

RESOLUTION NO. 2015-21

A RESOLUTION of the City Council of the City of Lakewood adopting the Region 5 All Hazard Mitigation Plan – 2015-2020 Edition and the City of Lakewood Addendum to the Region 5 Hazard Mitigation Plan; and Updating the 2004 Pierce County Natural Hazard Mitigation Plan.

WHEREAS, the Federal Disaster Mitigation Act of 2000 requires that for all disasters declared on or after November 1, 2004, applicants for sub-grants following any disaster must have an approved All Hazard Mitigation Plan in accordance with 44CFR 201.6 prior to receipt of Hazard Mitigation Grant Program project funding; and

WHEREAS, the Federal Disaster Mitigation Act of 2000 requires that for Pre-Disaster Mitigation grant program project funding on or after November 1, 2003, applicants must have an approved All Hazard Mitigation Plan in accordance with 44CFR 201.6 prior to receipt of project funding; and

WHEREAS, the All Hazard Mitigation Plan Update represents the commitment of the City of Lakewood along with other surrounding government entities to reduce the risks from natural, man-made and technological hazards, serving as a guide for decision makers as they commit resources to reducing the affects of hazards, and it is in the public interest to proceed with the planning process in a timely manner; and

WHEREAS, City of Lakewood has participated with the Pierce County Department of Emergency Management in the development of the City of Lakewood All Hazard Mitigation Plan Update, and recognizes the economic loss, personal injury, and damage that can arise from these hazards; and

WHEREAS, reduction of these impacts can be achieved through a comprehensive coordinated planning process which includes an updated risk assessment that provides the factual basis for activities proposed in the mitigation strategies to reduce losses and vulnerabilities, a five-year cycle for plan maintenance, and documentation of formal adoption by the City of Lakewood; and

WHEREAS, the 2015-2020 Region 5 All Hazard Mitigation Plan Edition has been completed and approved by the State and the Federal Emergency Management Agency; and

WHEREAS, the City of Lakewood could risk not receiving future disaster funding if the All Hazard Mitigation Plan Update is not adopted; and

WHEREAS, the City Council of the City of Lakewood reviewed the All Hazard Mitigation Plan Update.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF LAKEWOOD, WASHINGTON HEREBY RESOLVES, as follows:


Section 1. The Region 5 Hazard Mitigation Plan, 2015-2020 Edition, is hereby adopted as set forth in Exhibit A, which is attached.

Section 2. The City of Lakewood Addendum to the Region 5 Hazard Mitigation Plan, an update to the City of Lakewood All Hazard Mitigation Plan is hereby adopted and shall be in full force and effect upon passage and signatures hereon.

PASSED by the City Council this 6th day of July, 2015.

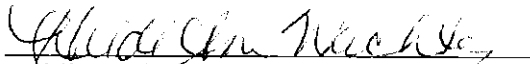

Don Anderson, Mayor

Attest:



Alice M. Bush, City Clerk

Approved as to form:



Heidi Wachter, City Attorney 7/15

APPENDIX A: LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The [Regulation Checklist](#) provides a summary of FEMA’s evaluation of whether the Plan has addressed all requirements.
- The [Plan Assessment](#) identifies the plan’s strengths as well as documents areas for future improvement.
- The [Multi-jurisdiction Summary Sheet](#) is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: Pierce County (Region 5)	Title of Plan: Region 5 Hazard Mitigation Plan – City of Lakewood	Date of Plan: September 2014
Local Point of Contact: Katie Gillespie	Address: 2501 S. 35 th Street, Suite D Tacoma, WA 98409	
Title: Program Coordinator		
Agency: Pierce County Department of Emergency Management		
Phone Number: 253 798-3311	E-Mail: kgilles@co.pierce.wa.us	

State Reviewer:	Title:	Date:
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FEMA Reviewer:	Title:	Date:
Date Received in FEMA Region (insert #)		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

**SECTION 1:
REGULATION CHECKLIST**

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST	Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)			
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Process Section pp. 1-8 to 1-12 Base Plan pp. 1-11, 27-31 Plan Maintenance pp. 7-9		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Process Section pp. 1-10 to 1-11		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Process Section pp. 1-6 to 1-7 Base Plan pp. 1-8		
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Capability Section pp. 3-3 to 3-8		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Plan Maintenance Section pp. 7-7 to 7-8		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Plan Maintenance Section pp. 7-3		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A: REQUIRED REVISIONS				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Risk Assessment Section pp. 4-6 to 4-21			
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Risk Assessment Section pp. 4-15 to 4-21			
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Risk Assessment Section pp. 4-15 to 4-21			
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Risk Assessment Section pp. 4-22 to 4-23			
ELEMENT B: REQUIRED REVISIONS				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Plan Maintenance Section pp. 7-4 Mitigation Strategy Section pp. 5-5 Capability Section PP. 3-3 to 3-7			
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Mitigation Strategy Section pp. 5-15			
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Mitigation Strategy Section pp. 5-5 to 5-18			
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Mitigation Strategy Section pp. 5-4 to 5-18 Capability Section pp. 3-3 to 3-7			

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Mitigation Strategy Section pp. 5-5 to 5-18			
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Plan Maintenance Section pp. 7-4 Mitigation Strategy pp. 5-5 Process Section pp. 1-10			
ELEMENT C: REQUIRED REVISIONS				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Process Section pp. 1-6 to 1-7 Infrastructure Section pp. 6-3 to 6-5 Profile Section pp. 2-6			
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Plan Maintenance Section pp. 7-4 Mitigation Strategy pp. 5-17 to 5-18			
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Plan Maintenance Section pp. 7-4 Mitigation Strategy pp. 5-5			
ELEMENT D: REQUIRED REVISIONS				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Appendix A			
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Appendix A			

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
<u>ELEMENT E: REQUIRED REVISIONS</u>				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)				
F1.				
F2.				
<u>ELEMENT F: REQUIRED REVISIONS</u>				

SECTION 2: PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

How does the Plan go above and beyond minimum requirements to document the planning process with respect to:

- *Involvement of stakeholders (elected officials/decision makers, plan implementers, business owners, academic institutions, utility companies, water/sanitation districts, etc.);*
- *Involvement of Planning, Emergency Management, Public Works Departments or other planning agencies (i.e., regional planning councils);*
- *Diverse methods of participation (meetings, surveys, online, etc.); and*
- *Reflective of an open and inclusive public involvement process.*

Element B: Hazard Identification and Risk Assessment

In addition to the requirements listed in the Regulation Checklist, 44 CFR 201.6 Local Mitigation Plans identifies additional elements that should be included as part of a plan's risk assessment. The plan should describe vulnerability in terms of:

- 1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*
- 2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
- 3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

How does the Plan go above and beyond minimum requirements to document the Hazard Identification and Risk Assessment with respect to:

- *Use of best available data (flood maps, HAZUS, flood studies) to describe significant hazards;*
- *Communication of risk on people, property, and infrastructure to the public (through tables, charts, maps, photos, etc.);*
- *Incorporation of techniques and methodologies to estimate dollar losses to vulnerable structures;*
- *Incorporation of Risk MAP products (i.e., depth grids, Flood Risk Report, Changes Since Last FIRM, Areas of Mitigation Interest, etc.); and*
- *Identification of any data gaps that can be filled as new data became available.*

Element C: Mitigation Strategy

How does the Plan go above and beyond minimum requirements to document the Mitigation Strategy with respect to:

- *Key problems identified in, and linkages to, the vulnerability assessment;*
- *Serving as a blueprint for reducing potential losses identified in the Hazard Identification and Risk Assessment;*
- *Plan content flow from the risk assessment (problem identification) to goal setting to mitigation action development;*
- *An understanding of mitigation principles (diversity of actions that include structural projects, preventative measures, outreach activities, property protection measures, post-disaster actions, etc);*
- *Specific mitigation actions for each participating jurisdictions that reflects their unique risks and capabilities;*
- *Integration of mitigation actions with existing local authorities, policies, programs, and resources; and*
- *Discussion of existing programs (including the NFIP), plans, and policies that could be used to implement mitigation, as well as document past projects.*

Element D: Plan Update, Evaluation, and Implementation (Plan Updates Only)

How does the Plan go above and beyond minimum requirements to document the 5-year Evaluation and Implementation measures with respect to:

- *Status of previously recommended mitigation actions;*
- *Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk;*
- *Documentation of annual reviews and committee involvement;*
- *Identification of a lead person to take ownership of, and champion the Plan;*
- *Reducing risks from natural hazards and serving as a guide for decisions makers as they commit resources to reducing the effects of natural hazards;*
- *An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.);*
- *Discussion of how changing conditions and opportunities could impact community resilience in the long term; and*
- *Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience.*

B. Resources for Implementing Your Approved Plan

Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:

- *What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?*
- *What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?*
- *What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?*
- *Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?*
- *What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?*

**SECTION 3:
MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)**

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/township/village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
1												
2												
3												
4												
5												
6												
7												
8												
9												

MULTI-JURISDICTION SUMMARY SHEET

#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

Section 1

Plan Process Requirements

Planning Process---Requirement §201.6(b):

An open public involvement process is essential to the development of an effective plan.

Documentation of the Planning Process---Requirement §201.6(b):

In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

- (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
- (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Documentation of the Planning Process---Requirement §201.6(c)(1):

[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

- Does the plan provide a narrative description of the process followed to prepare the new or updated plan?
- Does the new or updated plan indicate who was involved in the current planning process? (Who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, etc.?)
- Does the new or updated plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)
- Does the new or updated plan discuss the opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?
- Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?
- Does the updated plan document how the planning team reviewed and analyzed each section of the plan and whether each section was revised as part of the update process?

