could cause serious problems for businesses requiring time to shut down specialized equipment.[45] There is also the monetary impact borne by responding public or private emergency response organizations. These agencies may be challenged by the expenses dictated by a hazardous materials release, and may need to wait an uncomfortable length of time for the responsible party to reimburse any outstanding costs, further straining the economic resources of the region.

A major incident involving significant injuries may severely tax regional medical services, as medical facilities aren't generally designed to handle mass amounts of victims on short notice. Consequently, in the event of a major incident, hospitals and other medical facilities must still be able to provide their customary level of service to all patients, regardless of whether they were incident victims or not.

If severe weather contributes to a flooding incident(s), as example along the Green River Valley and/or due to the Howard Hanson Dam situational awareness for 2009

[43] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment: Hazardous Materials Section, http://www.co.snohomish.wa.us/documents/Departments/Emergency_Management/cemp_4-17-07_draft.pdf

[44] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment: Hazardous Materials Section, http://www.co.snohomish.wa.us/documents/Departments/Emergency_Management/cemp_4-17-07_draft.pdf

[45] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment: Hazardous Materials Section, http://www.co.snohomish.wa.us/documents/Departments/Emergency_Management/cemp_4-17-07_draft.pdf

and beyond, the hazard rankings in the introduction may be suddenly upgraded. Flooding impacts increases the risk of possible increased frequency of secondary hazards such as landslide, hazardous material spills or releases, fire hazards, and transportation system impacts.

History of Events

Hazardous materials emergencies have emerged as a public concern only within the past 30 years, as older records mixed hazardous materials emergencies with fire emergencies. As a result constructing a detailed history is difficult. This section highlights major incidents.[46]

A Washington State Department of Health study examined incidents occurring in 1992. According to the report there were 118 events in King County, about 10.2% involving transportation and 89.8% occurring at fixed facilities. Twenty-six incidents caused a total of 66 injuries, most commonly involving acids and volatile organic compounds. Additionally, 29 incidents resulted in the evacuation of nearly 1400 people. The report indicates that 44 incidents in King County occurred within one-quarter mile of residential areas, indicating some risk to people not directly involved with the released chemicals.[47]

A recent Washington State Hazard Identification and Vulnerability Analysis cited an average of 960 emergency spills occurring annually in King County. Significant events in King County detailed by the study include: the release of 2500 gallons of fuel from Olympic Pipeline at their Renton pumping station, the release of hydrofluoric and nitric acids from Boeing's Auburn plant, numerous drug lab events, metal finishing company fires at Boeing and Universal Manufacturing, a spill at UPS in Redmond, numerous releases of ammonia from cold storage facilities and the release of a small amount of chorine from a public water company. Response teams have narrowly averted some potentially large releases.

Hazardous materials may also be released during transport. For example, a 1994 King County study shows that the most common material transported along I-5 is gasoline. In addition, the most commonly released chemicals in transportation accidents included volatile organic compounds, acids, herbicides, and insecticides. Consequently, the Washington State Department of Transportation reported that almost 60,000 transportation incidents resulting in the accidental release of hazardous materials occurred between 1987 and 1989. Case in point of a typical problem posed by chemical transport involves a crash in 1975 where a gasoline tanker traveling north on the Alaska Way Viaduct lost control, bounced sideways, and crashed against the guardrail, where the tank ruptured. Gasoline flowed down the side of the Viaduct where it was ignited by flares set coincidentally by a railroad

[46] City of Seattle Emergency Management, Human-Caused Disasters: Hazardous Materials Resource Section, http://www.seattle.gov/emergency/hazards/hazardousMaterials.htm
[47] City of Seattle Emergency Management, Human-Caused Disasters: Hazardous Materials Resource Section, http://www.seattle.gov/emergency/hazards/hazardousMaterials.htm

crew. The resulting fire damaged several buildings, but there were no casualties.[48] As for railroad incidents however, King County has not had any significant events in recent years, although rail lines do run throughout downtown Seattle and populous areas of King County.

King County also has numerous abandoned hazardous waste sites that are being cleaned up under the Superfund program. In 2004, at least five sites in Kent and one very large site in South Seattle were identified. In 2009, twenty three sites are listed on the EPA website for small and large problems under the general category of Cleanup Sites, and three are Superfund sites, 2 located in Seattle, one in Renton. 48.5

Past Mitigation Efforts[49]

In 2004, there were sixteen hazardous materials response teams in King County. These were split evenly between public fire jurisdictions and the Boeing Company. It has changed somewhat for this 2009 update. Response capabilities are shared between 3 King County Zones (1, 3, and 5); with Boeing and the Port of Seattle having additional full response teams. Private response contractors working with the Environmental Protection Agency (EPA) and a unit of the Washington State Department of Ecology supplement the hazardous materials teams in King County.

An Area Contingency Plan was developed by the State Department of Ecology in cooperation with Federal, State and Local agencies. The purpose of the plan is "to provide orderly implementation of response actions to protect the people and natural resources of the states of Washington, Oregon, and Idaho from the impacts of oil or hazardous substances spills." The plan accounts for potential problems from vessels, offshore facilities, onshore facilities or other sources. The EPA has responsibility for all spills in inland waters. The United States Coast Guard has responsibility for all spills in coastal waters.

Other mitigation efforts include the Local Hazardous Waste Management Program, a regional consortium of local governments working together to protect public health and environmental quality by helping citizens, businesses and government reduce the threat posed by the use, storage, and disposal of hazardous materials. Prompted by citizen demand, this program was developed when Washington State directed local governments to create plans to ensure proper management of hazardous wastes produced by households, businesses, and other organizations. In 1991 local governments and agencies within King County established a partnership to manage these wastes regionally by developing the Local Hazardous

[48] City of Seattle Emergency Management, Human-Caused Disasters: Hazardous Materials Resource Section, http://www.seattle.gov/emergency/hazards/hazardousMaterials.htm
48.5 EPA Clean Up sites list for King County, WA
[49] Vulnerability Analysis prepared for the Local Emergency Planning Committee by Rich Tokarzewski, King County Office of Emergency Management

Waste Management Program.[50] This program offers information and services to help King County residents, businesses, and other groups reduce toxic and hazardous materials, safely use and store hazardous materials, and properly dispose of hazardous wastes.[51]

With 1.9 million (updated 2009) people living in King County and more than 60,000 businesses and other institutions operating therein, the amount of hazardous waste generated adds up.[51.5] When improperly used, stored or disposed of, these chemicals threaten human health and the environment. Moreover, exposure to some household products and business materials presents a risk to health and environmental quality even when used and disposed of properly. Program efforts focus on helping local residents, business owners and operators, and other institutions (such as schools, hospitals and government agencies): use fewer and/or less toxic materials (and generate less hazardous waste), properly use and store hazardous materials, and properly dispose of hazardous wastes.[52]

As demonstrated by the Local Hazardous Waste Management Program's efforts, public education is a key component to reducing the risks associated with a hazardous materials release. Educating the public on the fundamentals of shelter-in-place is also a key component. Citizens must know when, where, and how to shelter-in-place effectively, as this response mechanism is key to saving lives in a chemical emergency. Being aware and attentive of emergency officials and their public safety directives during a hazardous materials release will help ensure the protection of vulnerable populations and may lessen the economic impact of a release to the business and industrial community.

[50] Local Hazardous Waste Management Program in King County: Working Together to Reduce Hazardous Waste, http://www.govlink.org/hazwaste/about/
[51] Local Hazardous Waste Management Program in King County, http://www.govlink.org/hazwaste/
[51.5] *2009 Office of Financial Management Washington, April 2009*
[52] Local Hazardous Waste Management Program in King County: Working Together to Reduce Hazardous Waste, http://www.govlink.org/hazwaste/about/

Substantive additions made for 2009

Introduction

Transportation systems available in King County include air, rail, water and road. All of these systems and supporting transportation resources provide services on a national, regional and local basis and are critical to local, regional, national and international commerce. While highway traffic accidents are a daily occurrence, transportation accidents with impacts to local commerce or resulting in transportation diversions are fairly rare.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Transportation Probability and Transportation Impacts

Hazard Identification

King County is a transportation hub in the northwest. Major highways, air transportation, railroad operations and a deep water marine port all exist in King county.

Highways: Privately owned vehicles and local bus services traveling on area freeways, highways and roads provide the primary means of transportation for individuals in King County. The principal north-south arterials are Interstate 5 and Interstate 405. Interstate 90, which connects Seattle with Spokane and points east, is the most heavily traveled east-west corridor. US Highway 2 crosses the Cascade Mountains in northeast King County at Steven's Pass. The two Floating Bridges over Lake Washington link Seattle to the eastern portion of the county as well as eastern Washington, Idaho, Montana and other states.

Air Transportation: The largest airport in King County, for both passenger and cargo traffic, is the Seattle-Tacoma International Airport, where domestic and international service is provided by several major airlines. Sea-Tac is the largest airport in

Washington and was ranked 17th in the United States for passenger carriage in 2008.[53] (Updated 2009)

Sea-Tac generates substantial economic impacts to the region, as shown by the total combined direct output of on-airport tenants and general aviation and air carrier visitors, which was approximately $13.1 billion. Additionally, these expenditures were responsible for approximately 89,902 jobs, generating $2.15 billion in wages. Sea-Tac also provides numerous secondary impacts to the King County area through visiting passengers and airport-dependant firms, accounting for 35,584 jobs and posting wages of $1.9 billion. The total employment impact of Sea-Tac stands at approximately 138,370 earning $4.5 billion, while the sum total impact of economic activity was $17.6 billion.[54]

Rail Transportation: Rail Carriers in this area include Burlington Northern – Santa Fe and the Union Pacific for freight traffic, and Amtrak for passenger travel. North-South railways travel along the coastline though much of King County. East-West rail traffic primarily uses Steven's Pass, traveling a 7-mile tunnel through the Cascade Mountains. Sounder commuter rail service initially provided one-way service during peak hours between Tacoma and Seattle on weekdays, while service recently expanded to operate along the entire 82-mile track between Everett and Lakewood.[55] (Updated 2009)

Marine Transportation: As with other modes of transportation, there are both passengers and cargo transported in King County. The Washington State Ferry System provides the primary means of marine passenger transport in our region with four ferry terminals located in the County jurisdiction. In 1995, 1256 different ships made 3,619 calls to Puget Sound ports either through the Straits of Juan de Fuca or the Straits of Georgia.[56]

Washington State Ferries is the largest ferry transit system in the United States and one of the busiest, carrying over 24 million riders in 2008, and is the largest transit system in Washington State, second only to King County Metro. Commuters make up about 50% of the annual ridership, as exemplified by the busiest commuter route, Bainbridge to Seattle, where 18,000 people are carried in an average day.[57] (Updated 2009).

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[53] Washington State Department of Transportation Aviation Division Report on the Economic Impacts of Seattle-Tacoma International Airport, http://www.wsdot.wa.gov/NR/rdonlyres/2829F10B-E191-4A7A-ABB0-E51D728E533E/0/NWR_SeaTac.pdf

[54] Port of Seattle- SeaTac http://www.portseattle.org/downloads/seatac/2007activity.pdf , http://www.portseattle.org/downloads/business/EconomicImpact_20091.pdf

[55] Pierce County Department of Emergency Management, Hazard Identification and Vulnerability Assessment, Technological Hazards: Transportation Accidents, http://www.co.pierce.wa.us/pc/abtus/ourorg/dem/techaz.htm

[56] Washington State Office of Marine Safety, Vessel Entries and Transits for Washington Waters, 1995, p B2.

[57] Washington State Ferries: An Introduction to the Largest Ferry System in the Nation, http://www.wsdot.wa.gov/ferries/pdf/WSFLargest.pdf

Additional water transport systems exist with the Port of Seattle and numerous private marine facilities located on Puget Sound, Lake Union and Lake Washington, which provide services and docking facilities for marine cargo and tanker traffic.

Transportation Impacts

The Puget Sound region is vulnerable to all types of transportation emergencies. Growth in this region will continue to increase the risk of transportation accidents.

Highways: King County is likely to experience an increase of accidents along our highways as congestion increases. Many accidents involve rain, high speeds, and heavy traffic. These conditions are certainly not unique, as rain and fog are common, especially during the winter months, while heavy traffic and high speeds are common throughout the year. The bridges in King County play an important role in commerce and in the daily commute. Thanksgiving Day weekend in 1990, a span of the I-90 floating bridge over Lake Washington sank. While the span was replaced and a second bridge built, traffic patterns were disrupted for two years.

Air Transportation: The Puget Sound region is vulnerable to two types of major air transportation accidents. One is a crash involving a large passenger aircraft, while the other is an airplane crash causing casualties on the ground. Despite the large number of planes flying over heavily populated areas, the number of crashes killing or injuring non-passengers is quite small. In general, crashes are most likely to occur within five miles of an airport, typically along flight paths. The area within a five mile radius of airports in the Puget Sound region are heavily populated and therefore could result in a mass casualty event if a plane crashed in these areas, even if the plane itself was not a passenger aircraft. Weather is a significant factor in these air transportation accidents. Down bursts, thunderstorms, and ice are the primary weather-related events that increase risk.

Sea-Tac Airport is becoming as congested as some of the nation's major airports including Chicago's O'Hare and New York City's Kennedy airports. Currently, King County International Airport averages 400,000 flights per year while Sea-Tac is reaching its design capacity with 347,046 (updated 2009) flights per year. [58] The proximity of King County International Airport's flight path also increases the risk. The flight paths for these two airports overlap, increasing the risk of mid-air collisions. With the completion of a third runway, congestion will be reduced, but the total volume of flights over Seattle will probably increase, offsetting some of the benefits of the reduced congestion.

[58] City of Seattle Emergency Management, Human Caused Disasters: Aircraft Accidents Resource Section July 2009 update, http://www.seattle.gov/emergency/library/Haz%20Mit%20Plan%20Feb%2004.pdf

Rail Transportation: An accident involving an Amtrak train traveling through Washington State could result in a mass casualty incident. However, the greatest risk associated with freight trains is a spill of hazardous materials.[59] Nevertheless, with the development of Sound Transit, King County's railway vulnerability will increase, as new hazards may present themselves with the continued growth of this light rail service.

Marine Transportation: In addition to the Puget Sound itself, the region contains many smaller bodies of water. These areas are vulnerable to shipping and boating accidents, as well as those involving ferries. Ferry accidents could result in a mass casualty incident that may be difficult to address, though the United States Coast Guard has the primary responsibility for safety and rescue on the open waterways. Major emergencies associated with freight vessels though, are more likely to result from spills or collisions with passenger vessels.

History of Events

Highway Accidents: King County has slowly increased in traffic related deaths between 1998 and 2007, by about 2.5%.[60] Over the course of 2007 170 traffic deaths were reported. Past history also shows the potential for major incidents, like a 42 car pileup that occurred in 1996, closing southbound Interstate 5 for four hours, and was responsible for 23 injuries and one death.

Marine Accidents: It is fortunate that the Puget Sound region has not experienced a major incident involving a Washington State Ferry, but with an examination of the history of near misses or hard landings into docks, one can see that potential for a fatal accident does exist. For example, two incidents in 1994 involved a ferry running aground off Orcas Island, as well as a ferry colliding with a pleasure craft while attempting to dock.[61] Additionally, in the case of freight vessels, a Canadian Study that examined past collisions, accidents, and groundings in the Straits of Juan de Fuca, found that 56% involved bulk carriers, 12% involved container vessels, 12% involved passenger vessels and 18% involved tankers. Tankers are currently the most heavily regulated, as the Exxon Valdez oil spill in Alaska caused Washington State to pass strict regulations on their usage.

Air Accidents: The last accident occurred on September 29, 2005 when a medical helicopter crashed into the Puget Sound near Edmonds, killing three. Though infrequent, accidents in other parts of the country allow us to examine the potential vulnerabilities we face in this area.[58] In 1995 there were 175 deaths associated

[59] Transportation accidents involving hazardous materials releases and spills are discussed in a separate HIVA section.
[60] Washington Traffic Safety Commission: Fatalities by County, http://www.wtsc.wa.gov/research/data/data09/county_state_datatables98_07.pdf
[61] Taken from 1997 King County Hazard Identification and Vulnerability Assessment. http://www.kingcounty.gov/healthservices/health/news/2008/08123102.aspx

with large scheduled airline traffic and 732 deaths associated with general aviation flights. King County is at risk for these threats, as the region experiences extensive air traffic of both these types. SeaTac airport handles most of the scheduled airline traffic while King County International Airport/Boeing Field handles most of the general aviation traffic. A relatively minor commercial air traffic accident occurred when a Dash 8 commuter plane lost control after landing at SeaTac International Airport. It crashed into the terminal building causing some damage but no deaths or service disruptions.

Rail Accidents: The Puget Sound region has not experienced a major rail accident in recent history, however recent examples point to the potential for this hazard to occur in King County. For example, a massive landslide in nearby Snohomish County pushed five freight cars into Puget Sound, knocking out 100 yards of track. Railroad-related fatalities, on the other hand, are generally the result of people walking on or near railroad tracks. A 1994 statistic gathered that almost 75% of railroad-related deaths were attributed to such a situation.[62]

Past Mitigation Efforts

The source and location of transportation accidents can vary widely but the response is typically the same. Response is focused on determining the presence or absence of hazardous materials and then assisting the injured. Local emergency managers should work with transportation planners to mitigate current risks associated with major transportation corridors. Additionally these agencies should work together when planning new infrastructure such as the Regional Transit Authority or a third runway at SeaTac Airport to minimize associated risks.

For any type of transportation accident, mitigation involves first and foremost, the following of safety guidelines as well as using caution in unusual conditions or situations. Inspections required on a regular basis on carriers, as well as infrastructure like highways, airports, railroad, or marine systems must be carried through as required by the regulations in place in order to prevent transportation incidents. In addition, as new technology comes into being or new information is gathered as to the cause of transportation accidents, regulations on safety and maintenance need to be updated. [63]

Additionally, local media outlets, as well as King County Department of Transportation take care to keep the public updated of transportation-related emergencies and resulting highway, airport, rail, or ferry delays and closures. The Regional Public Information Network (RPIN) also provides the public with a central source for breaking news by providing links to information being released by a

[62] Taken from 1997 King County Hazard Identification and Vulnerability Assessment.
[63] Pierce County Department of Emergency Management, Hazard Identification and Vulnerability Assessment, Technological Hazards: Transportation Accidents, http://www.co.pierce.wa.us/pc/abtus/ourorg/dem/techaz.htm

variety of agencies and organizations in central Puget Sound, including those incidents involving transportation accidents.[64] Citizens can subscribe to RPIN to stay abreast of breaking transportation news and other regional alerts.

[64] Regional Public Information Network (RPIN), http://www.govlink.org/rpin/

No substantive changes made in 2009

Introduction

Tsunami (soo-NAH-mee): a Japanese word that means harbor wave; a sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes, major submarine slides, or exploding volcanic islands. [65]

Tsunamis, often incorrectly described as tidal waves, are sea waves usually caused by displacement of the ocean floor. Typically generated by seismic or volcanic activity or by underwater landslides, a tsunami consists of a series of high-energy waves that radiate outward like pond ripples from the area in which the generating event occurred. The arrival of tsunami waves is usually typified by a sudden and unexpected recession of water; the first wave will be followed by additional waves a few minutes or even a few hours later. Wave size typically increases over time, and coastal flooding may often precede the largest waves.

Seiche (saysh): a series of standing waves (sloshing action) of an enclosed body or partially enclosed body of water caused by earthquake shaking. Seiche action can affect harbors, bays, lakes, rivers, and canals. [66]

Tsunami and Seiche events occur only very infrequently in Puget Sound.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Tsunami / Seiche Probability and Tsunami / Seiche Impacts

Hazard Identification

Normally caused by earthquake activity, tsunamis and seiches can affect harbors, bays, lakes, rivers, and canals. In the majority of instances, earthquake-induced

[65] Skagit County Natural Hazards Identification Plan, http://www.skagitcounty.net/emergencymanagement/documents/2008hazplandraft/section%20ii%20final%20documents/9%20hiva%20skagit%20tsunami%20and%20seichei.pdf
[66] Skagit County Natural Hazards Identification Plan, http://www.skagitcounty.net/emergencymanagement/documents/2008hazplandraft/section%20ii%20final%20documents/9%20hiva%20skagit%20tsunami%20and%20seichei.pdf

events do not occur close to the epicenter of an earthquake, but hundreds of miles away. Earthquake shock waves close to the epicenter consist of high frequency vibrations, while those at much greater distances are of lower frequency. It is the low frequency vibrations that move bodies of water. The biggest tsunamis and seiches develop when the period of ground movement matches the frequency of oscillation in the body of water.[67]

Not all earthquakes produce tsunamis. To generate a tsunami, an earthquake must occur underneath or near the ocean, be very large (approximately Richter magnitude 7 or greater), and create vertical movement of the sea floor. All oceanic regions of the world can experience tsunamis, but in the Pacific Ocean there is a much more frequent occurrence of large, destructive tsunamis because of the many large earthquakes along the boundaries of the Pacific Ocean's "Ring of Fire." [68]

Tsunamis can be intensely powerful, as large Pacific Ocean tsunamis typically have wave crest to wave crest distances of 60 miles and can travel about 600 miles per hour in the open ocean, navigating the entire 12,000 to 14,000 miles of the Pacific Ocean in just 24 hours. In deep ocean waters, the length from wave crest to wave crest may be a hundred miles or more but only reaches a wave height of less than a few feet. As a result, tsunamis cannot be felt aboard ships nor can they be seen from the air in the open ocean. [69]

Tsunamis and seiches can be generated by a number of sources:

1. Distant earthquakes along the Pacific Rim.

2. Local earthquakes, such as those generated by local surface faults, those originating in the Benioff zone, or those that occur in the Cascadia Subduction Zone off the coast.

3. Large landslides into bodies of water, such as Puget Sound or area lakes.

4. Submarine landslides in bodies of water like Puget Sound.[70]

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[67] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment, http://www.co.snohomish.wa.us/documents/Departments/Emergency_Management/cemp_4-17-07_draft.pdf

[68] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment, http://www.co.snohomish.wa.us/documents/Departments/Emergency_Management/cemp_4-17-07_draft.pdf

[69] Skagit County Natural Hazards Identification Plan, http://www.skagitcounty.net/emergencymanagement/documents/2008hazplandraft/section%20ii%20final%20documents/9%20hiva%20skagit%20tsunami%20and%20seichei.pdf

[70] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf

Either a large subduction zone quake off the coast or along the Seattle fault could produce a tsunami, however, while a tsunami generated by a distant or Cascadia subduction earthquake could result in much damage to the coast, it wouldn't create as great of an impact in King County. For in the case of a subduction zone quake, a tsunami would travel from the coast through the Straight of Juan de Fuca into Puget Sound, and then south to Seattle. Because of the shielding effects of the Olympic Peninsula and the islands in Puget Sound, the tsunami expected from a magnitude 8.5 quake would be less then 2 feet high when it arrived at Seattle's shores, having lost much of its' velocity.[71] As a result, primary concerns lie with a tsunami or seiche generated by a land movement originating on the Seattle fault, which runs off the northern end of West Seattle through Elliott Bay towards the Kingdome (which was demolished on October 6, 2006 and replaced by the Safeco Field area) and across toward Bellevue. [72]

The National Oceanic and Atmospheric Administration (NOAA)'s Center for Tsunami Inundation Mapping Efforts developed a tsunami inundation model for Seattle's Elliott Bay using a magnitude 7.3 Seattle Fault earthquake as an initiating event (this model simulates the earthquake event 1,000 years ago, considered by NOAA to be the credible worst-case scenario.) The area modeled includes communities within one kilometer of the Puget Sound coast, such as portions of Seattle, Riverton-Boulevard Park and White Center, and projects a potential at-risk population of 11,056.[73]

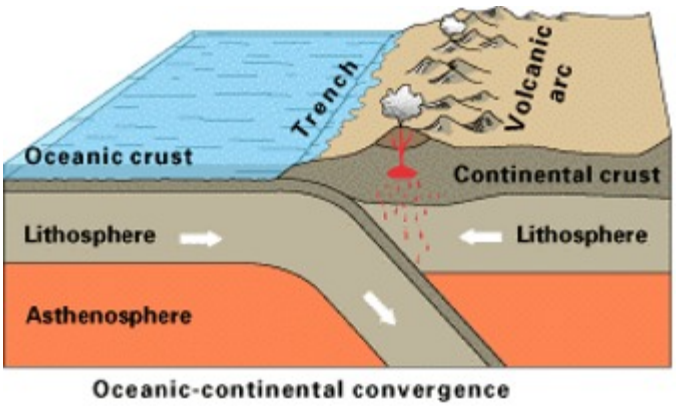
For example, in addition to Lake Washington, Lakes Sammamish and Union have many watercrafts, houseboats, docks, piers, houses and buildings located on or close to their waterfronts. Our area floating bridges may also be at risk for seiche damage. Additional vulnerabilities to seiche in King County include water storage tanks and containers of liquid hazardous materials, which could be affected by the rhythmic motion of a "sloshing" seiche.

Note: At the time of this 2009 Update, the Seattle Hazard Mitigation Plan is pending FEMA approval and is not available for current citation references.

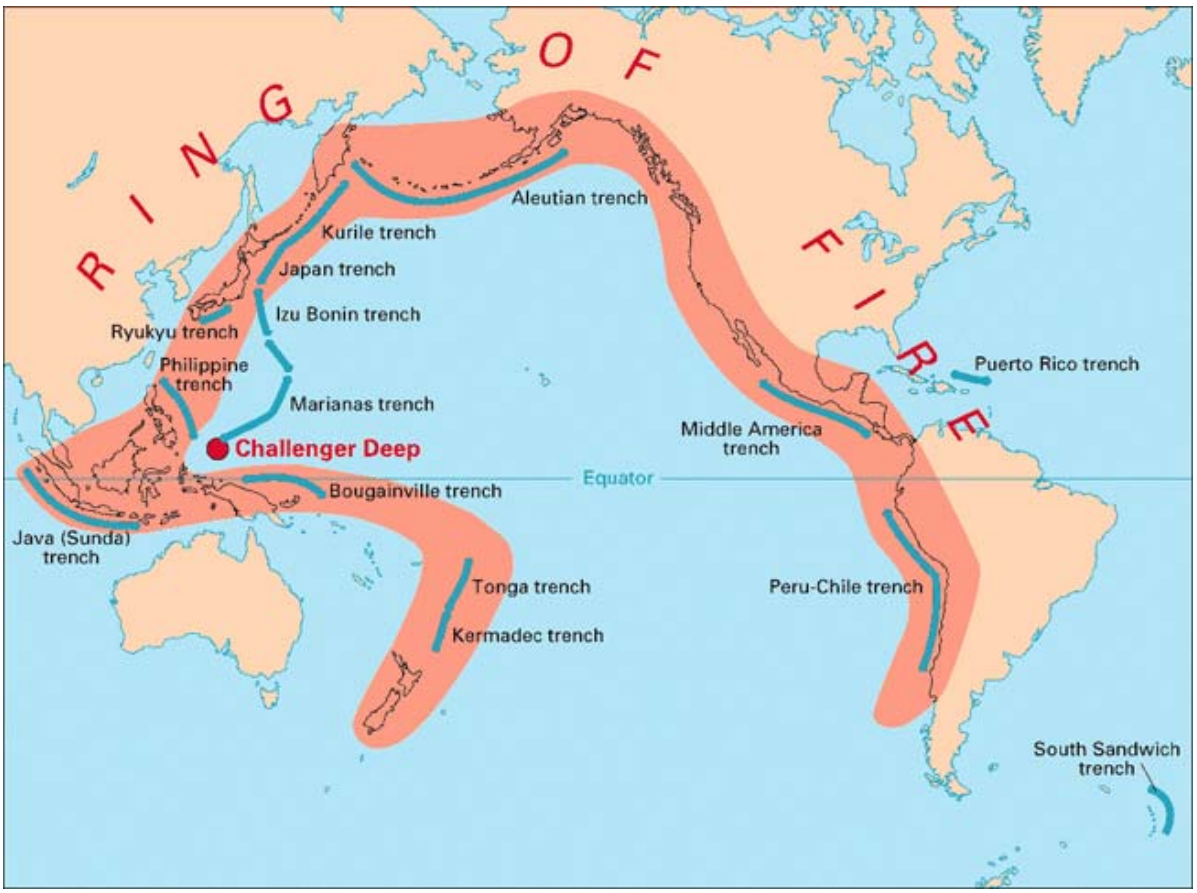
[71] City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm

[72] City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm

[73] City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm



Source: Peninsula Emergency Preparedness Committee, Pacific Northwest Tsunamis Resource Section, http://www.pep-c.org/pacificnorthwesttsunamis/



Source: National Geophysical Data Center (NGDC) 2007, http://celebrating200years.noaa.gov/magazine/dart_buoys/ring_of_fire.html

Hazard Impact

Several factors could influence the size, shape, volume, and potential destructiveness of a tsunami generated by the Seattle Fault. First, since Elliott Bay and Puget Sound are shallow, there is less water to displace; therefore, a resulting tsunami would be slower and have less volume than those generated in the deep ocean. Second, Puget Sound's steeply sloping seabed tends to increase the chance that a tsunami will break on the shore, thus potentially enhancing a tsunami's destructiveness. Finally, the shape of Elliott Bay could increase damage by funneling waves together, increasing wave height. The net result is unclear, as the depth versus shape relationship of Elliot Bay is relatively unknown.[74]

Estimated recurrence rate of an earthquake on the Seattle fault of the size necessary to generate a tsunami or seiche is estimated at once every 1,100 years. Great earthquakes in the North Pacific or along the Pacific coast of South America that generate tsunamis that sweep through the entire Pacific basin occur at a rate of about six every 100 years.[75]

With regards to seiche threats, both Puget Sound and Lake Washington could experience a seiche as they did in 1891, 1949 and 1964. In those years, there was not as much development near the waterfront as there is now. As a result, since the tsunami and seiche threats were not recognized until recently, most of the structures located near the water were probably not engineered to withstand them.[76]

The potential impact to bridges is expected to be minimal, since the Washington State Department of Transportation anticipates that storm-generated wave forces would exceed the force created by a small to moderate-sized tsunami. As to the possibility of earthquake-induced liquefaction impacting bridge support, bridge design assumes seismic effects to govern.[77]

Additional impacts from a tsunami include floating debris with the potential to batter and damage inland structures. The sheer impact of the waves could even cause breakwaters and piers to collapse. Ships moored in harbors would also be at risk, as they could be swamped, sunk or left battered and stranded high on the shore. In addition, railroad yards and oil tanks situated near the waterfront would also be particularly vulnerable, as resulting oil fires are often spread by waves.

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[74] City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm
[75] Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf
[76] City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm
[77] City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm

Moreover, port facilities, fishing fleets, and public utilities are frequently the backbone of the economy of the affected areas, and these are the very resources that generally receive the most severe damage. Until debris can be cleared, wharves and piers rebuilt, utilities restored, and the fishing fleets reconstituted, communities may find themselves without fuel, food, and employment. Wherever water transport is a vital means of supply, disruption of coastal systems caused by tsunamis can have far reaching economic effects. For example, Port of Seattle facilities and the Burlington Northern Railway tracks are likely to suffer damage because of their proximity to the shore.[78]

A seiche could affect a larger area because of King County's extensive shoreline, and could also affect the floating bridges across Lake Washington. While, the bridges have withstood waves up to eight feet, waves from a seiche could be much larger. A seiche's rapid onset could also hamper the ability of motorists to exit the bridge before it began.[79] Additionally, the "sloshing" effect of a seiche could cause damage to moored boats, piers and facilities close to the water. Secondary problems, including landslides and floods, are related to accelerated water movements and elevated water levels. Many landslide prone bluff areas are in residential settings, so risk could be quite high in the event of a secondary seiche threat.

History of Events

On average, the west coast of the United States experiences a damaging tsunami every 18 years. Geologic evidence shows that the Cascadia Subduction Zone has generated great earthquakes in the past, the most recent about 300 years ago. Any large earthquake has the capability to generate a tsunami or severe seiche action. Recent studies regarding the potential for a great Subduction zone earthquake off the Washington, Oregon, and Northern California coastlines indicate that local tsunami waves may reach nearby coastal communities within minutes of the earthquake thereby giving little or no time to issue warnings.[80]

Local studies of the Seattle Fault indicate a potential for tsunamis. Scientists interpret the evidence of irregular sand sheets in the Northern Puget Sound area found at the West Point Sewer Treatment Plant, Alki, and Restoration Point on Bainbridge as the result of a tsunami generated by an earthquake on the Seattle fault about 1,000 years ago.[81]

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[78] City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm
[79] City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm
[80] Skagit County Natural Hazards Identification Plan, http://www.skagitcounty.net/emergencymanagement/documents/2008hazplandraft/section%20ii%20final%20documents/9%20hiva%20skagit%20tsunami%20and%20seichei.pdf
[81] City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm

Similar evidence in Lake Washington sediments suggests a recurrence interval of 300 to 400 years. Several areas of the Seattle Fault show evidence of episodic fault rupture of about 6 feet that could produce a tsunami. Continued studies of Seattle Fault traces suggest that the fault may have ruptured in different segments and at different times.[82]

Table 5-15: History of Tsunami and Seiche in King County

Year	Conditions
A.D. 900-930	A magnitude 7 or greater earthquake on the Seattle fault created uplift on the floor of Puget Sound. The uplift generated a tsunami that deposited a sand sheet at West Point and the Duwamish Delta in Seattle. Computer simulations showed the tsunami reached heights of 10 feet or more on the Seattle waterfront.
1891	Water in Lake Washington and Puget Sound surged onto beaches two feet above the high water mark from two earthquake shocks and submarine landslides. This earthquake near Port Angeles also caused an eight-foot seiche in Lake Washington.
1949	Both Lake Union and Lake Washington experienced seiches during the 1949 earthquake (M7.1), but they did no damage.
1964	The tsunami generated by the magnitude 9.2 Alaska earthquake raised the water level 0.1 feet in Elliott Bay, Seattle. Seiches damaged houseboats, buckled moorings, and broke water and sewer lines in Lake Union. However, the tsunami's effect was negligible in Seattle because the complicated shoreline in Puget Sound acted as a baffle for incoming ocean waves.
1965	Due to a local earthquake event (M6.5), sloshing action was observed in area lakes.
2002	Seiches damaged houseboats, buckled moorings, and broke water and sewer lines in Lake Union following an Alaskan earthquake (Denali, M7.9).

Sources: Washington State Hazard Mitigation Plan, Region 6, http://www.emd.wa.gov/plans/documents/Tab_4_Planning_Process.pdf; City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm

[82] City of Seattle Emergency Management Natural Hazards, Tsunami and Seiche Section, http://www.seattle.gov/emergency/hazards/tsunamiseiches.htm

Past Mitigation Efforts

Since it is known that the speed of tsunamis varies with water depth, the prediction of tsunami arrival times at coastal locations is possible once the epicenter has been determined. But it is not yet possible to predict the wave height at a specific coastal location. Another indeterminable feature of a tsunami is how many successive waves there will be in the series, although there is rarely only one. However, efforts and programs exist to help mitigate the damage wrought by tsunamis and seiches, especially by providing warnings to vulnerable areas.

The Tsunami Warning System (TWS) in the Pacific, comprised of 26 participating international member states, monitors seismological and tidal stations throughout the Pacific Basin. The System evaluates potentially tsunami-generating earthquakes and disseminates tsunami warning information. The Pacific Tsunami Warning Center (PTWC) is the operational center of the Pacific TWS. [83]

The PTWC was instituted in 1948 following the extensive damage and loss of life in Hawaii caused by a tsunami generated by the great Aleutian Islands earthquake of 1946. [84] The PTWC is comprised of member nations and states that seek to coordinate tsunami detection and warning efforts within the area. The PTWC is responsible for providing warnings to international authorities, Hawaii, and U.S. territories within the Pacific basin.

Another mitigation program is the West Coast/Alaska Tsunami Warning Center (WC/ATWC), responsible for tsunami warnings for California, Oregon, Washington, British Columbia, and Alaska. [85] The devastation associated with the 1964 Alaskan earthquake and tsunami, led to the institution of the WC/ATWC in 1967. It serves as the regional warning center for Alaska, British Columbia, Washington, Oregon and California. This system is intended to detect, locate and calculate the magnitude of earthquakes in the region as quickly as possible and issue warnings to communities close to the epicenter.

The PTWC and WC/ATWC may issue the following bulletins:

WARNING: A tsunami was or may have been generated, which could cause damage; therefore, people in the warned area are strongly advised to evacuate.

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[83] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment, http://www.co.snohomish.wa.us/documents/Departments/Emergency_Management/cemp_4-17-07_draft.pdf

[84] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment, http://www.co.snohomish.wa.us/documents/Departments/Emergency_Management/cemp_4-17-07_draft.pdf

[85] Peninsula Emergency Preparedness Committee, Tsunami Warning Resource Section, http://www.pep-c.org/pacificnorthwesttsunamis/

This notification also gives time of arrival estimations to the vulnerable areas in question.

WATCH: A tsunami was or may have been generated, but is at least two hours travel time to the area in watch status. Local officials should prepare for possible evacuation if their area is upgraded to a warning.

ADVISORY: An earthquake has occurred in the Pacific basin, which might generate a tsunami. WC/ATWC and PTWC will issue hourly bulletins advising of the situation.

INFORMATION: A message with information about an earthquake that is not expected to generate a tsunami. Usually only one bulletin is issued.[86]

Recent revelations about the potential for a great subduction zone earthquake off the Washington, Oregon, and Northern California coastlines have led to several studies about the effect of a local tsunami generated in this source area. FEMA estimates that a Cascadia Subduction Zone earthquake-generated tsunami could cost $25-125 billion in damages to the region. If one assumes that the tsunami would cause 5% of these losses, then the tsunami losses would total between $1.25 and 6.25 billion. More significantly, the population directly at risk from a Cascadia tsunami is significant. About 300,000 people live or work in coastal regions that could be affected and at least as many tourists travel through these areas each year. Some tourism and financial corporations already plan for and educate employees about tsunamis. Others are interested but do not know where to begin and are unaware of the potential losses in terms of lives, operations, and clients.[87]

Early warning, coupled with education of the affected populations, proper zoning, and suitable structural design can aid in reducing the disastrous effect of this natural hazard. If warning is received early enough (2 to 5 hours), which is possible for tsunamis generated at a distance, hasty preventive action can be taken: people can be evacuated, ships can clear harbors or seek safer anchorage, planes and rolling stock can be moved, buildings can be closed, shuttered, and sandbagged. For tsunamis generated by local events, however, the time from initiation of a tsunami to its arrival at shore can be as little as a couple of minutes. Residents in areas susceptible to tsunamis should be made aware of the need to seek high ground if they feel strong ground shaking. Coastal communities should identify evacuation routes even if they do not have good information about potential inundation areas.

[86] American Red Cross Tsunami Resource Section, http://www2.redcross.org/news/in/tsunamis/faq.asp

[87] Snohomish County Department of Emergency Management Hazard Identification and Vulnerability Assessment, http://www.co.snohomish.wa.us/documents/Departments/Emergency_Management/cemp_4-17-07_draft.pdf

Seiches that occur in King County also have the potential to cause property damage and casualties. Although much work has been done on disaster preparedness for the public, local governments, emergency planners and the citizenry need to recognize the dangers and effects of seiches as an important component of the earthquake/tsunami hazard.

Because King County is most vulnerable to tsunamis and seiches produced by a local quake, comprehensive educational programs that keep the public informed of the dangers and steps to be taken for personal protection are especially important. In these instances, there may not be enough time between the triggering event and the arrival of the first wave for effective warning.

Cyberterrorism

No substantive changes made in 2009

Introduction

Cyberterrorism presents a hazardous threat to our increasingly digital world. The possibility of a major cyberterrorism attack in the United States would threaten infrastructure, financial systems, and everyday computing across the nation and here in Western Washington. Even more limited cyber infringement actions can disrupt the lifestyle of Central Puget Region residents and the daily activities of public, private, and nonprofit sector business and organizations, leading to potentially costly outcomes.

Far from the generally understood Internet irritations like "spam" (unwanted email) or "phishing" (email attempts to get the user to divulge private information like account numbers), cyberterrorism is much more sinister enterprise – a convergence of terrorism and cyberspace. By definition, it is generally understood to mean unlawful attacks and threats of attack against computers, networks, and the information stored therein when done to intimidate or coerce a government or its people in furtherance of political or social objectives. [1] Examples include attacks that lead to death or bodily injury, explosions, plane crashes, water contamination, or severe economic loss.[2]

Cyberterror can take a variety of different forms including:

Internet worms or viruses: these internet "viruses" or "worms" can be used to shut down programs, or even entire systems by hijacking email lists and address books. Worms or viruses may also be used to target communication devices like cellular phones or personal data assistants.

Phlooding: this new exploit targets businesses' central authentication servers with the goal of overloading them and causing a denial−of−service attack. These simultaneous but geographically distributed attacks have targeted but are not restricted to wireless access points with login requests using multiple password combinations in what are known as dictionary attacks. The multiple requests create a flood of authentication requests to the company's authentication server, which could slow down logins and potentially interfere with broader network operations, since many different users and applications often validate themselves against the same identity management system. Phlooding could effectively block broadband VPN or firewall connections making it temporarily impossible for employees to access their corporate network.[3]

System Threats: threats to various systems, new and antiquated, that power our everyday operations. An example of a new threat would be one to the security of

Voice-Over Internet Protocol (VoIP) processes, whose similarity to traditional data systems may become attractive to attackers, impacting the public's ability to utilize emergency services, or limit the ability of public safety organizations to act quickly in an emergency.[4]

Force Multiplier effects: Acts of cyberterror may also be used to multiply the impact of a physical attack when executed in concert. For example, terrorists might try to block emergency communications or cut off electricity or water in the wake of a conventional bombing or a biological, chemical, or radiation attack would impact the potential response capability for the initial attack. Many experts say that this kind of coordinated attack might be the most effective use of cyberterrorism.[5] Also, with much of the world becoming more web-savvy, terrorists are doing the same – experts are warning against terrorists researching hacker tactics in efforts to use the technology for their aims.[6]

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Cyberterrorism Probability and Cyberterrorism Impact

To understand the potential threat of cyberterrorism, two factors must be considered: first, whether there are targets that are vulnerable to attack that could lead to violence or severe harm, and second, whether there are actors with the capability and motivation to carry them out.[7]

Although many of the weaknesses in computerized systems can be corrected, it is effectively impossible to eliminate all of them. Even if the technology itself offers good security, it is frequently configured or used in ways that make it open to attack. In addition, there is always the possibility of insiders, acting alone or in concert with other terrorists, misusing their access capabilities.[8] With American society increasingly interconnected and ever more dependent on information technology, terrorism experts worry that cyberterrorist attacks could cause as much devastation as more familiar forms of terrorism.[9]

Cyberterrorism could involve destroying the actual machinery of the information infrastructure; remotely disrupting the information technology underlying the Internet, government computer networks, or critical civilian systems such as financial networks or mass media. Cyberterror could also include using computer networks to take over machines that control traffic lights, power plants, or dams in order to wreak havoc on unsuspecting populations.[10]

Hazard Identification

While some people use the term “cyberterrorism” to refer to any major computer-based attack on the U.S. government or economy, many terrorism experts would not consider cyberattacks by glory-seeking individuals, organizations with criminal motives, or hostile governments engaging in information warfare to be cyberterrorism. Like other terrorist acts, cyberterror attacks are typically premeditated, politically motivated, perpetrated by small groups rather than governments, and designed to call attention to a cause, spread fear, or otherwise influence the public and decision-makers. Terrorists try to leverage limited resources to instill fear and shape public opinion, and dramatic attacks on computer networks could provide a means to do this with only small teams and minimal funds. “Virtual” attacks over the Internet or other networks allow attackers to be far away, making borders, X-ray machines, and other physical barriers irrelevant.[11]

Acts of cyberterror can be used to disrupt our society and exploit our increasing reliance on computers and telecommunication networks, threatening the electronic infrastructure that supports computer networks tasked to regulate the flow of power, water, financial services, medical care, telecommunication networks, and transportation systems. The public and private sectors' unprecedented dependence on information and communications systems, computers, and networks, must recognize that networks are vulnerable to attack from any source. Also, the ability to distinguish a singular hacker-type incident from a cyberterrorist attack may not be readily evident, as tools for conducting cyberterrorism are widely available, broadly advertised, and easily used. Potential attackers only require access to a computer and a telecommunications network. [12]

As assessed by the Center for the Study of Terrorism and Irregular Warfare at the Naval Postgraduate School in Monterey, California, cyberterror capability can be described as:

Simple-Unstructured: The capability to conduct basic hacks against individual systems using tools created by someone else. The organization possesses little target analysis, command and control, or learning capability.[13]

Advanced-Structured: The capability to conduct more sophisticated attacks against multiple systems or networks and possibly, to modify or create basic hacking tools. The organization possesses an elementary target analysis, command and control, and learning capability. [14]

Complex-Coordinated: The capability for coordinated attacks capable of causing mass-disruption against integrated, heterogeneous defenses (including cryptography). Ability to create sophisticated hacking tools. Highly capable target analysis, command and control, and organization learning capability. [15]

Hazard Impacts

Cyber-attacks against computer systems could potentially shut down radio, telephone, and computer networks used to control and manage city or regional services, potentially resulting in loss of those services or the inability to properly dispatch public safety and other personnel to the scenes of crimes or physical terrorist attacks.[16]

Attacks on physical components of our information infrastructure could resemble other conventional attacks: for example, a bomb could be used to destroy a government computer bank, key components of web-based infrastructure, or even telephone switching equipment. Attacks could also involve remotely hijacking control systems in efforts to breach dams, impact air traffic, or shut down the power grid.[17]

Attacks launched in cyberspace could involve diverse methods of exploiting vulnerabilities in computer security: viruses, stolen passwords, insider assistance, software with secret “back doors” that intruders can penetrate undetected, and organized electronic traffic used to overwhelm computers – known as “denial of service” attacks are known to have occurred. Attacks could also involve stealing classified files, altering the content of Web pages, disseminating false information, sabotaging operations, erasing data, or threatening to divulge confidential information or system weaknesses unless a payment or political concession is made. If terrorists managed to disrupt financial markets or media broadcasts, an attack could undermine confidence or instill public panic. [18]

History of Events

Like other governments and businesses across the nation, the Central Puget Sound Region relies heavily on computers and networks to conduct its normal business. Some local examples include an attack of the SQL Slammer worm on January 25, 2003, which rendered the police computer-aided dispatch system of a Seattle suburb inoperable for several hours and stopped some bank ATM networks nationwide. Also, in August 2003, the MSBlaster and Nachi worms compromised Windows computers worldwide, including many within the City of Seattle government. [19]

Some attacks are conducted to further political and social objectives, as the following events illustrate:

- In 1996, a computer hacker allegedly associated with the White Supremacist movement temporarily disabled a Massachusetts ISP and damaged part of the ISP's record keeping system. The ISP had attempted to stop the hacker from sending out worldwide racist messages under the ISP's name. The hacker signed off with the threat, "you have yet to see true electronic terrorism. This is a promise." [20]

- In 1998, Spanish protestors bombarded the Institute for Global Communications (IGC) with thousands of bogus e-mail messages. E-mail was tied up and undeliverable to the ISP's users, and support lines were tied up with people who couldn't get their mail. Protestors spammed IGC staff and member accounts, clogged their Web page with bogus credit card orders, and threatened to employ the same tactics against organizations using IGC services. They demanded that IGC stop hosting the Web site for the Euskal Herria Journal, a New York-based publication supporting Basque independence. Protestors said IGC supported terrorism because a section on the Web pages contained materials on the terrorist group ETA, which claimed responsibility for assassinations of Spanish political and security officials, and attacks on military installations. IGC finally relented and pulled the site. [21]

- In 1998, ethnic Tamil guerrillas swamped Sri Lankan embassies with 800 e-mails a day over a two-week period. The messages read "We are the Internet Black Tigers and we're doing this to disrupt your communications." Intelligence authorities characterized it as the first known attack by terrorists against a country's computer systems. [22]

- During the Kosovo conflict in 1999, NATO computers were blasted with e-mail bombs and hit with denial-of-service attacks by hacktivists protesting the NATO bombings. In addition, according to reports, businesses, public organizations, and academic institutes received highly politicized virus-laden e-mails from a range of Eastern European countries. Web defacements were also common. Also, after the Chinese Embassy was accidentally bombed in Belgrade, Chinese hacktivists posted messages such as "We won't stop attacking until the war stops!" on U.S. government Web sites. [23]

- Since December 1997, the Electronic Disturbance Theater (EDT) has been conducting Web sit-ins against various sites in support of the Mexican Zapatistas. At a designated time, thousands of protestors point their browsers to a target site using software that floods the target with rapid and repeated download requests. EDT's software has also been used by animal rights groups against organizations said to abuse animals. Electrohippies, another group of hacktivists, conducted Web sit-ins against the WTO when they met in Seattle in late 1999. These sit-ins all require mass participation to have much effect, and thus are more suited to use by activists than by terrorists. [24]

While the above incidents were motivated by political and social reasons, whether they were sufficiently harmful or frightening to be classified as cyberterrorism is unknown as no attack thus far has led to violence or injury to persons, although some may have wreaked intimidation or inconvenience.[25]

Past Mitigation Efforts

Mitigation efforts against the threat of cyberterrorism are being addressed in trainings, workshops, and exercises taking place in the Central Puget Region and in national and global forums. Locally, the Pacific NorthWest Economic Region (PNWR) is convening scenario training on cyberterror for public and private entities. Exercises like "Blue Cascades" strive to harden infrastructure against potential attacks by examining vulnerabilities to our electrical, water, financial, and other computerized systems.[26] Per the recommendations of this exercise, a Cyber Security Council was formed to help lend advice on the direction of cyber security efforts in the region.[27]

Further efforts against cyberterror include the dedication and collaboration of public and private organizations in achieving cohesive and updated internet and network security applications. Like any mitigation effort against terrorism, organizations guarding against cyber attacks must remain vigilant and informed.

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[1] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[2] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[3] "New Wireless "Zero-Day" Attack Discovered" by IT Observer Staff, IT Observer, http://www.it-observer.com/new-wireless-zero-day-attack-discovered.html
[4] VoIP security chief warns of increased security threats, Networking Pipeline, http://www.networkingpipeline.com/showArticle.jhtml?articleI D=160700231
[5] Terrorism Questions and Answers, Council on Foreign Relations, http://www.terrorismanswers.org/terrorism/cyberterrorism.html
[6] "Terrorists copying hacker tactics", TechWeb, http://www.techweb.com/wire/security/167100173#_
[7] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[8] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[9] Terrorism Questions and Answers, Council on Foreign Relations, http://www.terrorismanswers.org/terrorism/cyberterrorism.html
[10] Terrorism Questions and Answers, Council on Foreign Relations, http://www.terrorismanswers.org/terrorism/cyberterrorism.html
[11] Terrorism Questions and Answers, Council on Foreign Relations, http://www.terrorismanswers.org/terrorism/cyberterrorism.html
[12] http://emd.wa.gov/3-map/a-p/hiva/25-hiva-th-terrorism.htm
[13] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[14] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html

[15] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[16] City of Seattle Office of Emergency Management, Terrorism; http://www.seattle.gov/emergency/hazards/terrorism.htm

[17] Terrorism Questions and Answers, Council on Foreign Relations, http://www.terrorismanswers.org/terrorism/cyberterrorism.html
[18] City of Seattle Office of Emergency Management, Terrorism; http://www.seattle.gov/emergency/hazards/terrorism.htm
[19]"Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/inosec/cyberterror.html
[20] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[21] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[22] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[23]"Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[24] "Cyberterrorism" by Dorothy Denning, Georgetown University; Testimony before the Special Oversight Panel on Terrorism Committee on Armed Services U.S. House of Representatives, May 23, 2000, http://www.cs.georgetown.edu/~denning/infosec/cyberterror.html
[25] "Dozens of Experts Take on Cyberterror", Seattle Post-Intelligencer, http://seattlepi.nwsource.com/local/190473_cyberterror13.html
[26] Puget Sound Partnership Update, http://www.psp.wa.gov/

Dam / Dam Safety

New section in 2009

Introduction

As of the writing of this portion of the Regional Hazard Mitigation Plan (early October 2009), the data contained in this section was current. It should be understood, however, that the Howard Hanson Dam issue was evolving as this document was created. As such, information was changing daily, and the data contained in this section may no longer be correct or valid. Individuals should not rely on this data, but should view it as a demonstration of a summary of **potential** impacts. Anyone seeking current information should check with the Army Corps of Engineers directly.