**SECTION 1
REGION 5 HAZARD MITIGATION PLAN
2014-2019 UPDATE
CITY OF LAKEWOOD
PROCESS SECTION**

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Changes To Jurisdiction Plan in this Document

This Addendum to the Region 5 Hazard Mitigation Plan includes the following changes that are documented as a result of a complete review and update of the existing plan for the City of Lakewood. The purpose of the following change matrix is to advise the reader of these changes updating this plan from the original document approved in November 2008.

The purpose for the changes is three-fold: 1) the Federal Law (Code of Federal Regulations (CFR), Title 44, Part 201.4) pertaining to Mitigation Planning has changed since the original Plan was undertaken; 2) this Plan will be an Addendum to the 2013 comprehensive and FEMA approved Region 5 Hazard Mitigation Plan and 3) the Local Mitigation Planning Requirements of the Disaster Mitigation Act of 2000 201.6 (d) (3) Plan Review states Plans **must** be reviewed, revised if appropriate, and resubmitted for approval within five years in order to continue to be eligible for HMGP project grant funding. This document when completed and approved will become an additional Addendum to the other jurisdictions encompassed in the 2013 approved Region 5 Hazard Mitigation Plan.

Change Matrix

This Matrix of Changes documents the pertinent changes made from the November 2008 City of Lakewood Hazard Mitigation Plan to the 2013 Region 5 Hazard Mitigation Plan-2013-2018 Update. The November 2008 plan was facilitated by Pierce County Department of Emergency Management. Most of the changes are a matter of additional detail, more information provided and reformatting to the current Pierce County DEM format. This 2013 version represents a complete review and update by Pierce County Department of Emergency Management using a detailed process for development and following an established format.

Table 1-1 Change Matrix for City of Lakewood

Section 1 – Plan Development, Process Section	
Section or Part of Plan	New in 2013 Plan
Section 1 – Process Section	Section 1 – Process Section
	The 2013 Process Section contains this Change Matrix Table.
	The 2013 Process Section contains a revised Risk Section to include nine (9) Technological Hazards.
	The 2013 Process Section contains a description of the new process to define goals and objectives for this jurisdiction in the Mitigation Strategy.

Section 1 – Plan Development, Process Section (Continued)	
	The 2013 Process Section contains a Mitigation Measure Matrix that reviews all the prior Mitigation Measures and shows those complete, those still viable and those no longer retained for further action.

Section 2 – Participating Jurisdiction Profiles		
Section or Part of Plan	Previous	2013 Plan
Section 2 – Profile	Information was current as of 2000 Census Data.	The 2013 version of the Profile has been updated using 2010 Census Data and most current GIS information from Pierce County.

Section 3 – Capability Identification		
Section or Part of Plan	Previous	2013 Plan
Section 3 – Capability	The Capability Tables shown in the previous plan are in a similar format.	The 2013 Capability Section has been improved and updated to show current information from the jurisdiction.

Section 4 – Vulnerability, Risk Analysis	
Section or Part of Plan	2013 Plan
The previous version of the plan contained a chart for previous history of disaster declarations broken down into Geological and Meteorological Hazards.	The 2013 Risk Section includes this same chart but it has been updated to show all additional declarations and expanded to include Technological Hazards as well.
The previous version of the plan contained four hazard maps.	The 2013 Risk Section includes updated maps and may contain additional hazard maps according to the specific jurisdiction's hazards.
The previous version included specific analysis showing vulnerability of population, land and infrastructure according to Census 2000.	The 2013 Risk Section includes completely updated tables showing vulnerability of population, land and infrastructure using Census 2010 data.

Section 5 – Mitigation Strategy	
Section or Part of Plan	2013 Plan
The previous document used the standard goals as outlined for the entire project.	The 2013 Mitigation Section was drafted using specific goals and objectives written by the jurisdictions to their specific hazards and concerns.
The previous document contained a Mitigation Measure Matrix chart followed by written descriptions of each individual measure.	The new document uses the same format as the original plan but with emphasis on new goals and objectives. New measures have been added to both the Matrix and the individual measure descriptions. Measures completed in the past five years have been deleted with explanation of same in the Process Section.

Section 6 – Infrastructure	
Section or Part of Plan	2013 Plan
The previous plan used a full table with detail on each piece of infrastructure as well as summary information on hazards and dependencies.	The 2013 plan uses the same table but with additional technological hazards now included. This table has been completely updated as have the accompanying tables.

Section 7 – Plan Maintenance	
Section or Part of Plan	2013 Plan
The previous Plan Maintenance for the jurisdiction was very similar in format to the newer version for 2013.	The 2013 version of the Plan Maintenance borrows from the format and content of the original; however the entire document has been reviewed and updated to current information.

Section 8 – Other Changes	
Section or Part of Plan	2013 Plan
The previous document contained three Appendices.	The 2013 Plan contains three Appendices including place for the final resolution and approval letter from FEMA and also the team members for the jurisdiction and a chart for any changes. The Acronym list appears in the Base Plan for the entire project.

Plan Process

The Region 5 Hazard Mitigation Plan Process Section is a discussion of the planning process used to update the Region 5 Hazard Mitigation Plan (Pierce County is Region 5 for Homeland Security (HLS) in Washington State, including how the process was prepared, who aided in the process, and the public involvement.

The Plan update is developed around all major components identified in 44 CFR 201.6, including:

- **Public Involvement Process;**
- **Jurisdiction Profile;**
- **Capability Identification;**
- **Risk Assessment;**
- **Mitigation Strategy;**
- **Infrastructure Section;** and,
- **Plan Maintenance Procedure.**

Below is a summary of those elements and the processes involved in their development.

Public Involvement Process

Public participation is a key component to strategic planning processes. Citizen participation offers citizens the chance to voice their ideas, interests, and opinions.

“Involving stakeholders who are not part of the core team in all stages of the process will introduce the planning team to different points of view about the needs of the community. It will also provide opportunities to educate the public about hazard mitigation, the planning process, and findings, and could be used to generate support for the mitigation plan.”¹

In order to accomplish this goal and to ensure that the updated Region 5 Hazard Mitigation Plan be comprehensive, the seven planning groups in conjunction with Pierce County Department of Emergency Management developed a public participation process of three components:

1. A Planning Team comprised of knowledgeable individual representatives of HLS Region 5 area and its hazards;
2. Hazard Meetings to target the specialized knowledge of individuals working with populations or areas at risk from all hazards; and
3. Public meetings to identify common concerns and ideas regarding hazard mitigation and to discuss specific goals, objectives and measures of the mitigation plan.

This section discusses each of these components in further detail below with public participation outlined in each. Integrating public participation into the development of the Region 5 Hazard

Mitigation Plan update has helped to ensure an accurate depiction of the Region’s risks, vulnerabilities, and mitigation priorities.

Planning Team

The Planning Team was organized early in 2012. The individual Region 5 Hazards Mitigation Planning Team members have an understanding of the portion of Pierce County containing their specific jurisdiction, including how residents, businesses, infrastructure, and the environment may be affected by all hazard events. The members are experienced in past and present mitigation activities, and represent those entities through which many of the mitigation measures would be implemented. The Planning Team guided the update of the Plan, assisted in reviewing and updating goals and measures, identified stakeholders, and shared local expertise to create a more comprehensive plan. The Planning Team was comprised of:

Table 1-1 Planning Team – City and Town Group

NAME	TITLE	JURISDICTION
Brian Hartsell	Executive Assistant	City of Bonney Lake
Don Morrison		City of Bonney Lake
Alan Predmore	Fire Chief/Emergency Manager	City of Buckley
Jim Arsanto	Chief of Police	City of Buckley
Bob Sheehan	Fire Chief	City of DuPont
Ed Knutson	Chief of Police	City of Edgewood
Kevin Stender	Community Development Senior Planner	City of Edgewood
Mark Mears	Assistant Police Chief	City of Fife
John Cheesman	Chief of Police	City of Fircrest
Mike Davis	Chief of Police	City of Gig Harbor
Paul Rice	Building and Fire Safety Director	City of Gig Harbor
Christine Badger	Emergency Management Coordinator	City of Lakewood
Dana Herron	Building Official	City of Milton
Jim Jaques	Assistant Chief	City of Milton/East Pierce Fire and Rescue
Mark Bethune	City Manager	City of Orting
Karen Yates	Mayor	City of Roy
Bill Llewellyn	Council Member	City of Roy
Ryan Windish	Planning Manager	City of Sumner
Ute Weber	Emergency Manager	City of Tacoma
Tricia Tomaszewski	Clerk-Treasurer	Town of Carbonado
Dailene Argo	Town Clerk	Town of Carbonado
Bob Hudspeth	Fire Chief	Town of Eatonville
Doug Beagle	Town Administrator	Town of Eatonville
Kerry Murphy	Public Works	Town of Eatonville
Peggy Levesque	Mayor	Town of South Prairie
Marla Nevil	Town Clerk	Town of South Prairie
Paul Loveless	Town Administrator	Town of Steilacoom
Melanie Kohn	Clerk/Treasurer	Town of Wilkeson

The Planning Team held 10 Planning Team Meetings for the following Planning Groups: City and Town Group, Fire Group, School Group, Special Purpose Group, and Utility Group for a total of 50 meetings from March of 2012 to February of 2013.

Table 1-2 Planning Team Meetings – Cities and Towns Group

<p>Planning Team Meeting #1 - Pierce County Library Administration Bldg-March 21, 2012</p>
<p>Planning Team members Katie Gillespie and Debbie Bailey conducted the meeting and the Planning Team discussed the following items: Introduction of Planning Team, Review of the history of the Grant Application, Defining the Planning Requirements, How We Establish the In-Kind Match, Benefits of Developing a Plan, Defining the Planning Process, Establishing the Planning Team Meetings, Elected Official Meetings and Public Comment Meetings, reviewing each jurisdiction's profile information, and defining next steps.</p>
<p>Planning Team Meeting #2 – Pierce County Emergency Operations Center-May 1, 2012</p>
<p>Planning Team members Katie Gillespie and Debbie Bailey conducted the meeting and the Planning Team discussed the following items: Introduction of Planning Team as there were new members present, review of items presented at previous meeting, Defining the Planning Requirements, Defining the Process, Establishing the Planning Team Meetings, Elected Official Meetings and Public Comment Meetings, and explaining the next steps.</p> <p>This meeting focused on continuing review of the Profile Section, an introduction to begin thinking about mitigation strategies to include a review of what measures from their original plan have already been completed and thinking about new measures they may like to add, and a review of existing infrastructure for accuracy or necessary changes. It was explained how the Homeland Security sectors correlate with the information on the Infrastructure Forms and the potential uses of the information as a means of populating a database of resources for future use. There was also information handed out on dependencies and how important it is to know who depends on you and who you depend on. Everyone was reminded to set up their Elected Official meetings. Everyone was given a copy of their original Section 6 – Infrastructure Information.</p>
<p>Planning Team Meeting #4 - Pierce County Emergency Operations Center-July 10, 2012</p>
<p>Planning Team members Katie Gillespie and Debbie Bailey conducted the meeting and the Planning Team discussed the following items: Reminder to set up Elected Official meetings. There was a recap of the Infrastructure Forms and the information necessary and some forms were collected at the meeting. Because this group missed one meeting in April, there were two areas of focus for this meeting; the Capability Section and the Risk Section. There was a discussion on how to recognize capabilities that already exist within the jurisdiction. Copies of existing Capability Sections were handed out and a discussion followed regarding making this section more comprehensive for everyone. The discussion continued, focusing on an explanation of the Risk Assessment and beginning to look at the local hazards for each jurisdiction. There was also some discussion about hazard maps and jurisdiction hazard maps were shown for the first time since they were updated. These now include technological hazards.</p>
<p>THERE WERE NO PLANNING TEAM MEETINGS IN JUNE OF 2012</p>
<p>Planning Team Meeting #5 - Pierce County Emergency Operations Center-Aug 7, 2012</p>

<p>Planning Team members Katie Gillespie and Debbie Bailey, along with special guest Casey Broom from State EMD, conducted the meeting and the Planning Team discussed the following items: State EMD Mitigation Coordinator, Casey Broom was present at this meeting to lead the discussion on goals and objectives. The primary discussion for this meeting was a review of how to write goals and how to move forward in developing objectives to address the goals as a part of the Mitigation Strategy for the project.</p>
<p>Planning Team Meeting #6 - Pierce County Emergency Operations Center-Sept 4, 2012</p>
<p>Planning Team members Katie Gillespie and Debbie Bailey, along with Casey Broom, conducted the meeting and the Planning Team discussed the following items: Casey led the discussion continuing with Goals and Objectives for each jurisdiction. There was also a lot of discussion regarding good mitigation measures and how they need to address the objectives identified.</p>
<p>Planning Team Meeting #7 - Pierce County Emergency Operations Center-Oct 2, 2012</p>
<p>Planning Team members Katie Gillespie and Debbie Bailey, along with Casey Broom, conducted the meeting and the Planning Team discussed the following items: The jurisdiction hazard maps (base map as well as hazard maps) and other administrative items were discussed. The majority of the meeting was dedicated to a discussion revolving around developing new mitigation measures and having 'shovel-ready' projects included in all plans. A general discussion was productive in finding new measures that others might also be able to include.</p>
<p>Planning Team Meeting #8 - Pierce County Emergency Operations Center-Nov 6, 2012</p>
<p>Planning Team members Katie Gillespie and Debbie Bailey conducted the meeting and the Planning Team discussed the following items: There was a call for questions on all sections completed thus far and any final cleanup of sections as necessary. The majority of the meeting was dedicated to continuing discussions about mitigation measures and answering all the questions regarding new measures and how they will be added to the plans. The jurisdictions were briefed and given guidance on how to prioritize their mitigation measures.</p>
<p>THERE WERE NO PLANNING TEAM MEETINGS IN DECEMBER OF 2012</p>
<p>The month of December was dedicated allowing the Plan Coordinators time to catch up on documentation for the 78 jurisdictions.</p>
<p>REGIONAL PLANNING MEETINGS WERE HELD IN JANUARY OF 2013 (See Table 1-15)</p>
<p>The month of January was dedicated to eight Regional Meetings where the groups were divided into geographical districts rather than their normal groups in order to develop potential regional measures together.</p>
<p>Planning Team Meeting #9 - Pierce County Emergency Operations Center-Feb 5, 2013</p>
<p>Planning Team members Katie Gillespie and Debbie Bailey conducted the meeting and the Planning Team discussed the following items: The primary discussion, besides a general review once more, was about the Plan Maintenance section and how that will be updated by the jurisdictions. Each jurisdiction was given copies of their existing section and we discussed possible changes and improvements. Those jurisdictions that still had outstanding sections of documentation brought those forward at this time.</p>
<p>Planning Team Meeting #10 - Pierce County Emergency Operation Center-March 5, 2013</p>

Planning team members Katie Gillespie and Debbie Bailey conducted the meeting and the Planning Team was able to discuss any final questions or concerns regarding the final sections of the plans and any updates or changes that will still need to be made before the plans are complete.

Joint Planning Requirement

The City of Lakewood has the following identified plan which must collaborate with the mitigation plan; these plans are identified in the table below and must be updated within the predetermined timeline.

Plan	Next Update
City of Lakewood Comprehensive Plan	June 2015

¹ State and Local Mitigation Planning How-to Guide, Getting Started: building support for mitigation planning, FEMA 386-1, September 2002, p. 3-1.

**SECTION 2
REGION 5 HAZARD MITIGATION PLAN
2014-2019 UPDATE
CITY OF LAKEWOOD
PROFILE SECTION**

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Mission Statement

The mission of the City of Lakewood is as follows:

The City of Lakewood enhances the quality of life of our residents by providing essential services in a fiscally responsible manner, ensuring public safety, promoting economic development and preserving our natural environment.

Services Summary

The City of Lakewood was incorporated in the year 1996.

The jurisdiction provides the following services through their own capabilities:

Table 2-1 City Services¹

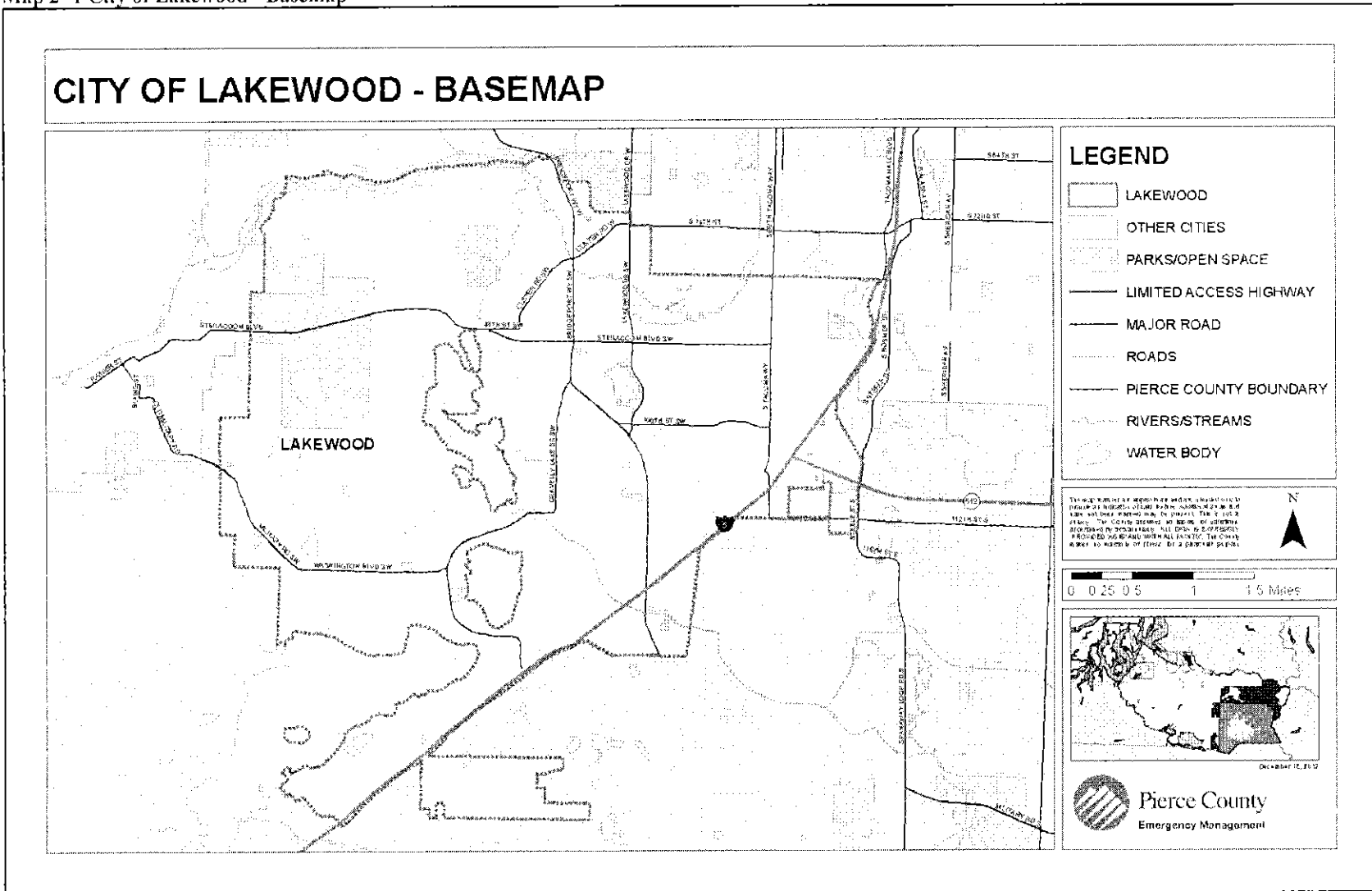
CITY SERVICES			
Service	Yes	Service	Yes
Mayor/City Manager	Yes	Municipal Airport	No
City Attorney	Yes	Municipal Court	Yes
City Clerk	Yes	Public Works/Improvements	Yes
City Treasurer	Yes	Comprehensive Planning	Yes
Sheriff or Police	Yes	Parking Meter Revenue	No
Parks Commissioners	No	Construction and Operation of Boat Harbors, Marinas, Docks, etc.	Yes
City Council	Yes	Issue Bonds and Levies of General Tax	Yes
License and Tax Fees	Yes	Fire Department/EMS	No
Non-Polluting Power Generation	No	Parking, Off-street Facilities	No
Hydroelectric Resources	No	Sanitary Landfill/Refuse Service	No
Radio Communications	Yes	Sidewalks	Yes
Streets	Yes	Storm Drains	Yes
Waste Water Treatment	No	Streets/Alleys	Yes
Water Utility	No	Parks and Parkways	Yes
Public Transportation Systems	No	Water Pollution Abatement	Yes
Residential Care Facilities	No	Local Improvement Districts	Yes
Child Care Facilities	No		