In Washington State, dam safety concerns were part of the normal water-rights duties in the state departments of Conservation and Development of Water Resources. In 1970, dam safety regulations were transferred to newly-created State Department of Ecology. In the early 1980s, a separate Dam Safety Program was formed to concentrate on dam issues, primarily in response to the National Dam Safety Act in 1977. In 1980, Ecology's Dam Safety Office was reorganized and initiated its first long-range planning for improving dam security in Washington. To reasonably secure the safety of human life and property, Ecology also conducts inspections of existing dams to assure proper operation and maintenance for 994 of the 1121 dams inventoried across the state. [1]

The King County Flood Control District was formed by King County Ordinance 15728 in April 2007. [2] More information on this is located in Section 3, Regional Profile, of this Plan, under Flood Control District and Flood Warning Center, and their association and relationship.

For the 2009 Plan update, the King County Flood Control District has provided a very detailed assessment and risk analysis of six major river basins in King County and is located in Section 6 of this Regional Hazard Mitigation Plan. This detailed documentation includes land use, structures, estimating potential losses, development trends, and repetitive loss properties, as available. [2, 2.5]

The Howard Hanson Dam and subsequent increased risk of Green River flooding impacts downstream will be the main focus of this plan section.

High Probability Low Impact	**High Probability Moderate Impact**	**High Probability High Impact**
Moderate Probability Low Impact	**Moderate Probability Moderate Impact**	**Moderate Probability High Impact**
Low Probability Low Impact	**Low Probability Moderate Impact**	**Low Probability High Impact**

Dam / Dam Safety Probability and Dam / Dam Safety Impacts

Hazard Identification

There are 122 dams in King County, or 10.90% of the 1121 dams in the state. Not all of the dams have oversight from the State Department of Ecology such as the United State Army Corps of Engineers (USACE) managed Howard A. Hanson Dam exempted from Washington State regulation by WAC173-175-020. [1]

Howard A. Hanson Dam is a U.S. Army Corps of Engineers flood control dam located near the headwaters of the Green River in King County. Its primary purpose is flood control in the winter and fish enhancement in the summer. Because the dam is located in a closed watershed, public access is not permitted. [3]

The Howard Hanson Dam has been categorized in the July 2009 State Ecology's "Inventory of Dams" publication as 1A – High Risk, for downstream hazard class IF the dam were to fail and release the reservoir. [1] The dam is not in immediate danger of failing, but there is an increased risk to the downstream communities. [3]

The 2009 Green River flooding hazard is addressed with more likelihood of occurring or presents a significant impact if it does. Serious flooding may occur in some areas of King County this 2009 winter, and for the next three to five years until the Howard Hanson repairs are made. Homes, farms and businesses in the Green River Valley are particularly at risk. [3]

King County has four major dams that would cause a countywide emergency IF they should fail. These dams are located on the Tolt, Cedar, White, and Green rivers. Certain areas of King County would also be adversely affected by failures of the White River Project located in Pierce County or the Jackson Project located in Snohomish County. Additionally, localized problems could occur if one of the minor dams in the county failed. [5]

Many of the County's levees were constructed by farmers more than 40 years ago to protect their fields. Now these facilities protect homes, businesses, and

critical public infrastructure such as utilities and transportation corridors that support the region's economic prosperity. 6

History of Events

An in-depth write up on the King County Flood Control District can be located in Section 3, and the associated Flood Warning Center detailed information is included in Section 5, Flooding, Past / Present Mitigation.

Howard A. Hanson Dam

The Howard A. Hanson Dam is the primary focus of this dam hazard section at this writing in September 2009.

The U.S. Army Corps of Engineers (USACE) has discovered damage to a portion of the Howard Hanson Dam in early 2009. This dam has controlled flooding in the Green River Valley since 1962, for nearly 50 years. However the dam will only operate at 30% capacity this winter, 2009, and possibly for an additional 3-5 years. Therefore, there is a much greater risk of significant flooding during periods of heavy rain throughout the lower Green River Valley, affecting the cities of Auburn, Kent, Renton, Tukwila, and south Seattle and surrounding infrastructure. 5.5

The U.S. Army Corps of Engineers is in the process of evaluating two depressions and seepage issues -- discovered following the January 2009 floods -- on the right abutment adjacent to the Corps' Howard Hanson Dam, which provides flood risk reduction and water storage on the Green River. Until investigations and cumulative assessments can be completed, the Corps of Engineers determined it would be prudent to lower the maximum pool level for flood storage from a reservoir elevation of 1,206 feet above sea level to a lower level. Howard Hanson Dam presents no immediate danger of catastrophic failure to people and property below the dam. However, risk of flooding for those living in the Green River Valley is higher until operational capacity can be raised. 3

USACE is actively testing and investigating the source of the problems and trying to identify solutions. The USACE has significantly reduced the water storage levels at the Dam and is taking a number of steps to try and minimize the flood risk. However, the USACE does not anticipate a full solution to the problems with the Dam by this flood season. 5.5

An established Green River Flood Control Zone District, which is separate from King County Government, a King County Flood Warning System, and the King County Flood Warning Center all working towards the upcoming flood season. The cities of Auburn, Kent, Renton, Tukwila, Seattle, King County government agencies, and many others are also working closely with the USACE to prepare for the 2009 flood season. 5.5

The USACE has advised King County and cities in the Green River Valley that the dam cannot operate at full capacity and to prepare for possible flooding if water into the Howard Hanson Dam exceeds 12,000 cubic feet per second. Flows in the river reached above that level 15 times between 1932 and 1962 when the dam started operating. Calculations estimate flows would have exceeded that level 17-20 times since 1962 without the dam. 7

The USACE has placed restrictions on the pool (water) elevation and will continuously reassess the pool restrictions as conditions change. While the dam is not in immediate danger of failing, there is an increased risk to the downstream communities. 3

Should a major flood event occur with the temporary restrictions on the pool level for flood storage, it is possible that levees in the lower valley could be overtopped. The Corps will continuously reassess the pool restriction as conditions change and may raise or change the restriction on pool elevation after careful deliberation. 3

Hazard Impacts

Higher risk to the Howard Hanson Dam is due to water seeping more rapidly through an earthen bank next to the dam after record high water last winter, January 2009. Until the U.S. Army Corps of Engineers (Corps) can make repairs, it must limit the amount of flood water it stores behind the dam. 4

If heavy and prolonged rain occurs this flood season (roughly October through March 2009 - 2010), many homes and businesses in the valley that don't typically see flood water--including parts of Auburn, Kent, Renton, South Seattle and Tukwila--could be flooded. 4

Since January, the Corps' Seattle District has been working in partnership with King County and the cities in the Green River Valley to warn residents and businesses of the increased risk for downstream flooding due to decreased water holding capacity at Howard Hanson Dam. Residents, businesses and farms below the Howard Hanson Dam in the Green River Valley are being asked to prepare now for a higher risk of flooding. 4

Evacuations in some communities are possible and preparedness planning is on-going. Key transportation routes and transit service could be disrupted, vehicles and buses could be damaged, and power outages and sewage back-ups are possible even outside the immediate flood zone. 6

Major flood disasters can also destroy critical communications and public safety infrastructure and strain police, fire, and medical services throughout the entire region. 6

Economic Impacts

The economic impacts to urban areas during a potential Green River Valley flooding are high. 6,7

According to the independent analysis, prepared by ECONorthwest, Inc., the Pacific Northwest's largest economics consulting firm, one third of the county's aerospace employment is located in the floodplains. Overall, one fifth of King County's total manufacturing employment lies within floodplains, primarily in and around the cities of Auburn, Kent and Renton. 6,7

The study also noted that while only 2 percent of King County's population lives in the floodplain, roughly 6 percent of the county's jobs are located within floodplains, or 65,000 jobs with wage and salary income of $3.7 billion. Property in King County's floodplains is valued at more than $7 billion. 6,7

Expert economists are predicting that a shutdown of economic activity in King County's floodplains would cost the region $46 million or more every day, and could curtail everything from aircraft manufacturing to bustling warehouse distribution centers. 8

The $46 million figure does not include the loss of economic output from businesses that are located outside the floodplains that rely on goods and services produced by businesses inside floodplain areas, or the value of damaged or destroyed property or equipment. The $46 million in lost economic output for every day of flooding is a conservative estimate. 6,7

While it is estimated the Green River Valley generates almost $46 million of economic activity per day, and a major flood could cause up to $3 billion in damages. Approximately 26,000 residents and 3000 businesses would have to be evacuated from the lower Valley and several hundred more who live in the unincorporated upper Green River Valley if a flood is anticipated. 6,7

Past / Present Mitigation Efforts

King County created a King County Flood Control District (Ordinance No. 15728) in April 2007. The Flood Control District has an association with the Flood Warning Center, and is referenced in the Plan as stated above. [8]

Howard A. Hanson Dam, specific mitigation efforts in 2009

The Flood Control District completed repairs to 9,300 linear feet of Green River levees at five high-priority points in 2008. In partnership with the Army Corps, it is currently completing repairs to 2,200 linear feet of levees in Kent and two low spots near Auburn. The District is preparing to replace 18,000 linear feet of levees at 14 sites along the Green River in 2010. [7]

The King County Executive has requested in mid-September 2009 $8.4 million to temporarily increase the height of Green River levees and for other items to increase flood fighting capabilities. [7]

Additionally, in mid-September 2009, the King County Executive has requested more than $32 million to plan and provide for continuity of regional services such as Superior Court, elections, animal control, wastewater treatment and public health. This amount will also help protect county facilities such as the Maleng Regional Justice Center, the South Wastewater Treatment Plant in Renton and the Black River Pump Station. [7]

The U.S. Army Corps of Engineers announced by Press Release on September 22, 2009 that it will purchase and pre-position flood fighting supplies and materials for the Green River Valley in preparation of the upcoming flood season. [4]

The U. S. Army Corps of Engineers is constructing a grout curtain within the abutment of the dam to reduce seepage through a critical area of concern, as well as performing drainage improvement work to route water into the drainage tunnel. Work is expected to be done by Nov. 1, 2009. [4]
The USACE, Seattle District, will continue to evaluate reservoir operations at Howard Hanson Dam to reduce downstream flows as interim risk reduction work is completed and tested. [4]

The U. S. Army Corps of Engineers will support and augment state and local efforts to include: [4]

- Purchase approximately 400,000 sand bags and 45,000 lineal feet of expedient flood barrier products.
- Pre-position flood fighting materials within the Seattle District and make them available for loan to protect river levees and ensure that these materials are available if further flooding occurs, well in advance of flood conditions.

- Continue to provide technical assistance to the state and local agencies, including continuous review of flood risk, identification of additional actions based on changing field conditions, and advice and/or recommendations for the proposed secondary protection measures.
- Work with U.S. Geological Survey and the National Weather Service to investigate immediate improvements of early flood warning systems. [4]

The U. S. Army Corps of Engineers will continue to work with the State of Washington, King County and their Congressional Delegation to look at additional options to assist Green River Valley. "The Corps is committed to ensuring safety of the Green River Valley residents." [4]

The USACE has placed restrictions on the pool (water) elevation and will continuously reassess the pool restrictions as conditions change. The dam is not in immediate danger of failing, there is an increased risk to the down stream communities. [3]

Should a major flood event occur with the temporary restrictions on the pool level for flood storage, it is possible that levees in the lower valley could be overtopped. The Corps will continuously reassess the pool restriction as conditions change and may raise or change the restriction on pool elevation after careful deliberation. [3]

Dam / Dam Safety Endnotes:

[1] State Department of Ecology, Water Resources Program, Dam Safety Section, *Inventory of Dams in the State of Washington,* July 2009, Publication #94-16, http://www.ecy.wa.gov/pubs/94016.pdf

2
[2.5] 2006 King County Flood Hazard Management Plan, King Department of Natural Resources and Parks, Water and Land Resources Division, Final, January 2007, http://www.kingcounty.gov/environment/waterandland/flooding/documents/flood-hazard-management-plan.aspx

[3] U. S. Army Corps of Engineers (USACE), USACE website, 909, http://www.nws.usace.army.mil/

[4] U. S. Army Corps of Engineers (USACE) Seattle District Press Release, Casondra Brewster, Public Affairs Specialist, September 22, 2009, http://www.nws.usace.army.mil/

[5] King County Office of Emergency Management, Hazards and Disasters, website http://www.kingcounty.gov/safety/prepare/residents_business/Hazards_Disasters/DamFailures.aspx

[5.5] Public Health Seattle & King County (PHSKC) September 3, 2009, Bulletin http://www.kingcounty.gov/healthservices/health/preparedness/greenriverbasin.aspx

[6] *Economic Connections Between the King County Floodplains and the Greater King County Economy*, Prepared for King County Water and Land Resources Division, ECONorthwest, October 2007,

http://www.kingcounty.gov/environment/dnrp/newsroom/newsreleases/2007/october/1024Floodplains.aspx
7 King County website, King County Executive News, September 17, 2009
http://www.kingcounty.gov/exec/news/release/2009/September/14GovFloodEvent.aspx
8 King County website, King County Natural Resources and Parks, October 24, 2007
http://www.kingcounty.gov/environment/dnrp/newsroom/newsreleases/2007/october/1024Floodplains.aspx

Lots more information is available on the USACE, King County, KC Flood Control District websites and others listed above about Howard Hanson Dam and the Green River Valley potential flooding.

Section 6: Vulnerability Assessment, Risk Analysis and Capabilities

New Sections Included for 2009; Crosswalk Section #8

Critical Facilities

Public Disclosure

This section of the RHMP seeks to describe facilities critical to the continued function and service delivery of cities, utilities, school districts, fire agencies, and King County Government. Many of the critical facilities referenced in this section may be considered as potential terrorist targets. For this reason, the List of specific critical facilities described in "**Annex G - Critical Facilities**" is not subject to public disclosure under the Federal Privacy Act.

Planning Methodology

All public and private facilities are vulnerable to the natural hazards common to the Northwest - high winds, earthquakes, power outages, and flooding. An increased risk of flooding is possible to a great extent from January 2009 and beyond for up to three to five years due to the Howard Hanson Dam situational awareness and potential flooding impacts to the Green River Valley until the Dam repairs are made. Additionally, there are many critical facilities and infrastructures that can also be vulnerable to civil disturbances and terrorism.

For this planning period, the RHMP participants focused their priority on identifying those facilities and infrastructures necessary for their organization to provide critical community services during and after hazard events. They also identified facilities they depend on outside of their organization, as well as those they need to support. It became immediately apparent that there was significant crossover among the disciplines in identifying common critical facilities they operate and/or rely on. Agencies utilized the six major goals and objectives in Section 1 of this Plan as a method to help to identify and prioritize critical facilities.

Because the focus is limited to a small number of 2009 participating agencies, there is significant amount of work to be done in the future to build upon this foundation. In order to develop a comprehensive assessment of all regional critical facilities, infrastructures, and interrelationships it will be necessary to gain more widespread involvement in the planning process. This is one of the objectives tied to Goals Five and Six of the Plan.

Critical Facilities Inventory – Cities in King County

The publicly-owned infrastructure identified as critical to the functioning of a community are described as those with the potential for human casualties or substantial monetary impact from catastrophic loss.

Cities are the most complex of the jurisdiction types participating in this regional hazard mitigation planning effort. Each city is different; some contract for police services, and/or fire services, and/or public works functions, while others do not. In some cases, special purpose districts or cities own their own water treatment and distribution and/or sewer treatment facilities.

Whether owned or leased, all cities identified their city hall locations as critical facilities. Of near equal importance, jurisdictions included police, fire and medical facilities in their essential/critical facilities inventory. Community centers and senior centers were also included.

Certain cities chose to identify facilities critical to the community but outside their direct control. In the later category were schools, hospitals, important transportation intersections or bridges, and both water and sewer utilities. A few cities recognized the importance of communications facilities within their boundaries.

Critical Facilities Inventory – Fire Districts in King County

Fire jurisdictions have a fairly focused mission - fire suppression and basic life-support response. Fire personnel may be called upon to direct evacuations, perform rescue operations as well, and provide hazardous materials response.

All fire jurisdictions acknowledge the importance of their fire stations and major apparatus as critical to their ability to maintain their life safety missions. A few fire agencies recognized the importance of particular transportation intersections and bridges to evacuation routes. Medical facilities, public education facilities, and major hazardous materials facilities or pipelines in a jurisdiction were also identified as critical. Most fire jurisdictions included public education as an integral part of their agency services.

Critical Facilities – Utilities in King County

Utilities in the King County region identified the infrastructure owned by their own various utility districts based on the criticality of those facilities on their own direct operations. The impact of a disaster to safety and utility property could have an impact to other public safety agencies.

These special-purpose districts provide the essential service of water and sewer to the communities served throughout the region. There is a strong association and

mandate that the water districts provide the essential fire protection service to the fire districts. This is evermore a challenge during a major hazardous event.

Both water and sewer districts identified their service lines, and pump and lift stations in their critical facilities inventory. For some cities, such as Mercer Island, and water districts in particular interlink to the larger Seattle Public Utilities (SPU) as their main water, and sometimes only, resource is important. The interlinking of the water system through districts has proven to be essential in providing uninterrupted services throughout the region. A few of the districts noted the essential nature of the office and maintenance buildings. Far more critical were the telemetry and data relays providing operational status for the whole of each system. With power failure it becomes quite a challenge to determine the operational working of the system.

Critical Facilities – King County Government

King County Government has a wide range of facility types that are critical to public health and safety. These include facilities that directly or indirectly support police services, health care, road maintenance, and adult and juvenile detention. The County includes district and superior court service locations as well as a wide range of administrative and licensing service facilities in its list of critical facilities.

Critical Facilities – 2006 King County Flood Hazard Management Plan (*new in 2009, pages 6-3 to 6-22*)

For the 2009 Plan update, critical facilities have been identified by the King County Department of Natural Resources and Parks, Water and Land Resources Division for the six major river basins in King County. Documentation is located in **Annex G**, and this information is not subject to public disclosure under the Federal Privacy Act.

Risk and Vulnerability Assessment

The following section discusses the risk and vulnerability of the flood hazard within the King county planning area. This is a detailed perspective of this hazard that looks at risk in two components:

- Exposure
- Vulnerability

It should be noted that this level of detailed risk assessment has only been completed for the flood hazard. This is due to the availability of data for the flood hazard, which was not available for the other hazards of concern addressed by this Plan. The tool utilized to perform this risk assessment was FEMA's HAZUS-MH (version MR-3). The other hazards of concern will be updated is similar format to the following flood risk assessment under Phase 2 of the planning process described in Section 2, and Section 4, of this Plan.

National Flood Insurance Program (NFIP)

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in communities participating in the program. To participate in the NFIP, communities are required to adopt flood damage prevention ordinances that equal or exceed standards specified under section 60.3, Chapter 44 of the Code of Federal Regulations. Participating communities are required to maintain compliance under the NFIP by enforcing their codes and regulations as written, and ensuring that all development that occurs within a FEMA designated floodplain is permitted.

King County has been participating in the NFIP since September 28, 1978. King County has maintained its status in the NFIP since 1978 by implementing one of the strongest floodplain management programs in the County. As the nation's second highest rated CRS community, and its highest rated County, King County has shown a commitment to sound floodplain management policy. Two agencies within King County government assume the responsibility for implementing the County's floodplain management program:

- Department of Development and Environmental Services (DDES)
- Department of Natural Resources and Parks, Water and Land Resources Division (WLRD)

DDES monitors and maintains the regulatory component of the NFIP, while the WLRD monitors both the structural and non-structural floodplain management components for the County. Both of these agencies are fully committed to maintaining the County's compliance and good standing under the NFIP, and well as their CRS class 2 rating by assuring their floodplain regulations continue to exceed the minimum NFIP standards and that development that occurs in the floodplain is consistent with the adopted regulations. King County is also a Cooperating Technical Partner with the Federal Emergency Management Agency to prepare and update flood insurance rate maps using the best available floodplain data. King County's active flood mitigation program purchases or elevates structures located within the floodplain to reduce or permanently eliminate flood damages with a particular focus on properties that are identified as repetitive loss properties under the NFIP. King County also receives CRS credit for the wide range of public outreach activities to floodplain property owners about the danger of living in a floodplain and how they can prepare, respond and recover from flooding. Finally, the 2006 King County Flood Hazard Management Plan is King County's CRS plan of record and is maintained in accordance with the CRS planning guidelines.

NFIP Repetitive Loss Properties

The National Flood Insurance Program (NFIP) defines repetitive loss properties as properties that have had two or more flood insurance claims of at least $1000 each in any 10-year period since 1978. In 2004, King County had 68 repetitive loss properties of which 55 were unmitigated. In 2009 King County has 87 repetitive loss properties of which 58 are unmitigated. Of the 58 unmitigated repetitive loss, 13 are considered severe repetitive loss properties which means they have had had four or more claims of more then $5,000 or two or three claims that cumulatively exceed the buildings value.

For 2009, King County Department of Natural Resources and Parks, Water and Land Resources Division included repetitive loss information in the following section for the six major river basins in King County.[1]

Risk Assessment and Vulnerability Analysis for Flood Hazards

The King County Department of Natural Resources and Parks, Water and Land Resources Division provided a hazard identification and vulnerability analysis for the for the six major river basins for the King County Regional Hazard Mitigation Plan 2009 Plan update. Section 5 of this Plan identified flood hazards and this Section 6 evaluates the exposure and impact to the economy from flooding using the HAZUS-MH MR3 risk assessment tool. Section 6 also identifies land use, development trends, and repetitive loss properties for each of the six major King County river basins listed in Table 6.1.

Note: The 2004 **Table 6-1** has been deleted in 2009 in its entirety and replaced in 2009 with **Table 6.1: Six Major King County River Basins,** September, 2009. 1

Table 6-1: Six Major King County River Basins 1
South Fork Skykomish River
Snoqualmie River
Sammamish River
Cedar River
Green River
White River

1

SOUTH FORK SKYKOMISH RIVER BASIN

Flood Hazard Profile on the South Fork Skykomish River

There are no significant dams or reservoirs on the South Fork Skykomish or its tributaries. With its steep upper basin slopes in high elevation terrain forming the entire watershed, significant runoff can be delivered directly to the flood hazard management corridor along the South Fork Skykomish. Precipitation at these high elevations can generate flooding from rain-on-snow events.

There is currently no functioning U.S. Geological Survey river gage along the South Fork Skykomish in King County or the Town of Skykomish, although the U.S. Geological Survey has had several river gages in the King County portion of the Skykomish River basin in the past. A gage on the South Fork Skykomish near Index (USGS #12133000) recorded data from 1897 to 1982. The flow frequencies listed for the South Fork Skykomish near Index are based on this period of record. The closest available flow measurements are taken downstream in Snohomish County at the Skykomish River near Gold Bar gage (USGS #12134500). Although a U.S. Geological Survey gage on the mainstem of the Skykomish River exists (USGS #12134500), the flows reflect the flow estimates derived from a hydrologic study of the Skykomish and Snoqualmie Rivers.

South Fork Skykomish River Flows

Recurrence Interval (years)	Discharge (cubic feet per second)	
	South Fork Skykomish near Index[a]	Skykomish River at Gold Bar[b]
10	44,300	75,300
50	65,200	106,100
100	74,700	119,300
500	98,500	149,900

FEMA 2005.
Flow estimates based on hydrologic analysis for the Lower Snoqualmie and Skykomish River Revised Flood Insurance Study (Draft, 2005).

Flood Characteristics of the South Fork Skykomish River Basin

The tables below summarize observed flooding characteristics typical for this basin. Understanding the potential flood conditions for a specific area enables the County to identify mitigation alternatives appropriate for the level of risk for that stream or reach. None of the flood events so far have surpassed the 100-year flood flow at the Goldbar gage. Observed flooding depths for this basin vary from less than 1 foot to 6 feet. King County considers the South Fork Skykomish River to have channel migration potential, and regulates this region under the channel migration zone provisions of the King County Critical Areas Ordinance.

King County provides no flood warning on the South Fork Skykomish River System. The only available flow data is collected near the City of Goldbar in Snohomish County, which is significantly downstream from hazard areas in King County. The available data is not useful for providing flood warning to residents in these areas.

South Fork Skykomish River Basin Flow Characteristics

Gage Location	USGS Station Number	River Mile	Drainage Area (square miles)	100-Year Flow (cfs)	Flood of Record, Date & Peak Flow (cfs)
Index	12133000	43.0	535	74,700	Recent Data Not Available

Land Use, Structures and Estimating Potential Losses

The predominant land use in the South Fork Skykomish basin is forest use. Fifty percent of the basin is protected wilderness; 43 percent is zoned for forest production; 6 percent is in rural residential use; and approximately 1 percent is in urban use. Development in the basin has been limited, but much of it has occurred in the floodplain. There are several developments in the Town of Skykomish, the unincorporated communities of Grotto and Baring and scattered residential subdivisions.

South Fork Skykomish Basin Flood Exposure

	EXPOSURE			
Reach	**GBS Value – Structures Exposed to 100-Year Event**	**GBS Value – Contents Exposed to 100-Year Event**	**GBS Value – (Structures and Contents) Exposed to 100-Year Flood**	**% of GBS**
South Fork	$25,236,600	$13,654,860	$38,891,460	31.97%
GBS means General Building Stock This risk assessment was prepared using Level 2 HAZUS – MR3				

South Fork Skykomish Basin Economic Impact

	ECONOMIC IMPACT					
Reach	**100-Year Flood Displaced Population**	**100-Year Flood People Requiring Short-Term Shelter**	**GBS Value Total Structure Damaged by a 100-Year Flood**	**GBS Value Total Contents Damaged by a 100-Year Flood**	**100-Year Flood Total GBS Value (Structures and Contents) Damaged**	**% of Exposed GBS Value**
South Fork	203	133	$5,304,000	$4,191,000	$9,495,000	7.8%
GBS means General Building Stock This risk assessment was prepared using Level 2 HAZUS – MR3						

Development Trends

The South Fork Skykomish River basin has maintained a rural land use environment. Significant development has not and likely will not occur in this area because a large portion of it is protected wilderness area and forest production area. Future land use is projected to be similar to current land use conditions. Only a small increase in households is projected for the 2001 through 2022 planning period.

Repetitive Loss Properties

There are ten FEMA repetitive loss properties in the South Fork Skykomish basin, three of which have been mitigated. The unmitigated properties are located mostly near Baring and Skykomish with one located near Gold Bar. All of these parcels are single-family residences located in the floodway, and it is concluded that the cause of repetitive flooding for all of them is overbank riverine flooding, as reflected by the mapping for the basin.

SNOQUALMIE RIVER BASIN

Flood Hazard Profile on the Upper Snoqualmie River

There are no significant dams on the upper Snoqualmie River to regulated flood flows. All three forks of the Snoqualmie River are relatively steep and confined through most of their course upstream of the confluence area. The combination of no flood control impoundments and steep, confined upstream channels that open to lower gradient floodplains make for areas of widespread flood risk from inundation and channel migration during winter throughout the three forks area. Rain-on-snow events can have a significant effect in this unregulated system with headwaters in the high elevations of the Cascades.

King County flood response efforts do not key to any one river gage, but instead collectively consider flows as the sum of the three forks. The Snoqualmie River near Snoqualmie gage (USGS #12144500) is located at the base of Snoqualmie Falls. U.S. Geological Survey gages are located on the Middle, North and South Forks of the Snoqualmie River. The table below summarizes flow data from these gages.

Upper Snoqualmie River Flows

Recurrence Interval (years)	Discharge (cubic feet per second)			
	Snoqualmie River near Snoqualmie[a]	Middle Fork Snoqualmie[b]	North Fork Snoqualmie[b]	South Fork Snoqualmie[b]
10	51,700	28,000	18,600	9,000
50	71,100	38,300	24,600	13,000
100	79,100	43,800	27,200	15,000
500	95,200	55,800	32,800	19,200

Flow estimates based on hydrologic analysis for the Lower Snoqualmie and Skykomish River Revised Flood Insurance Study (Draft, 2005).
FEMA 2005.

Flood Hazard Profile on the Lower Snoqualmie River

With headwaters and much of the eastern basin highlands in the Cascades and a drainage area of about 600 square miles at Carnation, the lower Snoqualmie basin typically responds to winter rains with flood levels that rise and fall slowly and steadily. With such high elevations and unregulated drainages, rain-on-snow events can be significant. None of the dams and modifications in the basin significantly

alters the flood flows that these mountain conditions produce on the lower mainstem Snoqualmie River. The low-gradient channel of the lower Snoqualmie meets the relatively steeper and faster-responding Skykomish River in Snohomish County, which can result in Skykomish River backwater influencing the lower Snoqualmie as far upstream as Duvall.

Lower Snoqualmie River Flows

	Discharge[a] (cubic feet per second)	
Recurrence Interval (years)	Snoqualmie River at Carnation	Snoqualmie River at Duvall
10	58,200	53,400
50	82,400	75,800
100	91,800	84,600
500	113,300	99,700

Flow estimates based on hydrologic analysis for the Lower Snoqualmie and Skykomish River Revised Flood Insurance Study (Draft, 2005).
The period of record of gage data used to derive values in this table may differ from the period of record currently available.

Flood Hazard Profile on the Tolt River

With its steep upper basin, the Tolt basin has a relatively fast runoff response. The high elevations of the basin can produce rain-on-snow events, which can increase downstream flood magnitude and extent. A typical Tolt River flood reaches its maximum peak 10 to 12 hours before the larger Snoqualmie River. Although the South Fork Tolt River dam is not intended for flood control purposes, dam operations are such that peak flows on the mainstem Tolt have been diminished by about 30 percent relative to pre-dam flows.

The primary gage referenced for Tolt River floods is the Tolt River near Carnation gage (USGS #12148500), which is located on the Tolt River mainstem at River Mile 8.7, with an 82-square-mile drainage area. Flow magnitudes and recurrence intervals are calculated by a standard flood frequency analysis based on flows measured at the USGS #12128500 gage throughout the period of record, which is 1928 to 1931 and 1937 to the present. There is no gage at the Tolt River mouth at River Mile 0.0; flow magnitudes there are calculated based on the relation between the drainage areas at the mouth and at the USGS #12148500 gage. The table below summarizes flow data for the Tolt River.

Tolt River Flows

Recurrence Interval (years)	Discharge (cubic feet per second)[a]	
	Tolt River at Carnation	Tolt River at Mouth
10	11,900	13,900
50	16,700	19,500
100	18,800	22,000
500	23,800	27,800

FEMA 2005.

Flood Hazard Profile on the Raging River

Most Raging River floods occur from during the rainy season in November through February. Raging River flows are unregulated, as there are no major dams in the basin. This relatively steep and short river basin produces floods that are quick to rise to a peak, have high velocity and erosive flows along the steep channel and confined floodplain, and are quick to subside. The upper basin receives some snowfall, so rain-on-snow events can affect flood flows.

The gage used by King County and other agencies for flood monitoring on the Raging River is USGS gage #12145500 near Fall City, which records runoff from approximately 93 percent of the watershed. Flow magnitudes and recurrence intervals were calculated for the FEMA Flood Insurance Study based on flows measured at this gage for the period of record from 1946 to 1992. There is no gage at the Raging River mouth at River Mile 0.0; flow magnitudes there are calculated based on the relationship between the drainage areas at the mouth and USGS gage #12145500. The table below summarizes flow data for the Raging River.

Raging River Flows

Recurrence Interval (years)	Discharge (cubic feet per second)	
	Raging River near Fall City	Raging River at Mouth
10	3,790	4,031
50	5,910	6,286
100	6,970	7,413
500	9,840	10,465

FEMA 2005

Flood Characteristics of the Snoqualmie River Basin

The table below summarizes observed flooding characteristics typical for the Snoqualmie River basin. This table reflects the range of flood conditions by identifiable reach or stream for planning purposes only. Understanding the potential flood conditions for a specific area enables the County to identify mitigation alternatives appropriate for the level of risk for that stream or reach. Flood depths in this basin can vary from less than 1 foot to 6 feet, with significant velocities depending on extent and location within the basin.

Snoqualmie River Basin Flow Characteristics

Gage Location	USGS Station Number	River Mile	Drainage Area (square miles)	100-Year Flow (cfs)	Flood of Record, Date & Peak Flow (cfs)
North Fork	12142000	9.2	64.0	27,200 *a*	02/26/1932; 15,800 cfs
Middle Fork	12141300	55.6	154.0	43,000 *a*	12/02/1977; 30,200 cfs
South Fork	12143400	17.3	41.6	15,000 *a*	11/23/1986; 8,450 cfs
Snoqualmie @ Snoqualmie.	-	40.0	375	79,100 *b*	11/24/1990; 78,800 cfs
Snoqualmie @ Carnation	-	23	603.0	91,800 *b*	11/24/1990; 65,200 cfs

Gage Location	USGS Station Number	River Mile	Drainage Area (square miles)	100-Year Flow (cfs)	Flood of Record, Date & Peak Flow (cfs)
Raging @ Fall City	12145500	2.75	30.6	6,970	11/24/1990; 6,220 cfs
North Fork Tolt	12147500	11.7	39.9	10,300	12/15/1959; 9,560 cfs
South Fork Tolt	12148000	6.8	19.7	9,160	23/15/1959; 6,500 cfs
Tolt @ Carnation	12148500	8.7	81.4	18,800	12/15/1959; 17,400 cfs
FEMA 2005. Period of record of USGS gage data used to derive values in table may differ from period of record currently available. Flow estimates based on hydrologic analysis for the Lower Snoqualmie and Skykomish River Revised Flood Insurance Study (Draft 2005).					

Land Use, Structures and Estimating Potential Losses

The major portion of the Snoqualmie River basin floodplain is in unincorporated King County, with small but significant portions in the cities of North Bend, Snoqualmie, Duvall and Carnation. Development throughout the incorporated portions of the Snoqualmie River floodplain is mainly commercial and residential. Agricultural and residential development predominates in unincorporated King County along the lower and upper portions of the river.

Snoqualmie Basin Flood Exposure

	EXPOSURE			
Reach	**GBS Value Structures Exposed to 100-Year Event**	**GBS Value Contents Exposed to 100-Year Event**	**GBS Value (Structures and Contents) Exposed to 100-Year Flood**	**% of GBS**
Upper Basin	$157,803,400	$86,883,140	$244,686,540	15.32%
Lower Basin	$124,937,400	$70,004,940	$194,942,340	3.86%
Basin Total	**$282,740,800**	**$156,888,080**	**$439,628,880**	
GBS means General Building Stock This risk assessment was prepared using Level 2 HAZUS – MR3 3				

Snoqualmie Basin Economic Impact

ECONOMIC IMPACT						
Reach	**100-Year Flood Displaced Population**	**100-Year Flood People Requiring Short-Term Shelter**	**GBS Value Total Structure Damage by a 100-Year flood**	**GBS Value Total Contents Damage by a 100-Year flood**	**100-Year Flood Total GBS Value (Structures and Contents) Damaged**	**% of Exposed GBS Value**
Upper Basin	1814	1497	$37,386,000	$25,161,000	$62,547,000	3.9%
Lower Basin	1987	1269	$56,283,000	$43,041,000	$99,324,000	2.0%
Basin Total	**3,801**	**2,766**	**$93,669,000**	**$68,202,000**	**$161,871,000**	
GBS means General Building Stock This risk assessment was prepared using Level 2 HAZUS – MR3 3						

Development Trends

Much of the urbanization of the watershed has been contained in high density incorporated areas. While urban areas constitute only about 3 percent of the total watershed area, they make up a significant portion of some subwatersheds including Coal Creek (50 percent), mainstem Snoqualmie (15 percent), Patterson Creek (10 percent), and Cherry Creek (6 percent). The potential for high density development is increased by the presence of vested lots and plats, particularly in the Patterson and Ames Creeks areas.

Repetitive Loss Properties

The upper Snoqualmie River basin has 31 repetitive loss properties, 16 of which have been mitigated. Of the 15 unmitigated repetitive loss properties, 10 are classified as severe repetitive loss properties. These repetitive loss properties tend to be clustered around the cities of Snoqualmie and North Bend. Of the 13 unmitigated repetitive loss properties, all are single-family residential. All but two property lies within a mapped 100-year floodplain, so it is concluded that the main cause of repetitive flooding for this basin is overbank riverine flooding reflected by the mapping for the basin. The two properties outside the 100-year floodplain are located in a closed depression that are impacted by the outflow from Brewster Lake.

The lower Snoqualmie River basin has 19 repetitive loss properties of which two have been mitigated. Of the 17 unmitigated repetitive loss properties, 2 are classified as severe repetitive loss properties Of these 17 unmitigated properties, all but one are single-family residential and with one being a golf course club house. All lies within a mapped 100-year floodplain, so it is concluded that the main cause of repetitive flooding for this basin is overbank riverine flooding reflected by the mapping for the basin.

SAMMAMISH RIVER BASIN

Flood Hazard Profile on the Sammamish River

Water from the Lake Sammamish basin originally flowed into Lake Washington through the old Sammamish Slough, a widely meandering, low-gradient river bordered by extensive wetlands and floodplains. When Lake Washington was lowered by 9 feet after construction of the Lake Washington Ship Canal in 1912, property owners along the slough formed a drainage district to straighten and deepen the channel in order to reclaim the adjacent lands for agriculture. The U.S. Army Corps of Engineers completed river channelization in 1966 and constructed a low weir at the outlet of Lake Sammamish. The weir outlet slows release from Lake Sammamish during low-flow periods. During high flows, the weir is completely submerged by the river, acting as an uncontrolled spillway. The project was designed to pass approximately a 40-year springtime flood, equivalent to a 10-year winter storm, over the weir without the water surface elevation in Lake Sammamish exceeding 29.0 feet. The result of the project has been significantly reduced the frequency and severity of flooding risks around the lake and adjacent to the river.

Flows in the river are recorded at the USGS gage #12125200, currently operated by King County, located at NE 116th Street in Redmond. Lake Sammamish surface water levels are also recorded near Vasa Park at USGS gage #12122000. The table below summarizes flow data used for current floodplain mapping. These flows are considerably out of date. The hydraulic model and topographic maps used to establish flows and create the maps were developed in 1966, based on conditions at the time. Recent hydrologic studies have updated some of the flow estimates, and the hydraulic model has been updated for a limited selection of parameters and locations along the river. King County is in the process of updating these maps to reflect changes in topography and hydrology over the last 40 years.

Lake Sammamish Levels and Sammamish River Flows

Recurrence Interval (years)	Surface Elevation (NGVD 1929)[a]	Discharge (cubic feet per second)[a]	
	Lake Sammamish	Redmond downstream of Bear Creek	Sammamish River at Mouth
10	29.0	1,740	2,300
50	31.3	2,480	3,300
100	32.5	2,830	4,300
500	34.0	3,820	5,600

FEMA 2005.
The period of record of USGS gage data used to derive values in table may differ from the period of record currently available.
The FEMA Flood Insurance Study for the Sammamish River indicates that Lake Washington is regulated to between 13.2 and 15.0 feet NGVD 1929 (FEMA, 2005).

Flood Characteristics of the Sammamish River Basin

The table below summarizes observed flooding characteristics typical for this basin. The table shows events that reached above Phase III at the Hobart gage for Issaquah Creek unless otherwise indicated. Warning time estimates were not available for the Sammamish River basin. King County collects gage information only on Issaquah Creek.

Sammamish River Basin Flow Characteristics

Gage Location	USGS Station Number	River Mile	Drainage Area (square miles)	100-Year Flow (cfs) [a,b]	Flood of Record, Date & Peak Flow (cfs)
Sammamish River @ Mouth	12122000	5.6	99.6	4,300	-
Issaquah Creek @ Mouth	12121600	1.2	55.6	3,960	01/09/1990; 3,200 cfs

FEMA 2005.
Period of record of USGS gage data used to derive values in table may differ from period of record currently available.

Land Use, Structures and Estimating Potential Losses

In recent decades, substantial development has occurred in the Sammamish River basin. Extensive commercial and residential developments have been constructed throughout the floodplain. There are also several parks and other recreational facilities. Land uses in the upper 10 miles are mainly recreational and agricultural as well as urban commercial, specifically in the Cities of Redmond and Woodinville. The lower 5 miles include significant residential and commercial developments as well as some open space areas.

Sammamish Basin Flood Exposure

	EXPOSURE			
Reach	**GBS Value – Structures Exposed to 100-Year Event**	**GBS Value – Contents Exposed to 100-Year Event**	**GBS Value – (Structures and Contents) Exposed to 100-Year Flood**	**% of GBS**
Basin Total	**$89,551,200**	**$58,018,120**	**$147,569,320**	**1.17%**
GBS means General Building Stock This risk assessment was prepared using Level 1 HAZUS – MR3 3				

Sammamish Basin Economic Impact

ECONOMIC IMPACT						
Reach	**100-Year Flood Displaced Population**	**100-Year Flood People Requiring Short-Term Shelter**	**GBS Value Total Structure Damaged by a 100-Year Flood**	**GBS Value Total Contents Damaged by a 100-Year Flood**	**100-Year Flood Total GBS Value (Structures and Contents) Damaged**	**% of Exposed GBS Value**
Basin Total	**586**	**239**	**$8,289,000**	**$22,868,000**	**$31,157,000**	**0.2%**
GBS means General Building Stock This risk assessment was prepared using Level 1 HAZUS – MR3 3						

Development Trends

The Sammamish River basin has been urbanizing rapidly since the 1950s. Future development is expected to continue throughout the Sammamish basin. Bellevue, Issaquah, Kirkland and Redmond have designated potential annexation areas, some of which are within the floodplain.

Repetitive Loss Properties

There only one repetitive loss properties in the Sammamish River basin and it has not been mitigated. This property is located outside the 100-year floodplain which means that the flooding was likely due to storm water drainage problems.

Issaquah Creek has two unmitigated repetitive loss properties which are not clustered together. One is a single-family residential property and the other is a mobile home. Both lie within a mapped 100-year floodplain, so it is concluded that

the cause of repetitive flooding for this basin is overbank riverine flooding reflected by the mapping for the basin.

CEDAR RIVER BASIN

Flood Hazard Profile on the Cedar River

The hydrology and hydraulics of the Cedar River basin have been substantially altered from the natural conditions. The lowest mile of the river was rerouted by the U.S. Army Corps of Engineers in 1914. The mouth of the Cedar River, which previously drained to the Black River and subsequently the Green River and into Puget Sound, was diverted into Lake Washington through a straightened, dredged channel with rock-stabilized banks. In the upper Cedar River watershed, the City of Seattle operates three dams designed for municipal water supply and hydropower purposes: the Masonry Dam, the reconstructed Crib Dam or Overflow Dike, and the Landsburg Diversion.

The first dam on the Cedar River was the rock-fill, timber-structured Crib Dam, constructed in 1903 and rebuilt as the Overflow Dike in 1987, at the outlet of what is now Chester Morse Lake. Masonry Dam controls storage capacity in Chester Morse Lake and the outflows used to produce hydroelectric power. Eleven miles farther downstream is the Landsburg Diversion constructed in 1899, which diverts municipal and industrial water supply for the City of Seattle. The Masonry Dam was not designed or built to serve as a flood control dam; however, in addition to its hydropower generation and water supply functions, it has the capacity to store up to 15,000 acre-feet of flood water. However existing flood-prone areas downstream remain vulnerable to severe flood risks.

The two primary gages used for monitoring flood flows along the Cedar River are the Cedar River at Renton (USGS #12119000) and the Cedar River at Landsburg (USGS #12117500). The table below summarizes flow data.

Cedar River Flows

Recurrence Interval (years)	Discharge (cubic feet per second)[a]	
	Cedar River at Renton	Cedar River at Landsburg
10	5,940	4,880
50	9,860	8,340
100	12,000	10,300
500	18,400	16,100

Final Flood Frequency Analysis Curve for Year 2000 Floodplain Mapping on the Lower Cedar River, March 2000; included with King County's submittal to FEMA for a revised Flood Insurance Study for the Cedar River.

Flood Characteristics of the Cedar River Basin

The table below summarizes observed flooding characteristics typical for this basin.

Cedar River Basin Flow Characteristics

Gage Location	USGS Station Number	River Mile	Drainage Area (square miles)	100-Year Flow (cfs) [a]	Flood of Record, Date & Peak Flow (cfs)
Cedar Falls	12116500	33.2	84.2	8,930	11/24/1990; 12,300
Landsburg	12117500	23.4	121.0	10,300	11/18/1911; 14,200
Renton	12119000	1.6	184.0	12,000	11/24/1990; 10,600

Final Flood Frequency Analysis Curve For Year 2000 Floodplain Mapping on the Lower Cedar River march 2000 include with King county's submittal to FEMA for a revised Flood Insurance Study for the Cedar River. Period of record of USGS gage data used to derive values in table may differ from period of record currently available.

Land Use, Structures and Estimating Potential Losses

Land use in the Cedar River basin is dominated by forest uses (60.6 percent). The other main uses are residential; 21.3 percent can be classified as low-density development, 7.7 percent as medium and 0.9 percent as high density development. High-density development is located primarily in the Cities of Renton and Maple Valley.

Cedar River Basin Flood Exposure

	EXPOSURE			
Reach	**GBS Value – Structures Exposed to 100-Year Event**	**GBS Value – Contents Exposed to 100-Year Event**	**GBS Value – (Structures and Contents) Exposed to 100-Year Flood**	**% of GBS**
Basin Total	**$61,561,700**	**$30,394,070**	**$91,955,770**	**0.78%**

GBS means General Building Stock
This risk assessment was prepared using Level 2 HAZUS – MR3 3

Cedar River Basin Economic Impact

ECONOMIC IMPACT						
Reach	**100-Year Flood Displaced Population**	**100-Year Flood People Requiring Short-Term Shelter**	**GBS Value Total Structure Damaged by a 100-Year Flood**	**GBS Value Total Contents Damaged by a 100-Year Flood**	**100-Year Flood Total GBS Value (Structures and Contents) Damaged**	**% of Exposed GBS Value**
Basin Total	**1,168**	**905**	**$11,659,000**	**$7,846,000**	**$19,505,000**	**0.2%**

GBS means General Building Stock
This risk assessment was prepared using Level 2 HAZUS – MR3 3

Development Trends

The greater part of the Cedar River floodplain is in unincorporated King County, with a smaller portion in the City of Renton. There is commercial, industrial and residential development throughout the incorporated areas of the Cedar River floodplain. Residential development has also occurred in unincorporated King

County along the upper floodplain, which is likely due to its proximity to Renton. There is expected to be a significant amount of growth in Renton during the 2001 to 2022 planning period.

Repetitive Loss Properties

There are 17 repetitive loss properties in the Cedar River basin, seven of which are mitigated. The 10 unmitigated properties are located in no consistent location in the basin and all are single-family residential properties. They all lie within a mapped 100-year floodplain, so it is concluded that the cause of repetitive flooding for this basin is overbank riverine flooding reflected by the mapping for the basin.

GREEN RIVER BASIN

Flood Hazard Profile on the Green River

The primary control on flooding characteristics is Howard Hanson Dam, at approximately River Mile 64. Howard Hanson Dam was completed in 1962 and is operated by the U.S. Army Corps of Engineers, with a primary purpose of flood control and secondary purpose of water conservation and municipal water supply. During the summer, low flows are augmented through release of waters stored in a conservation pool in the reservoir behind Howard Hanson Dam. Additional flows are stored and released to supply summer withdrawal needs at the Tacoma Public Utilities water supply diversion structure downstream.

The target flood control parameter for Howard Hanson Dam is a Congressionally authorized flow of 12,000 cubic feet per second at the Green River near Auburn gage (USGS #12113000), at about River Mile 31 in Auburn. Operations at Howard Hanson Dam that target flows at Auburn must also consider the magnitude and timing of local inflows from tributaries such as Soos and Newaukum Creeks.

Placing a cap of 12,000 cubic feet per second on Green River flood flows at Auburn has reduced all larger flood events to what would be the pre-dam equivalent of a 2-year event at Auburn. Howard Hanson Dam is capable of storing floods up to and including a 500-year reservoir inflow event and converting them to a discharge at Auburn of the historical 2-year flood, with such flows extending over a much longer duration than they would under natural conditions. However, damage to the Howard Hanson Dam in the January 2009 flood event will impact the ability of the dam to operate at the design capacity. Dam operations in combination with the lower Green levees contain most flood events from Auburn downstream to the mouth when the dam is operating at its design capacity. The table below summarizes flow data.

Green River Flows

Recurrence Interval (years)	Discharge at Auburn Gage[a, b] (cubic feet per second)
10	12,000
50	12,000
100	12,000
500	12,000

FEMA 2005
Affected by regulation at Howard Hanson Dam.

Flood Characteristics of the Green River Basin

The table below summarizes observed flooding characteristics typical for this basin.

Green River Basin Flow Characteristics

Gage Location	USGS Station Number	River Mile	Drainage Area (square miles)	100-Year Flow (cfs)[a,b]	Flood of Record, Date & Peak Flow (cfs)
Howard Hanson Dam	12105900	63.8	221.0	Maximum flow release to meet target of 12,000 cfs at Auburn	12/21/1960; 12,200 (pre-dam)
Auburn	12113000	32.0	399.0	12,000 (as regulated by Howard Hanson Dam)	11/23/1959; 28,100 (pre-dam)
Tukwila	12113350	NA	440.0	12,400	01/31/1965; 12,100

FEMA (2005)
Affected by regulation at the Howard Hanson Dam

Land Use, Structures and Estimating Potential Losses

Land use in the Green River basin varies significantly among the lower, middle and upper portions. The land in the Upper Green River is primarily forestland. The Middle Green River is primarily farmland and a mix of urban and rural residential. The major land uses are residential (50 percent), forestry (27 percent) and agriculture (12 percent). Several large state and county parks abut the river in this segment. The Lower Green River contains less farmland and is mainly urban. Except for occasional stretches of parkland, a mixture of residential, commercial and industrial land uses are the main land uses. Residential development (50 percent), industrial development (17 percent), and commercial development (10 percent) are the primary uses along the Lower Green River.

Green River Basin Flood Exposure

	EXPOSURE			
Reach	**GBS Value – Structures Exposed to 100-Year Event**	**GBS Value – Contents Exposed to 100-Year Event**	**GBS Value – (Structures and Contents) Exposed to 100-Year Flood**	**% of GBS**
Basin Total	**$76,706,600**	**$39,647,160**	**$116,353,760**	**1.08%**

GBS means General Building Stock
This risk assessment was prepared using Level 2 HAZUS – MR3 3

Green River Basin Economic Impact

IMPACT ECONOMY						
Reach	**100-Year Flood Displaced Population**	**100-Year Flood People Requiring Short-Term Shelter**	**GBS Value Total Structure Damaged by a 100-Year Flood**	**GBS Value Total Contents Damaged by a 100-Year Flood**	**100-Year Flood Total GBS Value (Structures and Contents) Damaged**	**% of Exposed GBS Value**
Basin Total	**1,374**	**841**	**$32,464,000**	**$27,920,000**	**$60,384,000**	**0.6%**
GBS means General Building Stock This risk assessment was prepared using Level 2 HAZUS – MR3 3						

Development Trends

The Green River basin has been urbanizing since the 1970s. In the 1990s, Black Diamond, Enumclaw and Covington experienced rapid growth. Land development estimates indicate that the largest areas of future development will be in the Lower and Middle Green River areas.