Geo-Political Summary

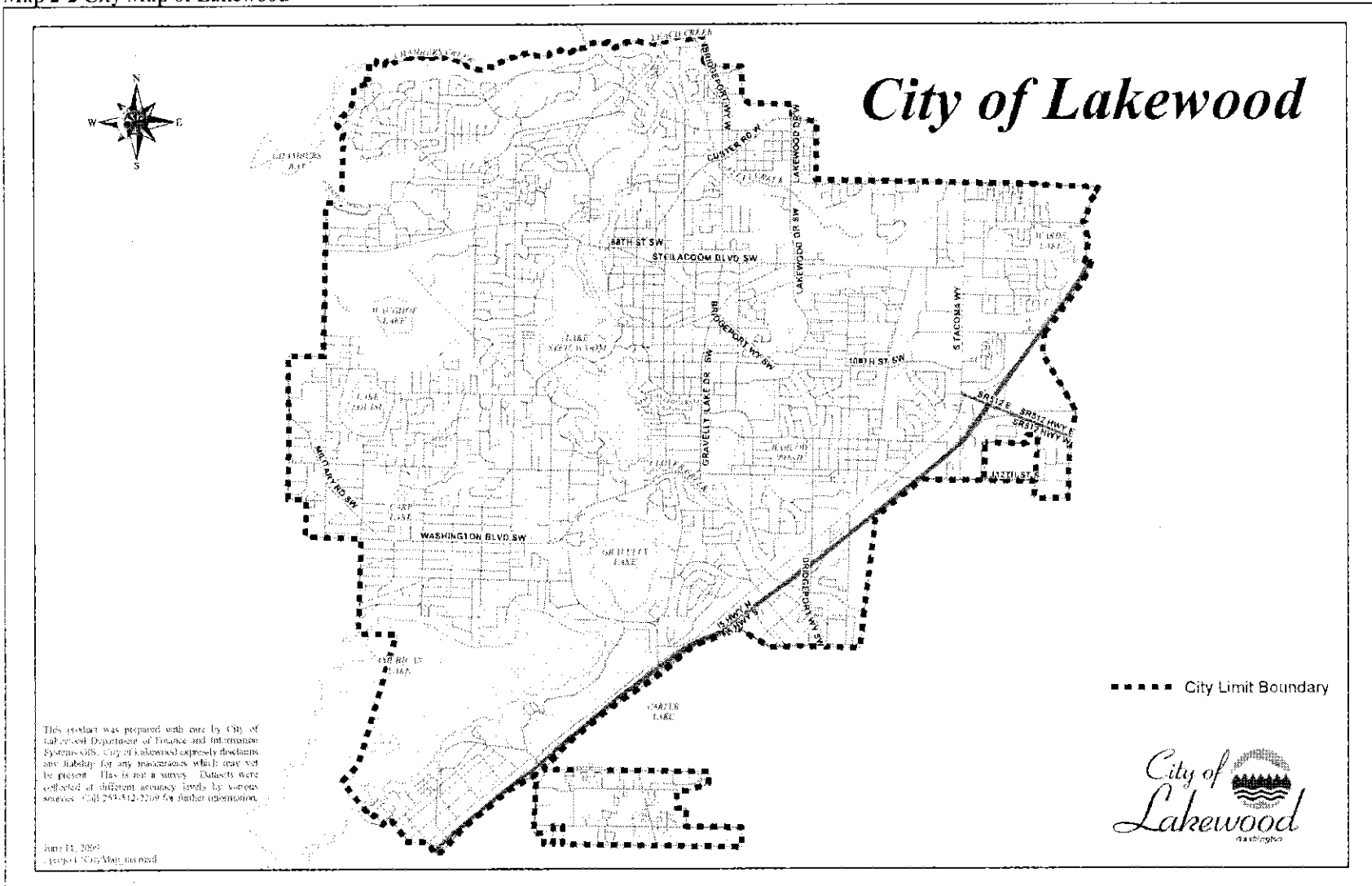
Table 2-2 Geo-Political Summary²

Jurisdiction	Area (sq mi)	Elevation Range (ft)	Major Water Features	Regional Partners	
				Shared Borders	Land Use Authorities
City of Lakewood	17.2405	60-380	<ul style="list-style-type: none"> • Chambers Clover Watershed • 2-Chambers Bay Basin • 6-Clover Creek/Steilacoom Basin • 9-American Lake Basin 	<ul style="list-style-type: none"> • University Place • Tacoma • Steilacoom • Unincorporated Pierce County • Western State Hospital • Camp Murray • WA—DNR • Joint Base Lewis-McChord 	<ul style="list-style-type: none"> • Lakewood • University Place • Tacoma • Steilacoom • Unincorporated Pierce County • WA—DSHS • WA—EMD • WA—DNR • WA—F & W • US DoD (Joint Base Lewis-McChord)

Map 2- 1 City of Lakewood - Basemap



Map 2-2 City Map of Lakewood



Population Summary

Demographics

Table 2-3 Population^{3, 4, 5, 6}

Jurisdiction	Population	Population Density (people/sq mi)	Population Served	Projected Year 2022 Population Change (%)	Projected Population Density	Projected 2022 Population Served
City of Lakewood	57,431	3,331	57,431	25.37%	4,176	72,000
Region 5	795,225	440	795,225	-18.39%	359	648, 895

Special Populations

Table 2-4 Special Populations⁷

Jurisdiction	Population	Population 65 Plus	% of Total	Population Under 20	% of Total
City of Lakewood	57,431	7,735	13%	14,646	26%
Region 5	795,225	87,770	11%	220,351	28%

In comparison to the last update, the overall population decreased slightly from 58,183 to 57,431 while the 65 and older population and the population ages 20 and under slightly increased. The City of Lakewoods' population density decreased from 4,116 to 3,331 people per square mile. As a result the City of Lakewood has identified a decrease in population density which reduces their population vulnerability.

Infrastructure Summary

General

Table 2-5 Parcel Summary⁸

Jurisdiction	# Parcels	Land Value	Average Land Value	Improved Value	Average Improved Value
City of Lakewood	17,421	\$1,953,089,400	\$112,111	\$3,134,545,900	\$179,929
Region 5	319,165	\$29,742,651,792	\$93,189	\$49,650,950,160	\$155,577

Jurisdiction	Total Assessed Value	Average Assessed Value
City of Lakewood	\$5,087,635,300	\$292,040
Region 5	\$79,393,601,952	\$248,766

Table 2-6 Housing Summary⁹

Jurisdiction	# Houses	Housing Density	Avg Year Built	Avg Year Built (%)
City of Lakewood	26,548	1,540	<ul style="list-style-type: none"> • <1939: 721 • 1940 – 1979: 17,065 • 1980 – 2004: 8,305 • 2005>: 505 	<ul style="list-style-type: none"> • <1939: 2.7% • 1940 – 1979: 64.1% • 1980 – 2004: 31.2% • 2005>: 3.9%
Region 5	291,983	162	<ul style="list-style-type: none"> • <1939: 34,368 • 1940 – 1979: 126,363 • 1980 – 2004: 139,894 • 2005>: 22,830 	<ul style="list-style-type: none"> • <1939: 10.6% • 1940 – 1979: 39% • 1980 – 2004: 43.2% • 2005>: 7.1%

Jurisdiction Infrastructure

The following table shows the overview of infrastructure owned by the City of Lakewood. The infrastructure is categorized according to the infrastructure sectors as designated by the Department of Homeland Security. This chart is intended as a summary only.

For further details on Department of Homeland Security infrastructure sectors, please see the Process Section I.

Table 2-7 City: Owned Infrastructure¹⁰

Total Infrastructure	Emerg. Services	Tele-comm	Transportation	Water	Energy	Government	Commercial	Total Value (\$)
2	0	0	0	0	0	2	0	\$26,131,786

Economic Summary

Table 2-8 Fiscal Summary¹¹

Jurisdiction	Operating Costs (per month)	Operating Budgeted Revenues ¹²	Operating Budgeted Expenditures ¹³	Fund Balance as % of Operating Cost	Avg Fund Balance (5 yrs)
City of Lakewood	Not Available	Not Available	Not Available	Not Available	Not Available

Table 2-9 Employment Profile¹⁴

Employment Category (SIC)	City of Lakewood	Pierce County
Agriculture, Forestry, Fishing, Mining and Hunting	154	2,532
Construction	1,957	29,441
FIRES (Finance, Insurance, Real Estate, and Services)	1,218	21,862
Wholesale Trade	658	13,064
Transportation and Warehousing and Utilities	1,261	21,796
Manufacturing	1,899	35,050
Retail	3,260	43,247
Education, Health and Social Services	5,119	76,821
Professional, Scientific, Management, Administrative, Waste Management	2,116	31,890
Public Administration	1,643	22,860

Table 2-10 Economic Summary¹⁵

Jurisdiction	Unemployment Rate
City of Lakewood	13.1%
Region 5	9.6%
WA State	8.4%

Resource Directory

Regional

- **City of Lakewood**
<http://www.cityoflakewood.us/>
- **Pierce County Government**
<http://www.piercecountywa.org/PC/>
- **Pierce County DEM**
<http://www.piercecountywa.org/pc/abtus/ourorg/dem/abtusdem.htm>
- **Pierce County PALS**
<http://www.co.pierce.wa.us/pc/abtus/ourorg/pals/palshome.htm>
- **Municipal Research & Services Center of Washington (MRSC)**
<http://www.mrsc.org/>

National

- **US Census**
www.census.gov/

Endnotes

¹ Information from a survey completed by the City.

² Information from Pierce County GIS application, CountyView Pro (2013/14).

³ "Population" from Census 2010, Office of Financial Management. It should be noted that current (as of July 2013) population of City of Lakewood is reported by the Office of Financial Management as 58,950.

⁴ "Projected Population Change (%)" from Pierce County Buildable Lands Report, Dec. 2007.

⁵ "Projected Population Density" is based on an assumption of the jurisdiction maintaining the same geographic area and boundaries. It does not consider changes in annexation, district mergers, etc.

⁶ "Projected 2022 Population" from Pierce County Buildable Lands Report, Dec. 2007.

⁷ "Special Population" from Census 2010, Office of Financial Management.

⁸ Information from Pierce County GIS application, CountyView Pro 2013/14.

⁹ Information from Census 2010, Office of Financial Management.

¹⁰ Information obtained from Jurisdiction from Infrastructure Matrix.

¹¹ Information obtained from the Budget of the jurisdiction.

¹² Information not available at the time of publication.

¹³ Information not available at the time of publication.

¹⁴ Information from Census 2010, Office of Financial Management.

¹⁵ Information from Census 2010, Office of Financial Management.

Section 3

Capability Identification Requirements

Planning Process---Requirement §201.6(b):

An open public involvement process is essential to the development of an effective plan.

Documentation of the Planning Process---Requirements §201.6(b):

In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

- Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?

Assessing Vulnerability: Analyzing Development Trends---Requirement §201.6(c)(2) (ii)(C):

[The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.]

- Does the plan describe land uses and development trends?

Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance--Requirement §201.6(c)(3)(ii):

[The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

- Does the new or updated plan describe the jurisdiction(s) participation in the NFIP?

SECTION 3
REGION 5 HAZARD MITIGATION PLAN
2014-2019 UPDATE
CITY OF LAKEWOOD
CAPABILITY IDENTIFICATION SECTION

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Legal and Regulatory

Table 3-1 Legal and Regulatory

Regulatory Tools (Ordinances and Codes)	Yes or No
Jurisdiction Capabilities	
Building Construction/Design Construction Codes	Yes
Flood Damage Prevention Ordinance	Yes
Growth Management Ordinance	Yes
Critical Area Ordinance	Yes
Hazard Setback Requirements	Yes
Hillside and Steep Slope Ordinance	Yes
Land Use and Regulatory Codes	Yes
Mechanical Codes	Yes
Plan Review Requirements	Yes
Plumbing Codes	Yes
Real Estate Disclosure Requirements	No
Storm Water Management	Yes
Subdivision Ordinance or Regulations	Yes
Tax and License Codes	Yes
Wildfire Ordinance	No
Zoning Ordinance	Yes

Administrative Capability

Table 3-2 Administrative Capability

Administrative Tools (Agency, Departments or Programs)	Yes or No
Jurisdiction Capabilities	
Architectural Review Board/Historic Review	Yes
Board of Adjustments/Hearing Examiner	Yes
Building Official	Yes
Chamber of Commerce	Yes
City/Town Council	Yes
City/Town Meetings	Yes
City/Town Planning Commission	Yes
City/Town Website	Yes
Commercial Fire Safety/Code Inspection Program	WPFR
Community CPR/First Aid Program	No
Community Emergency Response Teams (or PCNET)	Yes
Downtown Revitalization Committee	No
Economic Development Board	Yes
Emergency Manager	Yes
Engineers	Yes
Families First Coalition	Planned
Fire and Injury Prevention Program	WPFR
Fire Chief	WPFR
Fire Safety & Disaster Classes in Schools	WPFR
Flood Plan Manager	No
Government TV Access	No
Grant Writers	Yes
Home Safety Council	Yes
Information included in Utility Bills	Yes
Lahar Warning System	Yes
Planners	Yes
Planning Commission	Yes
Police Chief	Yes
Police Department	Yes
Public Utility	Yes
Public Works Department	Yes
Safe Streets Program	No
Safety Fairs	Yes
Stream Team	Yes
Surveyors	No

Table 3-3 Administrative Capability (Con'd)

Administrative Tools (Agency, Departments or Programs)	Yes or No
Regional Capabilities	
Local Business Districts	Yes
Local Department of Emergency Management	Yes
Local Fire Agencies plus Mutual Aid with others	WPFR
Local Hospitals	Yes
Local Law Enforcement Agencies and Mutual Aid with others	Yes
Local Neighborhood Associations	Yes
Local Newspapers	Yes
Local Parks Commission/Board	Yes
Local Power Companies	Yes
Local Parent Teacher's Association	Yes
Neighboring Counties	Yes
Pierce County Department of Emergency Management	Yes
Pierce County Fire Chiefs Association	Yes
Pierce County Neighborhood Emergency Teams (PCNET)	Yes
Pierce County Police Chiefs Association	Yes
Pierce County Safe Kids Coalition	WPFR
Pierce County Sheriffs Department	Yes
Puget Sound Clean Air Agency	Yes
Puget Sound Energy	Yes
Puget Sound Regional Council	Yes
Puget Sound Water Quality Management Plan	Yes
Service Organizations	Yes
Tacoma/Pierce County Health Department	Yes
Tribes	No

Technical Capability

Table 3-4 Technical Tools

Technical Tools (Plans and Other)	Yes or No
Jurisdiction Capabilities	
After Action Reports of Any Incident	Yes
Capital Improvement Plan	Yes
Comprehensive Emergency Management Plan	Yes
Comprehensive Plan	Yes
Continuity of Governmental Services and Operations Plan (COOP and COG)	Yes
Critical Facilities Plan	Yes
Drainage Master Plan	No
Economic Development Plan	Yes
Emergency Evacuation Plan	No
Emergency Response Plan	Yes
Generator Placement Plan	In process
Habitat Plan	No
Hazardous Materials Response Plan	WPFR
Lahar Evacuation Plan	No
Pandemic Flu Plan	Yes
Post-Disaster Recovery Plan	Yes
Sewer/Wastewater Comprehensive Plan (Pierce Co. PW)	Yes
Storm Comprehensive Plan	Yes
Water Comprehensive Plan (Lakewood Water District)	Yes
Regional Capabilities	
Coordinated Water System Plan and Regional Supplement 2001	Yes
Local and Regional Emergency Exercises – All Types	Yes

Fiscal Capability

Table 3-5 Fiscal Capability

Fiscal Tools (Taxes, Bonds, Fees, and Funds)	Yes or No
Jurisdiction Capabilities	
TAXES:	
Authority to Levy Taxes	Yes
BONDS:	
Authority to Issue Bonds	Yes
FEES:	
Fees for Water, Sewer, Gas or Electric Service	No
Impact Fees for Homebuyers/Developers for New Developments/Homes	Yes
Local Improvement District (LID)	Yes
FUNDS:	
Capital Improvement Project Funds	Yes
Enterprise Funds	No
General Government Fund (Departments)	Yes
Internal Service Funds	Yes
Special Revenue Funds	Yes
Withhold Spending in Hazard-Prone Areas	N/A
Regional Capabilities	
Pierce County Land Conservancy	Yes
Cascade Land Conservancy	No

Specific Capabilities

Table 3-6 Specific Capabilities

Jurisdiction Specific Capabilities
<u>Legal & Regulatory</u>
<u>Administrative & Technical</u>
<u>Fiscal</u>

Section 4

Risk Assessment Requirements

Identifying Hazards--- Requirement §201.6(c)(2)(i):

[The risk assessment shall include a] description of the type ... of all natural hazards that can affect the jurisdiction.