Repetitive Loss Properties

Based on the County's review of repetitive loss data provided by FEMA, there are three repetitive loss properties in the Green River basin that have not been mitigated. These properties are all single-family residential. One property is located at the south end of Horseshoe Land and the other two are in the 100-year floodplain of the Green River.

There are also three unmitigated repetitive loss properties located on Vashon Island, which are not technically part of the Green River basin but rather are part of the larger Puget Sound Drainage.

WHITE RIVER BASIN

Flood Hazard Profile on the White River

With headwaters on Mount Rainier glaciers, snowmelt also increases White River flows in late summer, but not to a level of flood concern. The primary determinant for flooding characteristics in the White River is the presence and flow control operations of Mud Mountain Dam.

As a sole-purpose flood protection facility near River Mile 30, Mud Mountain Dam reduces peak flood flows and releases the stored water at a lower flow over a longer duration than would occur if the dam were not in place. Mud Mountain Dam is operated by the U.S. Army Corps of Engineers to control floods along the lower Puyallup River. Its operation is targeted to the Puyallup River at the Puyallup gage (USGS #12101500). Although targeted for the Puyallup River, theses dam operations also result in decreased flood flows along the White River relative to pre-

dam conditions. Mud Mountain Dam is operated to a target maximum flow of 45,000 cubic feet per second at the Puyallup gage. In addition to this primary flood control authority directed toward the Puyallup River, the U.S. Army Corp of Engineers operates Mud Mountain Dam to achieve flood benefits on the White River as is feasible. The table below summarizes White River flow data. Flood frequencies for the White River were obtained from a backwater channel-capacity study by the U.S. Army Corps of Engineers of Engineers completed in 1974.

White River Flows

Recurrence Interval (years)	White River near Auburn Discharge[a] (cubic feet per second)
10	15,870
50	17,600
100	18,370
500	20,700

FEMA 2005
The period of record of gage data used to derive values in this table may differ from the period of record currently available.

Over the course of 90 years, flow control at Mud Mountain Dam and the Puget Sound Energy diversion to Lake Tapps have had a dramatic effect on the natural flow regimes of the basin. In this sediment-rich river, such changes in flow regime affect sediment transport capacity, geomorphic processes, channel patterns and fish habitat. Rapid changes in sediment levels and shifting channel locations in turn affect inundation and channel migration flood hazards.

Flood Characteristics of the White River Basin

The table below summarizes observed flooding characteristics typical for this basin. Understanding the potential flood conditions for a specific area enables the County to identify mitigation alternatives appropriate for the level of risk for that stream or reach.

White River Basin Flow Characteristics

Gage Location	USGS Station Number	River Mile	Drainage Area (square miles)	100-Year Flow (cfs) [a]	Flood of Record, Date & Peak Flow (cfs)
Buckley	12098500	27.9	401.0	17,600 (maximum release from Mud Mountain Dam)	12/01/1933; 28,000 (pre-dam)
Auburn	12100496	6.30	464.0	18,370	02/10/1996; 15,000
Greenwater	12097500	1.10	73.5	5,776	12/02/1977; 10,500

FEMA 2005.

Land Use, Structures and Estimating Potential Losses

Approximately 175 square miles in the White River basin is owned and managed by the Mount Baker-Snoqualmie National Forest. Another 90 square miles of the basin is part of Mount Rainier National Park. In this upper portion, the basin is mainly

undeveloped but includes some scattered residential and commercial property around Greenwater. In the lower areas of the basin, there are some agricultural lands and a mix of residential, commercial and industrial uses closer to and in the cities. Upstream of the Muckleshoot Indian Reservation, the river is unconstrained and the valley is mostly undeveloped.

FEMA floodplain mapping shows 3,025 acres of mapped floodplain in the White River basin. Approximately 74 percent of this, or 2,246 acres, is along the White River mainstem. The table below defines the mapped floodplain in terms of incorporated and unincorporated King County. One of the major risks in the White River basin is that there are significant channel migration hazards related to the river's significant sediment load and debris local, especially in the upper basin. Floodplain maps for the White River are outdated and do not reflect recent changes in several channel locations.

White River Basin Flood Exposure

	EXPOSURE			
Reach	**GBS Value –Structures Exposed to 100-Year Event**	**GBS Value – Contents Exposed to 100-Year Event**	**GBS Value – (Structures and Contents) Exposed to 100-Year Flood**	**% of GBS**
Basin Total	**$21,772,400**	**$11,006,160**	**$32,778,560**	**2.38%**
GBS means General Building Stock This risk assessment was prepared using Level 2 HAZUS – MR3 3				

White River Basin Economic Impact

	ECONOMIC IMPACT					
Reach	**100-Year Flood Displaced Population**	**100-Year Flood People Requiring Short-Term Shelter**	**GBS Value Total Structure Damaged by a 100-Year Flood**	**GBS Value Total Contents Damaged by a 100-Year Flood**	**100-Year Flood Total GBS Value (Structures and Contents) Damaged**	**% of Exposed GBS Value**
Basin Total	**529**	**275**	**$10,433,000**	**$9,405,000**	**$19,838,000**	**1.4%**
GBS means General Building Stock This risk assessment was prepared using Level 2 HAZUS – MR3 3						

Development Trends

The majority of the White River basin is in unincorporated King County, with a smaller portion in the cities and the Muckleshoot Indian Tribe Reservation. There is commercial, industrial and residential development throughout the incorporated areas of the White River floodplain. The majority of development is along the White River in the Auburn and Pacific area. This area has significant potential for new residential, commercial and industrial development.

Repetitive Loss Properties

There currently are no unmitigated repetitive loss properties in this basin. However, at one time, this basin included a single repetitive loss property with the most flood insurance claims of any property in the County. This property was located along the Boise Creek reach of this basin, and was mitigated through a property acquisition by King County in 2000. This is end of the King County Flood Control District data. [2]

INCORPORATED CITIES *(new for 2009)*

There are 39 incorporated citied within King County. Some of these cities, such as Snoqualmie, North Bend, Renton, Tukwila, Ken, Auburn and Pacific are located along King County's major river systems and are subjected to the same risks identified above. The tables below shows the exposure and impact to the economy of these 39 cities using HAZUS modeling based on census tract data, King County Assessor's data and geographic information system (GIS) data for flood hazards.

Unincorporated Cities Flood Exposure

	Estimated 2009 Population (1)	**Building Count (2)**	**GBS Value Structure in $ Exposed to a 100-Year Flood Event (2)**	**GBS Value Contents in $ Exposed to a 100-Year Flood Event (2)**	**GBS Value (Structure and contents in $) Exposed to a 100-Year Flood Event (2)**	**% of GBS**
Algona	2,760	0	$0	$0	$0	0.00%
Auburn	60,820	346	$244,168,500	$260,659,350	$504,827,850	5.44%
Beaux Arts	315	0	$0	$0	$0	0.00%
Bellevue	120,600	235	$108,611,300	$75,242,830	$183,854,130	0.66%
Black Diamond	4,180	7	$261,000	$136,500	$397,500	0.08%
Bothell	17,260	82	$380,780,700	$417,797,970	$798,578,670	29.24%
Burien	31,890	267	$106,395,100	$54,278,210	$160,673,310	3.65%
Carnation	1,910	85	$20,161,800	$12,203,580	$32,365,380	13.12%
Clyde Hill	2,815	0	$0	$0	$0	0.00%
Covington	17,530	87	$13,858,500	$7,267,950	$21,126,450	1.03%
Des Moines	29,270	125	$37,906,800	$27,171,480	$65,078,280	1.97%
Duvall	5,980	7	$2,294,700	$2,524,170	$4,818,870	0.52%
Enumclaw	11,460	0	$0	$0	$0	0.00%
Federal Way	88,580	92	$26,231,700	$13,533,450	$39,765,150	0.38%
Hunts Point	465	0	$0	$0	$0	0.00%
Issaquah	26,890	380	$149,405,200	$118,348,920	$267,754,120	4.65%
Kenmore	20,450	118	$26,443,800	$15,722,580	$42,166,380	1.75%
Kent	88,380	1069	$1,816,502,229	$1,982,705,452	$3,799,207,681	26.69%
Kirkland	49,010	12	$6,592,400	$7,251,640	$13,844,040	0.15%

Lake Forest Park	12,820	35	$10,390,000	$5,398,400	$15,788,400	0.87%
Maple Valley	20,840	0	$0	$0	$0	0.00%
Medina	2,970	0	$0	$0	$0	0.00%
Mercer Island	22,720	0	$0	$0	$0	0.00%
Milton	830	0	$0	$0	$0	0.00%
Newcastle	9,925	0	$0	$0	$0	0.00%
Normandy Park	6,485	81	$24,969,000	$12,511,500	$37,480,500	2.50%
North Bend	4,760	818	$187,507,100	$147,525,010	$335,032,110	42.86%
Pacific	6,200	37	$5,867,000	$3,983,500	$9,850,500	2.06%
Redmond	51,890	196	$457,748,500	$500,670,350	$958,418,850	7.76%
Renton	83,650	263	$346,655,800	$368,864,780	$715,520,580	5.69%
Sammamish	40,670	240	$97,905,000	$49,339,500	$147,244,500	1.70%
SeaTac	25,730	6	$258,100	$207,110	$465,210	0.01%
Seattle	602,000	675	$220,834,815	$164,123,296	$384,958,111	0.34%
Shoreline	54,320	16	$4,319,000	$2,159,500	$6,478,500	0.10%
Skykomish	210	171	$17,471,200	$13,009,520	$30,480,720	75.27%
Snoqualmie	9,730	628	$167,489,200	$117,606,120	$285,095,320	14.97%
Tukwila	18,170	74	$67,211,000	$73,219,900	$140,430,900	2.96%
Woodinville	10,670	16	$32,538,700	$35,792,570	$68,331,270	2.72%
Yarrow Point	965	0	$0	$0	$0	0.00%

(1) 2009 Washington Office of Financial Management estimated population.
(2) Exposure numbers were estimated using King County parcel centroids and Assessor data.

Unincorporated Cities Economic Impact

	100-year Flood Event - Displaced Population	100-year Flood Event - People Requiring Short-Term Shelter	GBS Value Structure in $ Damaged by a 100-Year Flood Event (1)	GBS Value Contents in $ Damaged by a 100-Year Flood Event (1)	GBS Value (Structure and Contents in $) Damaged by a 100-Year Flood Event (1)	% of GBS
Algona	0	0	$0	$0	$0	0.0%
Auburn	2666	2519	$45,514,000	$81,689,000	$127,203,000	1.4%
Beaux Arts	0	0	$0	$0	$0	0.0%
Bellevue	1024	827	$4,617,000	$5,545,000	$10,162,000	0.0%
Black Diamond	0	0	$0	$0	$0	0.0%
Bothell	554	476	$37,641,000	$81,060,000	$118,701,000	4.3%
Burien	14	1	$46,000	$56,000	$102,000	0.0%
Carnation	1323	1021	$5,974,000	$6,880,000	$12,854,000	5.2%
Clyde Hill	0	0	$0	$0	$0	0.0%
Covington	59	28	$45,000	$54,000	$99,000	0.0%
Des Moines	36	36	$212,000	$136,000	$348,000	0.0%

Duvall	9	1	$1,033,000	$2,096,000	$3,129,000	0.3%
Enumclaw	56	37	$875,000	$1,331,000	$2,206,000	0.2%
Federal Way	0	0	$0	$0	$0	0.0%
Hunts Point	0	0	$0	$0	$0	0.0%
Issaquah	1039	868	$15,821,000	$25,531,000	$41,352,000	0.7%
Kenmore	682	606	$2,158,000	$1,990,000	$4,148,000	0.2%
Kent	8946	8387	$250,828,000	$602,286,000	$853,114,000	6.0%
Kirkland	186	164	$222,000	$264,000	$486,000	0.0%
Lake Forest Park	0	0	$0	$0	$0	0.0%
Maple Valley	0	0	$0	$0	$0	0.0%
Medina	0	0	$0	$0	$0	0.0%
Mercer Island	0	0	$0	$0	$0	0.0%
Milton	0	0	$0	$0	$0	0.0%
Newcastle	0	0	$0	$0	$0	0.0%
Normandy Park	121	81	$4,429,000	$2,986,000	$7,415,000	0.5%
North Bend	2345	2109	$21,562,000	$36,122,000	$57,684,000	7.4%
Pacific	123	123	$1,373,000	$991,000	$2,364,000	0.5%
Redmond	2577	2485	$29,709,000	$62,722,000	$92,431,000	0.7%
Renton	713	509	$66,883,000	$147,987,000	$214,870,000	1.7%
Sammamish	13	3	$2,762,000	$1,432,000	$4,194,000	0.0%
SeaTac	11	0	$17,000	$34,000	$51,000	0.0%
Seattle	317	83	$657,000	$443,000	$1,100,000	0.0%
Shoreline	0	0	$0	$0	$0	0.0%
Skykomish	164	43	$2,760,000	$4,100,000	$6,860,000	16.9%
Snoqualmie	1653	1442	$11,322,833	$18,474,095	$29,796,928	1.6%
Tukwila	128	36	$44,693,000	$82,886,000	$127,579,000	2.7%
Woodinville	9	1	$3,779,000	$6,425,000	$10,204,000	0.4%
Yarrow Point	0	0	$0	$0	$0	0.0%

(1) The valuation of general building stock and loss estimates determined in King County were based off an updated HAZUS-MH MR3 general building stock dataset at a Census Block analysis level.

Vulnerable Populations Defined

The Regional Profile, provided in Section 3, describes the demographic setting of the King County region, its cities, economy and resources, and examines potential at-risk populations. In this section, we will evaluate *vulnerability* in more detail.

People at Risk[4]

Densely Populated Areas

More than 96 percent of King County's population lives in densely settled urbanized areas. The current growth pattern, both urban and rural, affects how agencies prepare for emergencies as changes in the population and development can increase risks associated with hazards. Growth is being directed into Urban Growth Areas (UGAs) of the County which can be more vulnerable to certain hazards, such as earthquakes. Comparing the hazard maps located in **Section 5: HIVA** and **Map 3-1: Population Density** provides an idea of where populations (and facilities) can be impacted.

Populations with Special Needs

The ability to prepare for and recover from a disaster varies among population groups. Research on various population groups and disasters found that it took some populations longer to recover from a disaster for a variety of reasons. These population groups include minorities, people with language barriers, the disabled, the elderly, those with low income, and young children.

- *Minorities:* People from non-white population groups generally experience longer recoveries due to lower incomes, savings and insurance; their difficulty accessing insurance; and their using aid and relief organizations differently than was anticipated. Language and cultural differences can pose difficulties in some populations understanding and implementing preparedness and mitigation actions as well as accessing and using available disaster relief resources.

- *People with Language Barriers*: Since nearly one in five residents in King County do not speak English as their primary language, there is a significant segment of the population may have a language barrier that prevents them from preparing for a disaster, responding to an event, or applying for assistance after a disaster. In 2009, 127 languages are spoken in King County reflecting great cultural diversity.

- *Disabled Persons:* People with disabilities often are left out of community preparedness activities for a disaster. They have complex challenges because of hearing, sight, mobility, or mental impairments. Additionally, a significant percentage of working-age people with disabilities do not work. These factors may make it difficult for the person with disabilities to prepare in advance of a disaster.

- *Elderly:* The elderly may be overlooked in preparedness and recovery activities; their age could lead them to have trouble after a disaster, perhaps not qualify for loans, or become disabled because of the disaster.

- *Low Income:* The amount of money people have influences what type of housing they live in, whether they can engage in mitigation actions, and how long it takes to recover. Income is based on a number of factors, including the individual, the economy, availability of jobs, and educational opportunity among others. Expenses can vary by location – rural places are cheaper to live but have fewer jobs, while urban areas can be costly, especially for renters.

- *Young Children:* The number of children attending school is a concern because many of the school buildings they spend considerable time in each day are older and potentially more vulnerable to the effects of disaster.

Property at Risk

Housing

The year housing was built is important for mitigation. The older a home is, the greater the risk of damage from natural disasters. Homes built after 1980 are more likely to have been constructed to current standards for hazards such as floods, high winds, snow loads, and earthquake. About two-thirds of the homes in King County were built before 1960 when codes were less restrictive.

Natural Resources at Risk

Conserving King County's rural and natural resource lands is integral to providing diversity in lifestyle choices, continuing farming and forestry economies, protecting environmental quality, fisheries, salmon streams, and wildlife habitat and maintaining a link to King County's resource-based heritage.

Capability Assessment

A capability assessment is an integral part of the planning process in which you identify, review and analyze what your community is doing to reduce risk. A capability assessment also allows you to identify a framework that is in place or should be in place for implementation of new mitigation actions. A capability assessment has 2 components: an inventory of a jurisdiction's mission, programs and policies; and an analysis of its capacity to carry them out. By completing a capability assessment, a community will learn how or whether they will be able to implement certain mitigation activities by determining:

- Certain types of actions that may be prohibited by law
- Limitations that may exist on undertaking actions; and
- The range of local regulatory, technical and financial resources available to assist in implementing the actions.

The following tables illustrate the regulatory, technical and financial capabilities of the King County Municipal government. It should be noted that each local government that links to this Plan under Phase 2 of this planning process will assess their individual capabilities in this format.

LEGAL AND REGULATORY CAPABILITY					
Regulatory Tools (Codes, Ordinances., Plans)	**Local Authority (Y or N)**	**Prohibitions (State or Federal)**	**Higher Jurisdictional Authority (Y or N)**	**State Mandated (Y or N)**	**Comments**
1) Building Code	Y	N	N	Y	Building and Construction Standards (King County Code Title 16); NOTE: King County had adopted the International Codes. Title 16 has been amended in 2009.
2) Zoning Ordinance	Y	N	N	N	Zoning (King County Code Title 21A) Title 21A has been amended in 2009.
3) Subdivision Ordinance	Y	N	N	N	Land Segregation (King County Code Title 19A) Title 19A has been amended in 2009.
4) Special Purpose Ordinances (floodplain management, critical or sensitive areas)	Y	N	N	N	Critical Areas Ordinance (CAO) (King County Code chapter 21A.24); Floodplain management (King County Code 21A.24.230-.270) State Environmental Policy Act (SEPA), (King County Code chapter 20.44), Ch. 43.21C RCW
5) Growth Management	Y	N	N	Y	King County Countywide Planning Policies, 10/2008, Washington State Growth Management Act (GMA), 1990
6) Floodplain Management/ Basin Plan	Y	N	N	N	King County Flood Hazard Management Plan, Ord. 15673, 1/17/2007, King County Flood Control District, Ord. 15728, 4/2007, King County basin plans (King County Code chapter 20.14), National Flood Insurance Program (NFIP)
7) Stormwater Management Plan/ordinance	Y	N	N	Y	Surface Water Management (King County Code Title 9) Title 9 has been amended in 2009, Surface Water Design Manual, updated in 2009, National Pollutant Discharge Elimination System (NPDES) phase I municipal stormwater permit updated in 2009
8) General Plan or Comprehensive Plan	Y	N	N	Y	King County Comprehensive Plan, 10/6/2008,
9) Capital Improvements Plan	Y	N	N	N	Capital Improvements Plans for roads, transit, airport, stormwater, wastewater,

LEGAL AND REGULATORY CAPABILITY					
Regulatory Tools (Codes, Ordinances., Plans)	**Local Authority (Y or N)**	**Prohibitions (State or Federal)**	**Higher Jurisdictional Authority (Y or N)**	**State Mandated (Y or N)**	**Comments**
					solid waste, parks, open space, and flood hazard management are approved annually as part of the King County budget process
10) Site Plan Review Requirements	Y	N	N	N	King County Code Title 21A (Zoning), 19A (Land Segregation) and 16 (Building and Construction Standards) all require site plan review
11) Habitat Conservation Plan	Y	N	N	N	Lake Washington, Cedars, Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan, 7/2005, Snohomish River Basin Salmon Conservation Plan (WRIA 7), 6/2005, Green/Duwamish & Central Puget Sound Watershed Plan (WRIA 9)
12) Economic Development Plan	Y	N	N	N	King County Business Development and Contract Compliance Program
13) Emergency Response Plan	Y	N	N	Y	King County Comprehensive Emergency Management Plan, December 2008
14) Shoreline Management Plan	Y	N	N	Y	Shoreline Management (King County Code Title 25) update in process , King County Shoreline Management Master Program, Ord. 3692, 5/1/1978, Shoreline Master Program Guidelines, Ch. 173-26 WAC, 1/17/2004, Washington State Shoreline Management, Ch. 90.58 RCW, 1971, Coastal Zone Management Act, 1972
15) Post Disaster Recovery Plan	N	N	N	N	NA
16) Post Disaster Recovery Ordinance	N	N	N	N	NA
17) Real Estate Disclosure req.	Y	N	N	Y	Washington State Real Property Transfer Disclosure Statement, Ch. 64.06 RCW, Amended 2003-2004
18) Other					

ADMINISTRATIVE AND TECHNICAL CAPABILITY		
Staff/ Personnel Resources	**Available (Y or No)**	***Department/ Agency/Position***
1) Planner(s) or Engineer(s) with knowledge of land development and land management practices	Y	King County Water & Land Resources Division, King County Department of Development and Environmental Services
2) Engineer(s) or Professional(s) trained in construction practices related to buildings and/or infrastructure	Y	King County Water & Land Resources Division, King County Department of Development and Environmental Services, King County Roads Services Division
3) Planners or engineers with an understanding of natural hazards	Y	King County Water & Land Resources Division, King County Department of Development and Environmental Services, King County Road Services Division
4) Public Information officer/liaison	Y	All King county Government Agencies,
5) Webmaster- website technical capability	Y	All King county Government Agencies
6) Floodplain Manager	Y	King County Water & Land Resources Division King County Department of Development and Environmental Services
7) Surveyor(s)	Y	King County Department of Development and Environmental Services, King County Road Services Division
8) Personnel skilled or trained in “GIS” applications	Y	King County Water & Land Resources Division, King County Department of Development and Environmental Services, King County Geographic Information Systems Center
9) Scientist familiar with natural hazards in King County.	Y	King County Water & Land Resources Division King County Department of Development and Environmental Services
10) Emergency Manager	Y	King County Office of Emergency Management
11) Grant Writer(s)	Y	King County Water & Land Resources Division
12) Staff with expertise or training in benefit/cost analysis	Y	King County Office of Emergency Management King County Water & Land Resources Division, River and Floodplain Management Program

FISCAL CAPABILITY	
Financial Resources	**Accessible or Eligible to use (yes/no/Don't know)**
1) Community development Block Grants (CDBG)	Yes
2) Capital Improvements Project Funding	Yes
3) Authority to Levy Taxes for specific purposes	Yes
4) User fees for water, sewer, gas or electric service	Yes
5) Impact Fees for homebuyers or developers of new development/homes	Yes
6) Incur debt through general obligation bonds	Yes
7) Incur debt through special tax bonds	Yes
8) Incur debt through private activity bonds	Don't Know
9) Withhold public expenditures in hazard-prone areas	No
10) State sponsored grant programs such as FCAAP	Yes
11) Other-Flood Control District Funding	Yes

Vulnerability Assessment and Risk Analysis Endnotes

0.5 State of Washington, Emergency Management Division, Hazard Mitigation Section staff, September, 2009

1 King Department of Natural Resources and Parks, Water and Land Resources Division, River and Floodplain Management, September 2009

2 2006 *King County Flood Hazard Management Plan*, King Department of Natural Resources and Parks, Water and Land Resources Division, Final, January 2007

3 FEMA, Level 1 HAZUS – MR3

4 *Washington State Hazard Mitigation Plan* – Regional 6 Profile, Sept 2003 Draft

Section 7: Regional Mitigation Strategy

The 2004 Plan

The 2004 Plan identified mission/vision statements, six regional goals and corresponding objectives that are all identified in section 1 of this Plan. Each of the planning partners covered by the 2004 Plan was asked to identify both strategies and initiatives that were consistent with these mission/vision statements, goals and objectives. The strategies were very broad stroke statements that read more like objectives. These statements provided each jurisdiction a focus for their actions identified in their mitigation action plan. While the goals and objectives were regional, these strategies were jurisdiction specific, and were based on the capabilities of each jurisdiction to carry out their action plan. Planning tools such as "Mitigation 20/20" were used by some planning partners to identify their actions. These mitigation actions plans were included in Appendix B of the 2004 Plan.

The Regional Hazard Mitigation Plan Planning Group (called Taskforce in 2004) discussed and determined the strategy to be a prioritization of the six (6) regional goals:

1) Protect Life and Property
2) Support Emergency Services
3) Increase Public Awareness
4) Preserve Natural Systems and Resources
5) Encourage Partnerships
6) Enhance Planning Activities

First Priority: Protect Life and Property and Support of Emergency Services

Most organizations and agencies identified initiatives that supported protection of critical infrastructure necessary to providing and supporting emergency services, public safety and essential services during a hazard event. Mitigating the potential loss of these facilities and systems has a direct and immediate impact on the ability to reduce injuries, save lives and minimize property damage. (Critical infrastructure and response capabilities are broadly identified in **Section 6: Vulnerability Assessment, Risk Analysis and Capabilities**; detailed critical facility data is located in "**Annex G**" which is not subject to public disclosure.)

The RHMP partners also identified the need to promote mitigation activities that prevent losses by making homes, businesses, other properties and infrastructures more resistant to the impacts of hazards. The first step in accomplishing this is to implement activities specific to repetitive loss properties and chronic hazard event damages. Viable activities include better coordination among other agencies

governing land use and building regulations to ensure hazard mitigation concerns and strategies are incorporated into development activities.

Protection of life and property often relies on the ability of citizens to take the appropriate action before, during and after a hazard event. Critical to minimizing the loss of life and preventing injuries is ensuring the population understands the potential hazards in our region, how to prepare or mitigate the impacts, and what to do if a disaster should happen. This leads to the next priority, increasing public awareness.

Second Priority: Increase Public Awareness and Preserve Natural Systems

Most agencies felt public education was one of the most important ingredients in the regional mitigation strategy equation, with emphasis on making additional efforts to reach populations who may be more vulnerable. Broadening the spectrum to include businesses and private agencies, in addition to private citizens, would also enhance the region's ability to sustain itself during a disaster or hazard event.

There are numerous natural systems within King County and the Puget Sound region that could be seriously impacted during a manmade or natural hazard event. Working closely with other agencies to understand potential impacts on our natural environment and resources, and to coordinate mitigation goals and objectives will help to support the preservation of natural systems.

Third Priority: Encourage Partnerships and Enhance Planning Activities

Encouraging additional partnerships and enhancing planning activities will build upon the existing planning effort. While the RHMP process is off to a good start, the overall success of a long-term planning effort relies on gaining support and involvement from the region as a whole. Inclusion of other regional partners and contributions from private entities is essential in promoting a comprehensive planning approach. Potential partners and private agencies must see the benefit in participating in such an effort.

The 2009 Plan Update

As stated in section 4 of this Plan, the Plan update process of the RHMP will be completed in 2 phases. Phase 1 will focus on the preparation of a "Base Plan" that addresses only King County Municipal Government Agencies, while Phase 2 will focus on reformatting the Base Plan back into a Regional plan with comprehensive enhancements. The prioritization discussed above will carry over to the Phase 1 Base Plan, and will be updated under Phase 2. The Phase 1 Base Plan will only evaluate the status of the initiatives identified in the 2004 Plan for King County Municipal Agencies. There will be no new initiatives identified in the Phase 1 Base Plan. Since the strategies identified in the 2004 Plan were broader stroke policy type

directives, no status report will be created for the strategies under the Phase 1 Base Plan. These strategies will be carried over to the Phase 1 Base Plan and reevaluated under Phase 2, and folded into a revised series of regional objectives pertinent to the reassembled planning partnership. The 2004 mitigation strategies and initiatives were developed using a combination of cost-benefit analysis and Mitigation 20/20 software as described below in detail. As no new initiatives have been developed for Phase 1 of the 2009 update, this methodology will remain intact.

Cost - Benefit Review

As in 2003, and within the current 2009 Plan edition, the Cost – Benefit review consideration is a requirement of this mitigation Plan. The Office of Management and Budget Circular A-94 describes the economic principles and methods by which most federal programs must determine the cost-effectiveness of funded projects. OMB A-94 states: “Analysis should include comprehensive estimates of the expected benefits and costs to society based on the established definitions and practices for program and policy evaluation. Social benefits, and not the benefits and costs to the Federal Government, should be the basis for evaluating government programs or policies that have effects on private citizens or other levels of Government.”

Elements of Cost - Benefit Review

Cost - Benefit Review is an effort to objectively prioritize projects that will best serve the community in a cost-effective way. This key element in the planning process is derived from the use of multiple elements. Many of the regional partners participating in the development of the Regional Hazard Mitigation Plan used Mitigation 20/20 software methodology (in 2004) to generate this ratio by using a formula. The formula requires an estimated cost to implement the project, the estimated replacement cost of the infrastructure protected by the project and the population served by the services provided by agencies using the infrastructure. Additional factors might include a valuation of human life derived from the World Trade Center Terrorist Attack on 9/11/01, relative service levels provided by major equipment and/or facilities in a jurisdiction. An effort to quantify other intangible benefits that might contribute to public or responder safety was included by specific agencies as needed.

All signatory agencies to the Regional Hazard Mitigation Plan have included Cost - Benefit Review as a primary consideration in the establishment of their strategy unless other wise specified in their annex. Only mitigation projects with a ratio greater than 1 have been considered for inclusion in the jurisdiction annexes. Some organizations included greater detail in their Cost - Benefit Review descriptions.

Criteria for evaluating impacts are somewhat more subjective. While some figures are available for dollar damages, productivity and economic losses are more difficult to gauge. Injuries and fatalities are similarly difficult to assess. There is no known method for evaluating and quantifying the impacts of personal injury or loss of life,

and whether the potential exists to affect one life or many. However, without establishing a value to human casualty, calculation of cost-benefit analysis for proposed mitigation projects could not be conducted.

Cost / Benefit = ratio

Cost-Benefit analysis is required to prioritize mitigation projects. High ratios would receive a higher priority than lower ratios. We will use $2.3 million as the minimum benefit of one life saved by these projects. The figure was one used by some in the 9-11 World Trade Tower settlement discussions.

Table 7-1 below illustrates the current status of those initiatives identified by King County Municipal Agencies covered in the 2004 Plan. The table summarizes the action, and lists the status as completed, ongoing or no progress reported at this time. (See Annex B for these 2004 materials with status updates noted in upper right-hand corner. Completed 2004 initiatives have been removed to Annex L.) To clarify terminology utilized in this table, the term “short-term” under timeline was assigned to those projects that could be completed in the initial performance period of the Plan, which is 1 t0 5 years. Long –term would be any project that may take more than 5 years to implement.

TABLE 7-1.
ACTION PLAN MATRIX-PROGRESS REPORT

Action Identifier	Initiative Description	Goals	Time Line	Priority	Status	Completion Status (X,O,✓)
King County Sheriffs Office (KCSO)						
KCSO-1	Enhance homeland security, mitigation, and response capabilities by acquiring dedicated staff for training, planning, response, and intelligence sharing and analysis	1	Short-term	High	The KCSO continues to seek opportunities to enhance its homeland security, mitigation and response capabilities. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	O
Solid Waste Division (SWD) - King County Department of Natural Resources and Parks						
SWD-1	*Grid 2 & 3 repairs*. Structural seismic retrofit of the Enumclaw transfer station. This initiative sets steel plating to the roof repairs increasing the resistance of the structure to strong earthquakes.	1, 2	Short-term	(high)	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
SWD-2	*Perimeter Wall*. Phase 2 of the structural seismic retrofit to the Enumclaw transfer station. This initiative sets steel plating to the perimeter wall increasing the resistance of the structure to strong earthquakes.	1, 2	Short-term	(high)	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
SWD-3	*Panel to Panel joint connections*. Phase 3 of the structural seismic retrofit to the Enumclaw transfer station. This initiative sets connecting the panels with joint connectors increasing the resistance of the structure to strong earthquakes	1, 2	Short-term	(high)	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
SWD-4	*Roof parapet bracing*. Phase 4 of the structural seismic retrofit to the Enumclaw transfer station. This	1, 2	Short-term	(high)	This project was completed during the initial performance period of the 2004 KCRHMP.	✓

TABLE 7-1.
ACTION PLAN MATRIX-PROGRESS REPORT

Action Identifier	Initiative Description	Goals	Time Line	Priority	Status	Completion Status (X,O,✓)
	initiative sets connecting the roof parapet with steel bracing increasing the resistance of the structure to strong earthquakes					
SWD-5	*Sheer wall connections*. Phase5 of the structural seismic retrofit to the Enumclaw transfer station. This initiative sets sheer wall bracing for increasing the resistance of the structure to strong earthquakes	1, 2	Short-term	(high)	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
Public Health – Seattle & King County (PHSKC)						
PH-1	Support the general public's health and safety by educating Public Health staff in emergency and disaster response	1, 2	Short-term	High	PH has begun programs to educate staff to respond at home and work to emergencies and disasters. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	O
PH-2	Enhance communication of Public Health sites internally (both within and between PH sites) as well as with other regional agencies through amateur and short-range radio programs	1, 2	Short-term	High	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
PH-3	Develop an infectious disease outbreak response team program	1, 2	Short-term	High	PH continues to seek opportunities to develop an infectious disease outbreak response team program. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	O

TABLE 7-1.
ACTION PLAN MATRIX-PROGRESS REPORT

Action Identifier	Initiative Description	Goals	Time Line	Priority	Status	Completion Status (X,O,✓)
PH-4	Educate the public in disaster response activities	1, 2, 3	Short-term	High	PH has completed public health information (i.e. fact sheets) for public distribution during disasters, but seeks additional opportunities for disaster response education. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	O
PH-5	Support and enhance first responder disaster reporting and regional emergency electronic data collection	1,2	Short-term	High	PH is in the process of developing and testing enhanced first responder reporting capabilities, but seeks additional support to improve these capabilities. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	O
PH-6a	Mitigate structural damage at Public Health sites. This initiative also involves training to determine structural damage during and after hazard events	1,2	Short-term	High	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
PH-6b	Mitigate non-structural damage at Public Health sites. This initiative also involves training to determine non-structural damage during and after hazard events	1, 2	Short-term	Low	The non-structural damage mitigation and non-structural damage determination training initiative was tabled although other mitigation and training activities continue to be sought by PH.	X
PH-7	Enhance syndromic surveillance program to support public health during emergencies and disasters	1, 2, 3	Short-term	High	Enhanced syndromic surveillance has been initiated by PH, although additional support is necessary to expand the program. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	O
PH-8	Enhance environmental health response programs for terrorist acts involving chemical and radioactive events, threats to food and water	1, 2, 5	Short-term	High	PH continues to seek funding opportunities to advance environmental health programs developed to respond to terrorist acts. This is considered to be an ongoing action that will be carried over to the	O

TABLE 7-1.
ACTION PLAN MATRIX-PROGRESS REPORT

Action Identifier	Initiative Description	Goals	Time Line	Priority	Status	Completion Status (X,O,✓)
	supply and airborne illnesses				2009 Base Plan.	
PH-9	Duplicate of PH-2					
King County Information and Technological Services Division (OIRM)						
ITS-1	Provide alternative sites and communication paths for County's information and communication infrastructure. This initiative also seeks to retrofit existing facilities to improve disaster resistance.	1, 2, 5	Short-term	High	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
Metro King County Transit (KC DOT)						
MKCT-1	Construct downtown Seattle transit tunnel positive ventilation system to allow for decontamination and recovery following chemical, gas, or fire event.	1, 2	Short-term	High	Project study and design are in progress. MKCT continues to pursue opportunities to develop the transit tunnel ventilation system. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	**O**
MKCT-2	Install security cameras on public buses to deter crime associated with civil unrest and terrorist acts	1, 2	Short-term	High	This project is in the study and developmental stage although additional funding sources are necessary to complete the security camera installation project. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	**O**
King County Facilities Management Division (FMD)						
FMD-1	Structural seismic retrofit of county buildings to improve resistance to earthquakes	1, 2	Short-term	High	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
FMD-2	*Administration Building 401-403 Security Additions*. Install motion detector, duress buttons, camera and monitoring system	NA	Short-term	High	This project was completed during the initial performance period of the 2004 KCRHMP.	✓

TABLE 7-1.
ACTION PLAN MATRIX-PROGRESS REPORT

Action Identifier	Initiative Description	Goals	Time Line	Priority	Status	Completion Status (X,O,✓)
FMD-3	*Administration Building 5th floor - Elections Security Upgrade.* Install card access control, duress buttons, camera and video monitoring system	NA	Short-term	High	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
FMD-4	*Administration Building 6th floor - Finance Security Upgrade.* Install card access control, duress buttons, camera and video monitoring system	NA	Short-term	High	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
FMD-5	*Elections 1st Ave MBOS Security Upgrade.* Install card access control, duress buttons, camera and video monitoring system	NA	Short-term	Low	This project was removed from FMD's action plan, although building security upgrades continue to be sought by FMD.	X
King County Fire Marshall's Office (FMO)						
FMO-1	Continue inspection of existing and new construction	1, 2, 3	Long-term	High	This project is ongoing although other opportunities are sought to continue to provide inspections. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	O
FMO-2	Provide plan reviews for noted construction	1, 2, 3	Long-term	High	This project is ongoing although additional support is necessary to provide plan reviews. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	O
FMO-3	Support education, training and information programs	1, 2, 3	Long-term	High	This project is ongoing although additional funding sources are necessary to support programs. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	O
FMO-4	Work with schools and fire service public educators to deliver public safety messages	1, 2, 3, 5	Long-term	High	Other resources are needed to further the public safety campaign. This is considered to be an ongoing action that will be carried over to the 2009 Base Plan.	O

TABLE 7-1.
ACTION PLAN MATRIX-PROGRESS REPORT

Action Identifier	Initiative Description	Goals	Time Line	Priority	Status	Completion Status (X,O,✓)
King County Department of Natural Resources and Parks (DNRP)						
DNRP-1	Snoqualmie 205 (Fund318F). Cooperative project between King County, City of Snoqualmie and Corps of Engineers to improve flood hazard conditions above Snoqualmie Falls through major channel excavation improvements.	1, 2, 4, 5	Short-term	High	This project was completed during the initial performance period of the 2004 KCRHMP.	✓
DNRP-2	North Bend 205 (Fund318F and 318U). This project is a cooperative flood damage reduction project between the Corps of Engineers (Corps), King County and the City of North Bend. The project will evaluate cost effective flood reduction options along the South and Middle Fork Snoqualmie Rivers in and around the City.	1, 2, 4, 5	Long-term	High	This initiative is in progress. Preliminary investigations underway. Likely re-scope to expand project area and redefine funding sources and partnerships. This on-going project has been transferred to the King County Flood Control District.	O
DNRP-3	Rivers Major Maintenance (Fund 318F and 318U). Major rivers maintenance project includes funds to repair damaged structural elements of King County's extensive inventory of flood protection facilities.	1, 2, 4	Long-term	High	The Rivers Major Maintenance initiative is an on-going body of work. King County has completed approximately 33 maintenance projects under this current plan. This on-going project has been transferred to the King County Flood Control District.	O

TABLE 7-1.
ACTION PLAN MATRIX-PROGRESS REPORT

Action Identifier	Initiative Description	Goals	Time Line	Priority	Status	Completion Status (X,O,✓)
DNRP-4	Floodway Corridor Restoration (FUND 318F and 318U). Floodway corridor restoration projects include the removal, slope-back or setback of County-owned flood protection facilities and other structural features to allow for improved riparian habitat, greater channel diversity and migration, reclaimed flood storage and enhanced open space or recreational/-interpretive uses.	1, 3, 4	Long-term	High	The Floodway Corridor Restoration initiative is an on-going body of work. King County has completed approximately six projects with others in progress. This on-going project has been transferred to the King County Flood Control District.	O
DNRP-5	Flood Hazard Mitigation (FUND 318F and 318U). Flood hazard mitigation projects include the acquisition of repetitively damaged homes, purchase of underdeveloped land to prevent future development in flood prone areas, and where cost-effective and feasible, the elevation of residential homes that sustain recurring deep, low-velocity flooding.	1, 4	Long-term	High	The Flood Hazard Mitigation initiative is an on-going body of work. King County has completed approximately 18 mitigation projects. This on-going project has been transferred to the King County Flood Control District.	O
DNRP-6	Critical Facility Retrofit. Currently, the fuel supply tanks for King County flood facilities cannot withstand a moderate to major quake. This project would retrofit the Black River Pump Station.	1, 2	Short-term	High	This project was completed during the initial performance period of the 2004 KCRHMP. In addition, the USGS Snoqualmie Cableway project has also been completed.	✓
DNRP-7	Critical Facility Relocation. Relocate the Flood Warning Center (FWC) from its current location that is subject to severe seismic exposure, to a location that is	1, 2	Short-term	Medium	This project was completed during the initial performance period of the 2004 KCRHMP. The Flood Warning Center has been relocated to the King Street Center, which is built to modern	✓

TABLE 7-1.
ACTION PLAN MATRIX-PROGRESS REPORT

Action Identifier	Initiative Description	Goals	Time Line	Priority	Status	Completion Status (X,O,✓)
	not subject to any natural hazard risk exposure.				standards to address seismic concerns.	
DNRP-8	Critical Facility Upgrade. Update the flood warning telemetry and gauging, computers, software applications, emergency power and other response facilities.	1, 2	Short-term	High	This project was completed during the initial performance period of the 2004 KCRHMP. King County has developed and started testing a system that automatically sends out e-mail and pager alerts when real-time gage data exceeds flood phase thresholds. King County has developed web pages designed for PDA and cell phone users to access real-time river gauge data. There is a need for continuous monitoring and upgrading of equipment and systems over time.	✓
DNRP-9	Flood Hazard Reduction Programs. This initiative includes elements such as hazard identification, warning, information dissemination and public outreach are vital to the mitigation of the natural hazards impacting King County.	1, 2, 3	Long-term	Medium	This initiative is an ongoing work program to provide flood warning, public outreach and hazard identification. This on-going project has been transferred to the King County Flood Control District.	**O**

Completion status legend:
✓= Project Completed
O = Action on-going towards completion
X = No progress at this time

Goals:
1) Protect life and Property
2) Support Emergency services
3) Increase Public Awareness
4) Preserve Natural systems and Resources
5) Encourage Partnerships

Section 8: *Annexes 2009

Annex A: Plan Distribution List

Annex B: Individual Jurisdiction Plans

Annex C: King County Government and Jurisdiction Participation

Annex D: King County Plan Adoption Documentation

Annex E: Public Participation

Annex F: Policy and Program Analysis

Annex G: Critical Facilities

Annex H: Potential Funding Sources

Annex I: References and Resources

Annex J: Glossary

(new for 2009)
Annex K: 2004 Plan Maps
(removed from Section 3)

Annex L: 2004 King County Government Initiatives - Completed
(removed from 2004 KC Annex B)

*** Name change for 2009 RHMP Plan**

Annex A: Plan Distribution List

The DRAFT 2009 King County Regional Hazard Mitigation Plan (RHMP) is available on the King County Office of Emergency Management (OEM) website at www.kingcounty.gov/prepare with a link to the Plan (10/02/09 version). When final approved and adopted Plan and annual version(s) of the RHMP becomes available, the website will be updated.

A hard copy DRAFT 2009 RHMP can be found in five (5) Regional Libraries, located in the Government Section, as a Reference Copy. The Libraries are: Bellevue, Bothell, Redmond, Auburn and the King County Library System (KCLS) online. When RHMP updates are available, they will be submitted in hard copy to the KCLS distribution system contact, for insertion into the 3 ring binders at the Libraries listed above, or replaced with a new binder, as needed.

The RHMP, with Annexes, will be submitted to the Washington State, Emergency Management Division (EMD) and the Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA), Region X, in the prescribed method and frequency interval as stated in Section 2 of this Plan.

Specific requests for individual annexes or data pertaining to specific participating jurisdictions will be forwarded to the respective jurisdiction.

Annex B: Individual Jurisdiction Plans

Attachment A
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ANNEX B Section 2, 1.1 **DRAFT**

Regional Hazard Mitigation Plan
Jurisdiction Letter of Intent to Join King County's Plan
Signature Form

I, jurisdiction of _____ hereby commit to actively participating in the Regional Hazard Mitigation Plan. I understand that each jurisdiction participating in the Plan is individually responsible for accomplishing the tasks listed below.

- Designate a Point of Contact (POC) for this jurisdiction to coordinate mitigation planning efforts. Inform KC OEM immediately when the POC changes.

  _____
  Point of Contact *email address* *phone number*

- Ensure the governing body of this jurisdiction adopts the Regional Mitigation Plan by local ordinance.

- Contribute at no cost available geographic data necessary to development of the Hazard Identification and Vulnerability Analysis including, but not limited to:
  - land use data
  - development patterns
  - population figures
  - infrastructure systems
  - hazard data and history of incidents

- Develop a Local Mitigation Strategy (LMS) based on the King County Hazard Identification and Vulnerability Analysis. The LMS will include:
  - a set of mitigation goals specific to this jurisdiction aimed at reducing long-term vulnerability to hazards
  - a list of mitigation projects and actions
  - a description of how projects and actions will be prioritized and implemented
  - Involvement in NIFP compliance
  - Other FEMA required Plan components as amended

- Develop a schedule for updating this jurisdiction's LMS and geographic data contained within the KC Regional Hazard Mitigation Plan guidelines, Section 2, Plan Maintenance and Plan Management section

- Incorporate recommendations, policies, and strategies included in the LMS into other local planning tools and methods such as land use plans, Capital Improvements Plans, site review processes, zoning ordinances, and others.

Signature of Chief Elected Official Signed: _____
Printed signature:_____
Jurisdiction: _____ Date: _____

Annex B: Cities

Annex B: Fire Districts

Annex B: Utility Districts

Annex B: School Districts

2009 Evaluation of 2004 King County Initiatives
(Status is noted in upper right-hand corner)

Annex B: King County Government Departments (2004)

King County Facilities Management
King County Department of Transportation
King County Department of Executive Services, Information and Telecommunications Services Division
King County Department of Development and Environmental Services
Seattle-King County Department of Public Health
King County Department of Natural Resources and Parks
King County Sheriff's Office

Regional Mitigation Plan
King County Government Strategy Summary

Jurisdictional Profile:

King County is the 12th largest county in the United States and home to more than 1.7 million people. The County, spanning 2134 square miles, comprises 39 cities and numerous utility, school and fire districts. Approximately two-thirds of the County's population resides in the cities. The City of Seattle is the largest city in King County and one of the largest cities on the West Coast. King County is a major transportation hub in the Northwest. Seatac Airport, the Port of Seattle, Burlington Northern Santa Fe, and Union Pacific Railroads all contribute to the County's regional economic leadership. Seattle has a major seaport serving passenger ships and cargo handling enterprises. Many important public companies are headquartered in Seattle or suburban cities. A large number of technology firms are based in King County. As a center for regional employment, large numbers of people commute to King County for work each day.

Hazard Vulnerability and Risk Assessment:

King County is subjected to the impact of several types of natural disasters. With its large and complex infrastructures, the County has experienced damages from earthquakes, flooding, and severe weather. As the regional seat of government and commerce, it has witnessed political civil unrest and is a possible target of terrorist activities. (See HIVA in Section 4 for more information.)

Ongoing Mitigation Efforts:

King County Government has long been a leader in hazard mitigation. Several agencies contribute to this effort. The King County Department of Natural Resources and Parks, Water and Land Resources Division is a national leader in flood mitigation. Floodplain protection programs have included the acquisition of properties experiencing repeated flood damages, warning systems, dam and levee inspections, and extensive preventative and emergency response plans. These proactive measures taken as a participant in the NFIP have earned King County a high CRS rating and resulted in the residents' having benefited from reduced flood insurance premiums (See **Flooding** in Section 5 for more information.). Other examples of current mitigation commitments include the recent dedication of the King County - Kent Pullen Regional Emergency Communications and Coordination Center, earthquake retrofitting of the King County Courthouse and Project Impact.

Additionally, many county government agencies engage in public education. The Seattle King County Department of Public Health, the King County Sheriff's Office, King County Office of Emergency Management, and King County Water and Land Resources all provide the public with mitigation information. The King County Fire Marshal's

Office and the Department of Developmental and Environmental Services provide inspections and code enforcement that improve safety in the region.

Mitigation Strategy:

Projects Currently Funded:

King County's Mitigation Strategy is to continue to work on programs and capital improvement projects already receiving funding derived from the existing tax base and grants. These projects are consistent with three Regional Goals: Protection of Life and Property, Support of Emergency Services, and Public Education/Awareness. These include the following in order of importance:

1. Public Education
2. Citizen Corp/CERT
3. Code revision and enforcement
4. Flood Hazard Reduction Program
5. Disaster Preparedness
6. Earthquake Mitigation Projects

Projects Contingent Upon Future Funding:

If additional funding becomes available, King County has identified its Information and Technology needs as its highest priority. Mitigation projects to this end involve the implementation of offsite data storage and backup, surveillance and monitoring capabilities. The City of Seattle, King County Information and Technology and King County Sheriff's Office staff have identified many common needs for system upgrade and improvements. Project planning discussions are already taking place between the City of Seattle and King County IT management on ways to best coordinate their efforts.

The County is considering the following projects, ranked by order of benefit-cost ratios:

1. Expansion of earthquake structural mitigation for public buildings
2. Flood property buy out program might be expanded as properties are identified
3. Backup Emergency Communications and ITS infrastructure
4. Expansion of Public Education Programs

If funding is not readily available, these projects will nevertheless be pursued but implementation and completion will be delayed. Further, if a project becomes funded, it will be implemented regardless of its order of importance.

Individual Agencies' Strategies:

Each agency within the King County government formulates its own mitigation strategy based upon benefit-cost analysis and other objective methods identified in the following section. The listed projects above are priorities across agency lines.

Benefits of Mitigation:

The mitigation strategy considered supports continuity of regional government services to 1.7 million people following disasters, protects public property from disaster impacts, and supports emergency service providers.

Regional Hazard Mitigation Plan
King County Government Administration

Planning Participation

Members of the King County Office of Emergency Management facilitated the research and writing of the Regional Hazard Mitigation Plan. One of the planning workgroups represented King County Government. This group consisted of representatives from King County Parks, Solid Waste, Waste Water, Transit, Information and Technological Services, the Sheriff's Office, Assessments, Facilities, and Public Health. The workgroups provided technical information regarding their organizations. They also produced their own agency strategies and initiatives. The group offered a consensus strategy for King County Government.

Plan Adoption

The King County Government adoption process involved multiple steps. The draft Regional Hazard Mitigation Plan was first distributed to the departments and divisions contributing to the King County Government Workgroup for acceptance. After requested revisions had been addressed, the revised draft was transmitted to the King County Executive's staff for review and comment. Once the Executive determined that the County's interests were acceptably communicated, the document was released to Washington State Emergency Management for review against FEMA requirements. It then went to Risk Management and the Prosecuting Attorney Office for their evaluation. The Regional Hazard Mitigation Plan will be forwarded to the 13-member King County Council for a resolution to adopt the King County government portion of the plan following its acceptance by FEMA. The process takes several months.

Plan Maintenance

The Regional Hazard Mitigation Plan will be revised annually for resubmission to FEMA and the State of Washington on the second Monday of December. King County Government amendments, revisions and additions will be provided to the Regional Hazard Mitigation Plan Taskforce by the end of September each year for incorporation into the plan. Changes to the King County portion of the plan will be affirmed by the impacted department managers.

Jurisdiction Strategy
King County Sheriff's Office

Jurisdiction Profile
The King County Sheriff's Office (KCSO) is a full service law enforcement agency that provides services to unincorporated King County and to 13 contract cities. The Sheriff's Office also provides service to King County Airport (Boeing Field), and Metro Transit, and enhanced service to one Native American Tribe. Specialized services to other jurisdictions are provided on a contract and/or regional basis. The King County Sheriff's Office is also a Primary Public Safety Answering Point (PSAP) for incoming 9-1-1 calls.