- Does the new or updated plan include a description of the types of all natural hazards that affect the jurisdiction?

Profiling Hazards---Requirement §201.6(c)(2)(i):

[The risk assessment shall include a] description of the ... location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

- Does the risk assessment identify (i.e., geographic area affected) of each hazard being addressed in the new or updated plan?
- Does the risk assessment identify the extent (i.e., magnitude or severity) of each hazard addressed in the new or updated plan?
- Does the plan provide information on previous occurrences of each hazard addressed in the new or updated plan?
- Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the new or updated plan?

Assessing Vulnerability: Overview---Requirement §201.6(c)(2) (ii):

[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

- Does the new or updated plan include an overall summary description of the jurisdiction's vulnerability to each hazard?
- Does the new or updated plan address the impacts of each hazard on the jurisdiction?

Assessing Vulnerability: Addressing Repetitive Loss Properties---Requirement §201.6(c)(2) (ii):

[The risk assessment] must also address the National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

- Does the new or updated plan describe vulnerability in terms of the types and numbers of repetitive loss properties located in the identified hazard areas?

Assessing Vulnerability: Identifying Structures---Requirement §201.6(c)(2) (ii)(A):

The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas...

- Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?
- Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

Assessing Vulnerability: Estimating Potential Losses---Requirement §201.6(c)(2) (ii)(B):

[The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate...

- Does the new or updated plan estimate potential dollar losses for vulnerable structures?
- Does the new or updated plan describe the methodology used to prepare the estimate?

Assessing Vulnerability: Analyzing Development Trends---Requirement §201.6(c)(2) (ii)(c):

[The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

- Does the new or updated plan describe land uses and development trends?

SECTION 4

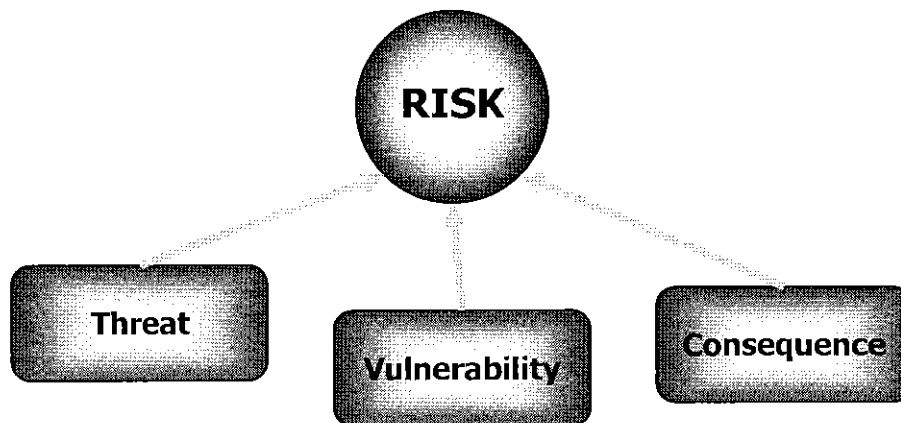
REGION 5 HAZARD MITIGATION PLAN 2014-2019 UPDATE CITY OF LAKEWOOD RISK ASSESSMENT SECTION

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Section Overview

The Risk Assessment portrays the threats of natural hazards, the vulnerabilities of a jurisdiction to the hazards, and the consequences of hazards impacting communities. Each hazard is addressed as a threat and is identified and profiled in the Hazard Identification. The vulnerabilities to and consequences of a given hazard are addressed in the Vulnerability Analysis. Vulnerability is analyzed in terms of exposure of both population and infrastructure to each hazard. Consequences are identified as anticipated, predicted, or documented impacts caused by a given hazard when considering the vulnerability analysis and the characteristics of the hazard as outlined in its identification.



The WA Region 5 **Hazard Identification** was used for this plan. Each jurisdiction's Vulnerability and Consequence Analysis are based on the Region 5 Hazard Identification. The Region 5 Hazard Identification can be found in the Base Plan. Each hazard is identified in subsections. The subsections are grouped by hazard-type (i.e., geological and meteorological hazards) and then alphabetically within each type. A summary table of the WA Region 5 Hazard Identification is included in this section as Table 4-1a and Table 4-1b.

The **Vulnerability Analysis** is displayed in six tables:

- Table 4-2 General Exposure
- Table 4-3 Population Exposure
- Table 4-4 General Infrastructure Exposure
- Table 4-5a Consequence Analysis Chart – Geological
- Table 4-5b Consequence Analysis Chart – Meteorological
- Table 4-5c Consequence Analysis Chart – Technological

Each jurisdiction has its own Vulnerability Analysis, and it is included in this section.

The **Consequence Identification** is organized by Threat. Each threat page summarizes the hazard, graphically illustrates exposures from the Vulnerability Analysis, and lists corresponding Consequences. Each jurisdiction has its own Consequence Identification and it is included in this section: avalanche, earthquake, landslide, tsunami, volcanic, drought, flood, severe weather, and wildland/urban interface fire.

Specific information and analysis of a jurisdiction's owned (public) infrastructure is addressed in the Infrastructure Section of its Plan.

Table 4-1a WA Region 5 Hazard Identification Summary – Geological

THREAT	DECLARATION # DATE/PLACE	PROBABILITY/ RECURRENCE	MAPS, FIGURES AND TABLES
<u>AVALANCHE</u>	Not Applicable	Yearly in the mountainous areas of the County including Mt. Rainier National Park and the Cascades.	Slab Avalanche Areas Vulnerable to Avalanche Pierce County Avalanches of Record
<u>EARTHQUAKE</u>	N/A--7/22/2001 Nisqually Delta N/A--6/10/2001 Satsop DR-1361-WA--2/2001 Nisqually N/A--7/2/1999 Satsop DR-196-WA--4/29/1965 Maury Island, South Puget Sound N/A--4/13/1949 South Puget Sound N/A--2/14/1946 Maury Island	Magnitude 4.3 Magnitude 5.0—Intraplate Earthquake Magnitude 6.8—Intraplate Earthquake Magnitude 5.8—Intraplate Earthquake Magnitude 6.5—Intraplate Earthquake Magnitude 7.0—Intraplate Earthquake Magnitude 6.3 40 years or less occurrence Historical Record—About every 23 years for intraplate earthquakes	Types of Earthquakes Major Faults in the Puget Sound Basin Seattle and Tacoma Fault Segments Pierce County Seismic Hazard Major Pacific Northwest Earthquakes Notable Earthquakes Felt in Pierce County Salmon Beach, Tacoma Washington following Feb 2001 Earthquake Liquefaction Niigata Japan-1964 Lateral Spreading – March 2001
<u>LANDSLIDE</u>	DR-1159-WA--12/96-2/1997 DR-852-WA--1/1990 DR-545-WA--12/1977	Slides with minor impact (damage to 5 or less developed properties or \$1,000,000 or less damage) 10 years or less. Slides with significant impact (damage to 6 or more developed properties or \$1,000,000 or greater damage) 100 years or less.	Northeast Tacoma Landslide January 2007 Pierce County Landslide and Soil Erosion Hazard Pierce County Shoreline Slope Stability Areas Notable Landslides in Pierce County Ski Park Road – Landslide January 2003 SR-165 Bridge Along Carbon River – Landslide February 1996 Aldercrest Drive - Landslide
<u>TSUNAMI</u>	N/A--1894 Puyallup River Delta N/A--1943 Puyallup River Delta (did not induce tsunami) N/A--1949 Tacoma Narrows	Due to the limited historic record, until further research can provide a better estimate a recurrence rate of 100 years plus or minus will be used.	Hawaii 1957 – Residents Explore Ocean Floor Before Tsunami Hawaii 1949 – Wave Overtakes a Seawall Puget Sound Fault Zone Locations, Vertical Deformation and Peak Ground Acceleration Seattle and Tacoma Faults Tsunami Inundation and Current Based on Earthquake Scenario Puget Sound Landslide Areas and Corresponding Tsunamis Puget Sound River Deltas, Tsunami Evidence and Peak Ground Acceleration Salmon Beach, Pierce County 1949 – Tsunamiogenic Subaerial Landslide Puyallup River Delta – Submarine Landslides Puyallup River Delta – Submarine Landslides and Scarp Damage in Tacoma from 1894 Tsunami
<u>VOLCANIC</u>	DR-623-WA--5/1980	The recurrence rate for either a major lahar (Case I or Case II) or a major tephra eruption is 500 to 1000 years. The recurrence rate for either a major lahar (Case I or Case II) or a major tephra eruption is 500 to 1000 years.	Volcano Hazards Debris Flow at Tahoma Creek – July 1988 Douglas Fir Stump – Electron Lahar Deposit in Orting Landslide from Little Tahoma Peak Covering Emmons Glacier Tephra Types and Sizes Lahars, Lava Flows and Pyroclastic Hazards of Mt. Rainier Estimated Lahar Travel Times for Lahars 10 ⁷ to 10 ⁸ Cubic Meters in Volume Ashfall Probability from Mt. Rainier Annual Probability of 10 Centimeters or more of Tephra Accumulation in the Pacific NW Cascade Eruptions Mt. Rainier Identified Tephra, last 10,000 years Pierce County River Valley Debris Flow History

Geological

Table 4-1b WA Region 5 Hazard Identification Summary – Meteorological and Technological

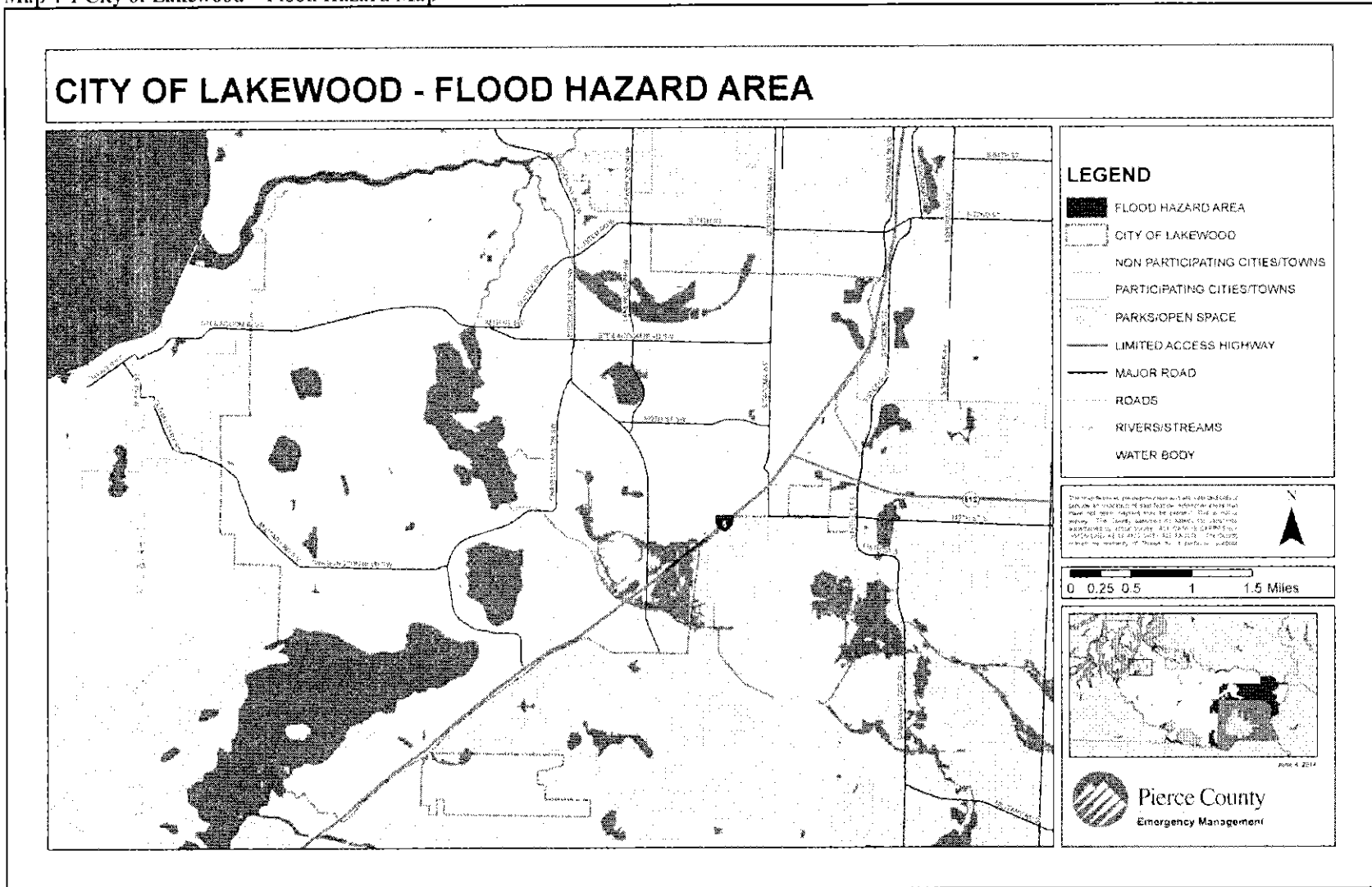
HAZARD	FEMA DECLARATION # DATE/PLACE		PROBABILITY/ RECURRENCE	MAPS, FIGURES AND TABLES
<u>CLIMATE CHANGE</u>	Not Applicable		Not Applicable	Global Temperature Change: 1850 to 2006 Recent and Projected Temperatures for the Pacific Northwest Comparison of the South Cascade Glacier: 1928 to 2003 Lower Nisqually Glacier Retreat: 1912 to 2001
<u>DROUGHT</u>	Many dry seasons but no declarations		50 years or less occurrence	Sequence of Drought Impacts Palmer Drought Severity Index Pierce County Watersheds %Area of Basin in Drought Conditions Since 1895 %Time in Severe to Extreme Drought: 1895-1995 %Time in Severe to Extreme Drought: 1985-1995 Notable Droughts Affecting Pierce County Columbia River Basin USDA Climate Zones – Washington State
<u>FLOOD</u> Since 1978 3 Repetitive Loss Areas have produced 83 Claims totaling Nearly \$1.78 Million Dollars.	DR-WA 1817--01/2009 NA-11/2008 DR-1734-WA--12/2007 DR-1671-WA--11/2006 DR-1499-WA--10/2003 DR-1159-WA--12/96-2/97 DR-1100-WA--1-2/1996 DR-1079-WA--11-12/1995 DR-896-WA--12/1990 DR-883-WA--11/1990	DR-852-WA--1/1990 DR-784-WA--11/1986 DR-545-WA--12/1977 DR-492-WA--12/1975 DR-328-WA--2/1972 DR-185-WA--12/1964	5 years or less occurrence Best Available Science--The frequency of the repetitive loss claims indicates there is approximately a 33 percent chance of flooding occurring each year.	Pierce County Watersheds Pierce County Flood Hazard Pierce County Repetitive Loss Areas Clear Creek Basin Repetitive Flood Loss Aerial Photo Flood Hazard Declared Disasters Feb 8, 1996 Flooding – Del Rio Mobile Homes Along Puyallup River Nov 2006 Flooding River Park Estates – Along Puyallup River Nov 2006 Flooding State Route 410 – Along Puyallup River Nov 2006 Flooding Rainier Manor – Along Puyallup River
<u>SEVERE WEATHER</u>	DR-4056-WA – 01/2012 DR-1825- WA – 12/2008 – 01/2009 DR-1682-WA--12/2006 DR-1159-WA--12/96-2/1997 DR-1152-WA--11/19/1996	DR-981-WA--1/1993 DR-137-WA--10/1962	The recurrence rate for all types of severe storms is 5 years or less.	Fujita Tornado Damage Scale Windsorm Tracks Pierce County Severe Weather Wind Hazard – South Wind Event Pierce County Severe Weather Wind Hazard – East Wind Event Notable Severe Weather in Pierce County Snowstorm January 2004 Downtown Tacoma Satellite Image – Hanukkah Eve Windsorm Before/After Tornado Damage Greensburg KS May 2007 Public Works Responds 2005 Snowstorm Downed Power Pole February 2006 Windsorm County Road December 2006 Windsorm Tacoma Narrows Bridge – November 1940 Windsorm
<u>WUI FIRE</u>	Not Applicable		Based on information from WA DNR the probability of recurrence for WUI fire hazard to Pierce County is 5 years or less.	Washington State Fire Hazard Map Pierce County Forest Canopy Industrial Fire Precaution Level Shutdown Zones Carbon Copy Fire August 2006 Washington State DNR Wildland Fire Statistics: 1973-2007 DNR Wildland Response South Puget Sound Region: 2002-2007 Pierce County DNR Fires