Mitigation Efforts to date
KCSO is working to increase and enhance its ability to respond to natural disasters and acts of terrorism by improving security, protecting personnel, physical and cyber assets against damage or attack. Counter terrorism mitigation continues to develop and to shift with the perceived local and national threat.

To date KCSO has developed plans and procedures for essential personnel, provided training, purchased and distributed personal protective equipment, tested security practices, participates in regional and national intelligence sharing teams and formed a regional intelligence group.

Mitigation Strategy
The KCSO Strategy is consistent with the Regional Goals and Objectives. The Mitigation Strategy proposed for the King County Sheriff's Office is to:

- Acquire protective and response equipment
- Provide training for department personnel
- Enhance security at critical facilities
- Enhance counter terrorism capabilities
- Enhance intelligence and information sharing capabilities

Prioritization Process
Our highest priority was given to life safety for officers; second priority given to protection of public property; third priority given to public education. Benefit cost review and population served objective criteria were primary considerations in the establishment of project priorities.

Funding Sources
KCSO continues to seek funding for this contingency through the budget process, grants and other funding sources to mitigate the impacts of natural and manmade threats. KCSO continues to participate in grant funded WMD response equipment acquisition programs. Other needs require additional funding, currently unavailable through the budget process.

Mitigation Benefits
Proposed projects would protect lives and property of commissioned law enforcement, emergency responders and citizens of King County and contract cities, and would allow the Sheriff's Office to continue to provide critical law enforcement services in the event of a disaster or terrorist attack.

PLAN IMPLEMENTATION
The Sheriff's Office has requested funding through an existing grant. Future projects may involve operational budget resources or grant funding.

BENEFIT COST REVIEW
Benefit Cost Review was a primary consideration in the prioritization of projects. The King County Sheriff's Office used $2.3 million as the value of a human life, consistent with the federal valuation of World Trade Center victims. Using the methodology consistent in this plan, the cost/benefit ratio for our single initiative is 1.5 to 1.

Status: Ongoing

Attachment A
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Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: King County Sheriff's Office

Type of Hazard: Terrorist Attack

Category: Public Safety

Priority: High (meets primary mission of Sheriff's Office)

Plan Adoption # (*tracking #*): 2003ULWX0012

Brief Description of Project: Enhance homeland security mitigation and response capabilities by acquiring dedicated staff for training, planning, response, and intelligence sharing and analysis.

Rationale for project: (*Recognizing the hazard and proposed solution, resolution, and/or specified law or regulation impinging on the project*). The Sheriff's Office must be able to provide law enforcement service in the event of a terrorist attack or other disaster.

RHMP Goals: (1) Protect life and property. RHMP Objectives: (1.b) Maintain essential services.

Lead Jurisdiction: King County (Sheriff's Office, Special Operations Division)

Participating Jurisdictions: N/A

Cost of Project: $1.5 million

Estimated time period implemented: 3 years

Funding Sources:
"COPS" Grants (DOJ)

Matching %
Primary 75
Secondary 25
Tertiary ____

Source and Date: County budget process (including supplementat funds); grants.

Adoptive date and/or Ordinance #: Grant start date 06-01-03; program implementation date 01-01-04. 2003ULWX0012

Status: $1.08 million grant approved, to be spent over 3 years. Seeking additional funding through budget process and future grants.

Benefit/Cost Ratio: Unable to attach a cost/value to human lives that could be lost in a terrorist attack.

Jurisdiction Strategy
Solid Waste Division, King County Department of Natural Resources and Parks

Jurisdiction Profile
The King County Solid Waste Division provides a system for the transfer and disposal of all mixed municipal solid waste generated within King County except for waste from the cities of Seattle and Milton. This service is provided to a population of approximately 1.14 million people. The Cedar Hills Regional Landfill is the only operating landfill located in King County. Materials are delivered to the landfill via tractor-trailers that provide transport from a system of eight transfer facilities located throughout the County.

The King County Solid Waste Division takes a proactive approach to disaster preparedness. Plans for the division's response and recovery from disaster impacts have been developed and are regularly updated. Staff training and plan updating are done on a continuous basis. As pre-disaster mitigation needs are identified, they are prioritized and the Division takes steps to include them in their capital improvement budget, their asset management budget, or to fund them through grants or similar sources.

The King County Solid Waste Division Strategy and Initiatives are consistent with the Regional Goal to Protect Human Health and Safety. KC Solid Waste supports this goal by providing quality services that responsibly manage the County's solid wastes.

Mitigation History
Past mitigation efforts conducted by the Division of Solid Waste have focused on providing all hazards capabilities to division sites and locations. This has included communications capability improvements, installation of backup power generator capacity, structural evaluation of facilities and subsequent roof replacement (completed) at one of the transfer stations.

Current mitigation activities include redesign and rebuilding of roof structures at a two additional transfer stations. One project is currently in progress, the other is in the permitting stage. The roof replacement will result in a significant reduction in possible earthquake damages, wind damages, and potential damage from excessive snow loading. The Division is in the progress of expanding its data sharing network to improve system redundancy and maintain system operations.

The Strategic focus of the Division of Solid Waste is to:

- To maintain essential services
- Provide environmentally sound transfer and disposal of solid waste
- To minimize damage during an event
- To return closed facilities to operation as quickly as possible

The Solid Waste Division Strategy will benefit the 1.14 million customers of King County by continuing service and supporting debris management resulting from natural or technological disasters. Our goals are consistent with the Regional Strategy.

Jurisdiction Strategy
Public Health Seattle King County

Public Health Seattle King County (Public Health) provides services to communities throughout King County, Washington, in order to sustain healthy people by promoting healthy behaviors and preventing disease and injuries. Public Health also cooperates with other counties and state jurisdictions for the provision of similar services. We serve the County with a staff of 1700 employees at 35 sites.

Public Health works to increase and enhance its ability to respond to natural, technological and criminal hazards by improving security, educating and protecting personnel and the public, and protecting physical and cyber assets against damage or attack. Mitigation against acts of bio terrorism continues to develop and shift with the perceived local and national threat.

To date, Public Health has developed plans and procedures for mobilizing personnel to address critical consequences. Critical training needs for all staff have been identified, as well as anticipated education, mitigation, and planning activities. Public Health has purchased and distributed communication equipment, tested security practices, participated in regional and national exercises, and cooperated with hospitals in planning for coordination of medical services such as regional and local hospital bed counts during emergencies and disasters.

The mitigation strategy proposed for Public Health is to:

- Acquire communications response equipment
- Provide training for department personnel
- Enhance security at critical facilities
- Enhance disease surveillance capabilities
- Enhance intelligence and information sharing capabilities with national and state government entities
- Enhance integrity of structural and non-structural building elements at sites occupied by Public Health

Public Health continues to seek funding for these issues through the budget process, grants and other funding sources. We continue to participate in grant funded CDC disease response programs as well as programs locally-funded by the levy process. Other needs require additional funding which are currently unavailable through the budget process.

Proposed projects would protect lives and property of Public Health staff, patients, emergency responders and citizens of Seattle and King County, and would allow the department to continue providing critical public health services in the event of a large-scale emergency, disaster, or terrorist attack.

Mitigation Strategy
J:\KC Regional Mitigation Plan\Initiatives Report\PHSKC Strategy.doc

Paragraph 1

1. Public Health Seattle King County provides services to communities throughout King County, Washington, in order to sustain healthy people by providing public health services which promote health and prevent disease. Public Health also cooperates with other counties and state jurisdictions for the provision of similar services. It serves the County with a staff of 1700 employees at 35 sites.

Paragraph 2

1. Regional Goals or Objectives Public Health Seattle King County is working to increase and enhance its ability to respond to natural disasters and acts of terrorism by improving security, educating and protecting personnel and the public, and protecting physical and cyber assets against damage or attack. Counter terrorism mitigation against acts of bio terrorism continues to develop and to shift with the perceived local and national threat.

2. Historic Projects Programs related to mitigation that illustrate jurisdictions commitment:

Public Health Seattle King County is working to increase and enhance its ability to respond to natural disasters and acts of terrorism by improving its vaccination programs and identification surveillance.

Paragraph 3

Future mitigation projects or plans associated with Year One Hazards:
To date, Public Health Seattle King County has developed plans and procedures not only for essential personnel, but also for the basic emergency training of all staff. It has planned for additional education, mitigation, and planning, purchased and distributed communication equipment, tested security practices, participated in regional and national exercises, and cooperated with hospitals in planning for coordination of medical services such as regional and local hospital bed counts during emergencies and disasters.
In addition, the Department is planning to secure non-structural elements at its facilities.

Paragraph 4

Mitigation Strategy: Prioritized list of projects

1. Education of PH staff.
2. Communications system
3. Infectious disease outbreak team..
4. Public Education
5. First responder reporting capabilities
6. Mitigation of nonstructural and structural damage to facilities
7. Syndromic surveillance
8. Environmental Health program enhancement

Paragraph 5

All of the above project area will require new sources of funding

Paragraph 6

1. Anticipated proposal benefits in dollars, services, or people/lives:
The primary benefits will be the community savings of preserving health and lives, the prevention of damage to structural, non-structural elements, and to public health records and the damage to potentially hazardous (medical) materials at the public health facilities.

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: Public Health Seattle/King County

Type of Hazard: Earthquake, winter storm, civil unrest, flooding, etc.

Category: Life and health safety, public information and education, internal all-hazards, first responder training and reporting,

Brief Description of Proposed Projects:

Our goals are to support the public's health through emergencies and disasters by

1. Education of the Public Health staff in response to emergencies

Rationale for project: (*Recognizing the hazard and proposed solution, resolution, and/or specified law or regulation impinging on the project*).

RHMP Goals
1.Supporting life and safety
Enhance physical structures
Education
Lead Jurisdiction:

Participating Jurisdictions:
Education: King Co. and City of Seattle
Cost of Project: Not yet determined
Estimated time period implemented: 5 years
Funding Sources: Not yet determined
Adoptive date and/or Ordinance #: Not yet determined

Status:
Programs have been begun to educate staff to respond at home and at work to emergencies and disasters.

Status: Ongoing

Attachment A
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Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: Public Health Seattle/King County

Type of Hazard: Earthquake, winter storm, civil unrest, flooding, etc.

Category: Life and health safety, public information and education, clinical response training, reporting, and communication of infectious diseases

Brief Description of Proposed Projects:

Our goals are to support the public's health through emergencies and disasters by

3. Infectious disease outbreak response team program

Rationale for project: (*Recognizing the hazard and proposed solution, resolution, and/or specified law or regulation impinging on the project*).

RHMP Goals
Supporting life and safety
Lead Jurisdiction: King Co. and City of Seattle
Cost of Project: Not yet determined
Estimated time period implemented: 5 years
Funding Sources: Not yet determined
Adoptive date and/or Ordinance #: Not yet determined

Status:
Enhanced environmental health program is currently unfunded

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: Public Health Seattle/King County

Type of Hazard: Earthquake, winter storm, civil unrest, flooding, etc.

Category: Life and health safety, public information and education, internal all-hazards, first responder training and reporting,

Brief Description of Proposed Projects:

Our goals are to support the public's health through emergencies and disasters by

4. Planning for the education of the public in disaster response

Rationale for project: (*Recognizing the hazard and proposed solution, resolution, and/or specified law or regulation impinging on the project*).

RHMP Goals
1.Supporting life and safety: PublicEducation
Lead Jurisdiction:
Participating Jurisdictions:
King Co. and City of Seattle
Cost of Project: Not yet determined
Estimated time period implemented: 5 years
Funding Sources: Not yet determined
Adoptive date and/or Ordinance #: Not yet determined

Status: Some planning has been done of public health information (fact sheets, etc for distribution) for the public during disasters.

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: Public Health Seattle/King County

Type of Hazard: Earthquake, winter storm, civil unrest, flooding, etc.

Category: Life and health safety, public information and education, internal all-hazards, first responder training and reporting,

Brief Description of Proposed Projects:

Our goals are to support the public's health through emergencies and disasters through:

5. support and enhance current EMS first responder reporting capabilities

Rationale for project: (*Recognizing the hazard and proposed solution, resolution, and/or specified law or regulation impinging on the project*).

RHMP Goals
Supporting life and safety:
Enhance current reporting of disasters and regional emergency electronic data collection by King County Medic One First responders
Lead Jurisdiction:
King County
Cost of Project: Not yet determined
Estimated time period implemented: 5 years
Funding Sources: CDC and King County bond issue (King County Levy)
Adoptive date and/or Ordinance #: currently being piloted

Status:
currently being developed and tested

Benefit/Cost Ratio: Not yet determined.

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: Public Health Seattle/King County

Type of Hazard: Earthquake, winter storm, civil unrest,flooding, etc.

Category: Life and health safety, public information and education, internal all-hazards, first responder training and reporting,

Priority: high

Brief Description of Proposed Projects:

Our goals are to support the public's health through emergencies and disasters by

6. Mitigation of
   a. structural damage at Public Health sites including training to determine structural damage during and after impacts
   b. non-structural damage at Public Health sites including training to determine non-structural damage during and after impacts

Rationale for project: (*Recognizing the hazard and proposed solution, resolution, and/or specified law or regulation impinging on the project*).

RHMP Goals
1.Supporting life and safety
Enhance physical structures
Education
Lead Jurisdiction:
We lease buildings from King Co., The City of Seattle and private building owners
Participating Jurisdictions:
Education: King Co. and City of Seattle
Cost of Project: Not yet determined
Estimated time period implemented: 5 years
Funding Sources: Not yet determined
Adoptive date and/or Ordinance #: Not yet determined

Status:
No current programs to enhance the seismic integrity of currently rented structures.
Some initiatives begun to mitigate non-structural hazards
Future policy to refrain from renting structures which do not meet current local seismic standards.

Status: Ongoing
Attachment A
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Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: Public Health Seattle/King County

Type of Hazard: Earthquake, winter storm, civil unrest, flooding, etc.

Category: Life and health safety, public information and education, internal all-hazards, first responder training and reporting,

Brief Description of Proposed Projects:

Our goals are to support the public's health through emergencies and disasters by

7. Enhancement of syndromic surveillance

Rationale for project: (*Recognizing the hazard and proposed solution, resolution, and/or specified law or regulation impinging on the project*).

RHMP Goals
Supporting life and safety
Lead Jurisdiction: King Co. and City of Seattle
Cost of Project: Not yet determined
Estimated time period implemented: 5 years
Funding Sources: Not yet determined
Adoptive date and/or Ordinance #: Not yet determined

Status:
Enhanced syndromic surveillance has been initiated by the addition of an expanded epidemiological program and the addition of personnel to staff it.

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: Public Health Seattle/King County

Type of Hazard: Earthquake, winter storm, civil unrest, flooding, etc.

Category: Life and health safety, public information and education, internal all-hazards, first responder training and reporting,

Brief Description of Proposed Projects:

Our goals are to support the public's health through emergencies and disasters by

8. Enhanced environmental health programs for response to terrorist acts involving:
   a. chemical and radioactive events
   b. threats to the food and water supply
   c. airborne illnesses

Rationale for project: (*Recognizing the hazard and proposed solution, resolution, and/or specified law or regulation impinging on the project*).

RHMP Goals
Supporting life and safety
Lead Jurisdiction: King Co. and City of Seattle
Cost of Project: Not yet determined
Estimated time period implemented: 5 years
Funding Sources: Not yet determined
Adoptive date and/or Ordinance #: Not yet determined

Status:
These environmental health programs are currently unfunded.

Jurisdiction Strategy
King County Information and Technological Services Division

Jurisdiction Profile
King County Government's enterprise technology infrastructure provides important tools to support government operations. The voice and data communications networks are the two most critical components. In the event of a disaster, either natural or man-made, the County's immediate ability to respond to the emergency, provide financial, human resource and criminal justice services and maintain other direct services to the public are dependent on continued operation of those communications networks. This communications network serves a workforce of approximately 13,000 employees who support over 1.7 million County residents.

Hazard Identification
In 2002, the County began to experience significant network outages as a result of the Nachi worm. This impacted over 3,000 King County Government employees. The resulting impact of lost productivity was conservatively estimated at 10-20%. At an average burdened cost of $35 per hour, productivity losses were between $170,000 and 340,000 for this event. Approximately 45 technology staff members were engaged in response and recovery at a cost of $65,000. Public Health billings worth approximately $100,000 per day were delayed. The county trend toward increasing on-line services increases the potential service impacts from such system outages.

King County ITS Mitigation Strategy

- **Create more securely architected networks.** This includes better segmentation as well as instituting additional security capabilities (e.g. firewalls, intrusion detection, etc.). This initiative provides for a three pronged attack: prevention, detection, and rapid isolation.
- **Add redundancy for essential application servers.**
  King County and the City of Seattle face the same risk exposures with their primary data centers.
- **Promote redundancy in regional voice and data communications networks**

Highest Priority will be given to protection of existing information and telecommunications infrastructure. Moderate priority includes backup capacity and training.

Implementing Funding Sources
Funds to accomplish these strategic objectives are not currently available. Minor improvements and assessments will occur through King County internal funding sources. As grants or other resources become available the supporting initiatives will be implemented. King County currently operates on an annual budget cycle.

Mitigation Benefits
Mitigation measures related to security and redundancy of information systems protects the productivity of 13,000 government employees, and the continuity of government services to 1.7 million citizens.

Consistency with Regional Objectives
Strategic Priorities were established using Economic Cost-Benefit and population served objective criteria.

Metro King County Transit

Jurisdictional Profile

King County Metro is a transit agency whose service area is King County including the major cities of Seattle and Bellevue. Operations are conducted from seven bus bases and one streetcar barn with a daily ridership of 300,000.

Hazard Identification and History

The primary hazards affecting operations are snow/ice storms, earthquakes, and terrorist acts. Snowstorms disabling major traffic corridors including the central business district of Seattle occur on a repetitive basis. Seismic activity due to geological faults in the area has resulted in several earthquakes and tremors in the recent past including a 6.8 in April of 2001. There have been no major acts of terrorism in King County but Seattle has been consistently assigned high target values. Transit vulnerabilities include a 1.3mile transit tunnel under the Seattle business district, several operating bases and a fleet of over 1300 buses.

Regional Goals

King County Metro Transit's identified hazards and correlating initiatives are consistent with the King County Regional Hazard Mitigation goals. Specifically Metro's initiatives as a provider of public transportation are to protect the life and property of the riding public (Regional Goal #1).

Current Mitigation Efforts

Primary mitigation planning has focused on providing continued transit service for the general public as well as assisting any local evacuations. To support the primary mission attention has been given to protecting agency human and physical assets. The protection of critical infrastructure has included retrofitting all critical facilities structurally as well as securing the contents. Facilities that could not be retrofitted are in the process of being replaced including the construction of a self-sustaining communications and control center. . Standby electrical generator capacity has also been added to three of the seven operating bases making them self-supporting. A Department of Justice grant has been approved for tunnel security improvements, creation of an All Hazards/WMD Plan and counter-terrorism/WMD mobile command centers. A full time security program manager has been hired to facilitate the integration of all transit security systems.

Mitigation Strategies and Prioritization

The Metro King County mitigation plan is consistent with the regional objectives of Protection of Life and Property. Metro's strategy is:

1. Protection of the ventilation system in the transit tunnel.
2. Completion of the security camera installation on board the bus fleet.
3. Make new and current facilities resistant to earthquakes.
4. Provide additional onsite electrical capacity to make key facilities self-supporting
5. Implement security upgrades to transit assets to detect or lessen the affect of terrorist acts.

Prioritization of the mitigation initiatives (#1 and #2), attached, was based on the benefit-cost ratio of the two capital projects and the presence or absence of factors already mitigating the identified hazards. Items #3-6 were rated lower in importance because they are either part of the building code or have been funded and initiated.

Mitigation Funding

Funding sources in addition to federal grants for King County Metro Transit are: fare box increases, fund balances, self-insurance fund reserve and bond sale. Plan implementation is based on funding availability.

Internal Planning

Mitigation planning is staffed with relevant managers and supervisors and is approved by the Deputy General Manager. This plan was prepared by Metro Transit Safety in accordance with King County Office of Emergency Management directives, document review/ research and interviews of pertinent Metro personnel.

Plan Maintenance

The planning team will continue to participate in the regional planning process and update the annex with an annual review with all King County agencies. Further review and revision will take place following every major hazard event. The primary holders of the plan are the Deputy General Manager/ Homeland Security Officer and the Supervisor of Service Communications.

Adoption Process

See King County plan adoption.

Status: In Progress

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Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: Department of Transportation; Division of Metro Transit

Type of Hazard: Multi-hazard

Category: Facility

Priority: #1 Plan Adoption # (*tracking #)*

Brief Description of Project: Ventilation of Downtown Seattle Transit Tunnel: A positive ventilation system to limit the damage resulting from fires, fumes, or gases from chemicals used to control terrorists, civil unrest, or released by natural hazards.

Rationale for project: Emergency fans would remain open to the atmosphere. Barriers would restrict the flow by 75% allowing quick decontamination and recovery after an event. Complete details of the plan needs to be studied.

RHMP Goals Life and Health Safety RHMP Objectives:

Lead Jurisdiction: King County Metro Transit Facilities Program Managing Engineer
Participating Jurisdictions:

Cost of Project: $1.2M

Estimated time period implemented: two years

Funding Sources: Dept. Homeland Security
Matching %

Primary	100%
Secondary	____
Tertiary	____

Source and Date:

Adoptive date and/or Ordinance #

Status: Study and Design

Benefit/Cost Ratio: 250 : 1

Status: In Progress
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Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: King County Metro Transit

Type of Hazard: Multi Hazards -Civil Unrest & Terrorism

Category: Health and Life Safety/ Property

Priority: #2 Plan Adoption # (*tracking #)*

Brief Description of Project: **Bus Security Cameras** Installation of cameras on 700 buses to deter crime associated with civil unrest and terrorism.

Rationale for project: Terrorists or criminal activity can result in the loss of a 60 foot bus and subsequent lives of passengers and infrastructure.

RHMP Goals Health & Life Safety RHMP Objectives:

Lead Jurisdiction: King County Metro Transit Manager of Vehicle Maintenance
Participating Jurisdictions:

Cost of Project: $7,420,000.00

Estimated time period implemented: 2-3 years

Funding Sources: General Funds & Grants

Matching %
Primary ____
Secondary ____
Tertiary ____

Source and Date:

Adoptive date and/or Ordinance #

Status: The proposal is in the study and developmental stage.

Benefit/Cost Ratio: .11 : 1

Jurisdiction Strategy
King County Facilities

The King County Facilities Management Division owns and operates 33 critical facilities located within 13 municipalities and in unincorporated King County in a jurisdiction that encompasses more than 2,200 square miles. Facilities include the King County Courthouse, Sheriff's Precincts and Communications Center, office space, clinics, maintenance locations and other facilities. A list of facilities is identified in the Critical Facilities Annex to this plan. Like other structures in King County, these facilities are subject to potential damages from natural disaster such as earthquakes, high winds and winter storms, urban flooding, or volcanic activity. Technological events like hazardous materials and radiological events are possible. Many King County government facilities are visible to the public and present opportunities for public demonstrations and terrorist activities.

The goal of King County Internal Government, Facilities Management Division is to protect life and property, to support emergency services and maintain continuity of government services in critical facilities through hazard mitigation. This is consistent with the Regional Mitigation Goals and Objectives.

Current Mitigation efforts include completion of seismic surveys, which identified the need for seismic mitigation projects in 17 critical facility buildings owned and operated by the King County Facilities Management Division. Seismic mitigation efforts have been completed in seven of those buildings are in progress at 8 buildings, and are scheduled for 1 additional facility. Design work is in progress for the one remaining facility requiring seismic upgrades.

Initiatives include:

- Seismic Upgrades to existing facilities
- Anti Terrorism improvements to warning and security systems in buildings (prioritized)

Mitigation efforts will continue on the facilities noted within existing capital improvement budgets. Extension of seismic mitigation projects to additional facilities is dependant of new sources of funding. Anti-terrorism warning and security mitigation measures are also dependant on finding new sources of project funding.

The anticipated benefits from following this strategy are the ability to protect the lives of government employees, emergency responders and the public, and reduce the vulnerability of public property to natural and terrorist impacts. Increased security at key government facilities would support and maintain continuity of government and critical functions prevent repetitive loss and remedy repetitive losses.

Strategic Priorities were established using Economic Cost-Benefit and population served objective criteria.

Jurisdiction Strategy
King County Fire Marshal's Office

The King County Fire Marshal's Office (FMO) serves the citizen and businesses of unincorporated King County and contract cities with fire prevention and fire investigation services. Its mission is to promote public safety within the Uniform Fire and Building Codes as amended and adopted by King County.

The King County Fire Marshal's Office promotes mitigation by conducting inspections of new and existing properties within its service area. Its services promote public safety and minimize fire damages to residents and commercial properties. Representatives of the Fire Marshal's Office participate in code review and the adoption/revision process for the fire and Building codes. The FMO provides technical assistance to the King County Office of Emergency Management in the development of the Regional Hazard Mitigation Plan.

The King County Fire Marshal's Office mitigation strategy is to continue to promote structural improvements, planning and training consistent with the Regional Mitigation Plan human safety and property conservation objectives. Mitigation Measures within the service area include:

- Continued inspection of existing and new construction
- Plan Reviews for noted construction
- Support of Education, training and informational programs
- Working with schools and fire service public educators delivering public safety messages

These efforts will continue with existing resources derived from permitting fees and general revenue budgets.

The citizens and businesses within the KC FMO service area benefit from mitigation efforts with lower insurance premiums, fewer incidents of fire damage to properties and few injuries and deaths from fires in King County.

Strategic Priorities were established using Economic Cost-Benefit and population served objective criteria.

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Annex C: King County Government and Jurisdiction Participation

Historical Planning Process Information Retained from 2004 Plan

Annex C: Historical King County 2003 / 2004 RHMP Planning Process Information (retained in 2009 Plan update)

2004 Editor's Note: The following sections outline the process utilized during the initial drafting of the Plan in 2003. The planning process consisted of multiple phases and teams, including the Taskforce, work groups, and partners group.

The RHMP "Taskforce" included representatives from participating agencies who acted as a guiding body for the direction of the regional plan and work group activities. The Taskforce met monthly to review work progress, adoption process and public participation efforts.

Originally, participating agencies met monthly as a group. When a review of the RHMP progress and information submitted by jurisdictions was conducted late in the spring of 2003, it became evident that some agencies had made substantial progress in the planning progress while other agencies had not. For this reason, participants were divided into two groups – one with a submission deadline of December 8, 2003 and a second group to convene for the 2004 planning phase. Only those with December 8th deadline targets participated in work group sessions. Work groups were segregated into operational areas: schools, cities, utilities, fire districts, and King County government agencies. They met every week to discuss selected topics, submit data and review draft plan document drafts. Eventually the schools joined the cities work group to consolidate meeting schedules. New work groups for the next planning phase were formed in early 2004.

In an effort to pull together the entire process, all participants and interested parties met once a month at the "RHMP Partners Meeting." This forum provided an opportunity to brief everyone on the plan status, distribute draft documents, share information and provide for agency comments and feedback.

Note: 2009 RHMP Partners are now referred to in the plan as "Planning Team," which is an informal body comprised of representatives from jurisdictions that have annexed or wish to annex to the RHMP.

King County Emergency Management Staff Support

King County's personnel contribution to the development of the Regional Hazard Mitigation Plan consisted of two full-time Project Management III staff members, one contract temporary technical writer, one part-time work-study student, and several volunteers. These staff resources were dedicated to the facilitation of regional participation, coordination of the planning process, research, data collection, plan writing, and administration of public presentations. Office of Emergency Management staff also provided support and guidance to partner agencies as requested and developed and maintained the RHMP website for the benefit of partner agencies and the general public.

Data Collection and Mitigation 20/20 Software

The County received a copy of "Mitigation 20/20" software as part of the 2003 / 2004 FEMA / State $100,000 Pre-Disaster Mitigation grant to develop a King County RHMP. This "Microsoft Access" database program provided a step-by-step method to help agencies collect and evaluate hazard mitigation data. We provided a limited version of the County's master copy to interested signatories, per the licensing agreement. While the software was somewhat useful for single jurisdictions, it did not lend itself to the political jurisdictional environment in King County or to a true regional hazard mitigation planning effort. In addition, some agencies did not have the computer hardware or software capability to run the program. Forms and data generated and collected in the Mitigation 20/20 software format was limited but somewhat useful as a standard for collecting data in hardcopy form. Some agencies opted to use their own methods for collecting, documenting and evaluating data for their plan. This information was manually integrated with other data submitted via the Mitigation 20/20 format. Due to program limitations, the County chose to manually develop the plan instead of utilizing the pre-written format provided in the Mitigation 20/20 program. Mitigation 20/20 will not be utilized for future revisions and additions to the RHMP.

Plan Adoption

The December 8, 2003 submission date and the RHMP work plan left very little time for the regional partners to review and adopt the final composite of the Draft Plan. For this reason, the plan sections were released to the partners as they were drafted for comment and reviewed at the weekly work group meetings. Draft documents were also made available on-line at the King County Office of Emergency Management website at www.metrokc.gov/prepare/KCRHMP as they were completed. Partners and citizens alike were given access to the documents in this fashion.

Intention to Adopt – Individual Agencies

Each jurisdiction chose to pass resolutions expressing their intention to adopt the King County Regional Hazard Mitigation Plan upon acceptance of the plan by Washington State Emergency Management and FEMA. This was done at different points in the process per the desires of each jurisdiction. Documentation of the adoption resolution was a requirement for acknowledgement of the jurisdiction's successful participation in the hazard mitigation planning process. All participating agencies in this planning session met this requirement as identified in the Annex D: Plan Adoption, in the 2004 Plan. Original resolutions are kept on file at the King County Office of Emergency Management.

Public Involvement

The planning process attempted to provide opportunity for public involvement in a variety of ways at every step. While we recognized this topic was typically of interest to specific individuals and groups, we provided appropriate opportunity to gain public interest and feedback. We felt it was important to educate the public on the hazard mitigation planning process as well as the specific work being done by the various agencies contributing to the Plan.

We also acknowledged the need to reach individuals and groups at all levels in a way that met their needs. To accomplish this we approached the task using several different methods:

CTV- King County Civic Television

In March 2003, the County produced and aired a "Project Impact" segment featuring the Director of Emergency Management, Taskforce members and RHMP project staff. The production, televised on County Television (CTV), focused on the types of hazards that occur in our region and the benefits to developing a multi-jurisdictional Regional Hazard Mitigation Plan. This segment was available to a potential viewing population of approximately 445,000 households throughout King County. VHS and DVD copies were also made available to RHMP partner agencies.

Internet / Website

A portion of the King County's Emergency Management website was specifically dedicated to regional hazard mitigation planning. This site was developed and still remains as a tool for participating agencies as well as the general public. It contains information on hazard mitigation planning, help for participating agencies, resources, draft and final plan components, and a method for providing plan comments and feedback. The address is www.metrokc.gov/prepare/kcrhmp.

Public Meetings

As the RHMP was being developed, Office of Emergency Management staff conducted presentations to a variety of political and community groups, including commissioners, city councils, emergency managers and the general public. Many of these meetings and/or presentations were provided as a direct result from public requests. To insure a formal opportunity for the public to provide input, staff and members of the RHMP Partners group hosted two public meetings, one in Woodinville and one in Federal Way. Meeting content included an overview of the hazard mitigation process and the Plan.

The public presentations completed prior to the submission of the plan to Washington State Emergency Management are listed in Annex E: Public Participation, of the 2004 Plan.

Citizen Involvement

The RHMP group benefited greatly from the interest and involvement of a private citizen who was willing to dedicate time and disaster-related expertise to the project. He contributed a considerable amount of personal time doing research, developing sections of the Plan, reviewing the draft document, and helping to facilitate meetings.

Participating Agency Input

For participating agencies, the review process was incorporated into the weekly work group meetings and monthly RHMP partner meetings. Partners were provided with draft documents in hard copy and/or via electronic format for their review. There were able to provide input, additions and corrections throughout the entire process.

Public Review Comment Period/Process

Throughout the planning process the RHMP was made available via the World Wide Web for public review; no comments were received from the general public by the November 8, 2003 deadline. Any written comments received after November 8, 2003 and prior to March 1, 2004 will be addressed in the next planning phase starting in 2004. The Plan was also distributed during public meetings with utility commissioners, city councils and fire commissioners.

Continued Public Involvement

The FEMA Approved Draft of the Regional Hazard Mitigation Plan will be made available via a link on the King County Office of Emergency Management website at www.metrokc.gov/prepare. A second Project Impact television Program was planned to elaborate on the Plan and the projects being implemented in the region. As the Plan underwent additional amendments and

additions, public meetings were announced at locations around King County. The pubic could contact the project manager at anytime with comments. The project manager scheduled public meetings during the revision process for inclusion of their comments. Meetings were held at locations around King County. Hardcopies of the most current version were made available to the library system in King County once FEMA approved the submitted draft.

Documentation

King County Office of Emergency Management, the coordinating agency, documented and tracked meeting attendance, participation activities, and public review and comment throughout the entire planning process.

RHMP partners were required to sign in at all meetings. Later in the process, OEM designed an electronic tracking record in order to monitor week-to-week agency participation.

OEM project staff developed a “Functional Group Work Plan” that outlined the weekly activities for each discipline group. Each agency was required to submit data in hardcopy and electronic formats. All data was filed in electronic as well as hard copy filing systems. In order to track whether data was submitted and if it was complete, OEM staff also developed a quick-reference tracking form. Meeting reminders and meeting summaries were provided to partners via e-mail.

Agendas and draft plan documents were provided at public meetings. Public input and comments were documented. Comments and input received through other avenues, such as participant meetings, agency review, or the web site were documented and maintained in hard copy files. Electronic media was also maintained in the electronic filing system. All plan comments were addressed and documented. For comments that were not included in the December 8, 2003 / 2004 Plan submission, written justification was provided.

All documents are maintained at the King County Office of Emergency Management. Work plan, data summaries and other tracking documents are in Annex C: 2004 Agency Participation.

Cost - Benefit Review

Cost – Benefit review consideration is a requirement of this mitigation plan. The Office of Management and Budget Circular A-94 describes the economic principles and methods by which most federal programs must determine the cost-effectiveness of funded projects. OMB A-94 states: “Analysis should include comprehensive estimates of the expected benefits and costs to society based on the established definitions and practices for program and policy evaluation. Social benefits, and not the benefits and costs to the Federal Government,

should be the basis for evaluating government programs or policies that have effects on private citizens or other levels of Government."

Elements of Cost - Benefit Review

Cost - Benefit Review is an effort to objectively prioritize projects that will best serve the community in a cost-effective way. This key element in the planning process is derived from the use of multiple elements. Many of the regional partners participating in the development of the Regional Hazard Mitigation Plan used Mitigation 20/20 software methodology to generate this ratio by using a formula. The formula requires an estimated cost to implement the project, the estimated replacement cost of the infrastructure protected by the project and the population served by the services provided by agencies using the infrastructure. Additional factors might include a valuation of human life derived from the World Trade Center Terrorist Attack on 9/11/01, relative service levels provided by major equipment and/or facilities in a jurisdiction. An effort to quantify other intangible benefits that might contribute to public or responder safety was included by specific agencies as needed.

All signatory agencies to the Regional Hazard Mitigation Plan have included Cost - Benefit Review as a primary consideration in the establishment of their strategy unless other wise specified in their annex. Only mitigation projects with a ratio greater than 1 have been considered for inclusion in the jurisdiction annexes. Some organizations included greater detail in their C - B Review descriptions.

Implementation of the Regional Hazard Mitigation Plan

All signatory agencies to the Regional Hazard Mitigation Plan implemented their designated strategies through the following funding mechanisms unless otherwise designated in their individual annexes:

- Capital Improvement Program Budgets
- Operations Budgets
- Grant Proposals where available
- Expansion of Public Education program scope
- Proposals for bond levies where applicable

Most signatory agencies operate on annual budget cycles. Some large projects may require implementation over multiple budget cycles (pipeline replacement is an example). Progress and changes were addressed in the regular revisions of this Plan by all signatory agencies as noted under Plan Administration and Maintenance below.

Plan Administration and Maintenance

The King County Office of Emergency Management Director/ Program Manager is the designated keeper of the Regional Hazard Mitigation Plan (RHMP). The King County Office of Emergency Management will be responsible for administering changes to the Plan, facilitating the planning process for new partners, and forwarding annual revisions to Washington State Emergency Management for review.

Signatory jurisdictions, businesses and agencies to the RHMP were responsible for the maintenance of their individual strategies, revision of incomplete mitigation initiative efforts, and submission of those changes to the King County Office of Emergency Management for review by the Regional Hazard Mitigation Plan Taskforce. RHMP amendments, revisions and additions were to be provided to the Regional Hazard Mitigation Plan Taskforce by the end of September each year for review. Changes to RHMP sections one through six will be affirmed by the impacted department managers.

The RHMP was to be revised annually for resubmission to FEMA and the State of Washington, on the second Monday of December. Changes to the RHMP would be posted on the King County Office of Emergency Management website. A public meeting to present the Plan changes or additions was conducted one month after review by Washington State Emergency Management but prior to acceptance by FEMA. Public comment will continue to be solicited.

Transmittal of Plan Documents

On November 12, 2009, King County Department of Executive Services, Office of Emergency Management (OEM), transmitted copies of the King County Regional Hazard Mitigation Plan (RHMP) to the State of Washington, Emergency Management Division (EMD), Mitigation Strategist, for official review and submission to FEMA. FEMA conditionally approved the Plan on November 30, which cleared the way for King County and each partner jurisdiction to formally adopt the Plan. Adoption dates for specific annexes may be found in Annex XX and in each jurisdictional annex.

Annex C

Attachment A
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2009 Planning Team - KC Hazard Mitigation Plan Meetings

Date	Document	Venue
5/18/2009	Sign-In Sheet	King County ECC
6/15/2009	Sign-In Sheet	King County ECC
7/13/2009	Sign-In Sheet	Hazard Mitigation Meeting
9/17/2009	Conference Call Roster	KC OEM, State EMD 2009 and Conference Call Participants
9/29/2009	State EMD Doodle Poll	"King County Technical Assistance Day" at KC ECC
9/29/2009	Sign-In Sheet	2009 Regional Mitigation Plan - Participating Agencies Workshop

King County ECC Sign in Sheet **Date** **Mission Number**

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Sign in Date	Sign in Time	Name	Agency Discipline	Cell phone	Pager	Sign Out Date	Sign Out Time
05/18	1245	Jerry B. Thornton Sr. ✓	WD 125	206/9475172	—	05/18	1440
5/18	1245	David Remmerth	EWPS	206 396-4275			
5/18	12:50	Robert Taylor ✓	Covington Water Dist	253-631-0565	—		
5/18	12:56	GLENN STAUFFMAN	"	"	—		
5-18	1256	JEFF MILLER	BLACK DIAMOND PD	253-631-1012			
5/18	12:56	Kris Finnigan ✓	Medina	206-931-6932	—		
5/18	12:55	Lacey Croco ✓	Bellevue	425-452-7923		5/18	1410
5/18	12:55	Jennifer Wormke ✓	Bothell	(425) 486-1678			
5/18	12:55	Tim CAMPBELL ✓	MIDWAY SEWER DISTRICT				
	12:57	LEN CORNWELL ✓	SAMMAMISH PLATEAU WSD	425-392-6256	DESK	5:15	2:10
5-18	13:00	Gordie Olson ✓	South King Fire & Rescue	2065103197			
5-18	13:00	Priscilla Kaufmann ✓	King County, Water & Land	206-205-0598		2:15	
5-18	1:00	Kurt Oakland ✓	Woodinville Water	206 255 2730			
5-18	1:05	Jeff Lakin ✓	Water District 19	206 300 4211		5/18	2:15
5-18	105	PATTI HARRIS	DES MOINES PD	(206)396-4690			
5/18	1309	BRET HEATH ✓	ISSAQUAH EM	4258323475			
5/18	1309	Mary Hobday	Federal Way	253-837-2704			
5/18	1310	Scott Webster	MVFLS (KCFD #43)	4254326200			
5/18	1320	Mike Barlow ✓	Fire District 44	253-569-3711		5/18	1430
5/18	1500	DAVE Nelson ✓	KCFD 20	425 864 1583			
5/19	1350	JAY BENNETT ✓	City of Pacific	253-929-1113			

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King County ECC Sign in Sheet **Date** **Mission Number**

Sign in Date	Sign in Time	Name	Agency Discipline	Cell phone	Pager	Sign Out Date	Sign Out Time
6-15	1250	Larry Rude	MVFLS	206 423-6857			
6-15	1250	Gordie Olson	South King F+R	206 510 3192			
6-15	1250	Dave Nelson	KCFD 20	425 8641583			
6/15	1250	GLENN STOCKMAN	COVINGTON WATER DISTRICT	253.631.0565			
6/15	1250	KORY BATTERMAN	DES MOINES POLICE	206 870 7617			
6/15	1251	JENNIFER WARNKE	BOTHELL	425-486-1678			
6/15	1254	Kris Finnigan	City of Medina	206-931-6932			
6/15	1255	DAVID REMMEM	Federal Way Publicschools	206-396-4275			
6/15	1255	Mary Hobday	Federal Way	253-835-2704			
6-15-09	12:59	Priscilla Kaufmann	Water & Land Resources Div	206-205-0598		6-15-09	1:59
6/15/09	12:59	Vernon Owens	City of Bellevue	(425)-452-6033			
06/15/09	1300	Jerry B. Thornton Sr.	KC Water District 125	206) 947 5172	electronic support matl's		(files & links
6/15/09	1300	LEN CORNWELL	SAMMAMISH PLATEAU WATER + SEWER DIST	425-392-6256			Tom J
6/15/09	13:00	David W. Brower	KCWD 125	206-396-4849			
6/15/09	13:00	Jay Bennett	City of Pacific	253-250-2074			
6/15/09	1300	SARAH MILLER	CITY OF AUBURN	253 876 1909			
6/15/09	13:00	Matt Everett	Highline Water Dist	206 571-1282			
6/15/09	13:00	JEREMY DELMAR	" " "	206 592-8904			
6/15/09	13:00	SCOTT WEBSTER	MVFLS	206-423-9670			
6/15/09	1300	Hillman J. Mitchell	Emergency Mgmt	206 433-7182			

SIGN-IN SHEET

Meeting Purpose: Hazard Mitigation Meeting

Date: 7/13/2009

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Name	Organization	E-Mail Address	Phone (including Area Code)	FAX (including Area Code)
LEN CORNWELL	SAMMAMISH PLATEAU WSD	LEN.CORNWELL@SAMMAMISH.WA.ORG	425-392-6526	
JEREMY DELMAR	HIGHLINE WATER DISTRICT	JDELMAR@highlinewater.org	206-592-8904	
LARRY RUDE	MAPLE VALLEY FIRE & LIFE SAFETY		425 4720200	
DAVE NELSON	KCFD 20	dnelson@kcfd20.org	425-864-1583	
SCOTT WEBSTER	MAPLEVALLEY FIRE + LIFE SAFETY	scottw@maplevalleyfire.org	425-432-0200	
Lo Pierro	K.C.W.D # 90		425-255-9600	425.2274128
JOSHUA DERAITUS	KCWD 90	JOSHUA_DERAITUS@MSN.COM	425-255-9600	
JENNIFER WARMKE	CITY OF BOTHELL	jennifer.warmke@ci.bothell.wa.us	425.486.1678	425.486.4555
KORY BATTERMAN	DES MOINES POLICE		206 870 7617	
PATTI HARRIS	DES MOINES POLICE	pharris@desmoineswa.gov	(206)870-7639	
Karen Ferreira	4-CITIES	~~KF~~ KarenF@Burienwa.gov		
WILLIAM C. HALL	KING COUNTY WATER DISTRICT #111	chall@WD111.com	(253) 631-3770	(253) 631-8072
Mike Barlow	Fire Dist. 44/Black Diamond	mbarlow@kcfd44.org	(253) 735-0284	
Jeff Bowe	KC DOT	~~Jeff.bowe@kingcounty~~ Jeff.bowe@kingcounty.gov	206-205-7062	
Vernon Owens	City of Bellevue	vowens@bellevuewa.gov	(425) 452-6833	
Frankie Iriarte	city of Tukwila	firiarte@ci.tukwila.wa.us	206-431-2445	
Mary Hobday	Federal Way	mary.hobday@cityoffederalway.com	253-835-2704	
Gordie Olson	South King Fire	GORDON.OLSON@SouthKingFire.org	206-810-3197	
Kurt Oakland	Woodinville Water	koakland@woodinvillewater.com	4254874113	
Tom Cobley	Roth Hill for Soos Creek W+S District	tcobley@rothhill.com	425/869-9418	
David Brower	KCWD 125	myhollywood@hotmail.com	206-396-4849	

temp\noreen\sign-in

Meeting Purpose: Hazard Mitigation Meeting

SIGN-IN SHEET

Date: 7/13/2009

Attachment A
16715

Name	Organization	E-Mail Address	Phone (including Area Code)	FAX (including Area Code)
Priscilla Kaufmann	KC Water & Land Resources Div	priscilla.kaufmann@kingcounty.gov	206-205-0598	

temp\noreen\sign-in

Conferance Call State EM. 2009 Participating Agencies
Thursday, September 17th, 2009 11:30am-1pm

Name	Bev O'Dea	Desk Phone	253-512-7073	Email	b.odea@emd.wa.gov
Agency	WA State EMD	Cell Phone		Address	
Name	Chuck Hagerhjelm	Desk Phone	253-512-7071	Email	c.hagerhjelm@emd.wa.gov
Agency	WA State EMD	Cell Phone		Address	
Name	Priscilla Kaufman	Desk Phone	206-205-0598	Email	priscilla.kaufmann@kingcounty.gov
Agency	Water and Land	Cell Phone		Address	201 S Jackson St. Rm 600; Seattle, WA 98104-3855
Name	Vernon Owens	Desk Phone	425-452-6033	Email	vowens@bellevue.gov
Agency	City of Bellevue	Cell Phone	206-696-4737	Address	450 110th Ave. NE; Bellevue, WA 98009
Name	Karen Ferreira	Desk Phone	206-248-5502	Email	KarenF@burienwa.gov
Agency	Cities of Burien/Des Moines/Normandy Park	Cell Phone	206-391-1643	Address	400 SW 152nd St. Suite 300 Burien, WA 98198
Name	Kory Batterman	Desk Phone	206-870-7617	Email	kbatterman@desmoineswa.gov
Agency	City of Des Moines	Cell Phone		Address	21900 11th Ave. S. Des Moines, WA 98198
Name	Mary Hobday	Desk Phone	253-835-2704	Email	mary.hobday@cityoffederalway.com
Agency	City of Federal Way	Cell Phone		Address	33325 8th Ave. S. Federal Way, WA 98063-9718
Name	Steve Roberge	Desk Phone	425-649-4444	Email	
Agency	City of New Castle	Cell Phone		Address	13020 Newcastle Way, Newcastle, WA 98059

KC-OEM — Bowers
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Attachment A
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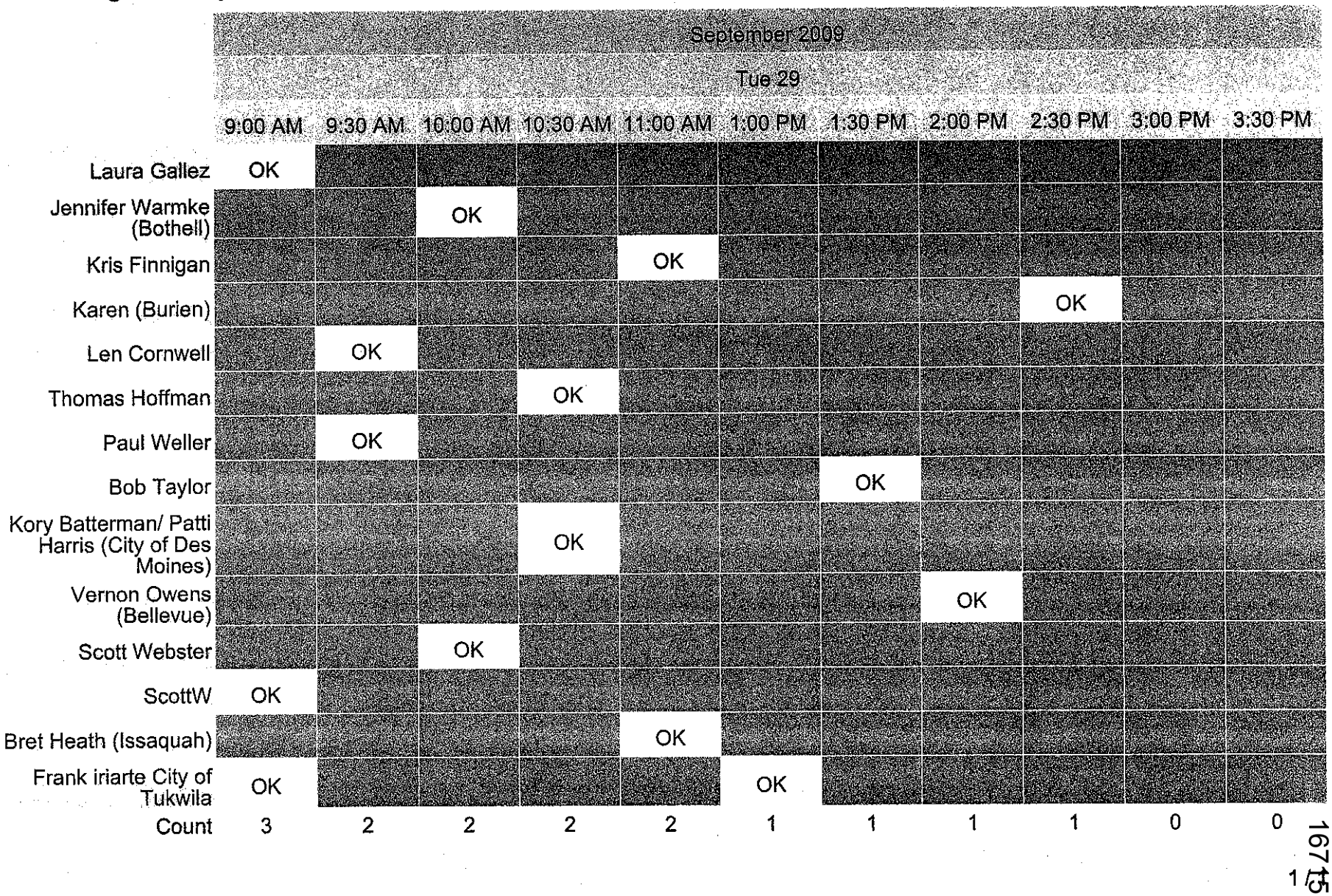
Conferance Call State EMD 2009 Participating Agencies
Thursday, September 17th, 2009 11:30am-1pm

Attachment A
16715

Name	**Frank Iriarte**	Desk Phone	**206-431-2445**	Email	**firiate@ci.tukwila.wa.us**
Agency	**City of Tukwila**	Cell Phone	**206-571-6319**	Address	**6300 Southcenter Blvd. Tukwila, WA 98188**
Name	**Gordie Olson**	Desk Phone		Email	
Agency	**KCFD #39- South King County**	Cell Phone		Address	**31617 1st Ave S. Federal Way, Wa 98003**
Name	**Scott Webster**	Desk Phone		Email	**scottw@maplevalleyfire.org**
Agency	**KCFD #43- Maple Valley Fire District**	Cell Phone		Address	**23775 SE 264th St. Maple Valley, WA 98038**
Name	**Pam Cobley**	Desk Phone	**253-631-3770**	Email	**pcobely@rothhill.com**
Agency	**KCWD #111**	Cell Phone		Address	**27224 144th Ave SE Kent, WA 98042**
Name		Desk Phone	**206-824-0375**	Email	
Agency	**Highline Water District**	Cell Phone		Address	**27224 144th Ave SE Kent, WA 98042**
Name		Desk Phone	**253-630-9900**	Email	
Agency	**Soos Creek Water District**	Cell Phone		Address	**14616 SE 192nd St. Renton, WA 98058-1039**
Name		Desk Phone		Email	
Agency		Cell Phone		Address	
Name		Desk Phone		Email	
Agency		Cell Phone		Address	

Poll "King County Technical Assistance Day"

http://doodle.com/yuez8huepv44fru3



Attachment A
16715

2009 Regional Mitagation Plan -Participating Agencies Workshop
Tuesday, September 29th, 2009 8am-4pm

Name: LEN CORNWELL	Desk Phone: 425-395-6256 x259	Email: LEN.CORNWELL@SAMMPLAT.WA.ORG
Agency: SAMMAMISH PLATEAU WSD	Cell Phone: 425-306-8100	Address: 1510 228th Ave SE SAMMAMISH WA 98075
[redacted]	[redacted]	[redacted]
Name: Paul Weller/Pam Cobley	Desk Phone: 425/869-9448	Email: pweller@rothhill.com/pcobley@rothhill.com
Agency: WD111 + SCWSD (RothHill Engineering)	Cell Phone:	Address: 2600-116th Ave ~~NE~~ #100 Bellevue 98004
[redacted]	[redacted]	[redacted]
Name: Jennifer Warmke	Desk Phone: 425-486-1678	Email: jennifer.warmke@ci.bothell.wa.us
Agency: City of Bothell	Cell Phone:	Address: 10726 Beardslee Blvd, Bothell 98011
[redacted]	[redacted]	[redacted]
Name: PATTI HARRIS	Desk Phone: (206) ~~396-4690~~ 870-7639	Email: pharris@desmoineswa.gov
Agency: CITY OF DES MOINES	Cell Phone: (206) 396-4690	Address: 21900 11TH AVE S. DES MOINES WA 98198
[redacted]	[redacted]	[redacted]

98198

2009 Regional Mitagation Plan -Participating Agencies Workshop
Tuesday, September 29th, 2009 8am-4pm

{ State EmD & FEMA } Joint meeting

Name: LAURA GALLEZ	Desk Phone: 206 244 9575	Email: laurag@swssd.com
Agency: SW Suburban Sewer District	Cell Phone: 206 ~~551 3948~~ 310 2191	Address: 431 SW Ambaum Blvd Burien WA 98166
Name: Scott Webster	Desk Phone: 425-433-2145	Email: [illegible]
Agency: Maple Valley Fire & Life Safety	Cell Phone: 206-423-9670	Address: 23775 SE 264th St Maple Valley 98038
Name: ROBIN GORDON	Desk Phone: 425-388-5071	Email: ROBIN.GORDON@CO.SNOHOMISH.WA.US
Agency: SNOHOMISH COUNTY	Cell Phone: 425-508-8005	Address: 3509 109th ST SW - Everett WA 98204
Name: [illegible]	Desk Phone: [illegible]	Email: [illegible]
Agency: City of Tukwila	Cell Phone: [illegible]	Address: [illegible]
Name	Desk Phone	Email
Agency	Cell Phone	Address
Name	Desk Phone	Email
Agency	Cell Phone	Address
Name	Desk Phone	Email
Agency	Cell Phone	Address
Name	Desk Phone	Email
Agency	Cell Phone	Address

Attachment A
16715

2009 Regional Mitagation Plan -Participating Agencies Workshop
Tuesday, September 29th, 2009 8am-4pm

Name Robert Taylor	Desk Phone 253-867-0940	Email btaylor@covingtonwater.com
Agency Covington Water District	Cell Phone 253-227-5887	Address 18631 SE 300th Place, Covington
Name [illegible]	Desk Phone [illegible]	Email [illegible]
Agency [illegible]	Cell Phone	Address [illegible]
Name Karen Ferreira	Desk Phone 206 248 5502	Email Karenf@burien.wa.gov
Agency Cities of Burien Des Moines Normandy	Cell Phone Park 206 391 1643	Address 400 SW 152nd St Ste 300 Burien 98166
Name [illegible]	Desk Phone [illegible]	Email [illegible]
Agency [illegible]	Cell Phone [illegible]	Address [illegible]
Name	Desk Phone	Email
Agency	Cell Phone	Address
Name	Desk Phone	Email
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Name	Desk Phone	Email
Agency	Cell Phone	Address

Attachment A
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Attachment A
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Annex D: King County Plan Adoption Documentation

Attachment A
16715

King County

Kurt Triplett
King County Executive

701 Fifth Avenue, Suite 3210
Seattle, WA 98104

206-296-4040 Fax 206-296-0194
TTY Relay: 711
www.kingcounty.gov

November 12, 2009

The Honorable Dow Constantine
Chair, King County Council
Room 1200
C O U R T H O U S E

Dear Councilmember Constantine:

I am pleased to transmit to you a proposed ordinance approving and adopting an updated Multi-Jurisdictional Regional Hazard Mitigation Plan (RHMP) for King County. Adoption of this plan by the Metropolitan King County Council and approval by both State of Washington, Emergency Management Division (EMD), and the Federal Emergency Management Agency (FEMA) is required to ensure access to future Federal mitigation project funding related to potential flooding or any other type hazard the region may experience over the next five year period.