Meteorological

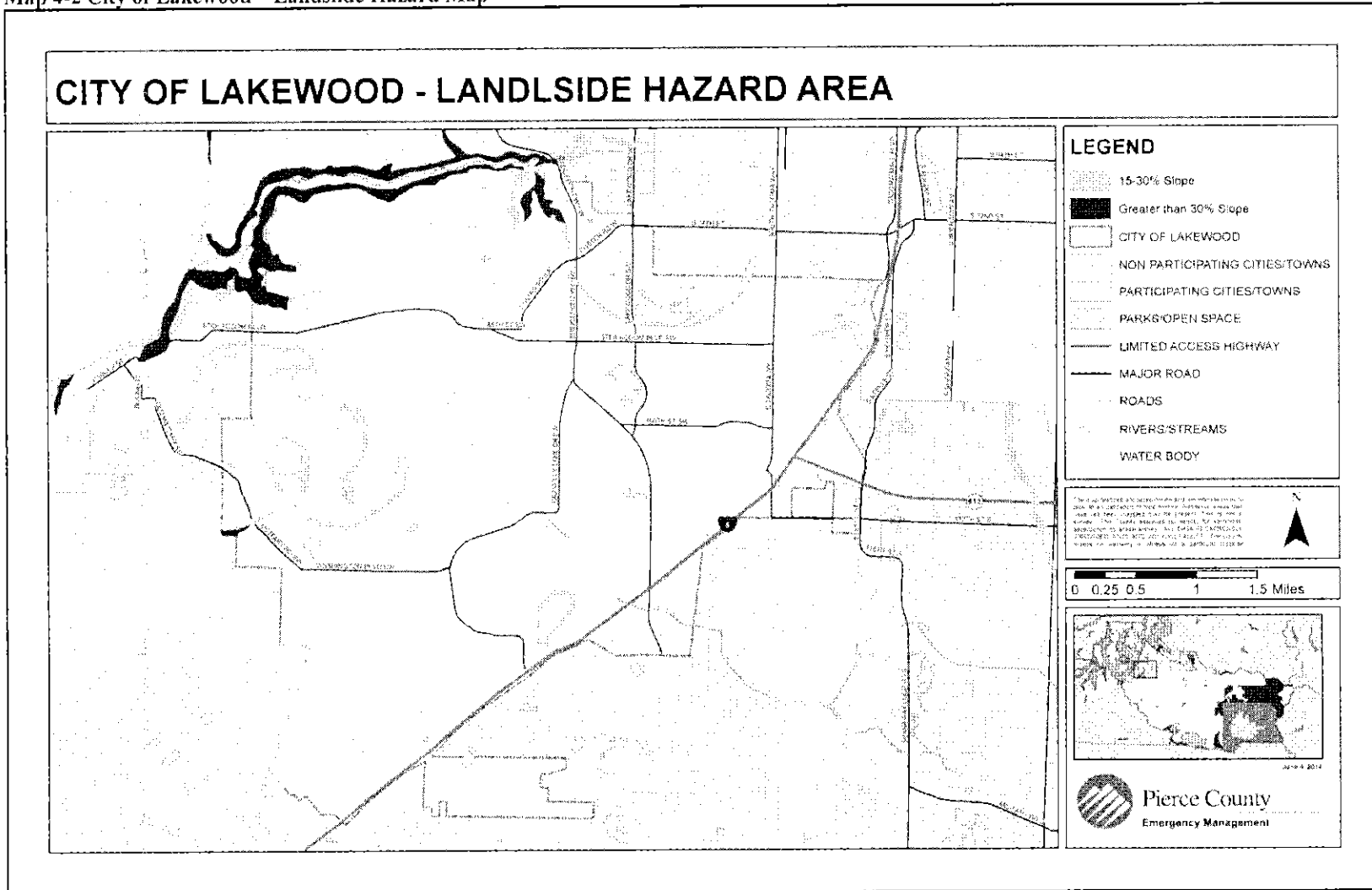
HAZARD	FEMA DECLARATION # DATE/PLACE	PROBABILITY/ RECURRENCE	MAPS, FIGURES AND TABLES
<u>ABANDONED MINES</u>	Not Applicable	Based on Information from WA DNR The Pierce County Sheriff's Department reports that they have had very few incidents of citizens entering the abandoned mines in east Pierce Co. Isolated issues of minor subsidence have occurred, typically following flood events in 2009/2010	Pierce County – Mine Hazard Areas MapBased on WA DNR Information Schasse, Koler, Eberle, and Christie, <u>The Washington State Coal Mine Map Collection: A Catalog, Index, and User's Guide</u> , Open File Report 94-7, June 1984 Pierce County 2009 HIRA
<u>CIVIL DISTURBANCE</u>	Not Applicable	Looking at the historical record, major civil unrest is a rare occurrence. Movement of military supplies from Port of Tacoma to Joint Base Lewis McChord	Pierce County Civil Disturbance Map Pierce County 2009 HIRA Hilltop Riots Tacoma 1969, 1991
<u>DAM FAILURE</u>	Not Applicable	No occurrences in Pierce County 50+ years recurrence	Table D-1 PC Dams that Pose a High or Significant Risk, Pierce County 2009 HIRA Table D-2 Dam Failures in WA State
<u>ENERGY EMERGENCY</u>	Not Applicable	<ul style="list-style-type: none"> January 2009 Loss of electricity to Anderson Island (underground [water] cable) Power Outage is the most frequent energy incident, via natural hazards (storms, ice) Recurrence Rate – 5 years (storms) Recurrence Rate – 50+ years (major)	Pierce County 2009 HIRA Tacoma Power Outage 1929, USS Lexington provide power Anderson Island January 2009 Underwater power cable broke
<u>EPIDEMIC</u>	Not Applicable	Pandemics <ul style="list-style-type: none"> 2009-2010 "Swine Flu" Recurrence Rate – 20 years	Pierce County 2009 HIRA Tacoma Pierce County Health District Pan Flu Plan Measles, State of WA, 1990 E Coli, January 1993, September 1998
<u>HAZARDOUS MATERIALS</u>	Not Applicable	<ul style="list-style-type: none"> Dalco Passage oil spill of October 13, 2004 Chlorine Spill Port of Tacoma February 12, 2007 Large Incidents 5 year recurrence Small Incidents 1 week recurrence	Pierce County 2009 HIRA Table HM-1 Reported Releases (in lbs.)of all chemicals, for Pierce Co. in 2008, all industries Chlorine Spill in the Port of Tacoma (February 12, 2007) Dalco Passage oil spill (October 13, 2004) Illegal methamphetamine sites (A high of 258 sites in 2001-56 sites in 2009)
<u>PIPELINE FAILURE</u>	Not Applicable	<ul style="list-style-type: none"> Northwest Pipeline Corporation natural gas incident May 1st 2003, in Sumner 10 years recurrence	Map P-1 Pierce County Pipelines Pierce County 2009 HIRA
<u>TERRORISM</u>	Not Applicable	Minor PC Incident – Recurrence 1-year Major Incident – Recurrence 100 years	Pierce County 2009 HIRA Tacoma's Model Cities and Human Rights Offices burned 1972 African American church burned 1993 White Supremacy Group Hate Crimes, 1998 Westgate Family Medicine Clinic bombed, 2011
<u>TRANSPORTATION ACCIDENT</u>	Not Applicable	Minor Incidents occur daily Major Incidents rare Recurrence Rate – 10 years	Pierce County 2009 HIRA Rail: Freight Derailment, Steilacoom 1996 Freight Train Derailment, Chambers Bay, 2011

Technological

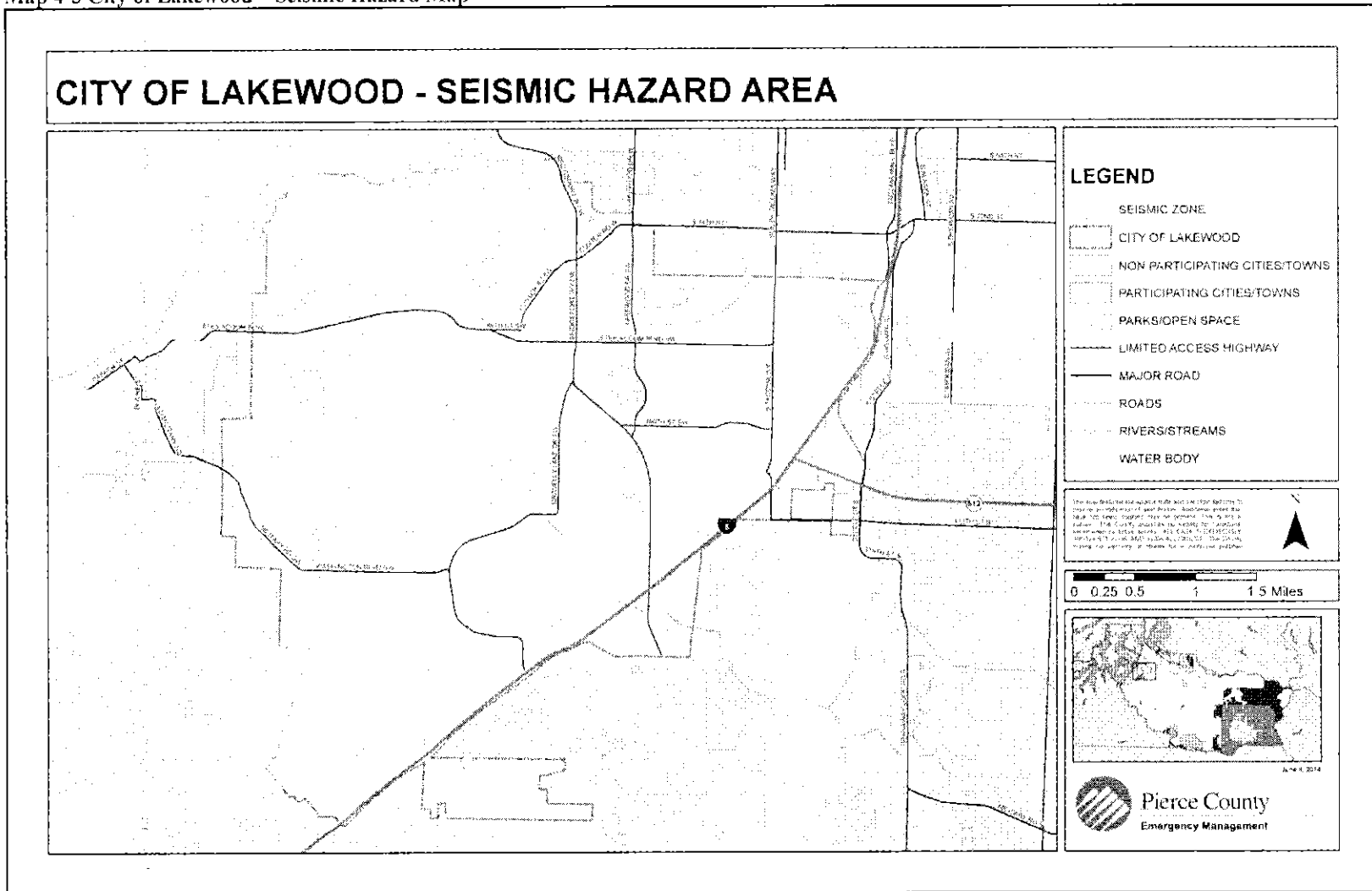
Map 4-1 City of Lakewood – Flood Hazard Map