A Mitigation Plan is a community-driven document used to identify projects or programs to reduce vulnerability to hazards. Mitigation planning is a process through which communities assess risks and identify prioritized actions or strategies to reduce vulnerability to hazards through hazard mitigation. The Plan and its process show the link between hazard identification, vulnerability and risk assessment and provide a vehicle to expand on and improve existing mitigation tools. Communities must have an approved Plan to apply for or receive federal mitigation grants. These grants augment local mitigation activities, reduce vulnerability, and allow communities to recover more quickly from disasters.

King County and its residents receive many benefits from the RHMP planning process:

- increases public awareness and understanding of vulnerabilities and specific actions to reduce losses from future natural or man-made disasters;

- builds partnerships with diverse stakeholders, increasing opportunities to leverage data and resources; and
- informs development, prioritization and implementation of mitigation projects

In addition, mitigation planning creates safer communities, reduces life and property damage, allows individuals to minimize post-disaster disruptions and recover more rapidly, and lessens the financial impact on individuals, communities, and society as a whole.

The King County Council adopted the County's initial RHMP in October 2004 (Ordinance 15038); an update of that plan is now required. The current plan expired November 1, 2009. Until King County has an adopted plan to update the 2004 plan, it cannot compete for funds through the Pre-Disaster Mitigation (PDM) program, a nationally competitive program, or the Flood Mitigation Assistance (FMA) program. King County and its residents continue to have access to Public Assistance or Individual Assistance following a declared disaster, as this funding is not contingent upon the required plan update.

State review is complete and the county's plan was forwarded as approved by Washington State to FEMA earlier this week for federal review. Upon adoption by the King County Council and Executive signature, FEMA has indicated a willingness to provide prompt review and consideration for final approval.

This transmittal package includes an adopting ordinance that will allow the county's Office of Emergency Management to incorporate any final FEMA changes required to gain Federal approval of the updated mitigation plan. It is common practice for a jurisdiction's legislative actions to occur in advance of final FEMA approval. FEMA expects such adjustments to the plan subsequent to Council approval.

Highlights of the updated 2009 RHMP include:

- flooding hazard risk increased to high, given the Howard Hanson Dam and potential increased risk for Green River Valley flooding for the next possible 5 years (Section 5);
- a risk assessment of the six major King County river basins (Section 6); and
- use of easy to read tables and charts to highlight 2009 RHMP updates in each Section and Annex.

If you have any questions, please contact Caroline Whalen, Program Project Director, Department of Executive Services at 263-9755.

Sincerely,

Kurt Triplett
King County Executive

Enclosures

cc: King County Councilmembers
ATTN: Tom Bristow, Interim Chief of Staff
Anne Noris, Clerk of the Council
Frank Abe, Communications Director
Pam Bissonnette, Assistant County Executive, Executive Office (EO)
Noel Treat, Chief of Staff, EO
Paul Tanaka, King County Emergency Manager, EO
Beth Goldberg, Deputy Director, Office of Management and Budget
Bob Cowan, Acting County Administrative Officer, Department of Executive Services (DES)
Caroline Whalen, Program Project Director, DES
Robin Friedman, Director, Office of Emergency Management, DES

..Title

AN ORDINANCE approving and adopting the updated Multi-Jurisdictional Regional Hazard Mitigation Plan, as approved by the Federal Emergency Management Agency.

..Body

BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

SECTION 1. **Findings:**

A. King County supports disaster mitigation efforts and regional disaster planning.

B. A locally adopted plan reviewed and approved by Federal Emergency Management Agency ("FEMA") is required under the Mitigation Act of 2000, 44 C.F.R. 201.

C. Regular revisions and updates to the updated five year plan are required by FEMA.

D. In October 2004, the King County council approved the county's initial five year Multi-Jurisdictional Regional Hazard Mitigation Plan.

E. An updated plan is now required to comply with the Mitigation Act of 2000.

F. King County and other jurisdictions within King County have a cooperative interest in disaster mitigation planning efforts.

G. Additional agencies are expected to annex to this plan following FEMA approval.

H. FEMA approval of this plan enables the county to seek Federal mitigation project funding related to potential flooding or other hazards the region may experience over the next five year planning period.

I. Certification of the King County council's approval of this plan is required for FEMA final approval.

SECTION 2. The King County council hereby approves and adopts the Multi-Jurisdictional Regional Hazard Mitigation Plan, Attachment A to this ordinance.

SECTION 3. The King County council authorizes the office of emergency management to make any required FEMA revisions to updated Multi-Jurisdictional Regional Hazard Mitigation Plan required by FEMA final approval.

Attachment A. King County Multi-Jurisdictional Regional Hazard Mitigation Plan, November 2009.

Annex E: Public Participation

The list provided in Annex E identifies the 2009 King County Regional Hazard Mitigation Plan (RHMP), King County Government, internal Public Participation activities, as shown on a chart.

Annex E

Attachment A
16715

2009 Public Involvement Phase 1

Date	Document	Venue	Status	Public Input
12/1/2005	Affidavit of Publication	King County Journal	Published	None
8/5/2009	Affidavit of Publication	Snoqualmie Valley Record	Published	None
8/5/2009	Affidavit of Publication	Bothell/Kenmore Reporters	Published	None
8/5/2009	Affidavit of Publication	Kent Reporter	Published	None
9/29/2009	Agenda	KCLS Board of Trustees Meeting	Public Announcement	N/A
9/29/2009	Announcement	KCLS Board of Trustees Meeting	Public Announcement	N/A
9/29/2009	Minutes	KCLS Board of Trustees Meeting	Public Announcement	N/A
10/26/2009	Email document confirming DRAFT 2009 KC RHMP is available in Libraries	King County Regional Libraries: Auburn, Bellevue, Bothell, Redmond and the KCLS Online Catalogue	5 Libraries have Plan in Government Section for Public Review with Request for Input document (with email address)	N/A
10/27/2009	Affidavit of Publication	Seattle Times	Published	None
10/28/2009	Affidavit of Publication	Kent Reporter	Published	None
10/28/2009	Affidavit of Publication	Snoqualmie Valley Record	Published	None
10/28/2009	Affidavit of Publication	Bothell/Kenmore Reporters	Published	None

Annex E

Attachment A
16715

2009 Public Involvement Phase 1

Date	Document	Venue	Status	Public Input
10/30/2009	Email document: Request for Input	Request to KC Government contacts and key jurisdictions to fill out the King County Hazard Mitigation Survey Questionnaire by November 8, 2009	Emailed	None
Year 2009	2009 Howard Hanson Dam and Green River Flood Planning - Regional Communications and Public Outreach (Spreadsheet)	Various Meetings and Forums Spreadsheet	2009 - Approx. 12 Events attended by KC OEM	N/A
Fall 2009	Hazard Mitigation Defined	Link posted on http://www.kingcounty.gov/safety/prepare/EmergencyManagementProfessionals/PlansandPrograms/RegionalHazardMitigationPlan.aspx	Posted	N/A
Fall 2009	mitigation.plan@kingcounty.gov	Email address maintained for gathering public/agency feedback on DRAFT 2009 Regional Hazard Mitigation Plan	Active	None
Fall 2009	Survey re DRAFT King County Regional Hazard Mitigation Plan - Public Involvment 2009	Link posted on http://www.kingcounty.gov/safety/prepare/EmergencyManagementProfessionals/PlansandPrograms/RegionalHazardMitigationPlan.aspx	Posted - Questionnaire Survey closing on Nov. 16, 2009	See below for Survey Results
11/9/2009	Survey Results Report	From link to questionnaire posted on http://www.kingcounty.gov/safety/prepare/EmergencyManagementProfessionals/PlansandPrograms/RegionalHazardMitigationPlan.aspx	Active	8 Responses Rec'd

STATE OF WASHINGTON, COUNTY OF KING }
AFFIDAVIT OF PUBLICATION

PUBLIC NOTICE

Tom Meagher, being first duly sworn on oath that he is the Legal Advertising Representative of the

King County Journal

a daily newspaper, which newspaper is a legal newspaper of general circulation and is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a daily newspaper in King County, Washington. The King County Journal has been approved as a Legal Newspaper by order of the Superior Court of the State of Washington for King County.

The notice in the exact form annexed was published in regular issues of the King County Journal (and not in supplement form) which was regularly distributed to its subscribers during the below stated period. The annexed notice, a

Public Notice

was published on December 1, 2005.

The full amount of the fee charged for said foregoing publication is the sum of $58.50.

Tom Meagher
Legal Advertising Representative, King County Journal
Subscribed and sworn to me this 2nd day of December, 2005.

JODY L. BARTON NOTARY EXP. 04/28/2009 PUBLIC STATE OF WASHINGTON

Jody L. Barton
Notary Public for the State of Washington, Residing in Auburn, Washington
PO Number: 2991
Cost of publishing this notice includes an affidavit surcharge.

Public Notice

Starting December 1st, 2005 the Regional Hazard Mitigation Plan will be open for public comment through the 14th of December. The Hazard Mitigation Plan is available at www.metrokc.gov/prepare. For additional information contract Rich Tokarzewski, King County Office of Emergency Management at (206) 296-3830.

Published in the King County Journal December 1, 2005. #848124

Attachment A
16715

STATE OF WASHINGTON, COUNTY OF KING }
AFFIDAVIT OF PUBLICATION

PUBLIC NOTICE
Linda M Mills, being first duly sworn on oath that she is the Legal Advertising Representative of the

Snoqualmie Valley Record

a weekly newspaper, which newspaper is a legal newspaper of general circulation and is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a weekly newspaper in King County, Washington. The Snoqualmie Valley Record has been approved as a Legal Newspaper by order of the Superior Court of the State of Washington for King County.
The notice in the exact form annexed was published in regular issues of the Snoqualmie Valley Record (and not in supplement form) which was regularly distributed to its subscribers during the below stated period. The annexed notice, a:

Public Notice

was published on August 5, 2009.

The full amount of the fee charged for said foregoing publication is the sum of $42.00

Linda M. Mills
Legal Advertising Representative, Snoqualmie Valley Record
Subscribed and sworn to me this 7th day of August, 2009.

Kathy Dalseg, Notary Public for the State of Washington, Residing in Covington, Washington
P. O. Number:

PUBLIC NOTICE #252973
PUBLIC COMMENT PERIOD

The **King County Office of Emergency Management** invites the public to read and provide comment on the King County Regional Hazard Mitigation Plan (RHMP). The plan, originally drafted in 2004 and scheduled to be updated this year, identifies hazards and assesses risk to guide regional decisions on how best to mitigate losses from future disasters and emergencies. The current plan is located online at http://www.kingcounty.gov/mitplan. Comments are being solicited through August 31, and should be submitted to Jeff Bowers, Assistant Director, at jeff.bowers@kingcounty.gov.
Published in the Bothell/Kenmore, Kent Reporters and Snoqualmie Valley Record on August 5, 2009.

KATHY DALSEG NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 10-19-11

Attachment A
16715

STATE OF WASHINGTON, COUNTY OF KING }
AFFIDAVIT OF PUBLICATION

PUBLIC NOTICE
Linda M Mills, being first duly sworn on oath that she is the Legal Advertising Representative of the

Bothell/Kenmore Reporters

a weekly newspaper, which newspaper is a legal newspaper of general circulation and is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a bi-weekly newspaper in King County, Washington. The Bothell/Kenmore Reporters has been approved as a Legal Newspaper by order of the Superior Court of the State of Washington for King County.
The notice in the exact form annexed was published in regular issues of the Bothell/Kenmore Reporters (and not in supplement form) which was regularly distributed to its subscribers during the below stated period. The annexed notice, a:

Public Notice

was published on August 5, 2009.

The full amount of the fee charged for said foregoing publication is the sum of $42.00.

Linda M. Mills
Legal Advertising Representative, Bothell/Kenmore Reporters
Subscribed and sworn to me this 7th day of August, 2009.

Kathy Dalseg, Notary Public for the State of Washington, Residing in Covington, Washington
P. O. Number:

KATHY DALSEG NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 10-13-11

PUBLIC COMMENT PERIOD

The **King County Office of Emergency Management** invites the public to read and provide comment on the King County Regional Hazard Mitigation Plan (RHMP). The plan, originally drafted in 2004 and scheduled to be updated this year, identifies hazards and assesses risk to guide regional decisions on how best to mitigate losses from future disasters and emergencies. The current plan is located online at http://www.kingcounty.gov/mitplan. Comments are being solicited through August 31, and should be submitted to Jeff Bowers, Assistant Director, at jeff.bowers@kingcounty.gov.

Published in the Bothell/Kenmore, Kent Reporters and Snoqualmie Valley Record on August 5, 2009. #252973.

RECEIVED
AUG 13 2009
King County Office of Emergency Management

Attachment A
16715

STATE OF WASHINGTON, COUNTY OF KING }
AFFIDAVIT OF PUBLICATION

PUBLIC NOTICE
Linda M Mills, being first duly sworn on oath that she is the Legal Advertising Representative of the

Kent Reporter

a bi-weekly newspaper, which newspaper is a legal newspaper of general circulation and is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a bi-weekly newspaper in King County, Washington. The Kent Reporter has been approved as a Legal Newspaper by order of the Superior Court of the State of Washington for King County.
The notice in the exact form annexed was published in regular issues of the Kent Reporter (and not in supplement form) which was regularly distributed to its subscribers during the below stated period. The annexed notice, a:

Public Notice

was published on August 5, 2009.

The full amount of the fee charged for said foregoing publication is the sum of $63.00.

Linda M Mills
Linda M. Mills
Legal Advertising Representative, Kent Reporter
Subscribed and sworn to me this 7th day of August 2009.

Kathy Dalseg
Kathy Dalseg, Notary Public for the State of Washington, Residing in Covington, Washington
P. O. Number:

KATHY DALSEG NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 10-19-11

PUBLIC COMMENT PERIOD

The **King County Office of Emergency Management** invites the public to read and provide comment on the King County Regional Hazard Mitigation Plan (RHMP). The plan, originally drafted in 2004 and scheduled to be updated this year, identifies hazards and assesses risk to guide regional decisions on how best to mitigate losses from future disasters and emergencies. The current plan is located online at http://www.kingcounty.gov/mitplan. Comments are being solicited through August 31, and should be submitted to Jeff Bowers, Assistant Director, at jeff.bowers@kingcounty.gov.

Published in the Bothell/Kenmore, Kent Reporters and Snoqualmie Valley Record on August 5, 2009. #252973.

RECEIVED
AUG 13 2009
King County Office of Emergency Management

Attachment A
16715

Attachment A
16715

Board Meeting Agenda

For Immediate Release

Jackie Brown: 425.369.3275 jabrown@kcls.org
Julie Brand Williams: 425.369.3273 jwilliams@kcls.org
Lauren Mikov: 425.369.3233 lpmikov@kcls.org
For Directions: 425.369.3200

960 Newport Way NW
Issaquah, WA 98027

Service Center
Tuesday, September 29, 2009
5pm

Open to the Public

1. Call To Order ..... Chair

Action Items

1. Approval of Agenda ..... Board
2. Approval of Board Minutes – August 25, 2009 (*Attachment A*) ..... Board
3. Payment of Bills (*Attachment B*) ..... Board
   a. Finance Report ..... Staff
   b. Approval of Bills ..... Board
4. Resolution 2009-13 – Sale of Unlimited Tax Obligation Bonds (*Attachment C*) ..... Staff
5. Sammamish Property Sale (*Attachment D*) ..... Staff
6. National Friends of Library Day Proclamation (*Attachment E*) ..... Planning Committee

Public Forum ..... Chair

Members of the public are invited to share their comments and concerns with members of the Board and Administration about library-related issues. The staff will be asked to respond to main topics and the Board will take the comments and responses under advisement. The forum will be conducted to maximize public input and participation. All are asked to be courteous of others, to listen to each other and to focus on the highest good of the entire library community, both for the present and the future. Thank you.

New Business

1. Summer Reading Program and Study Zone Annual Reports (*Attachment F*) ..... Staff
2. Library Advisory Boards in Unincorporated Areas ..... Planning Committee

Old Business

1. Interim Staff Survey Response Plan ..... Staff

Written Reports

1. Director's Report ..... Director
2. Dashboard ..... Staff

Information Items

1. Dashboard Details ..... Staff
2. Board Retreat Agenda & Summary Notes ..... Board
3. August Finance Committee Summary Notes ..... Board
4. September Planning Committee Agenda & Summary Notes ..... Board
5. Newspaper Clippings ..... Staff

Adjournment ..... Chair

Attachment A
16715

King County Library Board Meeting September 29, 2009, 5 pm

An Announcement from King County Emergency Management about:

The King County Regional Hazard Mitigation Plan update in 2009

This is required by the Disaster Mitigation Act of 2000

For 2009, we are in the process of an update of the 2004 RHMP, approved by FEMA and adopted by the King County Council, Nov 1, 2004.

The Plan includes all parts of King County, unincorporated KC, Cities, Special Purpose Districts such as Fire and Utility Districts, and School Districts – it's voluntary to participate

Same planning process to update the Plan including Public Involvement

"Old" Plan version - 2004 RHMP document - is on-line (for 5 years) now for you to review and provide comments on

The 2009 Plan update is scheduled to go – online on approximately October 8th, 2009 -
For public review and to provide comments

Once we have a completed Plan, we can offer putting 3-4 copies in Libraries around King County – as a Reference document, as arranged.

I also have brought copies of the Green River Flooding brochure. More copies can be put into the southern cities Libraries, if desired.

Contact:

Deirdre Totten, King County, Office of Emergency Management (KC OEM), 206-205-4064
deirdre.totten@kingcounty.gov www.kingcounty.gov/prepare

OR

Jeff Bowers, KC OEM, Assistant Director, 206-205-4062
jeff.bowers@kingcounty.gov

9/29/09 DT

King County Library System
Board of Trustees Meeting
Service Center
5pm ♦ 29 September 2009

PRESENT

KCLS BOARD
Jessica Bonebright
Judge Richard Eadie
Lucy Krakowiak
Rob Spitzer
Jim Wigfall

KCLS Staff
Bruce Adams
Jerene Battisti
Linda Glenicki
Kay Johnson
Holly Koelling
Cecilia McGowan
Donna McMillen
Lauren Mikov
Jed Moffitt
Bill Ptacek
Annie Poyner
Charlene Richards
Dri Ralph
Bruce Schauer
David Scott-Risner
Greg Smith
Nancy Smith
Jeanne Thorsen
Julie B. Williams
Jennifer Wiseman

GUESTS
Kyle Cruver
Bonnie de Steiguer
Dan Gottlieb
Martin Koenig
Susan Musselman
Connie Reed
Yoshiko Saheki
Deirdre Totten

EXECUTIVE SESSION

At 4:10pm, Jessica Bonebright announced, per RCW42.30.110(1)(g), that an executive session to review the performance of a public employee would begin. The estimated duration of the executive session was 50 minutes. Jessica Bonebright, Richard Eadie, Lucy Krakowiak, Rob Spitzer and Jim Wigfall were in attendance.

MOTIONS APPROVED

1. Motion to approve the Board agenda
2. Motion to approve the August 25, 2009 minutes
3. Motion to approve Payroll expenditures
4. Motion to approve General Fund #0010 expenditures
5. Motion to approve Construction Bond Fund '88 #3020 expenditures
6. Motion to approve Capital Project Fund 2005 #3070 expenditures
7. Motion to approve Gift Fund #6010 expenditures
8. Motion to approve Bond Resolution 2009-13
9. Motion to approve the sale of the current Sammamish Library to the City of Sammamish
10. Motion to approve the National Friends of Libraries Week proclamation
11. Motion to amend the agenda to move Library Advisory Boards in Unincorporated Areas before the Summer Reading Program report
12. Motion to recognize the Committee selected by the Vashon-Maury Island Community Council and to reaffirm that there will be a strong connection between KCLS, the community and the Committee
13. Motion to table the Vashon Library Committee motion until the October Board meeting

CALL TO ORDER

Jessica Bonebright called the meeting to order at 5:07pm.

APPROVAL OF THE AGENDA

Rob Spitzer moved approval of the agenda. Lucy Krakowiak seconded and the motion passed unanimously.

APPROVAL OF THE MINUTES

Lucy Krakowiak moved approval of the August 25, 2009 Board minutes. Jim Wigfall seconded and the motion passed unanimously.

FINANCE REPORT

General fund expenditures were $6.6 million in August, compared to a monthly average of $8 million. August is typically a low spending month. Year-to-date growth in benefits is 12.5%, down 17% from June 2009. That decline is due to the reduction in PERS rates. The percentage will drop throughout the rest of the year. Although there are no insurance expenditures in August, there has been a lot in the press about flood insurance and the Howard Hanson Dam. KCLS has three facilities in the pathway of the potential dam spillage: the Kent, Auburn and Southcenter libraries. KCLS' existing property insurance has always included flood coverage as a standard part of the property insurance package. The standard deductible for KCLS' property coverage is $5,000; however for occurrences of flood, the deductible is $100,000 in most locations. In a few cases, Southcenter being one, the deductible is $250,000. To address these high deductibles, KCLS has taken advantage of the national flood

insurance program, buying policies for locations that are more likely to experience flooding. The national insurance coverage has a $1,000 deductible and KCLS purchased coverage up to the amount of the deductible on the base property coverage, at which point the base policy takes over.

The following general fund items were called out:

- Repairs: Expenditures of $430 thousand in August are low versus the monthly average. More than half of the bills were related to contracted services such as janitorial and landscaping, and $97 thousand was related to the Automated Materials Handling annual maintenance contract. The large amount of expenditures in Repairs and Maintenance in 2008 was related to costs in excess of the budget for construction projects due to the construction inflation experienced at that time.
- Miscellaneous: Expenditures for 2009 include a payment made to the City of Renton for the Benson Hill annexation. In 2008, KCLS made the annexation payment near the end of the year, so at the end of 2009, the percentage growth over 2008 will be even. There is a payment due to Renton in December, but that payment has been suspended pending the outcome of the annexation election.
- Capital – Materials: Of the $797 thousand in August expenditures, $484 thousand were for books. Based on the average price for books, that equates to 15,000-20,000 books purchased in August. The remaining expenditures were for periodicals and electronic databases.

August is a slow revenue month, with $680 thousand in revenue for August 2009. This includes $92 thousand in contracts for the first half of this year's payment for the services KCLS provides to the Youth Services Center. Year-to-date collections of current and delinquent tax revenues are slightly ahead of 2008.

Expenditures in the 307 fund were high because KCLS has a few big projects in full swing. Overall 307 fund expenditures were $2.8 million, the largest being a payment of almost $1.4 million on the Sammamish Library project. Other big payments were on the Kirkland Library, which is in the midst of construction, and the Burien Library, for final bills after the completion of that project. Additional payments included installments on Automated Materials Handling equipment at three locations and a few other administrative items. Total spending to date in the 307 fund is $69.5 million. KCLS has spent almost all of the proceeds from the first bond issue, so the sale of the next tranche of bonds is timely.

Rob Spitzer asked why KCLS has spent more than expected on the Automated Materials Handling equipment at the Issaquah Library. Linda Glenicki replied that KCLS budgeted $515 thousand in 2009, but that the overall project budget is $772 thousand. KCLS misjudged the timing of how much would be spent on that project in 2009, but the spending is still well within the overall project budget.

Expenditures of $44 thousand in the 302 fund included a few small bills on the Redmond and Kent Library projects.

APPROVAL OF BILLS

Richard Eadie moved approval of Payroll Expenditures in the amount of $2,442,277.06; Checks August 1-15 Chk#145144-145281; 206524-207660 and August 15-31 Chk#145282-145423; 207661-208787. Rob Spitzer seconded and the motion passed unanimously.

Rob Spitzer moved approval of General Fund #0010 Expenditures for August 2009 in the amount of $4,337,558.60; (Travel Advances) Chk #943, (8/7) Chk #1010335-1010415, (8/11) Chk #1010416-1010459, (8/12) Chk #1010460-1010539, (8/13) Chk #5000107-5000124; 1010540-1010560; 1010561-1010595, (8/18) Chk #1010596-1010623; 5000125-5000128; 1010624-1010634, (8/19) Chk #1010635-1010684; 1010685-1010714, (8/21) Chk #1010715-1010744; 5000129-5000144; 1010745-1010785, (8/24) Chk #1010786-1010829; 1010830, (8/25) Chk #1010831-1010854, (8/26) Chk #1010855-1010890, (8/27) Chk #1010891-1010951, (8/28) Chk #5000145-5000152; 1010952-1010982, (8/31) Chk #1010983-1011036, (9/1) Chk #1011037-1011045, (9/2) Chk #1011046-1011097; 1011098-1011120, (9/3) Chk #5000153-5000156; 1011121-1011132; 1011133-1011164, (9/3) Chk #1011165-1011167, (9/4) Chk #1011168-1011172; 5000157, (Voids) Chk #1010977. Lucy Krakowiak seconded and the motion passed unanimously.

Lucy Krakowiak moved approval of Construction Bond Fund '88 #3020 Expenditures for August 2009 in the amount of $44,844.59; (8/7) Chk #3020009, (8/18) Chk #3020010, (8/19) Chk #3020011-3020013, (8/24) Chk #3020014. Jim Wigfall seconded and the motion passed unanimously.

Jim Wigfall moved approval of Capital Project Fund 2005 #3070 Expenditures for August 2009 in the amount of $3,099,863.06; (8/11) Chk #3070131-3070132; 3070133-3070134, (8/13) Chk #3070135, (8/19) Chk #3070136; 3070137-3070144, (8/20) Chk #3070145-3070152, (8/21) Chk #3070153-3070162, (8/26) Chk #3070163-3070164; 3070165-3070166, (8/28) Chk #3070167-3070171, (8/31) Chk #3070172-3070173; 3070174, (9/3) Chk #3070175-3070182; 3070183, (9/4) Chk #3070184. Richard Eadie seconded and the motion passed unanimously.

Richard Eadie moved approval of Gift Fund #6010 Expenditures for August 2009 in the amount of $1,238.87; (8/11) Chk #6010025-6010027, (8/14) Chk #6010028-6010029, (8/24) Chk #6010030, (8/28) Chk #6010031-6010032. Rob Spitzer seconded and the motion passed unanimously.

RESOLUTION 2009-13 – SALE OF UNLIMITED TAX OBLIGATION BONDS

Linda Glenicki introduced Susan Musselman, KCLS' financial adviser, and Dan Gottlieb, KCLS' bond counsel. KCLS held an auction process for the bond sale the morning of Tuesday, September 29, and inserted the sale details into an updated resolution. The bond sale is timely, as KCLS has used up the funds from the $65.3 million tranche issued in 2005. By resolution earlier in the year, the Board gave staff the authority to sell as much as $75 million in this tranche. When bonds are issued, KCLS wants the interest rate to be as low as possible. Since municipal yields have plummeted to a 42-year low, this is great timing for KCLS. The District also received an update of its bond rating and was upgraded from "AA-" to "AA". The rating agency provided a report regarding KCLS' fund balances and strong financial operations. The rating upgrade helped made the bonds more attractive to potential bidders.

The bonds were offered through a competitive sale process. Initially, 12 bidders expressed interest, eight of which actually submitted bids. The winner was JP Morgan Securities. KCLS was authorized to sell up to $75 million, and the sale was for $71.5 million in par value. KCLS will actually receive $75 million because JP Morgan will buy the bonds at a premium. The average interest rate was 2.6%. In 2005, the average interest rate was 4.4%, but those bonds had a longer maturity, so they are not directly comparable. By all accounts, KCLS did well in terms of the interest rate on this sale. Once the bond sale resolution is approved by the Board, KCLS will go through the closing process and receive the bond proceeds in about two weeks.

Susan Musselman congratulated KCLS on the upgrade of its rating from "AA-" to "AA." She noted that the rating has a great deal of value in today's market, although it is hard to quantify the exact value. Susan said that in this new era of finance and flight to quality, "AA" rated general obligation bonds are in high demand, which is evidenced by the fact that 12 national firms were interested in this bond sale. That eight of the 12 firms submitted bids is normal. Bids ranged from 2.61% to 2.85%. The top two bonds were within .0001% of each other. The bonds were structured to provide $75 million in proceeds, with a par amount of around $71.5 million. Approximately $36.8 million of remaining authority from the voter-approved amount will be issued in the future. Having been involved in the 2005 bond sale, Susan noted that KCLS hit the mark well in terms of long-term interest rates during that sale, and has now hit it perfectly for short-term rates on this sale. She said KCLS couldn't have executed a better plan. Rob Spitzer asked if it makes sense to issue additional bonds now, since the interest rates are so low. Susan replied that KCLS must consider the amount of projects it could have in a three-year period. In this sale, KCLS strived to maximize the borrowing within a three-year window. That is part of the IRS requirements related to tax-exempt bonds.

Dan Gottlieb mentioned that KCLS should only borrow as much as it can spend in three years. He noted that KCLS does a good job of spending in a timely way, and the proceeds from the previous bond sale are just running out now. Dan said that there was a bit of drama with the bidding process. Everyone was watching the bidding on computers in remote locations, and by 8:59 and 30 seconds, only one bid had been received. The remaining seven bids arrived in the last 30 seconds. The seventh arrived literally at the 9am deadline. The preliminary offering statement issued on September 18 said that KCLS was issuing $74.1 million worth of bonds. Because the purchasers were determined to buy at a premium, the bonds were re-sized to $71.56 million total par amount. The updated resolution reflects that adjustment. Exhibit C of the resolution governs the maturities and interest rates of the bonds. Dan said that should the Board adopt the resolution, his firm would be prepared to issue the opinion that the bonds are valid, binding and tax exempt.

Bill Ptacek asked for clarification on the fact that because the bonds were sold at this rate, KCLS will receive $75 million in proceeds for less par value than originally anticipated. This creates additional capacity for the next bond sale and additional resources to work from in capital planning. He asked what the approximate value of this is. Dan replied that in this case, the premium is $3.8 million, which is the differential KCLS is receiving in additional capacity. Bill noted that this will help KCLS complete the rest of the bond projects. Linda noted that

when KCLS first embarked on the capital program, the District said it would keep the levy rate less than 8 cents per $1,000 of assessed value. KCLS has worked to remain below that level, and it now appears that the rate in 2010 will be 6.6 cents. The rate will vary in the future depending on what happens with assessed values but KCLS' forecasts indicate that KCLS can expect to remain under the 8 cent threshold going forward.

Dan mentioned that there are changes to the new resolution due to changes in federal securities laws. The SEC changed the continuing disclosure rules that apply to municipal bonds: the disclosure now goes electronically to a single board instead of multiple locations. Linda Glenicki is now set up to submit the annual disclosures through this new process. In response to a question from Rob Spitzer, Dan also noted that his firm qualifies as nationally recognized bond counsel.

Rob Spitzer moved approval of Bond Resolution 2009-13. Jim Wigfall seconded and the motion passed unanimously.

SAMMAMISH PROPERTY SALE

KCLS is building a new Sammamish Library that is anticipated to open in early 2010, and is concerned about leaving the current Sammamish Library building and property vacant. The Board declared the property surplus in 2006 and KCLS is trying to find a good way to dispose of it. The City of Sammamish had requested that KCLS provide an intergovernmental sale to the City to use the building for a purpose other than City operations. It was not clear under what circumstances this would be permissible, so KCLS had initially thought that an intergovernmental sale would not work and sale of the property would have to be put out to the general market. Dan Gottlieb helped clarify that the sale would work if the City was willing to purchase the property at a fair price and that KCLS must use the proceeds for capital purposes similar to those outlined under the 1988 bonds. Staff developed a list of appraisers and presented it to the City of Sammamish, so that there would be no biased opinions about the appraisers. KCLS selected three appraisers off of the list, and the appraisals came in within $400,000 of each other. KCLS offered the property to the Sammamish City Council at 90% of the average of the three appraisals, which is a threshold level that appears in KCLS' purchasing policies for real estate transactions. Initially, KCLS had hoped to receive closer to $5 million for the project, but realistically none of the appraisals came in near that. The City may use the property as a teen center or as a location for other nonprofit organizations to provide service. With the Board's approval, KCLS staff will be able to take care of the details of the sale. Staff wanted to ensure that the Board approves the intergovernmental sale and its general terms.

Rob Spitzer asked if KCLS has considered leasing the property given the market at this time. Bill Ptacek replied that KCLS looked into a lease but is not able to do that. Dan Gottlieb clarified that the Sammamish library was originally funded with proceeds from the 1988 bond, some small portion of which remain outstanding. Encumbered by federal tax covenants, state law indicates that the building must be used as a library as long as there are bonds outstanding. Some portion of the sale proceeds would need to be applied to pay off the bonds still outstanding that are attributable to this facility. If KCLS entered into a lease transaction, the federal tax issue could not have been solved. KCLS must do an outright sale.

Richard Eadie noted that although the letter that KCLS received from the City of Sammamish does not have the details of formality the Board often sees or say whether the offer is backed by a motion of the Sammamish City Council, it has all of the aspects of an offer of purchase.

Rob Spitzer moved approval of the sale of the current Sammamish library to the City of Sammamish, with details to be worked out by staff. Lucy Krakowiak seconded and the motion passed unanimously.

NATIONAL FRIENDS OF LIBRARY DAY PROCLAMATION

A proclamation signed by Governor Gregoire declares October 18-24 as National Friends of Libraries Week in King County. Several KCLS Friends groups encouraged KCLS to celebrate this week, which is recognized by the American Library Association. Staff has prepared a proclamation for the Board recognizing its 36 Friends groups. The week of October 18, KCLS will promote National Friends of Libraries Week in the libraries with posters, special bookmarks and activities.

Lucy Krakowiak moved approval of the National Friends of Libraries Week proclamation. Jim Wigfall seconded and the motion was discussed.

Jessica Bonebright commented that she is glad the Board is hearing a report on the Summer Reading Program, since that is one of the efforts the Friends help make a success. Rob Spitzer asked if KCLS does anything else to

recognize the Friends. Julie Williams replied that each year, KCLS hosts a Friends event, and the KCLS foundation also recognizes several Friends with various awards. A plaque in the hallway of the Service Center is used to record the winners. Rob Spitzer commented that it is remarkable how much time and energy is given to support the Library. Julie noted that KCLS' 36 friends groups collectively contributed $325,000 of support to the libraries in 2008.

After discussion, the motion passed unanimously.

PUBLIC FORUM

Kyle Cruver, Vice President of the Vashon-Maury Island Community Council distributed a letter from King County Executive Kirk Triplett and King County Council Chair Dow Constantine in support of the formation of a local Library Advisory Board on Vashon Island. Kyle read the letter, as follows: "We are writing today to express our support for the formation of a local Library Advisory Board to represent the patrons of the Vashon Island Library. The King County Library System already recognizes Library Advisory Boards in cities that contract with KCLS for library services. Currently, the citizens of 14 suburban cities can provide comments and other feedback to the KCLS Board of Trustees and staff through their local Library Advisory Board. The KCLS website states that, 'Library Advisory Boards have important roles distinct from Friends of the Library groups and the KCLS Board of Trustees.' We wholeheartedly agree with this statement. We also agree that it is imperative that residents of rural areas such as Vashon and Maury Islands are given equal status with the residents of incorporated cities with regard to the operation of their local library, especially given that KCLS is chartered as a 'Rural Library District' under state law. Our offices would be happy to work with KCLS and the Vashon-Maury Island Community Council regarding the logistics of setting up a local Library Advisory Board to serve the patrons of the Vashon Library." Kyle noted that this should be something akin to a win-win situation, increasing transparency and accountability between the Community Council and KCLS.

Richard Eadie asked Kyle what he sees as the function of a Library Advisory Board with KCLS. Kyle replied that one of the challenges of a rural island community is a sense of consensus with the community in a situation that is geographically removed and where it's difficult for citizens to interact. Having a group in touch with the day-to-day activities of the Island as well as community forums could be generated to create something akin to a survey and get the pulse of the Island. He said it would be a valuable opportunity to expand KCLS' reach. Richard Eadie asked if the idea is that this organization would communicate to the Board the community's views on issues. Kyle said that as opposed to the Friends, which is less a consensus generating than an advocacy body, this would be more of a fact-finding and outreach communication vehicle. Richard asked what the difference is between what would come from the Advisory Board and what comes from the Friends. Kyle said that historically, Advisory Boards act more like a citizens' advisory group and are tasked with creating public forums for discussion on library-related topics such as siting. Richard asked if there is anything that prevents the Community Council from doing that now. Kyle replied that there is no specific mandate. This is something that would be a more directed effort akin to a branch of the Community Council. Richard said that it's a matter of communication. Kyle added that it's about expanding the reach in communication. Richard noted that what the Community Council is asking for is a way to communicate the Community Council's view of issues to the KCLS Board. Kyle mentioned that the Community Council formed a subcommittee tasked with library issues that is probably similar to other suburban cities that adopted a model of an Advisory Board. He said that the subcommittee is dedicated to other things than strictly internal issues.

Lucy asked the KCLS staff to take the time to create a response to the letter from Dow Constantine and Kurt Triplett. She noted that there needs to be clarification on the structure of government in unincorporated areas versus cities. Lucy said it's critical that KCLS connect with Vashon as the Board has been doing for communication. She stressed that the form that communication takes is already established, and the Advisory Board form is not the structure that's in place. To make that clearer, unincorporated areas work directly through their Friends groups. Cities that have annexed to KCLS have Advisory Boards appointed by the cities. Vashon is unincorporated. That form of communication (an Advisory Board) isn't available to unincorporated areas at this time.

Rob Spitzer noted that it would be interesting to see if there is any legislation that contemplates the Advisory Board structure. Bill Ptacek said that when the Library District was formed in 1942, it was a Rural Library District formed to represent the interests of people in unincorporated areas. That was the charge of the people appointed to be on the KCLS Board. When Cities had the ability to annex, some of them previously had library boards that worked with the City government. As a gesture to those communities that had elected officials already, the KCLS Board put in the annexation agreements an encouragement to the cities to appoint Advisory Boards. These Boards act as a liaison between KCLS and elected officials in the City, which was previously

outside of the Library District. Unincorporated areas are still represented by the KCLS Board, and there is a mandate to do that in State law. Advisory Boards are a creature of Library Systems seen as a way to have communication with Cities that were previously not part of the District. Advisory Boards require there to be elected officials and a City jurisdiction to appoint and coordinate them.

Rob Spitzer noted that, on the other hand, to the extent that there isn't a municipality on Vashon, there is a greater need to have some voice and organization to communicate. He said that what KCLS has gone through at Board meetings over the past year has indicated that good communication is important, and the Vashon community in particular is interested in communicating. He thinks that this issue is worth discussing more and just because this hasn't happened in unincorporated areas, KCLS shouldn't preclude it if there is no particular statutory mandate.

Bonnie de Steiguer said that she would like to respond to the statements made by Bill Ptacek during the September 17 Planning Committee meeting. She noted that Bill expressed a concern that if Vashon were to have an Advisory Board, other communities would want one as well. Bonnie mentioned that because of recent annexation activities, she believes that there will only be three libraries in unincorporated King County. She said that those communities may or may not feel the need for an Advisory Board or have an active Community Council. Bonnie asked if it would be so bad to have another Board or two if they improve communication between the communities and senior KCLS staff. She said Bill also proposed that the Vashon Friends of the Library could substitute for an Advisory Board. Bonnie said Bill is correct in stating that the Friends is a good group and does many worthwhile activities in support of the Library, such as selling books, T-shirts and plants to raise funds for the Library and its programs. The Friends also host other activities that add to the cultural richness of the Vashon community. Bonnie noted, however, that the Friends are an arm of the Library System and report only to KCLS. She said that in contrast, an Advisory Board is the community's liaison to KCLS. The missions are similar but not the same. Bonnie mentioned that the Vashon Friends of the Library feels that it is not in a position to question library policies or siting issues, whereas an Advisory Board would be able to make recommendations based on public comment and open discussion of issues via the Community Council. She suggested that it was interesting that no mention was made at the Planning Committee meeting that those in attendance at the last Friends' meeting expressed support for a Vashon Library Advisory Board. Bonnie said another reason that the Friends of the Library would not be the appropriate organization to substitute for an Advisory Board is that the Board needs to have active representation from the Vashon Park District since it is integral to the success of the shared use of Ober Park. She noted that the Vashon Park District Commissioners have specifically requested a local board that would include representation from the Park District because they feel they currently do not have a means of communication with the Library System. She said the Park District Board has been waiting for talks to start for months and are still waiting. Bonnie mentioned that the community has a strong desire to improve communication with KCLS, which will be beneficial to KCLS and the community and cost nothing. On behalf of the Library Committee of the Vashon Community Council, Bonnie requested that the Board of Trustees change its policy to recognize an Advisory Board for Vashon. Bonnie noted that she has been at a meeting in the past when the KCLS Board modified a policy, and she knows they can do it if they choose. She said it would be a shame to allow a lack of communication to prevent what is best for the Vashon community as well as what is best for KCLS.

Martin Koenig, a Vashon resident, said that it's been a while since he's been at KCLS Board meetings. He wasn't at the last meeting when the Board made the decision to pursue Ober Park, and he thanked the Board for that decision. Martin has a family, a wife and two teenage children, and meaningful work, so he said that coming to these Board meetings is a big effort for him, Kyle, Bonnie and anyone else from Vashon. He said that it's a huge effort to get off the Island and that there is a moat around it that is psychological as well as physical. Martin noted that Vashon residents' sole interest in coming to KCLS Board meetings is to stress the need for excellent communication between Islanders and KCLS staff and between the Vashon Park District and KCLS staff and the Board. He said that there are two issues: communication between the Vashon Park District and KCLS, and communication between Islanders in general and KCLS. His understanding is that in terms of the Vashon Park District, that discussion hasn't been happening. Martin has been in real estate transactions and knows that they take time, conversation and paragraph by paragraph review. He said that there needs to be conversation and meetings, and there are people of good will sitting at the table. Martin noted that there are two excellent agencies serving the community: KCLS, which provides a fabulous Library, and the Park District, which serves the community as well. He feels that it would be a shame to allow lack of communication to prevent what's best for the Vashon community and what's best for KCLS. Martin said that good communication and dialogue would be beneficial to both KCLS and Vashon and cost nothing. He knows that in their work lives, the Trustees participate in dialogue, whether in court, real estate, unions or administration, and dialogue is what it's all about. Martin said that Vashon's request for this Committee to be acknowledged is to have the dialogue to let things run more smoothly.

Dierdre Totten provided an announcement from King County Emergency Management about the King County Regional Hazard Mitigation Plan update in 2009, which is required by the Disaster Mitigation Act of 2000. King County Emergency Management is in the process of updating the 2004 Regional Hazard Mitigation Plan, approved by FEMA and adopted by the King County Council on November 1, 2004. The Plan includes all parts of King County: unincorporated King County, Cities and special purpose districts, such as fire, utility, school and library districts. It is voluntary to participate. The 2004 version of the Plan is currently online and available for public input. The 2009 Plan is scheduled to go online on October 8, 2009 for public review. Once the Plan is complete, copies can be made available through KCLS libraries. Deirdre also distributed the Green River Flooding brochure.

Lucy asked if an electronic version of the plan will also be available for distribution at the libraries. Deirdre said that the plan is available on the King County Emergency Management site, and the department would be happy to supply electronic and hard copy versions for patrons at the libraries as well. Richard Eadie asked what the current projection of damage and flooding is for the Green River Valley. Deirdre said that although she doesn't know that information offhand, she can direct the Board to the people who can provide it. Richard asked if the curtaining testing was successful or not. Deirdre replied that the test will occur in the event of heavy rains. She said that the Army Corps of Engineers is now buying sandbags and doing levee work, and directed the Trustees to the King County Emergency Management Web site for more details. Bill Ptacek noted that Danielle Perry in KCLS' HR department is coordinating KCLS' disaster preparedness efforts, and Greg Smith is working on getting sandbags lined up. Greg said that KCLS is obtaining contracts for pre-delivered sandbags so that all KCLS will need is the manpower to put them in place. Richard asked if KCLS attended the tour of the dam and heard the report by the Army Corps Colonel. Greg replied that KCLS did not. Richard suggested making that connection. Charlene Richards noted that KCLS is connected on this issue, and Danielle Perry has access to the flood maps and identified the libraries that are in the flood plain. Richard said that given KCLS' significant investments in the area, he would like to see that KCLS is on the same level of information as other organizations.

Yoshiko Saheki thanked the KCLS Board for serving as Trustees. She said that KCLS could not operate without their good work. Yoshiko noted that as Trustees, they have a unique perspective from the very top. She said she would like to share view from the ground and describe an activity that goes on in many branches throughout the System: the Friends' book sale. She said that many, if not most branches in KCLS have a supporting Friends group. Typically, the Friends run an ongoing sale at their library, usually through a bookcase or two in the lobby or another very visible area of the library. But on top of the ongoing sale, many Friends groups have an annual or semiannual book sale. These sales utilize meeting rooms and involve a cast of dozens. Yoshiko mentioned that the book sale is an activity that encompasses the Friends, public, area booksellers and KCLS staff at multiple levels. The sales tend to be noisy, spirited, fun-filled and, to the sale organizers, all-consuming. She said that the branch staff is very accommodating, patient and indulgent, for which the Friends are most appreciative. Under optimal conditions, the annual book sale is a bonding experience for all. Yoshiko noted that although the Friends groups have many things in common in regards to the book sale, each Friends group does things according to individual needs and schedules, including the Shoreline Friends. She said that like other Friends, Shoreline's annual book sale has its beginnings when members of the community donate their unwanted books. Three Shoreline Friends, Mary Ellen Asmundson, Juanita Birkner, and Liz Poitras, are at the Library every week to sort through the donations. Some donations are placed on the ongoing sale and the remaining materials in decent shape are boxed and sent to KCLS storage. During the course of a year, hundreds of boxes are sent to storage. Yoshiko reported that planning for the 2009 annual sales began in earnest in mid-summer when Shoreline's long-time book sale chair, Mary Ellen Asmundson, hosted a dinner party at her home. She said that over lasagna and several bottles of wine, eight of the Friends hashed over the 2008 sale and divided chores among themselves in preparation for the sale in September. The actual setup for the sale began on Wednesday, September 16, when a KCLS driver delivered hundreds of boxes of books from storage. Since the book sale cannot happen without the books, the friends view the driver as their hero. Unpacking the boxes takes a while. With the setup, sale and cleanup, the Friends rely on 33 volunteers plus all 15 members of the Friends board. The Friends sell hardbacks and quality paperbacks for a dollar and paperbacks for $0.50. All children's books are sold for a quarter a piece. The annual sale made just more than $3,800 this year. Yoshiko said that a cynic may note that this is not much money for the planning and many volunteer hours, but this misses the larger purpose of the sale as a community building event. It helps to rally the community around a branch library and, by extension, the entire King County Library System. It gathers booklovers and readers an activity that is all the more enjoyable because the Friends know that the proceeds, as well as all the fuss, will benefit the Library. Yoshiko noted that Friends groups throughout the System have sales at different times of the year. She hopes the Trustees will take the time to drop in on one or more of the sales and buy a few used books.

Richard Eadie moved to amend the agenda to move Library Advisory Boards in Unincorporated Areas to the next agenda item, before the Summer Reading Program report. Lucy Krakowiak seconded and the motion passed unanimously.

LIBRARY ADVISORY BOARDS IN UNINCORPORATED AREAS

This agenda item was based on an August 25 letter from Jean Bosch, Chair of the Vashon-Maury Island Community Council (VMICC). The Board asked that it be referred to the Planning Committee, and it was included in the discussion at the September Planning Committee meeting. By the request of the Planning Committee, staff prepared a draft letter in response that encapsulated some thoughts from the Planning Committee members. The letter from the VMICC requested that KCLS assign staff to a committee appointed by the Community Council.

The Planning Committee discussed the fact that recognizing an Advisory Board in an unincorporated part of the County would not be consistent with the definition of Advisory Board. Advisory Boards came about when Cities began annexing into KCLS and the Library System asked that they appoint liaisons between elected officials and the Library Board. The spirit of that decision in part was that before annexation of the community into the Library District, library service was the responsibility of the governing body: the City Council. Advisory Boards were seen as a way to keep the City in touch with the Library District due to the changed nature of their relationship. The function of the KCLS Board was to represent the interests of unincorporated areas. As mentioned in the draft letter and discussed by the Board, there are a number of avenues for people in unincorporated areas to be involved. The letter from VMICC asked how the community can have input during the siting and design process. KCLS has a series of public meetings and opportunities for people to comment in person as well as online, including budget hearings and KCLS Board meetings. Referring to the fact that the Board of Trustees has set up a number of channels for communication, having an Advisory Board in an unincorporated area would mean turning over the responsibility of the KCLS Board to another group.

Richard Eadie asked if there is any legislation or County ordinance that specifically identifies Library Advisory Boards. Bill Ptacek replied that Advisory Boards are only identified in annexation agreements as an encouragement from the Library District to the City. In annexation agreements with a number of Cities, a standard section in the draft says that KCLS encourages the City to appoint an Advisory Board to be a liaison. Richard asked if there is a part of the annexation agreements that says that KCLS will appoint a particular person to represent KCLS on the Advisory Board. Bill replied that the staff relationship with Advisory Boards has evolved over time. Currently, Community Liaisons at all of the clusters take on that responsibility. Richard noted that he believes that in some Library Advisory Boards there's a more formal connection, and in others there isn't, and some Boards are more active. Bill replied that some Boards do meet more often, and that for most, one of their biggest activities is an annual report to the City Council. KCLS works with almost all of the Boards to develop their reports to the City. That happens in just about all the groups.

Richard asked what the developed role of the Library Advisory Board is with respect to KCLS, and if it is primarily informational. He doesn't recall seeing Advisory Board members come to KCLS Board meetings with a proposal for a motion by the Board. Bill said that bringing resolutions to the KCLS Board is not the Advisory Boards' role. He noted that KCLS staff works with Advisory Boards to educate them on the Library System and ensure that they are knowledgeable about System activities. KCLS also encourages Advisory Boards to come to budget hearings and participate in System-wide activities. Bill mentioned that this issue came up for the KCLS Board in the past when there was a request for the appointment of an Advisory Board in another unincorporated area. At that time, the issue was participating in an annual gathering compared to the Friends groups, but both groups now meet annually. They are similar in many ways. The difference would be that an Advisory Board reports back to the City government and provides information. The members are appointed by City elected officials. Advisory Boards were created as a way to help the City know what's going on in service to citizens that at one time they had responsibility for.

Richard Eadie asked if there is any reason why communication between the Vashon Community Council and KCLS wouldn't be the same as a relationship between a City and KCLS. Recognizing that an Advisory Board wouldn't be reporting to a City because there is no municipality on Vashon, he asked if there is any reason why a representative group from Vashon couldn't do the same as a City Advisory Board.

Lucy Krakowiak suggested that the big picture is improving communication with Vashon. She said how that happens is important to acknowledge and work on. Lucy said that this is about structure. In unincorporated areas, the governing body is the County Council. The Community Council is an elected body and serves in an advisory role to the County Council. In Cities, the governing body is the City Council. The Advisory Board reports

to the governing body, which would be the City. The City provides a structure for that. In unincorporated areas, there is no structure to support an Advisory Board because that support comes from the municipality, not the Library. The Advisory Board reports directly to the governing body. For unincorporated areas, the Community Council is free to appoint committees. Lucy thinks that a great tool for the community would be to create a committee to act as a voice with KCLS. She believes that splitting hairs and modifying the structure KCLS has in place is going to create more challenges moving forward. Lucy said that KCLS can reach the goal of communication and support by having the VMICC appoint a committee to focus on the Library. She does not feel comfortable modifying KCLS' policies to have a Vashon Library Advisory Board.

Rob said that Lucy suggested the best vehicle for facilitating communication, given that there isn't a statutory framework with rules that KCLS is commanded to follow and that Library Advisory Boards are intended to facilitate communication. He noted that communication with Vashon is important and the experiences of the past year have shown that KCLS can improve communication with Vashon and needs to explore ways to do that. Rob said that if the VMICC sets up a committee that would act in the same way as an Advisory Board, KCLS shouldn't care what it's called. He noted that the Committee members would be volunteers, and it's not like KCLS is depleting its coffers to pay more people. Rob said that KCLS supports the goals of people wanting to help the library and facilitate communication. He also doesn't understand why Vashon is not a City. Bonnie de Steiguer replied that the current reason is that Vashon is designated as a rural area, so under land use management regulations, it can't be a City. Richard Eadie also noted that there are a lot of financial issues in terms of the ability to have a tax base to support services that would be municipal rather than County if Vashon became a city. Lucy said that a rural-urban line gets drawn, and Vashon is drawn into the rural side. It's hard to get that line changed. Rob noted that Vashon is an Island, and a clearly defined community with a Community Council that does municipal things. He would support a Vashon Library Advisory Board. Lucy said that she would support the format and the creation of a Vashon Library Committee, but she would not support including it as a Library Advisory Board. Rob said that as a community institution, he doesn't think it is a positive message for KCLS to reject Vashon's request. He doesn't want to send that message. Rob said it would work for him to recognize the Committee as Vashon's representative to the Community Council under a different name. He said KCLS should thank citizens for working for their libraries, and trying to communicate better and make the System stronger. Richard Eadie noted that at one level, it's a matter of semantics in terms of communication and the form it comes in, but at another level it's a little bit more than semantics. He said that is because KCLS has had Library Advisory Boards as an agreement between Cities and KCLS, as an organization that reports to an established governmental entity that has chosen to join KCLS. The Advisory Boards do have a role of reporting to elected officials chosen in public elections to represent cities. He recognizes that the VMICC members are elected, but the VMICC is not the same as a City. Lucy said that it is her understanding that people don't have to be Vashon residents to serve on the Council since it's not a formal governing body. That point was disputed by Bonnie de Steiguer.

Jessica Bonebright said that when she attended the Planning Committee meeting, she didn't understand what Community Councils were, but Bonnie explained that the VMICC members are elected in a regular election. The difference is that they don't run Vashon the way a City would. The things that a City would handle are done by the King County Council. The functions they do aren't the same as a City Council, or City officials, but the fact is that they're elected. Richard asked why KCLS shouldn't have a Vashon Library Advisory Board if the VMICC members are elected in a regular election.

Rob Spitzer asked if it makes sense before the October Board meeting to have someone from the Board or staff talk to the people from the VMICC that are interested in this to see if there is some way to facilitate communication without setting a precedent and while helping the community feel recognized and listened to. Bill asked if the Board would like staff to explore doing something similar in lieu of recognizing the Advisory Committee as requested. Rob replied that the Board is exploring calling the group something slightly different and giving it some official recognition.

Richard Eadie said that one of the distinctions he wanted to make is that there would still be some distinction in that cities that have Library Advisory Boards serve the function of reporting to a City. A City has the power to remove itself from the Library System. He noted that there's a different kind of communication in maintaining the choice to be part of KCLS. That being said, he thinks it boils down to semantics. Richard said there is something to be said for preserving the term Advisory Board for those groups with which KCLS has that particular relationship. He thinks the decision needs to be made in a way that shows that KCLS understands that some kind of communication will come in from the Vashon group. He believes that one of the things that is different about Vashon is that it is a very geographically defined entity that is different from other unincorporated areas where residents may go partly to one library, and partly to another. It makes Vashon more like a City than the rest of the unincorporated areas. Bill Ptacek said that staff can come up with a different name for this group, if that is

what the Board would like. KCLS would be happy to talk to any group that came together that wanted to discuss libraries. He noted that one point that was made, however, is that KCLS might rely on Advisory Boards to help with some issues. For instance, in Auburn, where KCLS is working with the City to expand the Library, one of the ideas is the possibility of acquiring more frontage on Auburn Way to make the Library and Park more visible. The Advisory Board is working to lobby for that issue. It's a little bit different on Vashon in that the Vashon Community Council does not have that responsibility or jurisdiction. In lieu of recognizing a Library Advisory Board, staff would be happy to find another moniker, if that's what the KCLS Board wants to do.

Lucy said that she would love to see a follow-up letter from KCLS restating that the System would love to work with an appointed Committee from the Community Council and reconfirming the importance of communication with the Vashon community.

Jim Wigfall asked if it was true that the Vashon Parks District had issues and things that they wanted to do differently, and the Friends group took an active role to get them to change their position. Bonnie de Steiguer said that was not the case. Jim said, however, that it was an active role that the Vashon community took to make the difference. Bonnie noted that the Friends feel they don't have permission to take a stance because they're part of the Library. Bill replied that the Friends are not part of the Library; they're a distinct and very independent group. Jim said that the community took an active role to make a difference in the Library issue, similar to the role an Advisory Board would take. It was an active role to make sure the position of KCLS was taken into account. Richard Eadie noted that one of his concerns is that whatever KCLS does in terms of recognition is done in a way that doesn't undercut the Friends and make them feel their position is minimized in some way or disrespected. Bonnie said that Vashon has a wonderful Friends group, but they don't feel free to express any opinion contrary to what their perception of KCLS' position. She said that Vashon needs to get people sitting together at the table talking: the Parks District, KCLS staff and the community. Bonnie noted that that has not been happening. She said that Vashon doesn't need a Library Advisory Board if KCLS can make that conversation happen.

Lucy said that if the committee that is formed comes from the VMICC, it will have the voice of the community. She noted that it needs to come from the VMICC rather than the Library so that it has the voice of the Community Council. Lucy supports creating a committee focused solely on library issues for the Vashon community. She said that it has the ability to have a powerful voice, and it needs to come from the Vashon community, but it's not the same role that Advisory Boards play because those report to a City.

Bonnie noted that the Community Council has a great deal of influence on the community. She has a project to improve the flow past the book drop, and the Library Advisory Board could help her do that. Richard asked if the community would take any offense if the name of the group was not exactly Advisory Board. Bonnie replied that KCLS' Advisory Boards have a lot of different names. Lucy asked what the VMICC needs to make that committee happen. Bonnie said that the VMICC would like some recognition. The VMICC has created a Committee already. She said that the community is tired of reinventing the wheel and nobody having any position or a way to communicate. Bonnie noted that the community is frustrated that KCLS staff is not meeting with the Park District. She said they feel that almost everyone on the Island wants the same thing and they are worried about the lack of progress in making this happen. They feel they could make it happen better if they had recognition and a little bit of power. Lucy asked if the group has a spokesperson. Bonnie said that she is the acting Chair of the Library Committee. The other members would be appointed by the Executive Council of the Community Council. There are application forms for people to fill out. Bonnie said the Committee process is about democracy and transparency. Jim Wigfall noted that it sounds like the Committee would be in line with the guidelines KCLS has in place for Advisory Boards.

Richard Eadie suggested a resolution recognizing the Library Committee on Vashon as the representative of the Vashon Community Council. Jessica added that KCLS should note that the Committee will have representation from KCLS in a similar manner to other Advisory Boards. Bill Ptacek said that KCLS works with Advisory Boards to provide annual reports to City Councils, and the relationship is a bit different. Jessica Bonebright asked if each Board has a KCLS staff member assigned to work with them, and knows who that is. Bill said that KCLS asks staff to communicate with any group that wants to be involved with the Library. Richard noted that the Cluster Managers often serve as liaisons to Advisory Boards, but his understanding is that there isn't anyone whose formal job is to represent KCLS to Advisory Boards. Bill said that each cluster has a Community Liaison that does that type of work. There are different communication issues and KCLS promotes the idea that people should participate in budget hearings. Not all of the communication issues would be the same because Advisory Boards work with City governments. KCLS would talk to a Vashon group and be connected, and take whatever direction the KCLS Board provides. The work KCLS does with Advisory Boards of cities is specific to their group and their relationship with the cities.

Lucy Krakowiak moved to recognize the Committee selected by the Vashon-Maury Island Community Council and to reaffirm that there will be a strong connection between KCLS, the community and the Committee. Richard Eadie seconded and the motion was discussed.

Lucy noted that she doesn't feel comfortable including the Committee as an Advisory Board.

Jessica Bonebright asked if there is any feedback mechanism to clarify that this meets the needs and interests of the community. Richard said that one way to do that is to table this motion until the October Board meeting so that there can be communication between both sides. Jim Wigfall asked Bonnie if this is something she thinks the VMICC would support. Bonnie replied that what Vashon wants is for Bill and possibly Kay Johnson to spend time with the Park District Board to help work out negotiations. She said this motion might mean that the Vashon Committee would be treated differently than other Advisory Boards.

Julie Williams noted that, historically, KCLS has worked to educate Friends and Advisory Boards about their role with the Library System and help them understand that their role is not to deal with the operations of KCLS. She said that there may be some confusion with that point. Julie thinks that part of KCLS' communication with a Vashon group needs to include the understanding of their appropriate role. Julie stressed that neither Friends nor Advisory Boards have influence over operations. Bill Ptacek added that KCLS does not include Advisory Boards in negotiations on property matters.

Bonnie noted that part of the research she did showed that Advisory Boards do work on buildings. Yoshiko Saheki commented that there is a difference between what Friends and Advisory Boards do. She was appointed to the Shoreline Library Advisory Board by the Shoreline City Council. Yoshiko said that one of the first ordinances the City Council passed after incorporation was to create the Library Advisory Board. Yoshiko noted that the operative word is Advisory. Having been appointed by the City Council, Yoshiko believes that she was advising the City Council on library matters, not advising KCLS Trustees. She mentioned that the Advisory Board was active when the Richmond Beach Library was built in the park and during the Shoreline Library parking lot expansion. She noted, however, that the Advisory Board served as a conduit to the community of Shoreline, taking feedback from the community to report to the City Council. Bonnie asked if it could work both ways. Yoshiko said that she was taking information from KCLS to the City Council, but it seems that the Vashon group would like to go the other direction. Bonnie asked if she shouldn't make a suggestion regarding a solution to a library problem.

Jessica Bonebright asked if the Board would like to table this issue and come up with an agreeable proposal in October.

Lucy Krakowiak moved to table Richard Eadie's motion until the October Board meeting.
Rob Spitzer seconded and the motion passed unanimously.

SUMMER READING PROGRAM AND STUDY ZONE ANNUAL REPORTS

Cecilia McGowan reported that the Summer Reading Program (SRP) had a 9% increase in the number of signups, a 20% increase in the number of children who reached the halfway goal and an 11.5% increase in the number of total finishers. The Summer Reading Program can't happen without everyone at KCLS working together, and Cecilia especially thanked the KCLS Foundation, Friends groups, Community Relations, Graphics and the Shipping department. She said it is fabulous that everyone that works in the community libraries feels like SRP is part of their regular programming that can help children be better readers. Staff also provided great stories of people loving the art kit prizes for this year's SRP. Cecilia mentioned that this year, 934 unique students visited the libraries, of the 3,500 total participants. These are children who don't regularly go to the library, some of whom were taken there on buses, supported by the KCLS Foundation.

Rob Spitzer asked what KCLS could and will do differently with SRP in the future. Cecilia replied that KCLS is hoping to increase participation in and the completion of SRP. She and Jerene Battisti have been discussing the best way to target specific age groups and get the word out to schools for students to sign up and complete SRP. KCLS would also like to increase participation by preschoolers, so Cecilia will be working to target parents.

Lucy Krakowiak said SRP is fabulous, but enthusiasm from a few students she knows fizzled after a few weeks when they were out of school because their parents were not able to listen to them read. Lucy asked if there is a way to do this program during the school year, because it seems that the schools are an important part of getting students excited about SRP. She said it is a shame that the students she knows did not participate fully in

the program because their family life was unable to support them; however they could be supported during the school year. Cecilia replied that during the school year, students can participate in Ready, Set, Read, where they read for 20 minutes a day, for 20 days a month and receive a book. Lucy suggested that a pizza prize might help fuel participation in that program. Cecilia noted that KCLS is always looking for ways to reach children who have no family support for reading, including day cares, camps and other outlets. Richard Eadie said SRP is a very successful program, and a credit to KCLS and the staff who put it together.

Annie Poyner reviewed the 2009 Study Zone Annual Report. She noted that in the 2008-2009 school year, the number of volunteers increased and student usage of the program nearly doubled. KCLS began receiving requests for tutors before the program officially started. Richard Eadie asked if the increased usage at the Muckleshoot Library is attributable to the size of the new Library. Annie noted that this was the first year that Muckleshoot has offered Study Zone, and it was also a test site for the online Study Zone. Through the online program, students at branches where tutors are unavailable can connect with online volunteer tutors. Online tutors are available Sundays from 3:30pm- 6pm and Monday–Thursday from 3pm-8pm. So far, there have been 1-3 students booking 2.5 hour sessions of online tutoring in each of the first two weeks of the program.

Annie reported that KCLS ended the year with 206 tutors at 31 libraries, and is already starting the next school year with around 200. The number of tutors usually increases throughout the school year, and by next June KCLS could have anywhere from 200-300 Study Zone volunteers.

In 2008, KCLS held the first summer Study Zone program, with 180 students getting help at seven branches. In 2009, summer Study Zone was offered at 16 locations. Both years, students sought help with skills building to prepare for the next school year.

Annie reported that this year, the annual recognition event for Study Zone was combined with recognition for Netmasters and Talk Time volunteers. The event was a huge success with better turnout than previous years. Staff provided workshops for the groups, and formal recognition of the volunteers' efforts. A surprising number of volunteers participate in more than one of the programs.

Lucy Krakowiak asked if there has been an increase in tutors willing to volunteer in the south end of the County. Annie replied that there have been increases in volunteers at many locations, and increases at all of the south end libraries except Skyway, which lost tutors due to scheduling conflicts. So far, Skyway is the only actively recruiting library that hasn't been able to find a tutor yet, while usually two or three locations have that type of delay. Media attention, including coverage by King-TV last fall, increased the demand for tutors.

Jerene Battisti provided a review of KCLS' teen programs. She thanked the Graphics department, the KCLS Foundation and KCLS staff for their support of the Read 3, Get 1 Free program. More teens than ever are participating, and so far 7,000 books have been given away. This summer, the program offered gift card incentives from Barnes and Noble, Target and Zumiez, and all of the teens who participated were eligible to win the first prize, a laptop, or second prize, an iPod. The laptop went to a regular user of the Burien Library, and the iPod went to a member of the Bothell Teen Advisory Board.

With 52 entries, participation in the 2009 Read.Flip.Win. program almost doubled that of 2008. After review by a panel of judges, the top four entries were tied and Jerene Battisti had to think long and hard to pick the grand prize winners in the Book Review and Book Trailer categories. The Board viewed the winning entries. Jerene said it was a privilege to host the contest, and KCLS hopes to continue it once again. She thanked the Foundation for providing support for the Flip camera prizes.

INTERIM STAFF SURVEY RESPONSE PLAN

Through the Interim Staff Survey Response Plan, KCLS is engaged in making improvements in the five key areas identified in the most recent staff survey: communication, chain of command, scheduling, staff participation and teamwork, and policies and procedures for emergencies. Holly Koelling provided an update on the progress in each of the five areas. Under communication, the Cluster Managers have spearheaded improvements to local and cluster-level meeting structures so staff at all levels have access to information through consistent formats. All of the Cluster Managers and management team members set office hours and one-on-one appointment schedules for staff to have access to them. KCLS also formed a team of staff to look at KCLS' passive communication structure to discover what's working, what is not and how to make changes. The group came up with recommendations for increased communication at the individual, local and System levels, which will be brought to the Administrative Planning Team before the end of the year. Those recommendations led to the revision of the System-level communication norms document.

One of the primary issues around chain of command is that staff feel they don't know who to go to for various issues under the current structure. The Cluster Managers therefore worked with the Public Services Team to create a template for a responsibility matrix, which the Cluster Managers have fleshed out for staff to use along with a searchable spreadsheet to help them find the person they need to talk to regarding particular issues. The Public Services Team has also been working with the Staff Development Coordinator to develop a clearer system to identify the person in charge of a location at any given time and to help the people who might serve in that role get the training they need to do so.

Staff have also created, compiled and posted updated information, including policies, rules, guidelines and procedures, on how staff is scheduled. This information can be used by the management teams in annual appointments with staff to help them understand why schedules are the way they are. The Public Services Team created a process for involving cluster-level staff in opportunities to engage in their communities. The Cluster Managers also developed expertise expectations to identify who to seek expertise from in a cluster when it is not easily available from a local individual.

KCLS is also working to update its emergency policies, procedures and guidelines, the first two of which were presented to the Board for approval in April. This is part of a larger effort by the Public Services Team to update its Policy Manual and ensure policies, procedures and guidelines are easy to locate, search, and interpret. A number of policies are under review by groups of staff, including those related to the Rules of Conduct, volunteer services, unscheduled library closures, incident reports, and bans and trespasses. Some of those policies will require Board approval, and those that don't will be rolled out as they are finalized.

Jessica Bonebright asked if there will be an additional staff survey to see if KCLS is making improvements in these areas of concern. Bill replied that the staff and Board agreed to give these efforts a chance to be implemented and get far enough along to be measured. KCLS is planning to follow up with an additional survey to measure the success of this effort once it has had a chance to take effect. Jessica noted that Boeing just released an annual employee survey with simple questions regarding employee pride, motivation and satisfaction. She would like to see KCLS do a broad staff survey in the future rather than being limited to measuring just these things. Bill Ptacek replied that since KCLS has spent time and effort on these items that were identified in the previous staff survey, KCLS should see if the response plan has made a difference. He noted that KCLS could do a general survey as well. Jessica requested that staff provide a report to the Planning Committee before a future survey is released. She hopes that a future staff survey will be broad enough to address the areas identified as problematic in the last staff survey. Lucy Krakowiak added that she supports following through with the areas identified as needing attention and getting specific data to see if KCLS is making progress. She thinks that once these problems are addressed, it would be good to have a regular survey with big-picture questions similar to a patron satisfaction survey.

Bill said that when it is appropriate, KCLS will go back and survey staff on the issues raised in the Interim Staff Survey. Holly noted that it will likely take a year to fully design and implement the tools needed to improve in these areas. She anticipates that KCLS would get the most useful data back from staff in late 2010 or early 2011. Bill added that the Board would have the opportunity to review an additional survey before it was finalized. Rob Spitzer said that he is satisfied with waiting a year to assess the results of this plan, but asked if the Administrative Planning Team is aware of other issues that staff might have. Lucy noted that that is a tough question, and what KCLS is working on now is data from staff at the ground level. She believes that it is appropriate for the Trustees to go to the libraries and talk to staff, get a sense of the patrons and see how the libraries are functioning. Bill replied that operations is always a difficult question, and he appreciates the fact that the Board wants to be aware of any potential issues. He noted that one thing going on right now is 34 staff meetings to discuss implementation of the Future Services Strategy with regards to staffing. That and the levy lid lift are key issues for staff right now, in addition to the libraries being very busy. Jessica noted that the issues in this plan are mostly to do with the public services staff. Holly added that all of the Administrative Planning Team members could give anecdotal thoughts, but the only way to get definitive is to ask the public services staff. She pointed out however that doing so would give a non-representative sample as opposed to the trends of the larger staff. Holly agreed with Bill that the most challenging issues for staff at the moment are the Future Services changes being implemented and the economy and how those issues might impact staff on a personal level. Julie Williams also added that staff has appreciated the opportunities provided by the libraries developing their own Annual Service Priorities. The process provided a lot more interaction with public services staff, and got them more engaged and excited about the opportunity to do more locally based things in their communities.

DIRECTOR'S REPORT

KCLS is excited about the progress being made on the Evergreen project. Jed Moffitt reported that the Evergreen team was just up at the North Bend Library doing an Evergreen demo for staff members there, who were excited about the fact that Evergreen lets them click and store a barcode to make library cards for members of the same family. There are a lot of small things that Evergreen can do that is really important for staff and that can make huge improvements for individual experiences with patrons. The recent news of the almost $1 million grant from the Institute of Museum and Library Services is exciting because it validates at a high level that what KCLS is doing can not only help KCLS staff to improve the software but is also helping spread word of what KCLS is doing across the country. Through the grant, KCLS can share the work on Evergreen with other Library Systems, which in turn can share their improvements with KCLS. Richard Eadie noted that this is a good example of the national recognition of KCLS that the Board discussed at its Retreat.

ADJOURNMENT

Jessica Bonebright adjourned the meeting at 7:59pm.

Jessica Bonebright, President

Rob Spitzer, Secretary

From: Danielle Perry [mailto:dmperry@kcls.org]
Sent: Monday, October 26, 2009 1:29 PM
To: Totten, Deirdre
Subject: RE: 2009 Draft KC Plan in libraries; 10/26/09 Plan Binder Status

Attachment A
16715

Yes, this is correct.

Danielle Perry
Safety & Security Program Coordinator
King County Library System
(425) 369-3218

From: Totten, Deirdre [mailto:Deirdre.Totten@kingcounty.gov]
Sent: Monday, October 26, 2009 1:17 PM
To: Danielle Perry
Subject: RE: 2009 Draft KC Plan in libraries; 10/26/09 Plan Binder Status

Hi Danielle,
This is to confirm our phone conversation today about the DRAFT 2009 KC Regional Hazard Mitigation Plan binder copies initially sent for distribution to the (5) Regional Libraries (5);10/22/09.

As of 10/26/09 - Due to construction at Kent and Federal Way Regional Libraries, Auburn Library and the KCLS online Catalogue at www.kcls.org) will be subbed for these two Regional Libraries.
3 DRAFT Plan binder copies are also at the following three Regional Libraries today:
Bellevue, Bothell, Redmond.

When the Draft Plan is approved as Final (Phase 1, and 2), a new cover and guts will be sent to you based on the completion date to insert into the existing binders. And we will evaluate where the "construction is at that point", to reassess where the Plan will be (re) distributed to, as appropriate.

In summary: as of 10/26/ 09: Five (5) *DRAFT 2009 KC Regional Hazard Mitigation Plan* binder copies are at the following Libraries in the Government section: Bellevue, Bothell, Redmond, Auburn, and KCLS Online Catalogue at www.kcls.org.

When I get your confirmation, I'll have the last paragpraph uploaded to our website.

Thanks so much,
Dee

Thanks and Sincerely,
Deirdre (Dee) Totten
Emergency Management Program Manager

King County, Office of Emergency Management
RCECC - 3511 NE Second Street
Renton, WA 98056
deirdre.totten@kingcounty.gov
EOC/Office - 206-296-3830
Desk - 206-205-4064

www.kingcounty.gov/prepare

Attachment A
16715

From: Danielle Perry [mailto:dmperry@kcls.org]
Sent: Monday, October 26, 2009 9:57 AM
To: Totten, Deirdre
Subject: 2009 Plan in libraries

Dee,

I just wanted to give you an update on the plan. We decided to keep them bound as-is, rather than rebinding them in-house. When we last spoke, we were talking about putting copies in all the regional libraries. Both the Kent and Federal Way libraries are under construction right now. Even though they are open for business, this business is being conducted out of temporary locations and the traffic flow is significantly lighter than usual. One of our government document staff recommended putting the fourth copy at Auburn instead of the temporary locations. The fifth copy will be available through our cataloging and processing department. These will all be cataloged and available for public review shortly.

Danielle Perry
Safety & Security Program Coordinator
King County Library System
(425) 369-3218

The Seattle Times

seattletimes.com
PO Box 70, Seattle, WA 98111

Attachment A
16715

K/C OFFICE OF EMERGENCY MGMT

3511 NE 2ND ST
RENTON, WA 98056

Re: Advertiser Account #85864015
Ad #: 784664300

Affidavit of Publication

4046692 / 3

STATE OF WASHINGTON
Counties of King and Snohomish

The undersigned, on oath states that he/she is an authorized representative of The Seattle Times Company, publisher of The Seattle Times of general circulation published daily in King and Snohomish Counties, State of Washington. The Seattle Times has been approved as a legal newspaper by orders of the Superior Court of King and Snohomish Counties.

The notice, in the exact form annexed, was published in the regular and entire issue of said paper or papers and distributed to its subscribers during all of the said period.

Newspaper	Publication Date
The Seattle Times	10/27/09

Agent Debbie Collantes Signature Debbie Collantes

Subscribed and sworn to before me on October 28, 2009 (DATE)

CHRISTINA M. ROTHMAN NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 10-29-12

Christina M. Rothman (NOTARY SIGNATURE) Notary Public in and for the State of Washington, residing at Seattle

The Seattle Times

seattletimes.com

Attachment A
16715

Re Advertiser Account #85864015 **Ad # 784664300**

Ad TEXT: PUBLIC INPUT PERIOD

The King County Office of Emergency Management in vites the public to read and pro vide input on the 2009 King County Regional Hazard Miti gation Plan (RHMP). The Plan, originally drafted in 2004 and scheduled to be updated this year, identifies hazards and assesses risk to guide re gional decisions on how best to

mitigate losses from future emergencies and disasters. The

current Plan is located online at http://www.kingcounty.gov/ mitplan.

Public input on a 2009 Question naire is being solicited via email at mitigation. plan@kingcounty.gov and found on the King County Office

of Emergency Management website at www.kingcounty. gov/prepare, along with a Re quest for Input document, ex plaining and further defining hazard mitigation.

STATE OF WASHINGTON, COUNTY OF KING }
AFFIDAVIT OF PUBLICATION

PUBLIC NOTICE
Linda M Mills, being first duly sworn on oath that she is the Legal Advertising Representative of the

Kent Reporter

a bi-weekly newspaper, which newspaper is a legal newspaper of general circulation and is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a bi-weekly newspaper in King County, Washington. The Kent Reporter has been approved as a Legal Newspaper by order of the Superior Court of the State of Washington for King County.
The notice in the exact form annexed was published in regular issues of the Kent Reporter (and not in supplement form) which was regularly distributed to its subscribers during the below stated period. The annexed notice, a:

Public Notice

was published on October 28, 2009.

The full amount of the fee charged for said foregoing publication is the sum of $70.00.

Linda Mills

Linda M. Mills
Legal Advertising Representative, Kent Reporter
Subscribed and sworn to me this 28th day of October 2009.

Kathy Dalseg

Kathy Dalseg, Notary Public for the State of Washington, Residing in Covington, Washington
P. O. Number:

KATHY DALSEG NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 10-19-11

PUBLIC INPUT PERIOD

The King County Office of Emergency Management invites the public to read and provide input on the 2009 King County Regional Hazard Mitigation Plan (RHMP). The Plan, originally drafted in 2004 and scheduled to be updated this year, identifies hazards and assesses risk to guide regional decisions on how best to mitigate losses from future emergencies and disasters. The current Plan is located online at http://www.kingcounty.gov/mitplan.

Public input on a 2009 Questionnaire is being solicited via email at mitigation.plan@kingcounty.gov and found on the King County Office of Emergency Management website at www.kingcounty.gov/prepare, along with a Request for Input document, explaining and further defining hazard mitigation.

Published in the Snoqualmie Valley Record, Kent and Bothell/Kenmore Reporters on October 28, 2009. #285705

Attachment A
16715

STATE OF WASHINGTON, COUNTY OF KING }
AFFIDAVIT OF PUBLICATION

PUBLIC NOTICE
Linda M Mills, being first duly sworn on oath that she is the Legal Advertising Representative of the

Snoqualmie Valley Record

a weekly newspaper, which newspaper is a legal newspaper of general circulation and is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a weekly newspaper in King County, Washington. The Snoqualmie Valley Record has been approved as a Legal Newspaper by order of the Superior Court of the State of Washington for King County.
The notice in the exact form annexed was published in regular issues of the Snoqualmie Valley Record (and not in supplement form) which was regularly distributed to its subscribers during the below stated period. The annexed notice, a:

Public Notice

was published on October 28, 2009.

The full amount of the fee charged for said foregoing publication is the sum of $49.00.

Linda M Mills
Linda M. Mills
Legal Advertising Representative, Snoqualmie Valley Record
Subscribed and sworn to me this 28th day of October, 2009.

Kathy Dalseg
Kathy Dalseg, Notary Public for the State of Washington, Residing in Covington, Washington
P. O. Number:

PUBLIC NOTICE #285705
PUBLIC INPUT PERIOD

The King County Office of Emergency Management invites the public to read and provide input on the 2009 King County Regional Hazard Mitigation Plan (RHMP). The Plan, originally drafted in 2004 and scheduled to be updated this year, identifies hazards and assesses risk to guide regional decisions on how best to mitigate losses from future emergencies and disasters. The current Plan is located online at http://www.kingcounty.gov/mitplan.

Public input on a 2009 Questionnaire is being solicited via email at mitigation.plan@kingcounty.gov and found on the King County Office of Emergency Management website at www.kingcounty.gov/prepare, along with a Request for Input document, explaining and further defining hazard mitigation.

Published in the Snoqualmie Valley Record, Kent and Bothell/Kenmore Reporters on October 28, 2009.

KATHY DALSEG NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 10-19-11

Attachment A
16715

STATE OF WASHINGTON, COUNTY OF KING }
AFFIDAVIT OF PUBLICATION

PUBLIC NOTICE
Linda M Mills, being first duly sworn on oath that she is the Legal Advertising Representative of the

Bothell/Kenmore Reporters

a weekly newspaper, which newspaper is a legal newspaper of general circulation and is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a bi-weekly newspaper in King County, Washington. The Bothell/Kenmore Reporters has been approved as a Legal Newspaper by order of the Superior Court of the State of Washington for King County.
The notice in the exact form annexed was published in regular issues of the Bothell/Kenmore Reporters (and not in supplement form) which was regularly distributed to its subscribers during the below stated period. The annexed notice, a:

Public Notice

was published on October 28, 2009

The full amount of the fee charged for said foregoing publication is the sum of $49.00.

Linda M Mills
Linda M. Mills
Legal Advertising Representative, Bothell/Kenmore Reporters
Subscribed and sworn to me this 28th day of October , 2009.

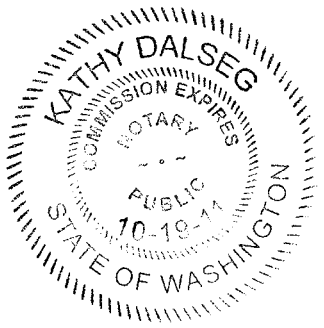
Kathy Dalseg
Kathy Dalseg, Notary Public for the State of Washington, Residing in Covington, Washington
P. O. Number:

PUBLIC INPUT PERIOD

The King County Office of Emergency Management invites the public to read and provide input on the 2009 King County Regional Hazard Mitigation Plan (RHMP). The Plan, originally drafted in 2004 and scheduled to be updated this year, identifies hazards and assesses risk to guide regional decisions on how best to mitigate losses from future emergencies and disasters. The current Plan is located online at http://www.kingcounty.gov/mitplan.

Public input on a 2009 Questionnaire is being solicited via email at mitigation.plan@kingcounty.gov and found on the King County Office of Emergency Management website at www.kingcounty.gov/prepare, along with a Request for Input document, explaining and further defining hazard mitigation.

Published in the Snoqualmie Valley Record, Kent and Bothell/Kenmore Reporters on October 28, 2009. #285705



Attachment A
16715

Attachment A
16715

Rohr Tran, Holly

From: Totten, Deirdre

Sent: Friday, October 30, 2009 11:12 AM

To: 'Al Church (allen.church@southkingfire.org)'; Alston, Allen; 'Backer, Bud'; Bleifuhs, Steve; 'Bob Taylor'; 'breth@ci.issaquah.wa.us'; 'Chief Barlow'; 'Chief Tim Lemon'; 'Chris Hall'; 'Dana Dick'; 'David Brower'; 'David Nelson'; 'David Remmem (dremmem@fwps.org)'; DeCapua, Mike; 'Dick Swaab (dswaab@kcwd20.com)'; 'Forrest Miller'; 'Frank Iriarte'; 'Gordie Olson (gordon.olson@southkingfire.org)'; Hayes, William; 'Jay Regenstreif (jay@sammplat.wa.org)'; 'Jeffrey Lakin (jlakin@water19.com)'; 'Jennifer Warmke (Jennifer.Warmke@ci.bothell.wa.us)'; 'Jeremy Delmar'; 'Jerry Thornton'; 'John Lambert'; 'Joshua Deraitus'; 'Karen Ferreira (KarenF@burienwa.gov)'; Kaufmann, Priscilla; 'Ken Miller'; Kimble, Larry; 'Kory Batterman'; 'Kris Finnigan'; 'kurt Oakland'; 'Larry Rude'; 'Laura Gallez'; 'LCroco@bellevuewa.gov'; 'len cornwel'; 'Mark Adler (madler@burienfire.org)'; 'Mark Davidson (mdavidso@fwps.org)'; 'Mary Hobday'; 'Pam Cobley'; 'Patti Harris'; 'PWeller'; 'Ray Gross'; 'Rick K'; 'Ron Garrow (rong@ci.north-bend.wa.us)'; 'Sarah Miller (skmiller@auburnwa.gov)'; 'Scott Webster'; 'Steve Campbell'; 'Steve Roberge'; 'Tim Campbell'; 'Tom Hoffman'; 'Vernon Owens (vowens@bellevuewa.gov)'

Cc: 'O'Dea, Beverly (EMD)'; Whalen, Caroline; Worsham, Dennis; Rohr Tran, Holly; Friedman, Robin; 'Flaner, Rob'; Smith, Lauren; Miller, Lynne

Subject: Request for Input: Please fill out the King County Hazard Mitigation Survey Questionnaire by November 8, 2009

To all Hazard Mitigation planning partners:

Please take 5 minutes to fill out the King County Hazard Mitigation Survey Questionnaire by November 8, 2009.

A Request for Input and a Questionnaire are posted on the King County, Office of Emergency Management, website under "Hot Topics", as part of Regional Hazard Mitigation Planning effort, linked below from homepage. The Plan, King County Government - Phase 1, is a work in progress; so please recheck the website for the most current version updates and information coming "soon". Please distribute this email to others, as appropriate.

www.kingcounty.gov/prepare

Thank you,
King County Regional Hazard Mitigation Planning Team

2009 Howard Hanson Dam and Green River Flood Planning - Regional Communications and Public Outreach			✓ = King County, Office of Emergency Management (OEM) Involvement
Past Public Events	**Meeting Location**	**Year 2009**	
Green River Flood Safety Information Meeting	GR Community College	31-Mar	✓
Boeing Health & Enviro. Fair	Renton	15-Jul	
Auburn Wastemobile Kick off event	Auburn	17-Jul	
Enumclaw Fair	Enumclaw	July 16-18	
Boeing Health & Enviro. Fair	Auburn	24-Jul	
Boeing Environmental Fair	Tukwila	5-Aug	✓
Snoqualmie Railroad Days	Snoqualmie	Aug. 18	
Lower Green River Valley Public Safety Meeting		Sept. 9	✓
Executive's Media Event re: pre-declaration		Sept. 9	✓
King County Employee Site live on Intranet Site		Sept.8	
American Red Cross “National Day of Caring” (door to door to vulnerable pop.)		Sept. 11	
Olympia Capitol Preparedness Fair.		Sept. 11	
Truckers Association luncheon		Sept. 1	
Press event with the Governor’s office	River Bend Golf Course - Kent	Sept. 14	✓
School drop,cover & hold drills (GR PIO mtg. notes)		Sept. 16	
Agriculture workshop (150 attendees)	Flaming Geyser Park	Sept. 14	✓
Agricultureworkshop (46)	Auburn City Hall	Sept. 17	✓
Agriculture workshop (50)	Emerald Downs	Sept. 22	✓
Combined Chambers Event	ShoWare Center Kent	Sept. 23	✓
OEM's Public Educator making 4 presentations at Puget Sound Energy's facility	Lake Tapps	Sept 24th	✓
Superior Courts Educational event - Jackie Austin	Seattle City Hall	Sept. 24	
NOAA Radio Event @retailers points of purchase throughout State		Sept. 26	✓
Disaster Preparedness Event at Les Gove Park - contact - Sarah Miller	Auburn	Sept. 26	
BUSINESS - Train the Trainer	Tukwila - Foster HS	Sept. 30	

RESIDENTS - Flood Information	Tukwila Community Center	Sept. 30	
Building Owners and Managers Association		Oct. 1	✓
Kent - Showare Center	Kent	Oct. 3	
Healthcare Providers Free two-day workshop to learn the fundamentals of business preparedness and how to easily accomplish critical preparedness activities	Kent	Oct. 6	
Healthcare Providers Free two-day workshop to learn the fundamentals of business preparedness and how to easily accomplish critical preparedness activities	Kent	Oct. 7	
Flood Information Mtg -Residents	Tukwila Community Center	Oct. 7	
Kent - Showare Center	Kent	Oct. 8	
Redcross Preparedness Presentation H1N1 and Flood - Disabled Populations	HS& Deaf Center	Oct. 9	
Residents - Haz Waste Management	Tukwila Community	Oct. 10	
South Park Community of Seattle	Seattle	Oct. 13	
Business - Haz Waster Management	Foster HS Tukwila	Oct. 14	

Thank you for reviewing our 2009 KC Regional Hazard Mitigation Plan at www.kingcounty.gov/prepare

Please go to the King County Office of Emergency Management website link to view the Questionnaire and to provide your input on the survey monkey.

NOTE: This Plan is not a forum to address issues with the Howard Hanson Dam and Green River Valley Flood planning effort currently being undertaken in earnest.

HAZARD MITIGATION DEFINED

What is mitigation? [1]

Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. This is achieved through risk analysis and hazard assessment, which results in information that provides a foundation for mitigation activities that reduce potential risk, such as purchasing flood insurance that protects financial investment or changing building codes to protect property in landslide or liquefaction zones.

What is a Mitigation Plan?

A Mitigation Plan is a community-driven, living document that communities use to reduce their vulnerability to hazards. Mitigation planning is a process through which communities assess risks and identify actions or strategies to reduce vulnerability to hazards through hazard mitigation.

Why assess and plan for risk?

The Plan and its process show the link between hazard risk assessment and vulnerability and provides a vehicle to expand on and improve existing tools. Government agencies and the public must understand the full impact of natural hazards vulnerability and risk assessment in order to reduce natural and man-made hazard effects. Planning serves as a tool to be used by planners or other officials to advise and inform decision makers about future planning decisions, as example, land-use.

Why have a Mitigation Plan?

Communities must have a Plan to apply for or receive a mitigation grant. These grants can augment local mitigation activities already being done. Ultimately, these actions reduce vulnerability, and communities are able to recover more quickly from disasters.

Benefits of Mitigation Planning

- Increases public awareness and understanding of vulnerabilities as well as support for specific actions to reduce losses from future natural or man-made disasters.
- Builds partnerships with diverse stakeholders increasing opportunities to leverage data and resources in reducing workloads as well as achieving shared community objectives.
- Expands understanding of potential risk reduction measures to include structural and regulatory tools, where available, such as ordinances and building codes.
- Informs development, prioritization, and implementation of mitigation projects. Benefits accrue over the life of the project as losses are avoided from each subsequent hazard event.

Mitigation is valuable to society in these ways:

- It creates safer communities by reducing loss of life and property damage. For example, the rigorous building standards adopted by 20,000 communities across the country are saving the nation more than $1.1 billion a year in prevented flood damages.
- It allows individuals to minimize post-flood disaster disruptions and recover more rapidly. For example, homes built to NFIP standards incur less damage from floods. And when floods do cause damages, flood insurance protects the homeowner's investment, as it did for the more than 200,000 Gulf Coast residents who received more than $23 billion in payments following the 2005 hurricanes.
- It lessens the financial impact on individuals, communities, and society as a whole. For example, a recent study by the Multi-Hazard Mitigation Council shows that each dollar spent on mitigation saves society an average of four dollars.

1 FEMA website 2009; Hazard Mitigation

Attachment A
16715

DRAFT King County Regional Hazard Mitigation Plan - Public Involvement 2009

Exit this survey

1. Hazards

1. Please tell us your name and/or name of your organization or community group (optional):

Name:	
Company/Organization/Group:	
Address:	
Address 2:	
City/Town:	
State:	-- select state --
ZIP/Postal Code:	
Email Address:	
Phone Number:	

2. Are you responding as:

- Citizen
- Local Jurisdiction
- Community Organization
- Company
- Non-Profit Organization

3. How concerned are you about the following natural and man-made hazards affecting you, your community or organization?

	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	No Concern
Avalanche					
Climate Change					
Dam/Dam Safety					
Drought					
Earthquake					
Flood					

Attachment A
16715

Hazardous Materials					
Severe Winter Storm and High Winds					
Landslide / Ground Failure					
Public Health					
Tsunami					
Volcanic Eruption					
Wildfire					
Other (Please specify in box below)					

Please fill in if "Other" line above is checked

4. Are you prepared for the following disasters?

	No	Yes
Avalanche		
Climate Change		
Dam /Dam Safety		
Drought		
Earthquake		
Flood		
Hazardous Materials		
Severe Winter Storm and High Winds		
Landslide / Ground Failure		
Public Health		
Tsunami		
Volcanic Eruption		
Wildfire		
Other (Please specify in box below)		

Please fill in if "Other" line above is checked

5. Did you know preparedness information is available about these hazards from King County, your local jurisdiction, and/or the State of Washington?

- ○ No
- ○ Yes

6. Do you have insurance for the following?

	No	Yes
Earthquake	○	○
Flood	○	○

Next

Attachment A
16715

DRAFT King County Regional Hazard Mitigation Plan - Public Involvement 2009

Exit this survey

2. Mitigation Strategies

A number of activities can reduce your own, or jurisdiction/community/organization's risk from hazards. These activities can be both regulatory and non-regulatory. An example of a regulatory activity is a policy that limits or prohibits development in a known hazard area such as a floodplain. An example of a non-regulatory activity would be to develop a public education program to demonstrate steps citizens can take to make their homes safer from hazards.

1. Please select the option that best represents your opinion of each of the following community-wide strategies.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Not Sure
I support a regulatory approach to reducing risk.	○	○	○	○	○	○
I support a non-regulatory approach to reducing risk.	○	○	○	○	○	○
I support a mix of both regulatory and non-regulatory approaches to reducing risk.	○	○	○	○	○	○
I support policies to prohibit development in areas subject to natural hazards.	○	○	○	○	○	○
I support the use of tax dollars (federal, state and/or local) to compensate landowners for not developing in areas subject to natural hazards.	○	○	○	○	○	○
I support the use of local tax dollars to reduce risks and losses from disasters.	○	○	○	○	○	○
I support protecting historical and cultural structures.	○	○	○	○	○	○
I would be willing to make my home or business more disaster resistant.	○	○	○	○	○	○
I support steps to safeguard the local economy following a disaster event.	○	○	○	○	○	○
I support improving the disaster preparedness						

of local schools.	○	○	○	○	○	○
I support a local inventory of at-risk buildings and infrastructure.	○	○	○	○	○	○

Prev Done

1. Please tell us your name and/or name of your organization or community group (optional):

	Response Percent	Response Count
Name:	85.7%	6
Company/Organization/Group:	**100.0%**	**7**
Address:	**100.0%**	**7**
Address 2:	28.6%	2
City/Town:	**100.0%**	**7**
State:	**100.0%**	**7**
ZIP/Postal Code:	**100.0%**	**7**
Email Address:	**100.0%**	**7**
Phone Number:	**100.0%**	**7**
	answered question	**7**
	skipped question	**1**

2. Are you responding as:

	Response Percent	Response Count
Citizen	0.0%	0
Local Jurisdiction	**87.5%**	**7**
Community Organization	0.0%	0
Company	12.5%	1
Non-Profit Organization	0.0%	0
	answered question	**8**
	skipped question	**0**

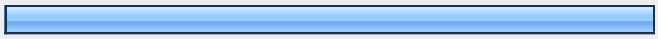
3. How concerned are you about the following natural and man-made hazards affecting you, your community or organization?

	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	No Concern	Rating Average	Res C
Avalanche	0.0% (0)	0.0% (0)	0.0% (0)	12.5% (1)	**87.5% (7)**	1.13	
Climate Change	0.0% (0)	**37.5% (3)**	25.0% (2)	**37.5% (3)**	0.0% (0)	3.00	
Dam/Dam Safety	**37.5% (3)**	25.0% (2)	0.0% (0)	12.5% (1)	25.0% (2)	3.38	
Drought	0.0% (0)	25.0% (2)	**37.5% (3)**	12.5% (1)	25.0% (2)	2.63	
Earthquake	37.5% (3)	**50.0% (4)**	12.5% (1)	0.0% (0)	0.0% (0)	4.25	
Flood	14.3% (1)	**57.1% (4)**	0.0% (0)	14.3% (1)	14.3% (1)	3.43	
Hazardous Materials	0.0% (0)	0.0% (0)	**50.0% (4)**	25.0% (2)	25.0% (2)	2.25	
Severe Winter Storm and High Winds	**62.5% (5)**	25.0% (2)	12.5% (1)	0.0% (0)	0.0% (0)	4.50	
Landslide / Ground Failure	25.0% (2)	25.0% (2)	**50.0% (4)**	0.0% (0)	0.0% (0)	3.75	
Public Health	**25.0% (2)**	**25.0% (2)**	**25.0% (2)**	**25.0% (2)**	0.0% (0)	3.50	
Tsunami	0.0% (0)	0.0% (0)	25.0% (2)	25.0% (2)	**50.0% (4)**	1.75	
Volcanic Eruption	0.0% (0)	12.5% (1)	**50.0% (4)**	25.0% (2)	12.5% (1)	2.63	
Wildfire	0.0% (0)	0.0% (0)	**50.0% (4)**	25.0% (2)	25.0% (2)	2.25	
Other (Please specify in box below)	**100.0% (1)**	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	5.00	
						Please fill in if "Other" line above is checked	
						answered question	
						skipped question	

4. Are you prepared for the following disasters?

	No	Yes	Response Count
Avalanche	**87.5% (7)**	12.5% (1)	8
Climate Change	**75.0% (6)**	25.0% (2)	8
Dam /Dam Safety	**50.0% (4)**	**50.0% (4)**	8
Drought	37.5% (3)	**62.5% (5)**	8
Earthquake	0.0% (0)	**100.0% (8)**	8
Flood	0.0% (0)	**100.0% (8)**	8
Hazardous Materials	25.0% (2)	**75.0% (6)**	8
Severe Winter Storm and High Winds	0.0% (0)	**100.0% (8)**	8
Landslide / Ground Failure	25.0% (2)	**75.0% (6)**	8
Public Health	25.0% (2)	**75.0% (6)**	8
Tsunami	**75.0% (6)**	25.0% (2)	8
Volcanic Eruption	37.5% (3)	**62.5% (5)**	8
Wildfire	**50.0% (4)**	**50.0% (4)**	8
Other (Please specify in box below)	0.0% (0)	**100.0% (1)**	1
		Please fill in if "Other" line above is checked	1
		answered question	**8**
		skipped question	**0**

5. Did you know preparedness information is available about these hazards from King County, your local jurisdiction, and/or the State of Washington?

		Response Percent	Response Count
No		0.0%	0
Yes		**100.0%**	**8**
	answered question		**8**
	skipped question		**0**

6. Do you have insurance for the following?

	No	Yes	Response Count
Earthquake	14.3% (1)	**85.7% (6)**	7
Flood	37.5% (3)	**62.5% (5)**	8
		answered question	**8**
		skipped question	**0**

7. Please select the option that best represents your opinion of each of the following community-wide strategies.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Not Sure	Rating Average	Response Count
I support a regulatory approach to reducing risk.	37.5% (3)	0.0% (0)	**50.0% (4)**	0.0% (0)	12.5% (1)	0.0% (0)	3.50	8
I support a non-regulatory approach to reducing risk.	**37.5% (3)**	25.0% (2)	**37.5% (3)**	0.0% (0)	0.0% (0)	0.0% (0)	4.00	8
I support a mix of both regulatory and non-regulatory approaches to reducing risk.	**37.5% (3)**	**37.5% (3)**	12.5% (1)	0.0% (0)	12.5% (1)	0.0% (0)	3.88	8
I support policies to prohibit development in areas subject to natural hazards.	**50.0% (4)**	37.5% (3)	0.0% (0)	0.0% (0)	12.5% (1)	0.0% (0)	4.13	8
I support the use of tax dollars (federal, state and/or local) to compensate landowners for not developing in areas subject to natural hazards.	12.5% (1)	**25.0% (2)**	12.5% (1)	**25.0% (2)**	**25.0% (2)**	0.0% (0)	2.75	8
I support the use of local tax dollars to reduce risks and losses from disasters.	25.0% (2)	**50.0% (4)**	25.0% (2)	0.0% (0)	0.0% (0)	0.0% (0)	4.00	8
I support protecting historical and cultural structures.	0.0% (0)	**62.5% (5)**	37.5% (3)	0.0% (0)	0.0% (0)	0.0% (0)	3.63	8
I would be willing to make my home or business more disaster resistant.	**62.5% (5)**	37.5% (3)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	4.63	8
I support steps to safeguard the local economy following a disaster event.	**62.5% (5)**	37.5% (3)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	4.63	8
I support improving the disaster preparedness of local schools.	**50.0% (4)**	**50.0% (4)**	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	4.50	8
I support a local inventory of at-risk buildings and infrastructure.	37.5% (3)	**50.0% (4)**	12.5% (1)	0.0% (0)	0.0% (0)	0.0% (0)	4.25	8
						answered question		**8**
						skipped question		**0**

Annex F: Policy and Program Analysis

This annex was updated by Department of Development and Environmental Services (DDES) for the 2009 Plan update.

VISION 2020 in 2004 is replaced with Vision 2040 in 2009.

VISION 2040

VISION 2040 is a regional strategy for accommodating the additional 1.7 million people and 1.2 million new jobs expected to be in the region by the year 2040.

VISION 2040 is an integrated, long-range vision for maintaining a healthy region – promoting the well-being of people and communities, economic vitality, and a healthy environment. It contains an environmental framework, a numeric regional growth strategy, six policy sections guided by overarching goals as well as implementation actions and measures to monitor progress.

The concept of people, prosperity, and planet provides a central theme for VISION 2040. This concept signals that our regional leaders use an approach that takes into account social, cultural, economic, and environmental benefits when making decisions

King County Region

Countywide Planning Policies

The Countywide Planning Policies (CPPs) define the countywide vision and sets the framework for the County's and cities' comprehensive plans. The CPPs, adopted by the County and cities in 1992, are primarily goals that, if properly implemented, should improve the quality of life in King County during the next twenty years. The policies established an Urban Growth Area (UGA) within the western one-third of King County where most growth and development is targeted. The goals and policies include: reducing urban sprawl, protecting rural areas, providing affordable housing throughout the county and coordinating protection of environmentally sensitive areas. Many of these policies directly and indirectly influence hazard mitigation activities. The King County Benchmark Report, issued annually, provides a mechanism to monitor progress of the Countywide Planning Policies to determine if public policy and programs are making a difference. This information is also helpful in understanding trends

affecting hazard mitigation issues. King County Annual Growth Report – Benchmark Highlights.

King County (Unincorporated)

Municipalities, Districts, and Other Agencies
King County Comprehensive Plan

King County's comprehensive land-use planning dates back to 1964, the year the first comprehensive plan under the State Growth Management Act (GMA) was adopted. In 1994, Comprehensive plans adopted in accordance with GMA must manage growth so that the majority of new development is directed to designated urban areas and away from rural areas. The GMA also requires jurisdictions to designate and protect critical areas and commercially significant forestry, agriculture, and mining areas. The GMA requires each Comprehensive Plan to adhere to a set of thirteen goals and to include the following elements: land use, housing, capital facilities, utilities, rural and transportation. King County's Comprehensive Plan applies only to unincorporated areas of the County. Source: *2008 KC Comp Plan*

Land Use: Cities also develop their own comprehensive plans and development regulations. These plans must be consistent with the Countywide Planning Policies.

BUILDING CODES SUPPORT MITIGATION (rewritten for 2009)

The Building Services Division of the Department of Development and Environmental Services serves the citizens, homeowners and business of unincorporated King County with building permit services. Its mission is to promote public safety in accordance with the International Building Codes.

The Building Services Division promotes mitigation by ensuring that the design and construction of buildings and structures are in compliance with the building code as amended and adopted by King County. As stated in the International Building Code; "The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations."

The Division also operates the Code Enforcement section who's mission is to ensure properties that have non-permitted structures or site code violations are mitigated by either obtaining a permit or removing the violation. This Section works with a wide variety and level of public hazard conditions, coordinating with

other agencies including; the Public Health - Seattle & King County, the King County Sheriff, and the King County Department of Natural Resources and Parks.

Annex G: Critical Facilities

”Annex G: Critical Facilities” is exempt from public disclosure pursuant to RCW 42.56.420. Requests for public disclosure of this document, or parts thereof, should be referred immediately to the King County Prosecuting Attorney’s Office.

Distribution of this document beyond the intended party is prohibited unless authorized in writing in advance by the King County Prosecuting Attorney’s Office or Designee.

Annex H: Potential Funding Sources

In fulfillment of 44 CFR § 201.4(c) (3) (iv), the following are the identification of current and potential sources of Federal, State, local, or private funding that may be utilized to implement mitigation activities. With jurisdictions of similar disciplines (e.g., water, sewer & utilities) all having common resource pools, the resources are grouped below. This list is representative of the types of funding sources possibly available and may not be all inclusive in 2009.

King County Government – Internal Agencies

- Taxes
- Bonds
- Levies
- Grants: FEMA, CDBC, ODP, DOE, DOJ
- General Fund
- Debt Capacity
- Self-Insurance fund (Raid; borrow)
- Capitol Improvement Fund
- WoLP – Budgeted – non-discretionary funds

  Fair Increases (Metro Transit)

<u>Utility District</u>

- Rates – Customer/ Product / Sales
- FEMA – Hazard Mitigation Grants (Pre and Post Disaster)
- PWPF – Public Works Trust Fund
- DOE--Water Quality Program (SRF, Centennial)
- General Facilities Changes/Development Fees
- Pilot Projects (Coal Creek)
- Bonds
- Insurance (? Mitigation)
- CDBG (Community Development Block Grants)
- State Line Item Appropriations
- ULID -Utility Local Improvement Districts

- General Facilities Funds
- Water Revolving Funds

Fire Districts

- Taxes
- Bonds
- Levies
- Grants (FEMA, EPA, Dept of Education, DOE, DOJ, HHS)
- State Fire Mobility (Mutual aid/ FEMA Reimbursement)
- Corporate and Private Donations
- Benefit Service Charge (based upon structure and s. f.)

Estimating Existing Resource Availability

- Current Capital Improvement Budget
- Current Debt Capability
- Annual Budget

CITIES

- General Fund
- Levies
- Bonds
- Grants: FEMA, CDBC, WA State, etc.
- Loan (Public Works Trust Fund)
- Reserve Fund
- Insurance (? As a loan or a reduction in rates?)
- Impact Fund (only for new facilities and operations)
- Debt Capacity
- Local Improvement Districts
- VOADs (Faith Based – Shelters)
- Native American Nation Partnerships

SCHOOLS

- Levies
- Bonds
- Impact Fees

Current Resource Availability

- Capital Improvements
- Budget
- Debt Capacity

Annex I: References and Resources

Forms

2009 KC RHMP, Regional Mitigation Plan Signatory Form
In Annex B; 1.1 Letter of Intent; Refer to Section 2, Plan Development, Plan Maintenance and Plan Management

Hazard Mitigation Planning References / Resources

The following agencies were major resources in the development of this Plan. This list is representative only and is not a complete list. Please look to the footnotes and / or endnotes in each KC RHMP Plan Section, for more detailed information on sources and documentation.

Federal Emergency Management Agency (FEMA)
500 C Street SW
Washington, DC 20472
Website: http://www.fema.gov

- Plan Adoption Resolution Sample

Federal Regional Center
130 228th Street SW
Bothell, WA 98021-9796
(425) 487-4600
Website: http://www.fema.gov/about/regions/regionx/index.shtm

- FEMA Region X - Local Hazard Mitigation Plan Review Crosswalk, July 1, 2008

King County Office of Emergency Management
3511 NE 2nd Street, MS: ECC-ES-0100
Renton, WA 98056
(206) 396-3830
Website: http://www.metrokc.gov/prepare

King County GIS Center
King Street Center
201 South Jackson Street
MS: KSC-NR-0706
Seattle, WA 98014
Website: http://www.metrokc.gov/gis/

Municipal Research Center
Website: http://www.mrsc.org

United States Census Bureau
4700 Silver Hill Road
Washington, DC 20233
(301) 763-4636
Website: http://www.census.gov

Washington Institute for Hazards Mitigation Planning and Research
Website: http://depts.washington.edu/mitigate/

Washington State Military Department - Emergency Management Division
Building 20, M/S: TA-20
Camp Murray, WA 98430-5122
800-562-6108
Website: http://www.emd.wa.gov

Washington State Office of Financial Management (OFM)
PO Box 43113
Olympia, Washington 98504-3113
(360) 902-0555
Website: http://www.ofm.wa.gov

Annex J: Glossary

A.F.I.S. – Automated Fingerprint Identification Systems

ALF – Animal Liberation Front

ALS – Advanced Life Support

BLS – Basic Life Support

CBA– Cost / Benefit Analysis

CDC – Center for Disease Control and Prevention

CERT – Citizens Emergency Response Team

CHS Engineers – Contractor hired by multiple utilities for plan development

CIP – Capital Improvement Program

CS – Tear gas

CTV – County Television

DI – Ductile-iron

DOJ – United States Department of Justice

EAS – Emergency Alert System

EDC – Education Development Center

EMAC – Emergency Management Advisory Committee

EMS – Emergency Medical Services

EMT – Emergency Medical Technician

EOC/ECC – King County Emergency Operation Center/Emergency Coordination Center

ERP – Emergency Response Plan

ESCA – Emergency Services Coordinating Agency

FBI – Federal Bureau of Investigation

FEMA – Federal Emergency Management Agency

Flood Phases – Phase I-IV Progressive with IV being worst

FMO – Fire Marshal's Office

FTA – Federal Transit Administration

GIS – Geographic Information System

HIVA – Hazard Identification Vulnerability Analysis

HMGP – Hazard Mitigation Grant Program

HMP – Hazard Mitigation Plan

ISB – Investigative Services Bureau

K.C.F.D. – King County Fire Department

KCDNR&P – King County Department of Natural Resources and Parks

KCSO – King County Sheriff's Office

LEPC – Local Emergency Planning Committee, Hazardous Materials Planning group

M.A.R.R. – Major Accident Response and Reconstruction

MCI – Mass Casualty Incident

NET – Neighborhood Emergency Team

ODP – Office of Domestic Development, part of Homeland Security

OEM – King County Office of Emergency Management

PBEC – Precinct-Based Emergency Communications
Presidential Decision Directive #39 – Issued by the President without congressional approval process

Project Impact – FEMA public info. television production

PRV –

PSA – Public Service Announcements

PSAP – Public Safety Answer Point (911)

RCPGP – Regional Catastrophic Preparedness Program

RH2 Engineers – Contractor hired by multiple utilities for plan development

RHMP – Regional Hazard Mitigation Plan

RWD – Ronald Wastewater District

SAR – Search and Rescue

SBA – Small Business Administration

SKDPH – Seattle-King County Department of Public Health

SPART – Ski Patrol and Rescue Team

SPU – Seattle Public Utility

SWAT – Special Weapons and Tactics Teams

Tac 30 – Tactical Team 30 (SWAT)

TOPOFF – Top Officials (Exercises)

TSA – Transportation Safety Administration

U.S.C. – United States Code

UGA – Urban Growth Area

ULID – Utility Local Improvement District

USAR – Washington State Urban Search and Rescue

VATS – Vessel and Terminal Security

WAC 118-04 – Regulation governing Emergency Management Registration of Emergency Workers

WAC 118-40 – Regulation creating LEPC's

Washington Growth Management Act (GMA) – Encourage wise land use and planning

Washington State Fire Services Resource Mobilization Plan – also "Mobilization Plan;" designed to provide a process to quickly notify, assemble, and deploy fire service personnel and equipment to any local fire jurisdiction in the state that has expended all local and mutual aid resources

WAWSD – Washington Association of Water and Sewer District

WMD – Weapons of Mass Destruction

WSDOT – Washington State Department of Transportation

WTD – Water Treatment Division

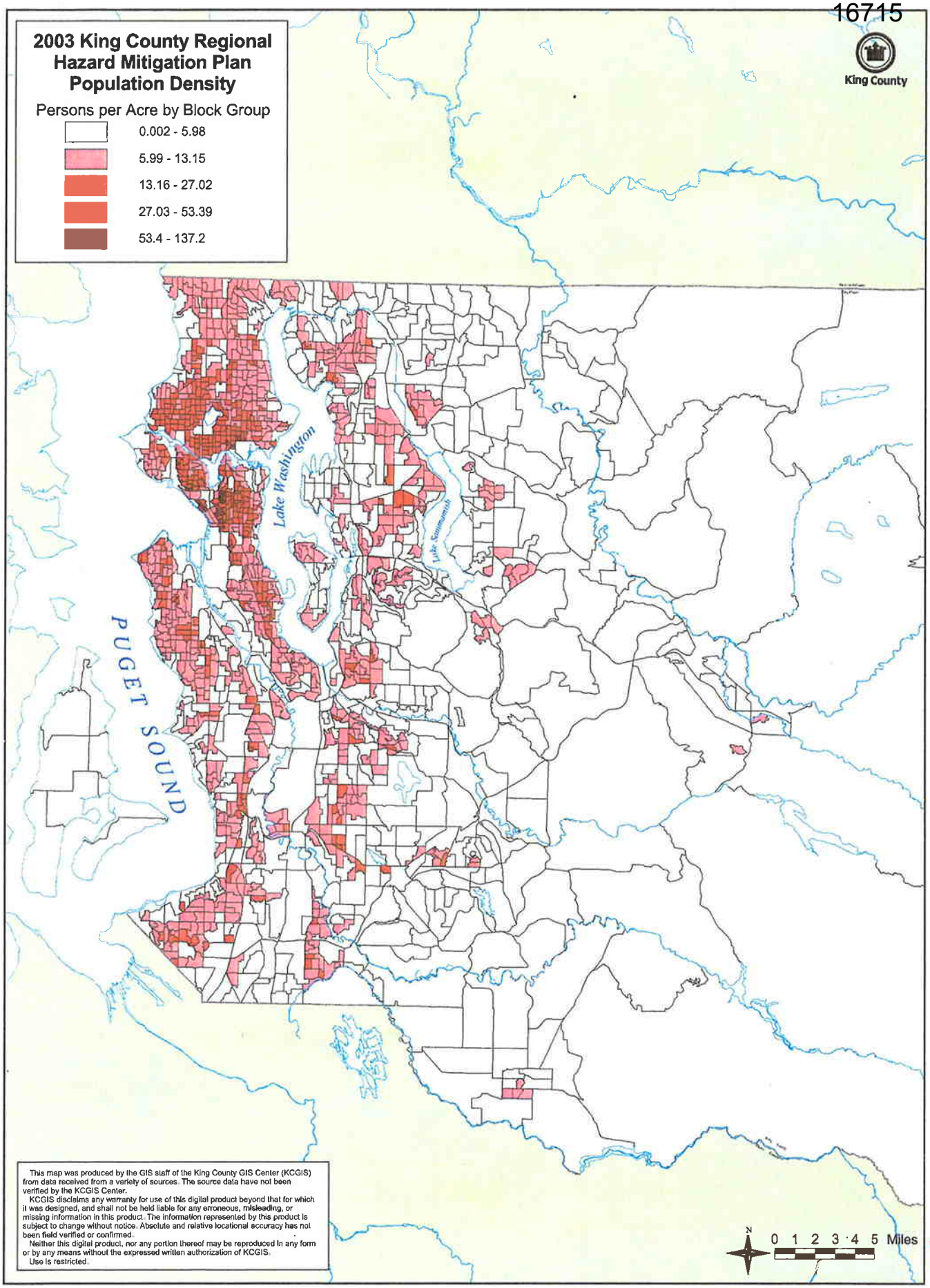
WTO – World Trade Organization

Attachment A
16715

Annex K: 2004 Plan Maps (removed from Section 3)

Map 3-1

Attachment A
16715



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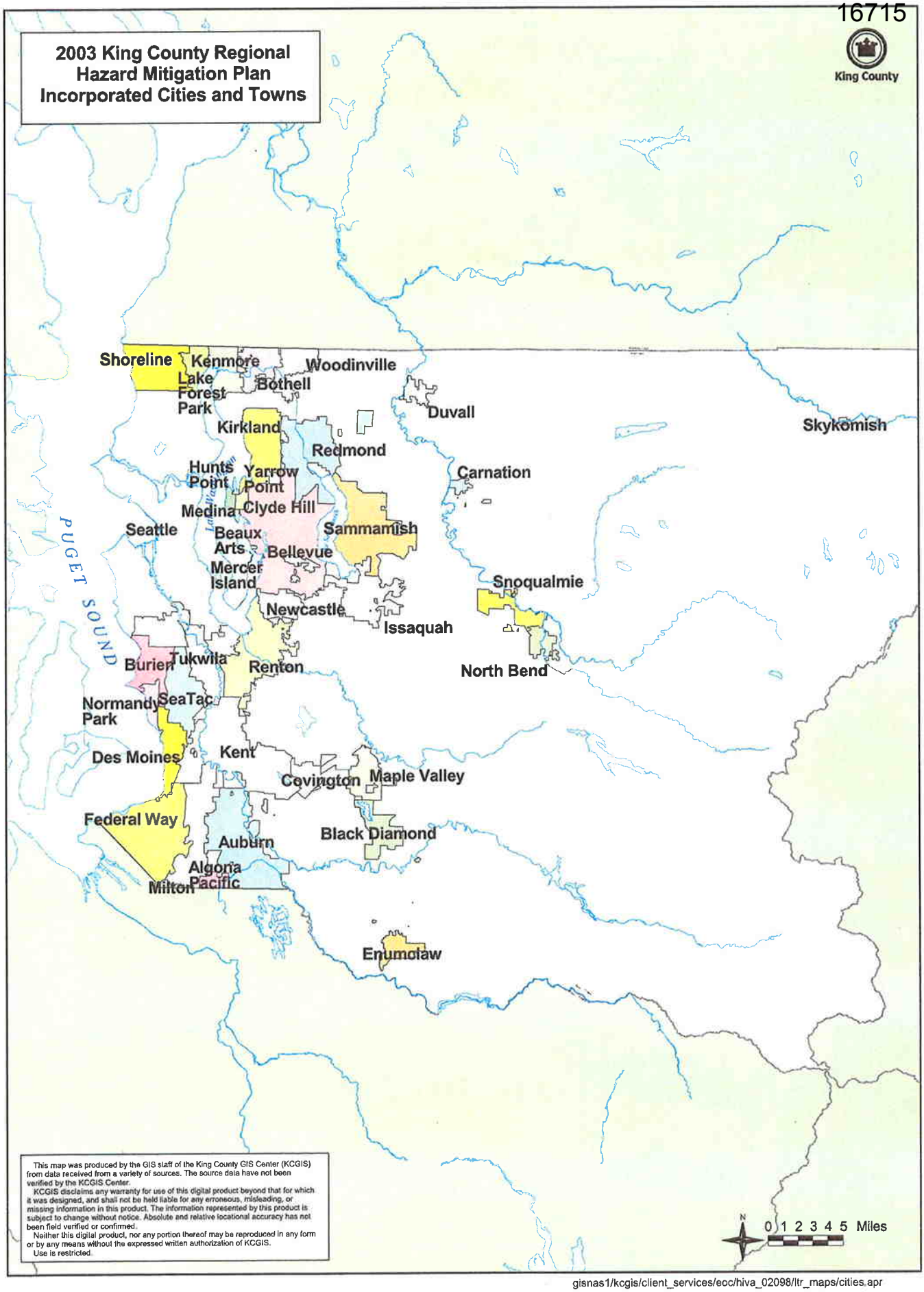
Map 3-2

Attachment A
16715



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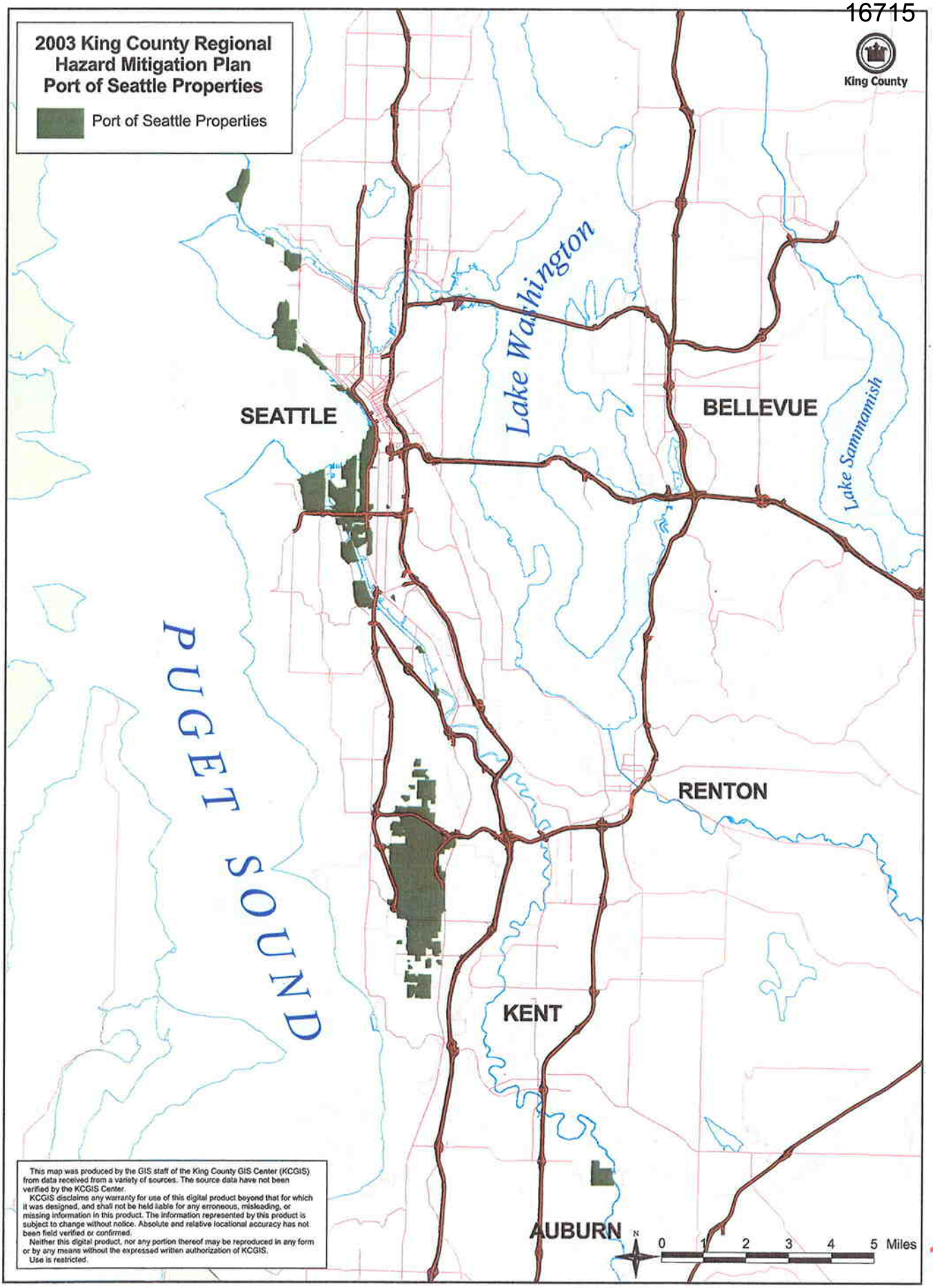
Map 3-3

Attachment A
16715



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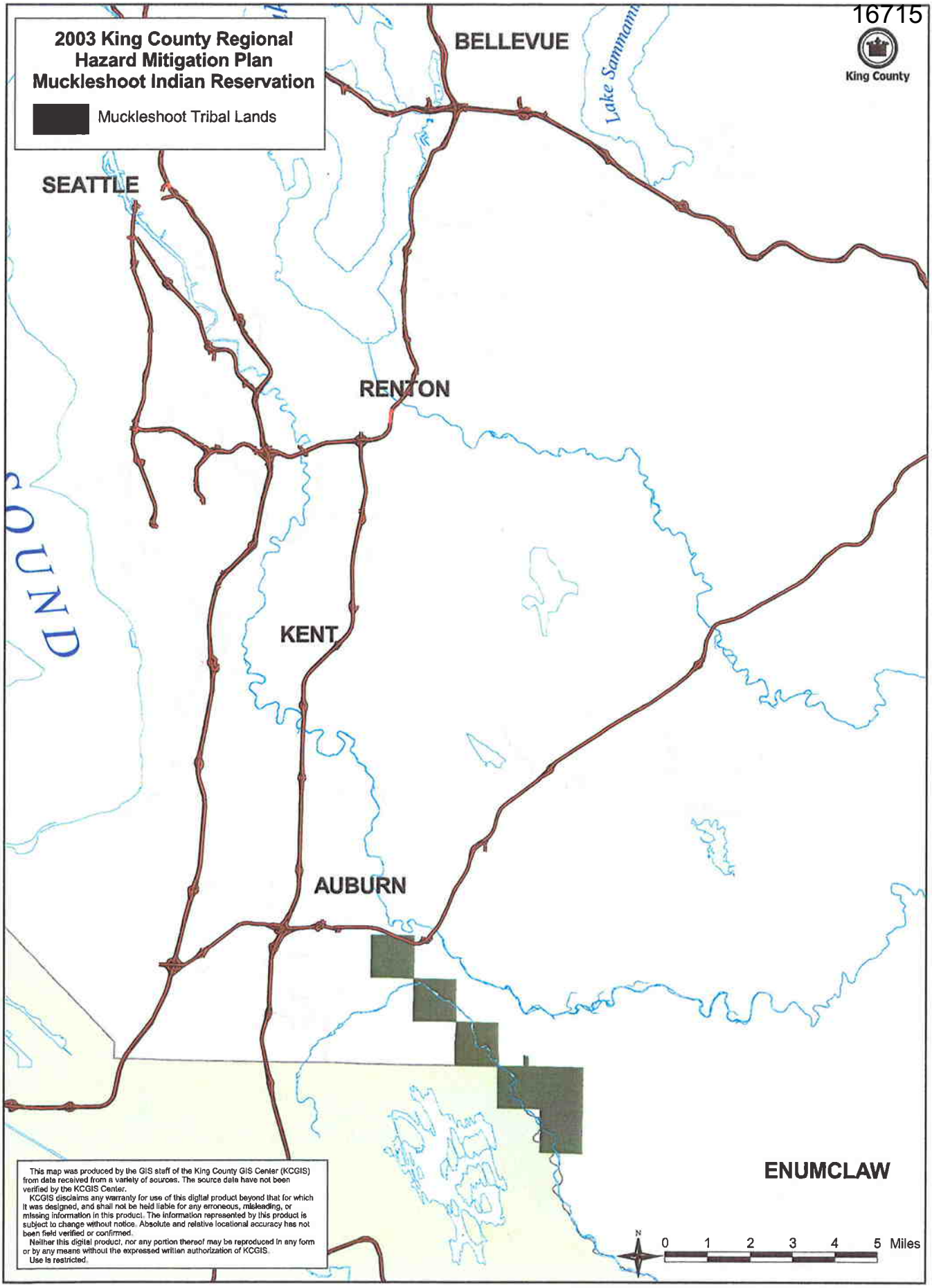
Map 3-4

Attachment A
16715



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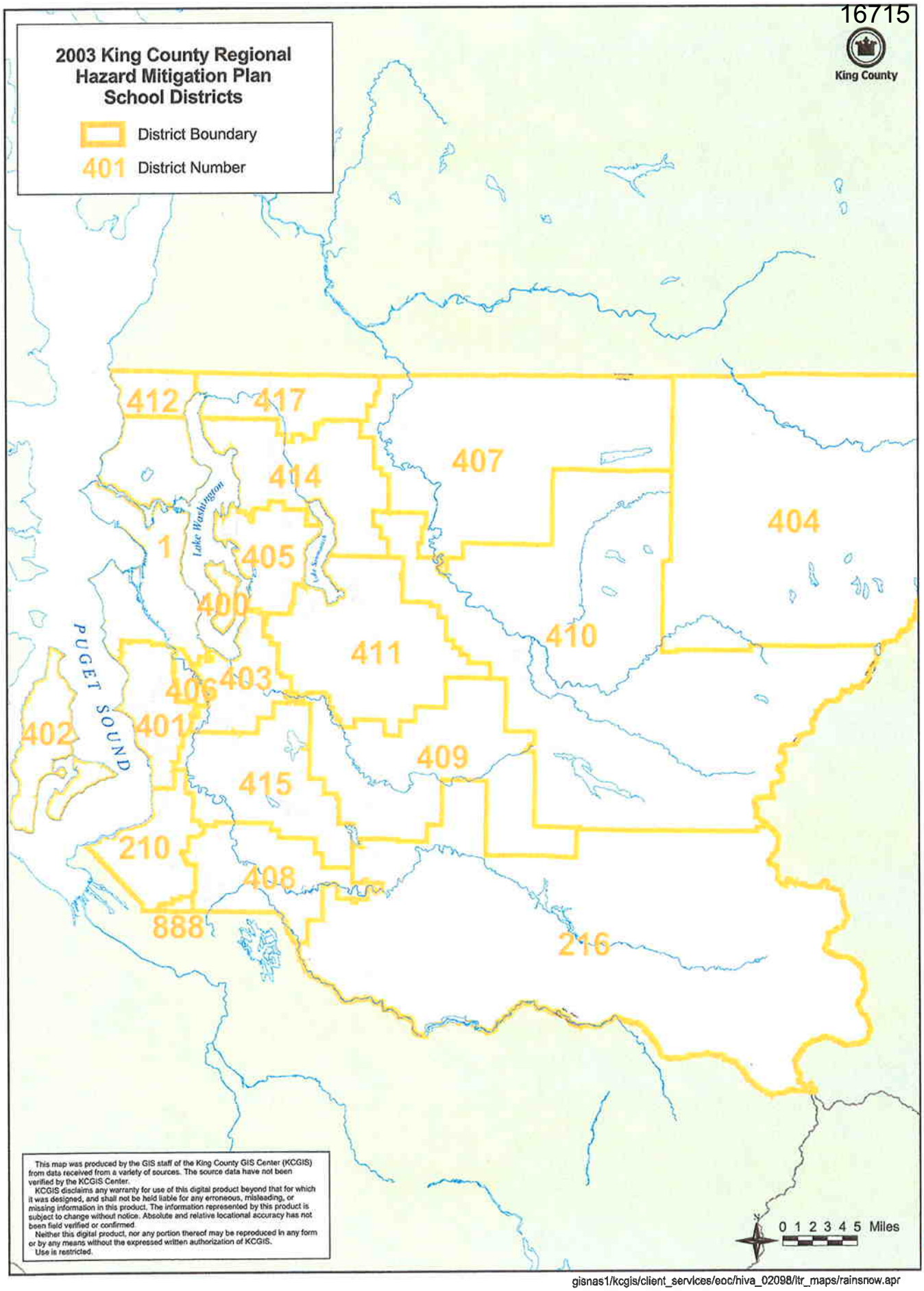
map 3-5

Attachment A
16715



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map 3-6

Attachment A
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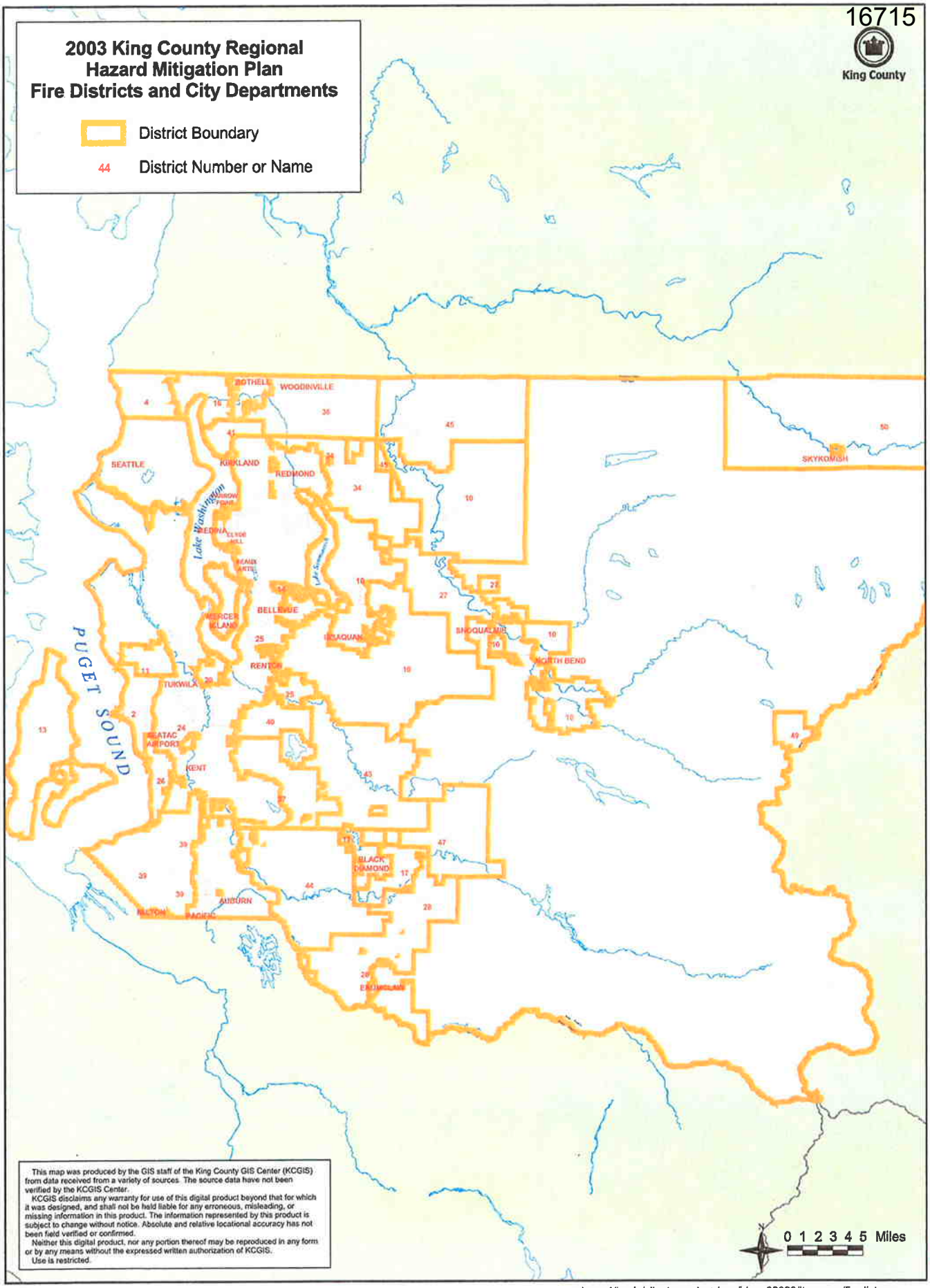

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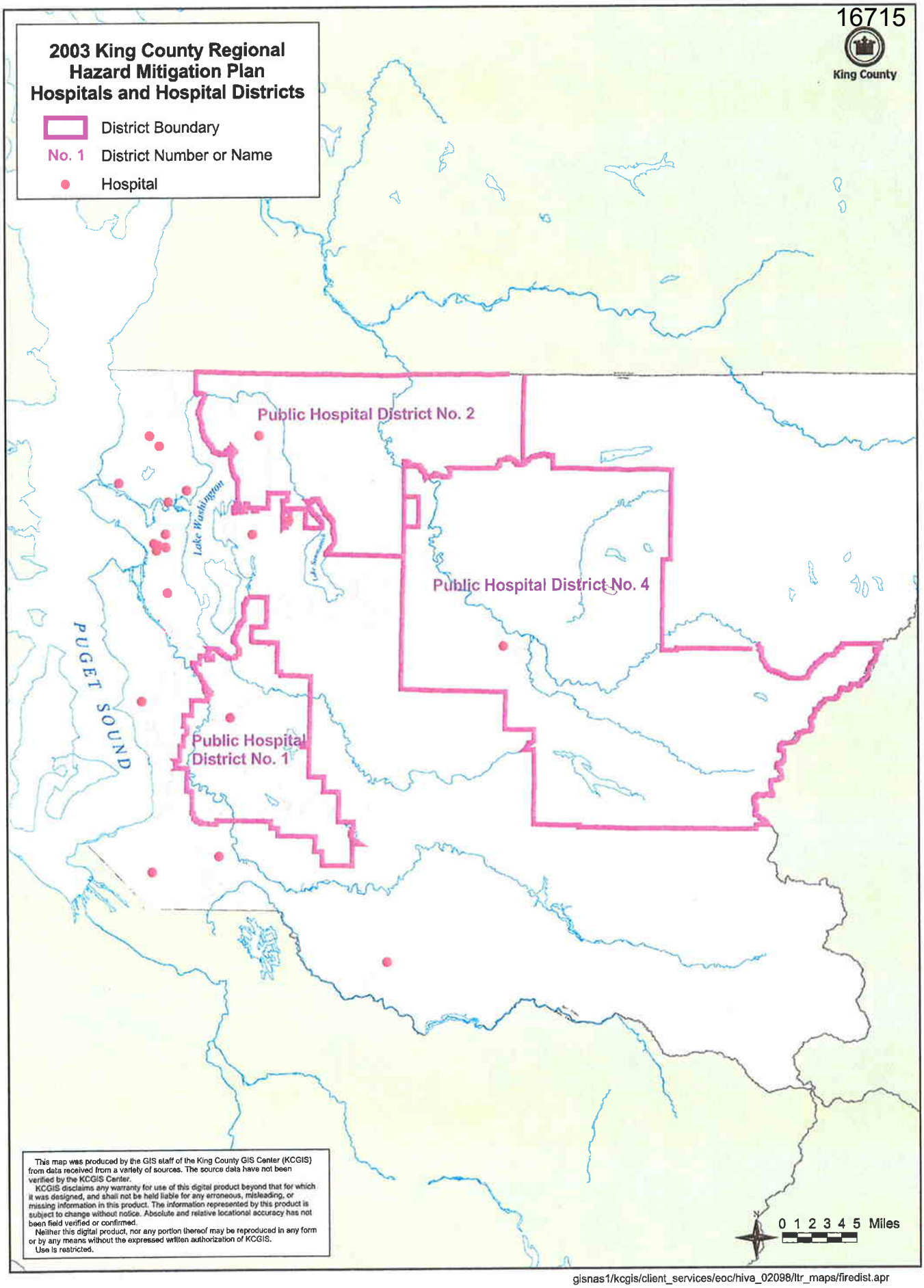
map 3-7

Attachment A
16715



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map 3-8

Attachment A
16715

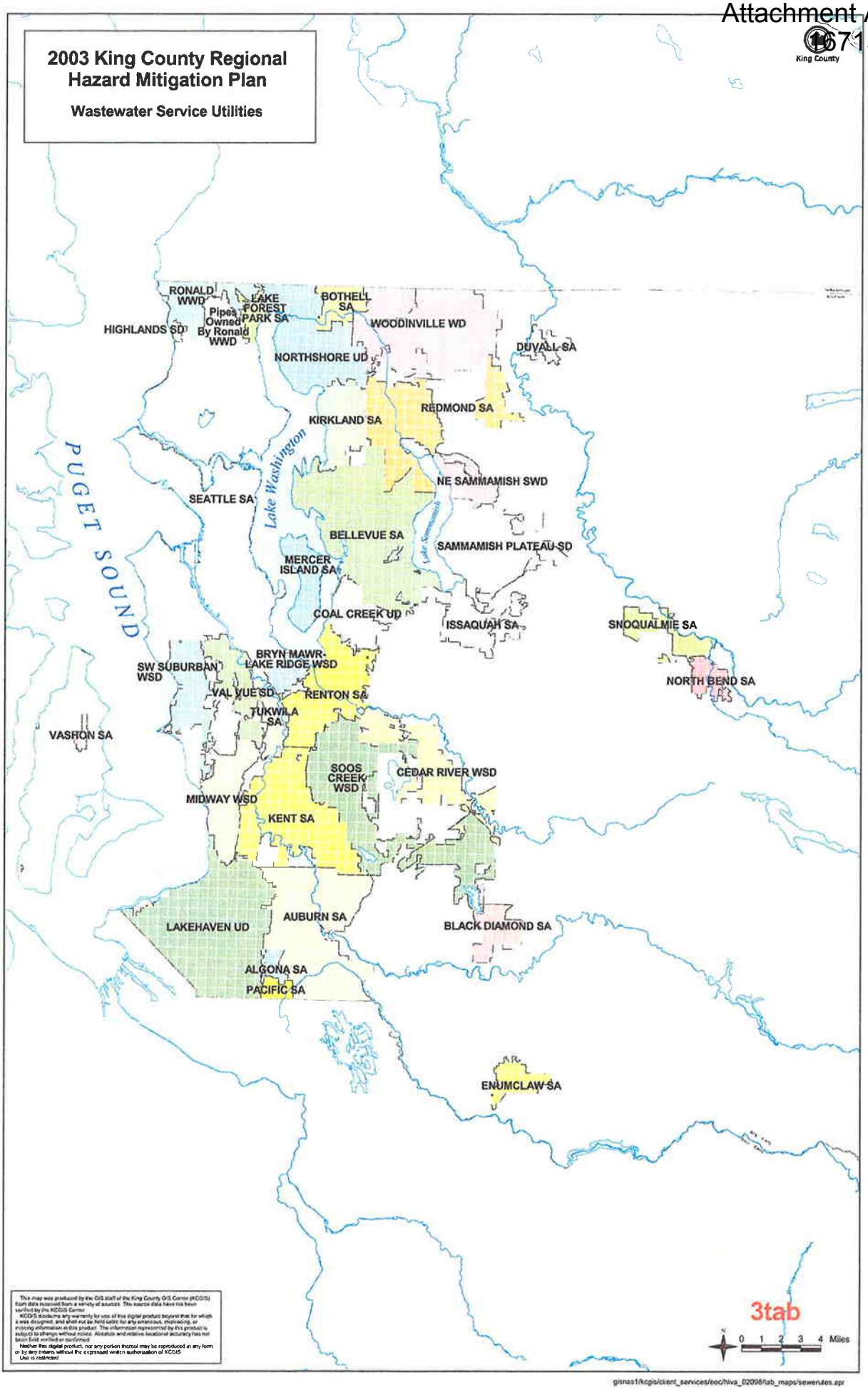
Map 3-4

Attachment A
16715

King County

2003 King County Regional Hazard Mitigation Plan

Wastewater Service Utilities



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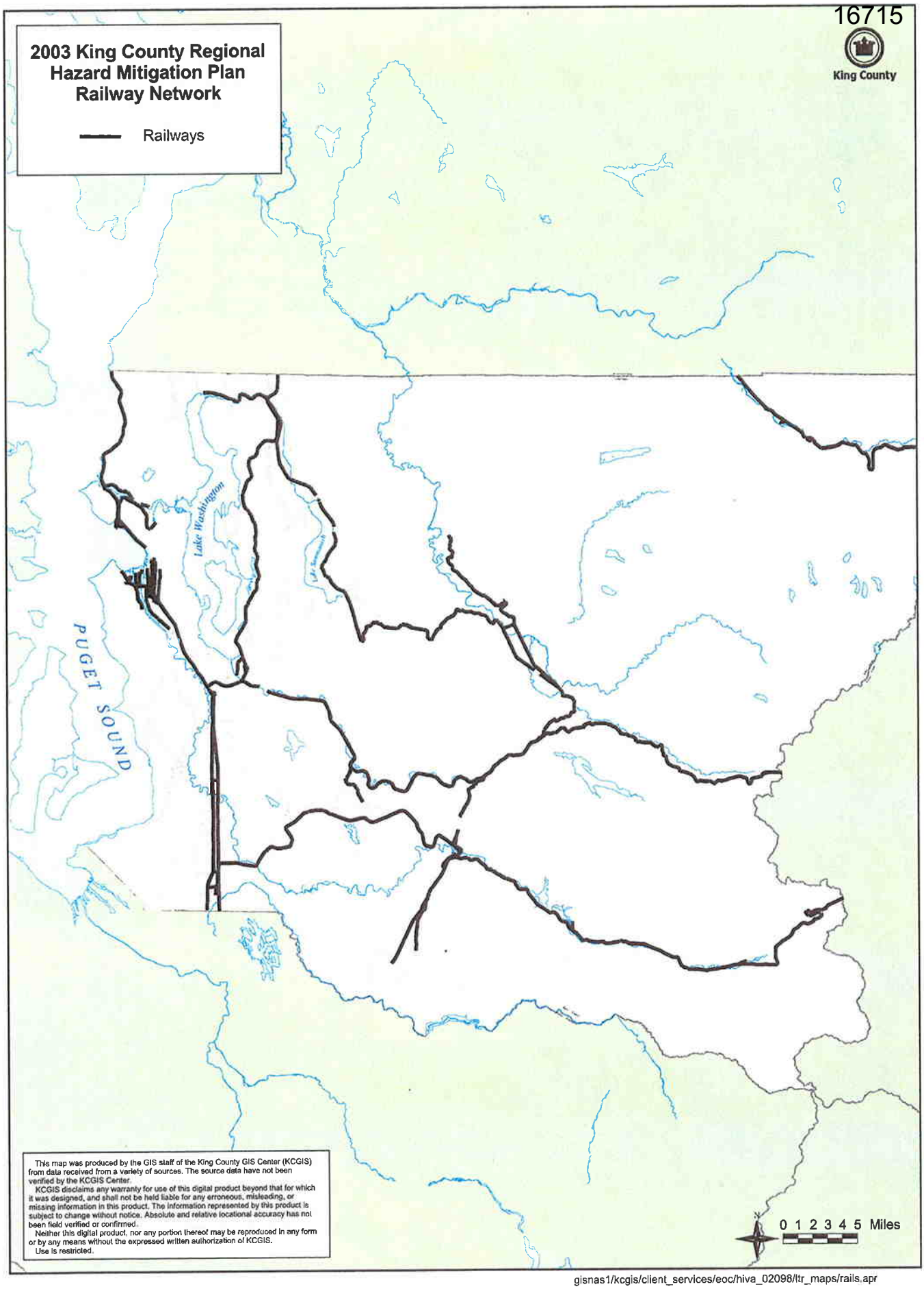
map 3-10

Attachment A
16715



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map 3-11

Attachment A
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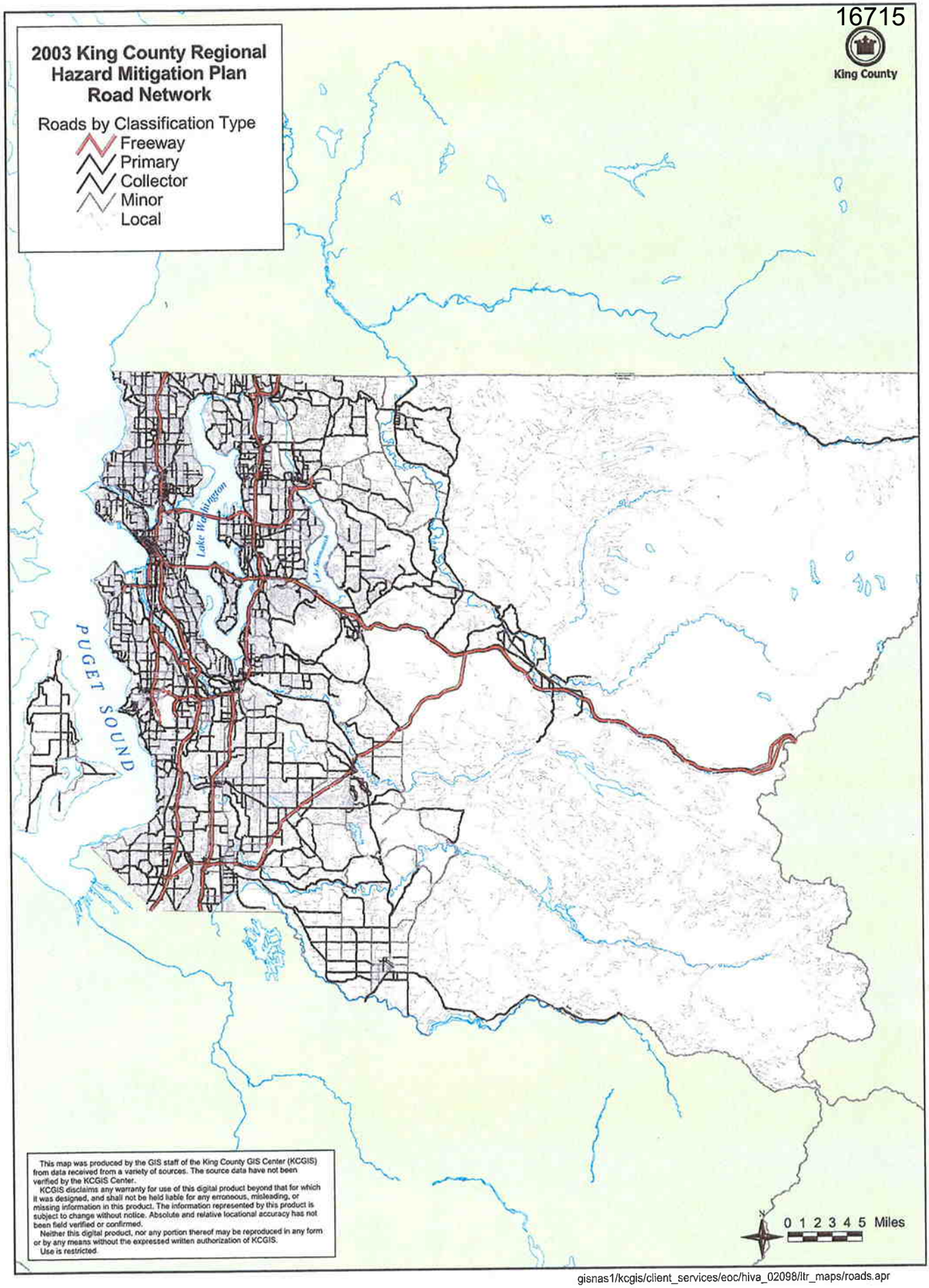

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map 3-12

Attachment A
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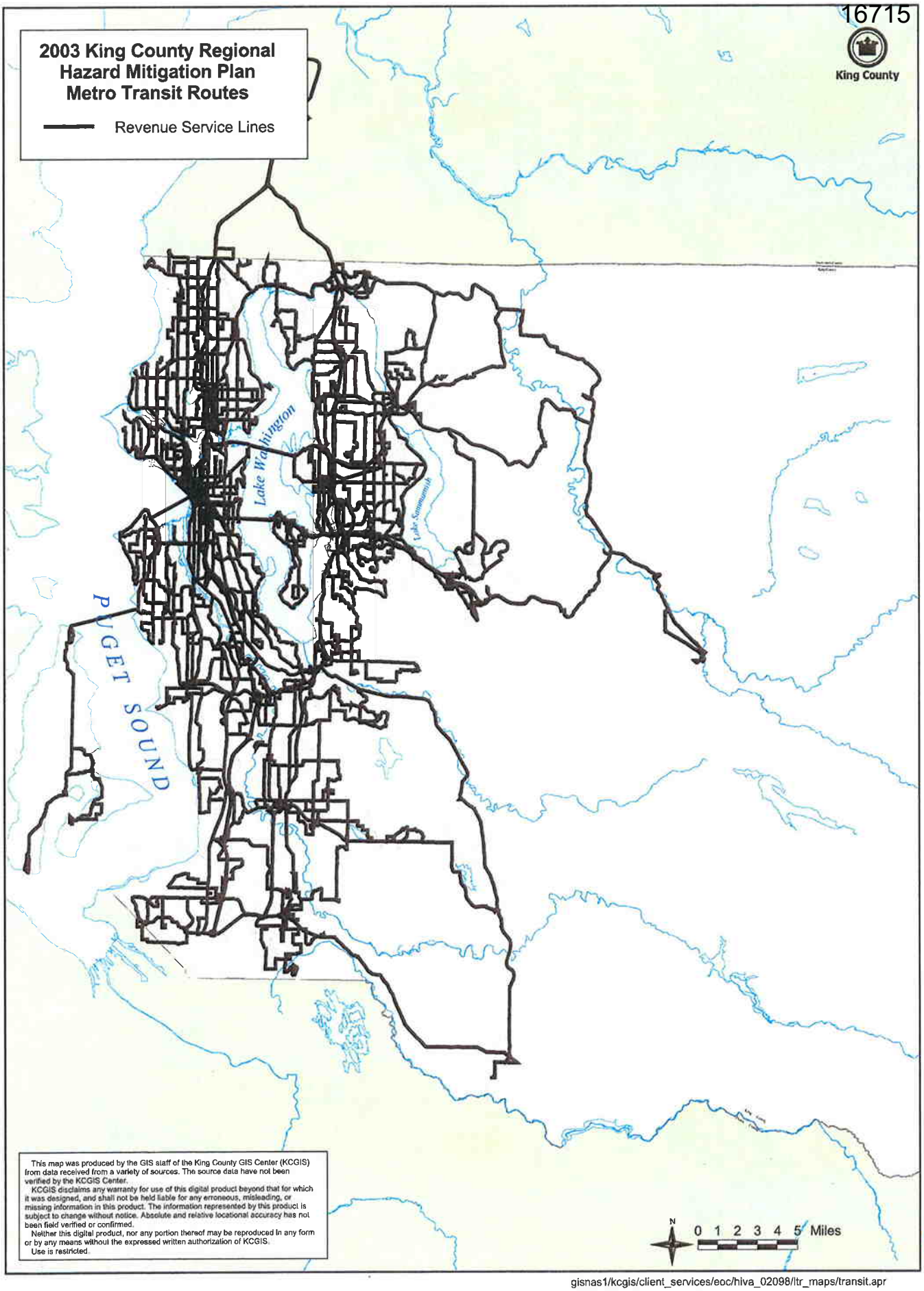

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map 3.13

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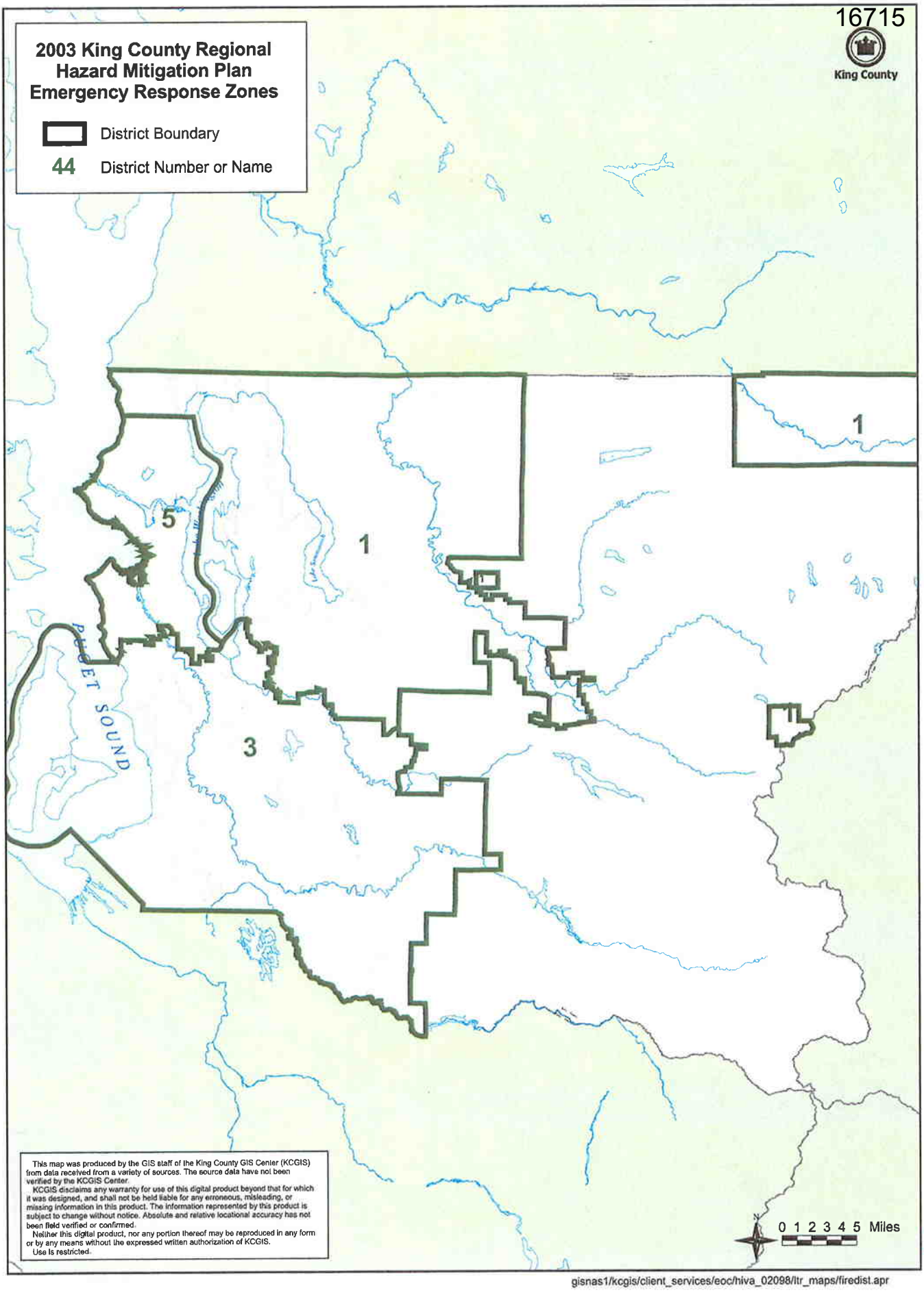

map 3-14

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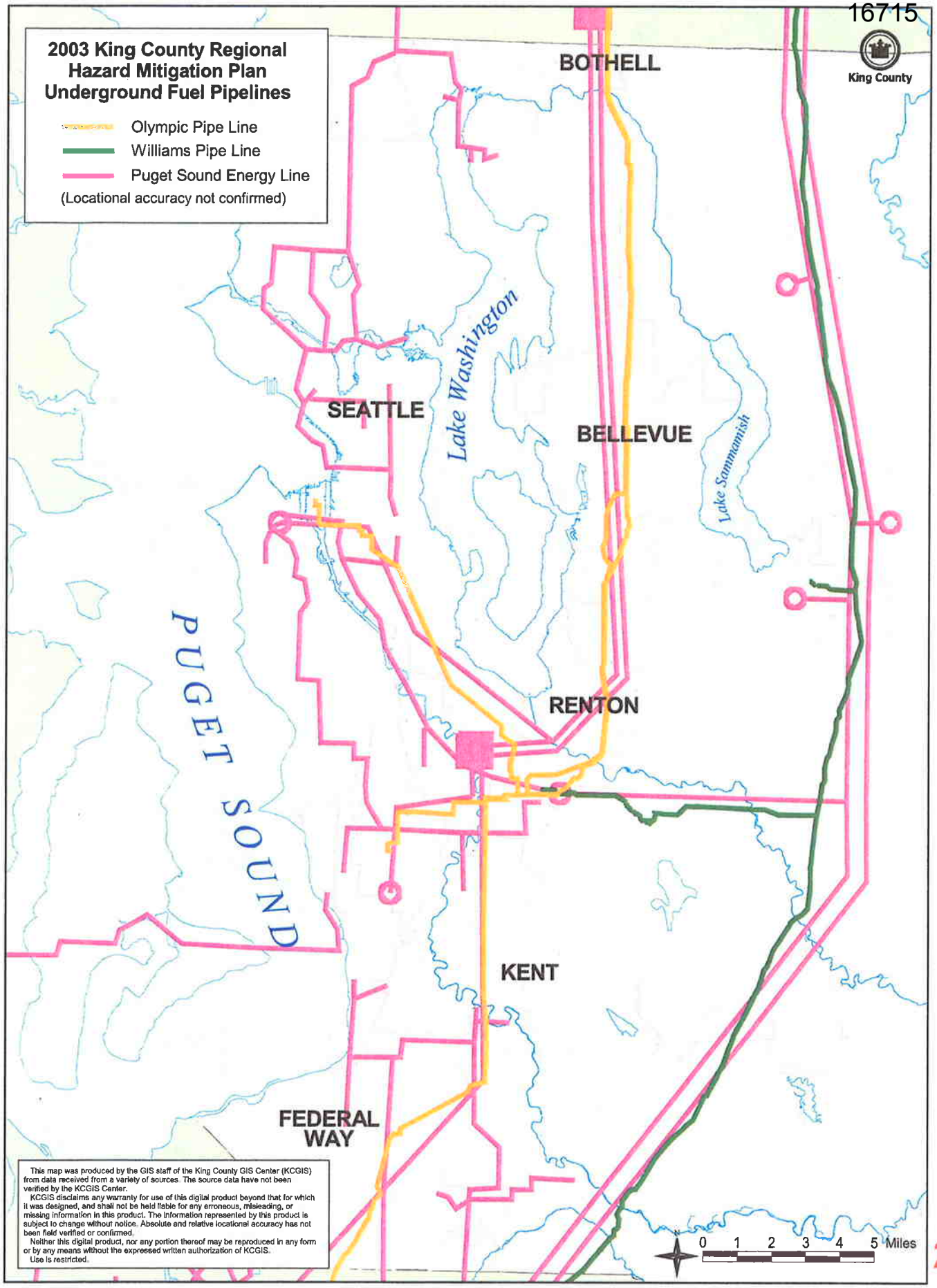

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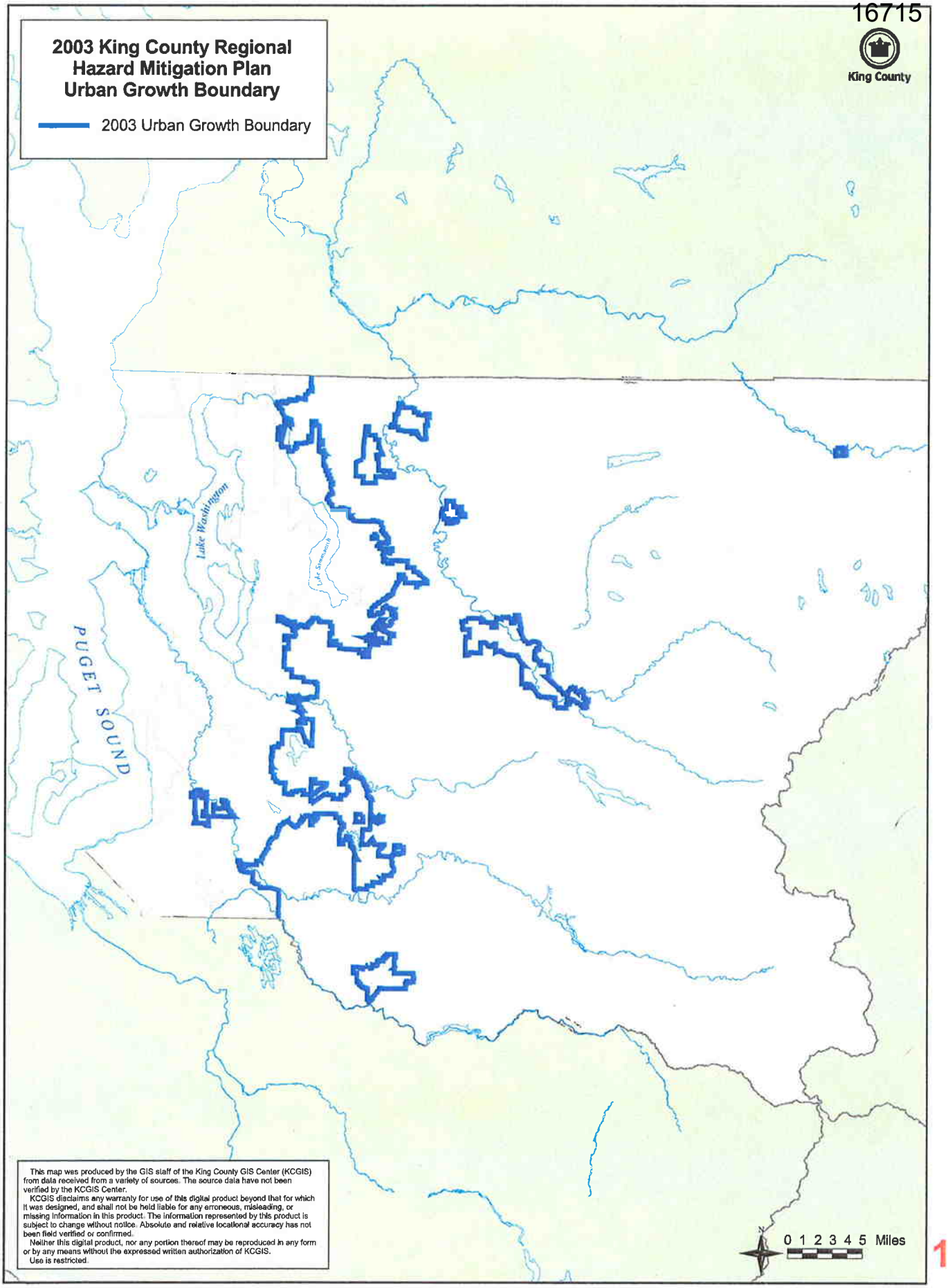
map 3-15

Attachment A
16715



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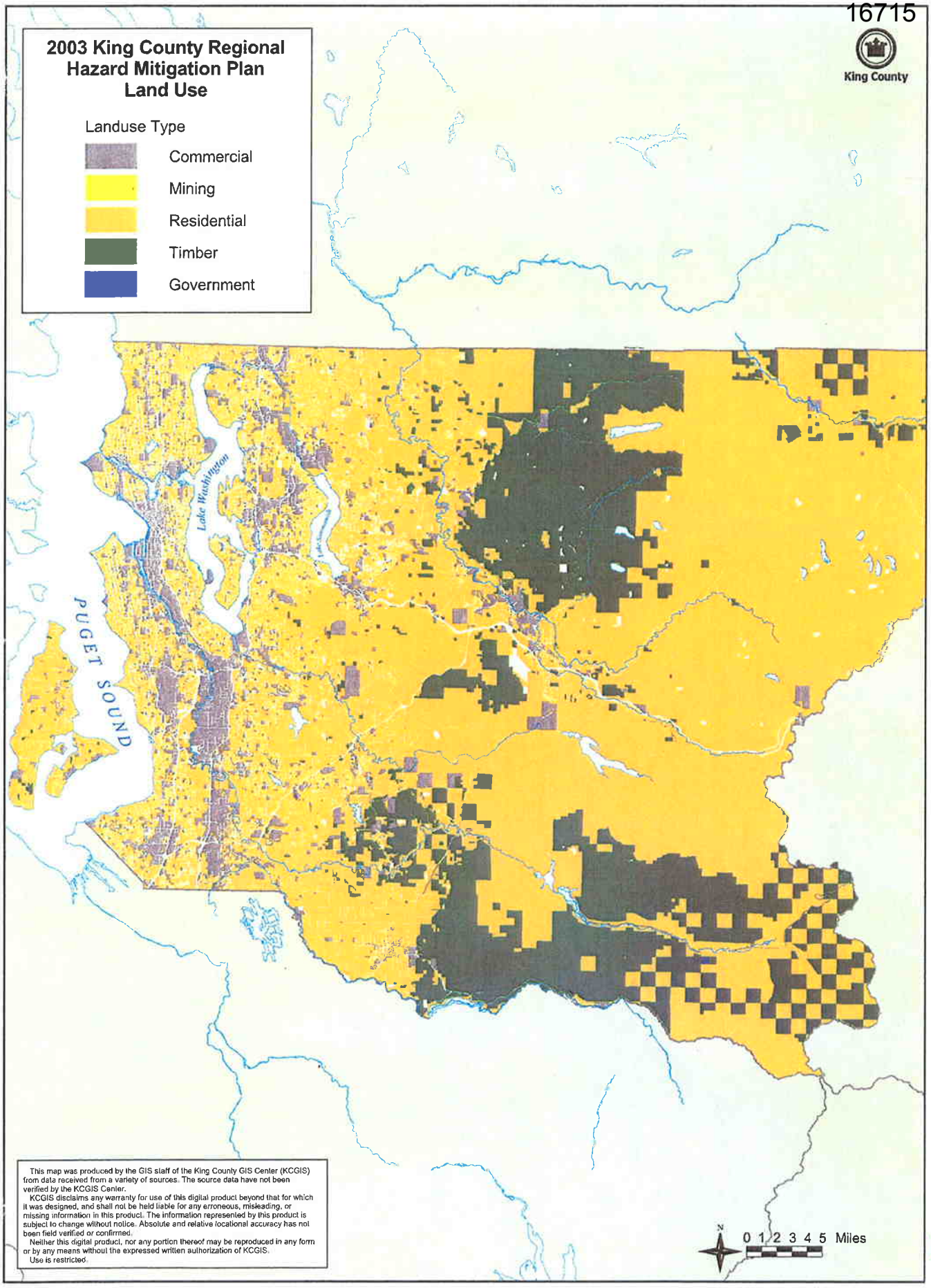
Map 3-16

Attachment A
16715



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Annex L: 2004 King County Government Initiatives – Completed (removed from 2004 KC Annex B)

Status: Completed

Attachment A
16715

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: King County Solid Waste

Type of Hazard: Earthquake

Category: Continuity of Service / Health and Life Safety

Priority: 1 Plan Adoption # (*tracking #)*

Brief Description of Project: **Grid 2 & 3 Repairs** The Enumclaw Transfer Station needs improvements to meet current earthquake standards. This initiative sets steel plating to the roof repairs increasing the resistance to strong earthquakes.

Rationale for project: This facility is the only transfer station in south King County. It supplies an essential service to both the public and to other jurisdictions. If an earthquake were to impact the facility during normal operation hours, the facility could collapse and fatalities could be incurred, along with the loss of operations. Cost benefit analysis for the facility was cone for replacement cost alone.

RHMP Goals Continuity of Service& Health life safety RHMP Objectives:

Lead Jurisdiction: King County Solid Waste
Participating Jurisdictions:

Cost of Project: $148,000.00

Estimated time period implemented: < 12 months

Funding Sources: Grant & CIP

Matching %
Primary ____
Secondary ____
Tertiary ____

Source and Date: unknown

Adoptive date and/or Ordinance #

Status: Study has been completed with current costs.

Benefit/Cost Ratio: >16:1

Status: Completed

Attachment A
16715

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: King County Solid Waste

Type of Hazard: Earthquake

Category: Continuity of Service / Health and Life Safety

Priority: 2 Plan Adoption # *(tracking #)*

Brief Description of Project **Perimeter Wall** The Enumclaw Transfer Station needs improvements to meet current earthquake standards. This initiative sets steel plating to connect the roof to the perimeter wall increasing the resistance to strong earthquakes.

Rationale for project: This facility is the only transfer station in south King County. It supplies an essential service to both the public and to other jurisdictions. If an earthquake were to impact the facility during normal operation hours, the facility could collapse and fatalities could be incurred, along with the loss of operations. Cost benefit analysis for the facility was cone for replacement cost alone.

RHMP Goals RHMP Objectives:

Lead Jurisdiction: King County Solid Waste
Participating Jurisdictions:

Cost of Project: $266,000.00

Estimated time period implemented:

Funding Sources: Grant & CIP

Matching %
Primary ____
Secondary ____
Tertiary ____

Source and Date:

Adoptive date and/or Ordinance #

Status: Study has been completed with current costs

Benefit/Cost Ratio: >4.5:1

Status: Completed

Attachment A
16715

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: King County Solid Waste

Type of Hazard: Earthquake

Category: Continuity of Service / Health and Life Safety

Priority: 3 Plan Adoption # *(tracking #)*

Brief Description of Project **Panel to Panel Joint Connections** The Enumclaw Transfer Station needs improvements to meet current earthquake standards. This initiative sets connecting the panels with joint connectors increasing the resistance to strong earthquakes.

Rationale for project: This facility is the only transfer station in south King County. It supplies an essential service to both the public and to other jurisdictions. If an earthquake were to impact the facility during normal operation hours, the facility could collapse and fatalities could be incurred, along with the loss of operations. Cost benefit analysis for the facility was cone for replacement cost alone.

RHMP Goals RHMP Objectives:

Lead Jurisdiction: King County Solid Waste
Participating Jurisdictions:

Cost of Project: $153,000.00

Estimated time period implemented: < 12 months

Funding Sources: Grant & CIP

Matching %
Primary ____
Secondary ____
Tertiary ____

Source and Date:

Adoptive date and/or Ordinance #

Status: Study has been completed with current costs

Benefit/Cost Ratio: >7.8:1

Status: Completed
Attachment A
16715

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: King County Solid Waste

Type of Hazard: Earthquake

Category: Continuity of Service / Health and Life Safety

Priority: 4 Plan Adoption # (*tracking #)*

Brief Description of Project **Roof Parapet Bracing** The Enumclaw Transfer Station needs improvements to meet current earthquake standards. This initiative sets connecting roof parapet with steel bracing increasing the resistance to strong earthquakes.

Rationale for project: This facility is the only transfer station in south King County. It supplies an essential service to both the public and to other jurisdictions. If an earthquake were to impact the facility during normal operation hours, the facility could collapse and fatalities could be incurred, along with the loss of operations. Cost benefit analysis for the facility was cone for replacement cost alone.

RHMP Goals RHMP Objectives:

Lead Jurisdiction: King County Solid Waste
Participating Jurisdictions:

Cost of Project: $33,000.00

Estimated time period implemented: < 12 months

Funding Sources: Grant & CIP

Matching %
Primary ____
Secondary ____
Tertiary ____

Source and Date:

Adoptive date and/or Ordinance #

Status: Study has been completed with current costs

Benefit/Cost Ratio: >36:1

Status: Completed
Attachment A
16715

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: King County Solid Waste

Type of Hazard: Earthquake

Category: Continuity of Service / Health and Life Safety

Priority: 5 Plan Adoption # (*tracking #)*

Brief Description of Project **Shear wall Connections** The Enumclaw Transfer Station needs improvements to meet current earthquake standards. This initiative sets shear wall bracing for increasing the resistance to strong earthquakes.

Rationale for project: This facility is the only transfer station in south King County. It supplies an essential service to both the public and to other jurisdictions. If an earthquake were to impact the facility during normal operation hours, the facility could collapse and fatalities could be incurred, along with the loss of operations. Cost benefit analysis for the facility was cone for replacement cost alone.

RHMP Goals RHMP Objectives:

Lead Jurisdiction: King County Solid Waste
Participating Jurisdictions:

Cost of Project: $165,000.00

Estimated time period implemented: < 12 months

Funding Sources: Grant & CIP

Matching %
Primary ____
Secondary ____
Tertiary ____

Source and Date:

Adoptive date and/or Ordinance #

Status: Study has been completed with current costs

Benefit/Cost Ratio: >7:1

Status: Completed
Attachment A
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Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: Public Health Seattle/King County

Type of Hazard: Earthquake, winter storm, civil unrest, flooding, etc.

Category: Life and health safety, public information and education, clinical response to disease, training, reporting, and communication

Brief Description of Proposed Project:

Our goals are to support the public's health through emergencies and disasters by

2. Enhancement of communication of Public Health sites internally (both within structures and between Public Health sites) and with other regional agencies though an amateur radio program and a short-range (family radio) program.

RHMP Goals
Supporting life and safety
Lead Jurisdiction: King Co. and City of Seattle
Cost of Project: Not yet determined
Estimated time period implemented: 5 years
Funding Sources: Not yet determined
Adoptive date and/or Ordinance #: Not yet determined

Status:
Program has been initiated with purchase of some amateur radio equipment, some family radios. Some staff of teams have been trained, some equipment reviewed and recommended for future purchases.

Status: Completed
(Note: this is duplicative of PH Initiative 2)

Attachment A
16715

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: Public Health Seattle/King County

Type of Hazard: Earthquake, winter storm, civil unrest, flooding, etc.

Category: Life and health safety, public information and education, clinical response to disease, training, reporting, and communication

Brief Description of Proposed Project:

Our goals are to support the public's health through emergencies and disasters by

9. Enhancement of communication of Public Health sites internally (both within structures and between Public Health sites) and with other regional agencies though an amateur radio program and a short-range (family radio) program.

RHMP Goals
Supporting life and safety
Lead Jurisdiction: King Co. and City of Seattle
Cost of Project: Not yet determined
Estimated time period implemented: 5 years
Funding Sources: Not yet determined
Adoptive date and/or Ordinance #: Not yet determined

Status:
Program has been initiated with purchase of some amateur radio equipment, some family radios. Some staff of teams have been trained, some equipment reviewed and recommended for future purchases.

Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: DES/ITS

Type of Hazard: **Downtown Seattle core becomes uninhabitable**

Category:

Priority: Plan Adoption # *(tracking #)*

Brief Description of Project: Provide alternative sites and communication paths for King County's information and communication infrastructure, and/or harden existing facilities to make them more failure tolerant

Rationale for project: (*Recognizing the hazard and proposed solution, resolution, and/or specified law or regulation impinging on the project*). King County has concentrated its data and voice networks, data centers, and data processing capability in downtown Seattle, one of our key regional hubs. This infrastructure supports public health, detention facilities (jail), courts, transit, and the sheriff's operations. If the downtown core, or parts of it, became unusable for any period of time, the communications and information processing of these government functions would quickly deteriorate.

In addition, significant portions of the communications and information processing for the City of Seattle, Port of Seattle, and the University of Washington (including Harborview Hospital, the region's first level trauma hospital) reside in or near the downtown core.

Significant amounts of high bandwidth fiber exist in the County, much of it owned or operated by King County. In addition King County has sites geographically disbursed across the county.

In partnership with other jurisdictions, the project would identify government functions that must be disaster resistant and those functions that need to be recoverable during and shortly after a disaster. Government functions with high criticality could be hardened or recoverable as separately funded projects. Other functions with lower criticality could be hardened or recoverable as part of normal, planned re-engineering and upgrades.

RHMP Goals RHMP Objectives:

Lead Jurisdiction: King County
Participating Jurisdictions: City of Seattle, Port of Seattle, University of Washington, suburban King County cities, fire districts, regional emergency management and E911 organizations

Cost of Project: Unknown, likely in the $50,000,000 range.

Estimated time period implemented: 2004 - 2009

Funding Sources:

Matching %
Primary ____
Secondary ____
Tertiary ____

Source and Date:

Adoptive date and/or Ordinance #

Status: Assessment and planning has started. $6,489,447 has been budgeted for initial business continuity, security, network infrastructure optimization, and data center alternative projects that tie into this initiative.

While we need a top down, government function assessment, there are obvious bottom up technological and location initiatives we will undertake while the full assessment is underway. Estimated expenditure, $500,000.

Benefit/Cost Ratio:

Status: Completed

Attachment A

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Regional Hazard Mitigation Plan of King County - Initiatives

Jurisdiction Agency: King County Internal Government, Facilities Management Division

Type of Hazard: Earthquake

Category: Structure Retrofit

Priority: First, per RHMP Plan Adoption # (*tracking #)*

Brief Description of Project: Structural upgrade of King County owned buildings operated by the Facilities Management Division to meet current seismic building standards.

Rationale for project: The protection of life and property, support of emergency services and to maintain continuity of government in King County owned buildings operated by the Facilities Management Division.

RHMP Goals Protect Life and Property
Support Emergency Services

RHMP Objectives:

Lead Jurisdiction: Manager, DES/FMD Building Services Section, King County Internal Government

Participating Jurisdictions:

Cost of Project: 71,500,000

Estimated time period implemented: 10 years, 1995 through 2005

Funding Sources: Capitol Improvement Budget

Matching %
Primary ____
Secondary ____
Tertiary ____

Source and Date:

Adoptive date and/or Ordinance #

Status: Seismic mitigation retrofit of 17 buildings in 13 critical facilities is completed or in progress as follows: Mitigation has been completed in 7 buildings, is in progress in 8, is scheduled for 1 and mitigation for the last identified building requiring retrofit is in the planning stage.

Benefit/Cost Ratio: 9.46 : 1 per MG 20-20

AB 401-403 Security additions.

The proposed upgrade to AB 401-403 security includes the following :

1. Adding the new, but already installed duress buttons at all AB401 counter stations. Splitting them into at least 2 zones , east and west.
2. Adding a door contact and motion to the vault in AB403.
3. Adding one duress button on the natural egress route from AB403 to AB401.
4. Adding one PTZ camera to Lobby/Waiting Area.
5. Duress to be monitored by Ccure System. Video including PTZ on Allegent system.

New equipment needed :	Equipment
1. 1 (ea) motion detector	$57.95
2. 1 (ea) door contact	N/C
3. 1 (ea) Phillips G3 PTZ Camera	$1768.00
4. 1 (ea) Phillips camera power supply	$59.95
5. 1 (ea) duress button.	N/C
6. 1 (ea) motion power supply	$64.95
7. 1 (ea) NVT passive transceiver	$134.50
8. Misc Parts	$100.00
	$2185.00 +tax and contingent.

Installation requires new wire pulls including:

1 (ea) 25pair UTP cable to 2nd Flr AB Electrical Closet terminate at added punch blocks both ends.
1 (ea) Cat 3 UTP from 2nd Flr AB Electrical PB to 4th 401 new Camera location.
1 (ea) 18g 2C Shielded wire from CH EB36 to AB 2nd Flr Elec closet and then on to new camera location in 401 lobby.
2 (ea) 18g4C from 403 vault to AB 2nd Flr Elec Closet.
1 (ea) 18g4C from 401 Elec Room extend duress to AB 2nd Flr Elec Closet.
1 (ea) 16g 2C from New Camera Location to Camera Pwr Supply.

*Place Pwr supply for Motion/Camera at existing AC power source to be determined.

Labor

Security Project Manager 6hrs x $40.77 = $245.00

*Wiring and device installation costs to be determined by others.

Attachment A
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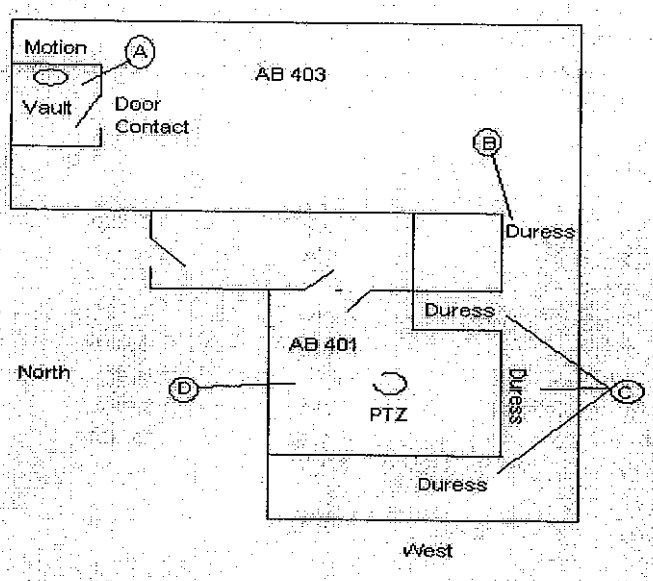


1. Add 1 Door Contact and 1 Motion Detector at Vault location A
2. Add a new Duress button on wall location B
3. Connect already installed duresses as 2 seperate zones (east and west). location C
4. Add Pan tilt zoom camera centerof waiting room for full view of doors, counter stations and waiting area. location D
5. Duress zones will call up camera PTZ.
6. Motion and Door contact in vault on seperate inputs.

All Signal cable to 2nd Flr Electrical closet.

New devices
1ea Motion detector
1ea Door Contact
1ea Phillips C3 PTZ Camera
1ea Phillips Camera Power supply
1ea Duress button.
1ea motion pwr supply.

Administration Building 5th Floor Elections security system upgrade.

Security additions to the Elections Suite on the AB 5th floor include the addition of access control to provide an audit trail of access to the general suite as well as specific access to vital locations within the suite. In addition duress and video monitoring is provided to facilitate immediate Security reponse to the public areas. Video monitoring of vital locations provides post event incident review.

Locations to receive card access include the two entry point to the suite, the vault, and the (2) doors into the Kings/JEMs rooms. A duress alarm push button at the public entrance counter and controllible camera provide staff with instant security response and the ability to monitor the public area by EDC security staff.

Budget estimate of New Equipment needed:

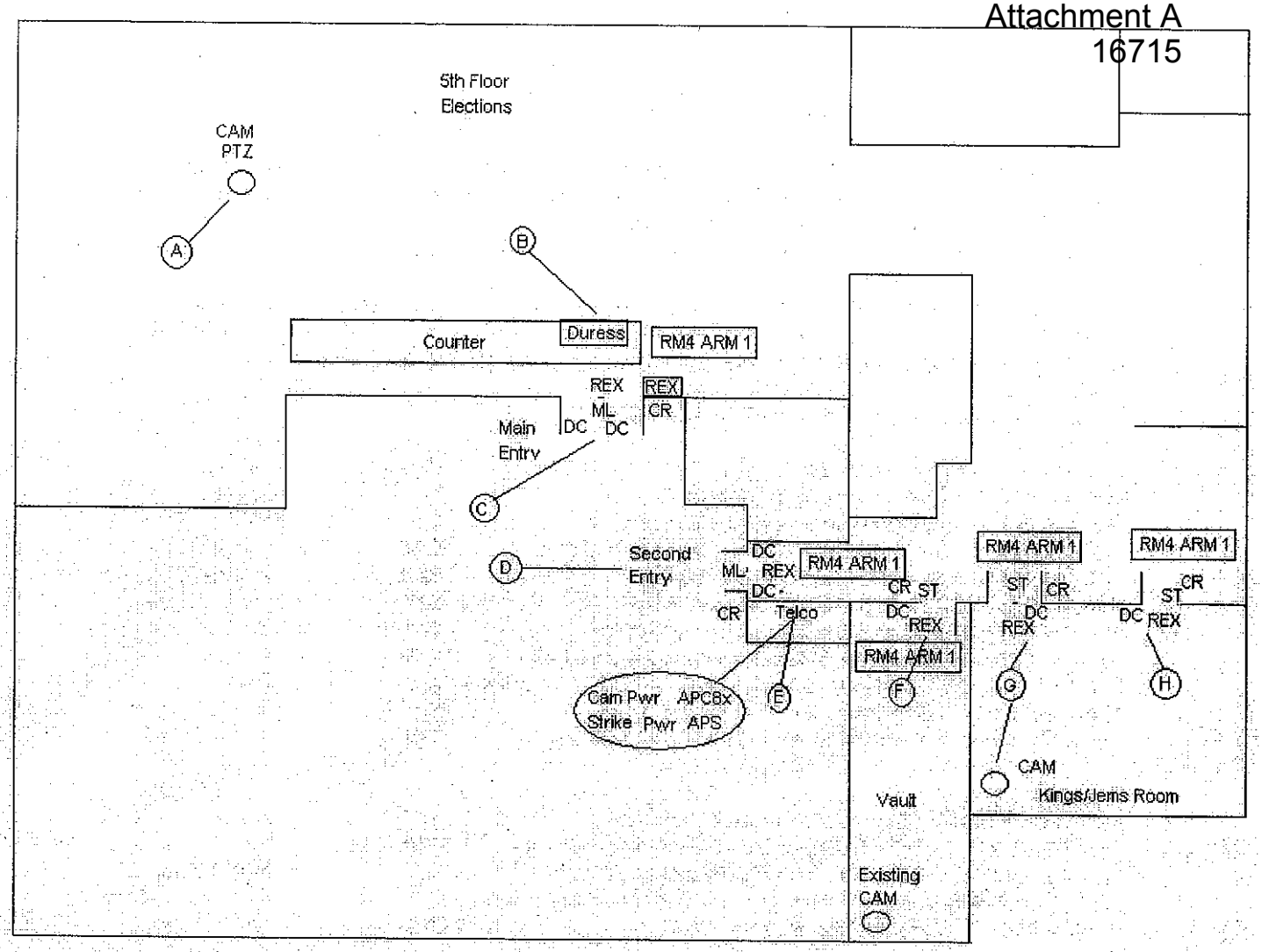
1ea	AS0100-004	SoftwareHouse APC8x	$3,000	$3,000
1ea	AS00-63-00	SoftwareHouse APS Power Supply	$700	$700
5ea	131-912	SoftwareHouse ARM1 Relay Module	$75	$375
5ea	RM-4	SoftwareHouse Rm4 Personality Module	$300	$1,500
5ea	Indala SG	Motorola Indalla Card Reader	$215	$1,075
5 ea	DS 150i	REX PIR Access Control 12-24v	$70	$350
5ea	AC-TS2-2T	REX switch illuminated button DPDT	$105	$525
3ea	DY-2011	Dynalock Mag lock 1200lb 12/24v	$210	$630
2ea	AI-DBL1000S	Double Mag Lock 1000lb ea 12/24/Vdc 500ma	$321	$642
7ea	SR-1085TWH	Sentrol Mag. DC Surface mount	$3	$21
1ea	AX-AL400ULX	Altronix Pwr Supply UL 12or24 vdc 4A	$193	$193
1ea	PB-G3ACS6T	Phillips AutoDome PTZ-Interior	$1,769	$1,769
2ea	N1-VB37F	NITEK UTP passive Transeiver Female BNC	$50	$100
2ea	N1-VB37M	NITEK UTP passive Transeiver Male BNC	$50	$100
1ea	YY-PS2480	Camera Pwr Supply 24vac 4A in a can	$82	$82
1ea	LTC0455/20	Phillips Color Camera	$250	$250
1ea	LTC3364/50	Phillips Varifocal lens auto iris 2.8-10mm	$71	$71
1ea	882-03W	Panvise Camera Mount	$17	$17
1ea	US-HUB2A	USP Hold Up Buttons DPDT	$12	$12
	Misc. Parts			$200
			Equipment cost:	11,612 +tax

Security project management, programming and testing 12hrs $490

Notes:

1.) Actual door hardware cost based on selection by others.
Listed cost is budget estimate.
2.) Wiring and device installation costs not included, to be determined by others.
Cable, electrical boxes, raceways and other installation parts cost not included.
3.) Suggest minimum 10% added contingent.
4.) RM4 and ARM1 require ceiling mounted generic enclosure not included.
5.) Installation requires a Fire System (FACP) relay interface to interrupt power to the magnetic door lock provided and installed by others.

Diagram attached:



DC Door Contact
REX Request to Exit
ML Magnetic Lock
CR Card Reader
ST Strike
CAM Camera
PTZ Pan Tilt Zoom

All devices monitored in real time in CH EDC.

1. Add PTZ camera at Location A
2. Add Duress At reception counter B
3. Add Camera in Kings/JEMS Room G
4. Add Card Readers/Door Contacts/Request to exits/Mag Locks or Strikes to 5 doors C,D,F,G,H
5. Add APC8x Controller, APS power Supply, Camera Pwr Supply, Strike/Mag Pwr Supply a E Telco Closet.
6. Add RM4 and ARM1 modules for card readers above ceiling near doors C,D,F,G,H
7. Install devices and wiring per electrical code and manufacturers installation instructions.
8. Requires CCure RS485 connection from Telco E to Electrical Closet AB 2nd Flr.
9. Requires Cat3 UTP 8C and 18G 2C shielded from each Camera location A and G to 2nd Flr Electrical Closet AB 2nd Flr.

* Installation assumes 25pr UTP video cable and camera Biphase 18G 2C shielded installed in AB 2nd Flr Electical closet as part of 401-403 security project.

** Strike/Mag lock selection by others, equipment, location and price assumes generic installation, actual may vary.

Administration Building 6th Floor Finance security system upgrade.

Security additions to the Finance Suites on the AB 6th floor include the addition of access control to provide an audit trail and entry control to the general suite as well as specific access to vital locations within the suite. In addition duress and video monitoring is provided to facilitate immediate Security reponse to the public areas. Video monitoring of vital locations provides post event incident review.

Locations to receive card access include the five entry points to the suites, and four internal cross zones. Duress alarm push buttons at the public area counters 600a and camera provide staff with instant security response and the ability to monitor the public area by EDC security staff.

Original Budget estimate of new equipment needed:

2ea	AS0100-004	SoftwareHouse APC8x	$3,000	$6,000*
2ea	AS00-63-00	SoftwareHouse APS Power Supply	$700	$1,400*
9ea	131-912	SoftwareHouse ARM1 Relay Module	$75	$675
9ea	RM-4	SoftwareHouse Rm4 Personality Module	$300	$2,700
9ea	Indala SG	Motorola Indalla Card Reader	$215	$1,935
9 ea	DS 150i	REX PIR Access Control 12-24v	$70	$630
3ea	AC-TS2-2T	REX switch illuminated button DPDT	$105	$313
6ea	SNMUNL24	Securitron Mortise Electronic Strike 24V	$234	$1404
3ea	AI-DBL1000S	Double Mag Lock 1000lb ea 12/24/Vdc 500ma	$321	$963
12ea	SR-1085TWH	Sentrol Mag. DC Surface mount	$3	$36
1ea	AX-AL600ULX	Altronix Pwr Supply UL 12or24 vdc 6A	$282	$282

Recommeded Adds:

1ea	PB-G3ACS6T	Phillips AutoDome PTZ-Interior	$1,769	$1,769
1ea	N1-VB37F	NITEK UTP passive Transeiver Female BNC	$50	$50
1ea	N1-VB37M	NITEK UTP passive Transeiver Male BNC	$50	$50
1ea	YY-PS2480	Camera Pwr Supply 24vac 4A in a can	$82	$82
8ea	US-HUB2A	USP Hold Up Buttons DPDT	$12	$96

Misc. Parts $300

Total Equipment cost: $18,685

Security project management, programming and testing 24hrs $978

Notes:

* Each APC8x supports 8ea door control. 9 doors requires 2nd APC8x.

1.) Actual door hardware cost based on selection by others.
Listed cost is budget estimate.

2.) Wiring and device installation costs not included, to be determined by others.
Cable, electrical boxes, raceways and other installation parts cost not included.

3.) Suggest minimum 10% added contingent.

4.) RM4 and ARM1 require ceiling mounted generic enclosure not included.

5.) Installation requires a Fire System (FACP) relay interface to interrupt power to the magnetic door lock provided and installed by others.

Diagram attached:

Attachment A
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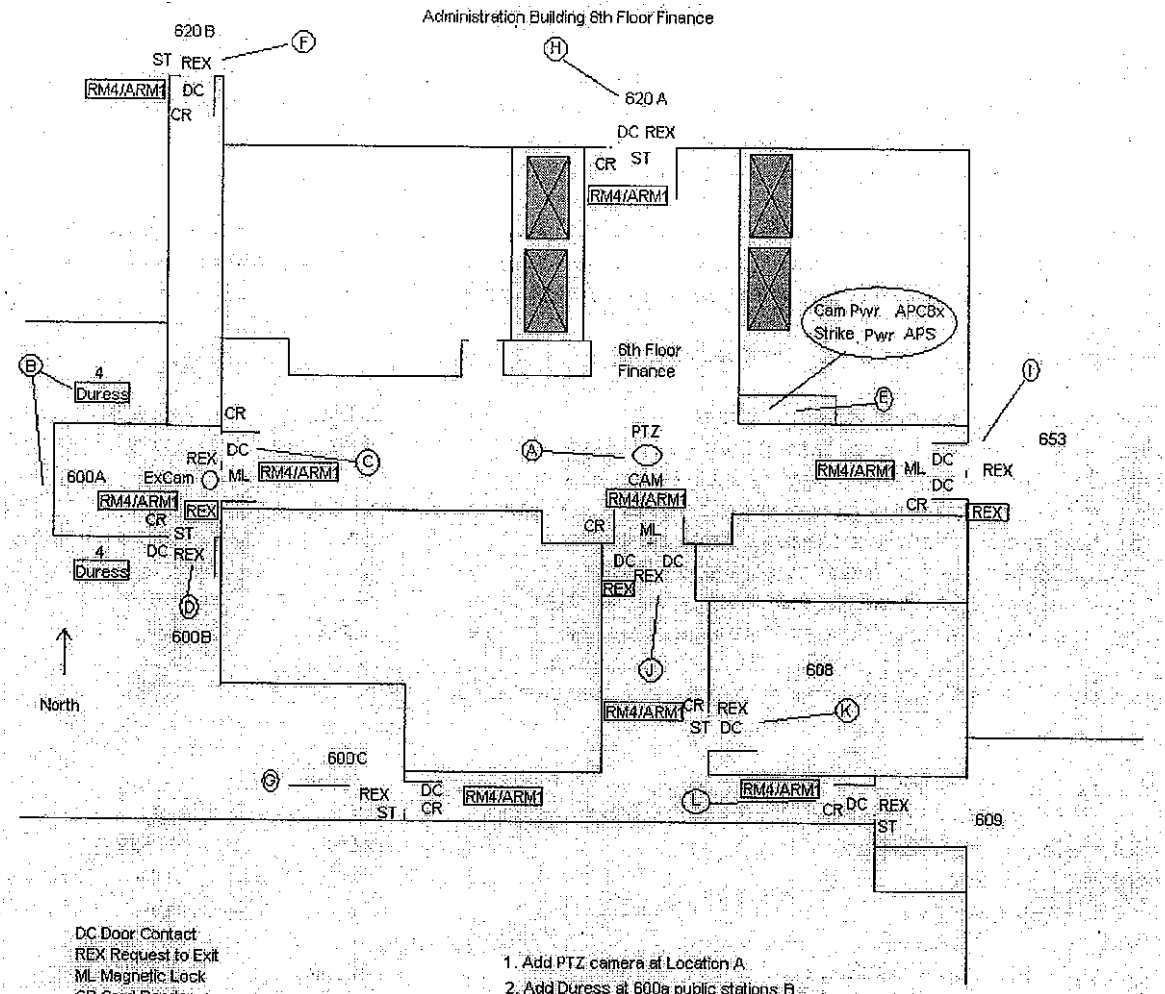

DC Door Contact
REX Request to Exit
ML Magnetic Lock
CR Card Reader
ST Strike
CAM Camera
PTZ Pan Tilt Zoom

All devices monitored in real time in CH EDC.

1. Add PTZ camera at Location A
2. Add Duress at 600a public stations B
3. Install Acccess Control at locations C, D, F, G, H, I, J, K, L
4. Existing Camera at 600a to remain as is.
5. Add APC8x Controller, APS power Supply, Camera Pwr Supply, Strike/Mag Pwr Supply a E Telco Closet.
6. Add RM4 and ARM1 modules for card readers above ceiling
7. Install devices and wiring per electrical code and manufacturers installation instructions.
8. Requires CCure RS485 connection from Telco E to Electrical Closet AB 2nd Flr.
9. Requires Cat3 UTP 8C and 18G 2C shielded from Camera location A to 2nd Flr Electrical Closet AB 2nd Flr.

* Installation assumes 25pr UTP video cable and camera Biphase 18G 2C shielded installed in AB 2nd Flr Electical closet as part of 401-403 security project.

** Strike/Mag lock selection by others, equipment, location and price assumes generic installation, actual may vary.

*** Magnetic Locks require Fire Alarm System power interface provided and installed by others.

Elections 1st Ave MBOS Security upgrade.

Security modifications to Elections 1st Ave MBOS suite include the addition of access control to provide an audit trail of access to the general suite and cage area . In addition duress and camera video monitoring is provided to facilitate Security reponse. Video monitoring of vital locations provides post event incident review and motion detection.

Locations to receive card access include the main 1st Ave. street entry point to the suite and the caged record storage area. Duress alarm push buttons in the center office area provide an immediate security response. Video Monitoring provides post event record review.

Budget estimate of New Equipment needed:

1ea	AS0100-004 SoftwareHouse APC8x	$3,000	$3,000
1ea	AS00-63-00 SoftwareHouse APS Power Supply	$700	$700
3ea	131-912 SoftwareHouse ARM1 Relay Module	$75	$225
3ea	RM-4 SoftwareHouse Rm4 Personality Module	$300	$900
3ea	Indala SG Motorola Indalla Card Reader	$215	$645
1 ea	DS 150i REX PIR Access Control 12-24v	$70	$70
3ea	AC-TS22 REX switch illuminated button DPDT	$36	$315
3ea	DY-2011 Dynalock Mag lock 1200lb 12/24v	$195	$585
3ea	SR-1085TWH Sentrol Mag. DC Surface mount	$3	$9
1ea	AX-AL400ULX Altronix Pwr Supply UL 12or24 vdc 4A	$182	$182
1ea	Intellex DV-8000 Digital Video recorder up to 8 cameras	$9200	$9200
1ea	YY-PS2480 Camera Pwr Supply 24vac 4A in a can	$82	$82
4ea	Phillips Color Camera	$250	$1000
4ea	Phillips Lens	$71	$284
4ea	Camera mounts	$21	$84
1ea	Small site WAN installation	$4540	$4540
1ea	RSC6000 Terminal Server	$618	$618
3ea	US-HUB2A USP Hold Up Buttons DPDT	$10	$30
1ea	Reprogram existing 7400xi security panel to report to EDC at courthouse by others (estimate) 4 hrs x $127.00.	$508	$508
	Misc. Parts		$500
		Equipment cost:	$22,977

*excludes ongoing T1 data access charges of approx. $5000 per year.

Security project management, programming and testing 24hrs	$978
Total	$23,955

Notes:

1.) Actual door hardware cost based on selection by others.
Listed cost is budget estimate.
2.) Wiring and device installation costs not included, to be determined by others.
Cable, electrical boxes, raceways and other installation parts cost not included.
3.) Suggest minimum 10% added contingent.

4.) RM4 and ARM1 require ceiling mounted generic enclosure not included.
5.) Assumes keeping existing security system intact and that it currently operates without faults. Reprogram of existing 7400xi panel to report to EDC by others.
6.) Add 2nd set of door contacts to front door main entrance.
7.) Requires manufacture and installation by others of special mounting bracket to mount Magnetic Lock and Door Contact to each cage roll gate.
8.) Requires modification of gate fence material to create 2 "hand openings" for readers.
9.) Assumes KC network IT can provide separate T1 access to site and connect Ccure system at Courthouse to network.

Diagram attached: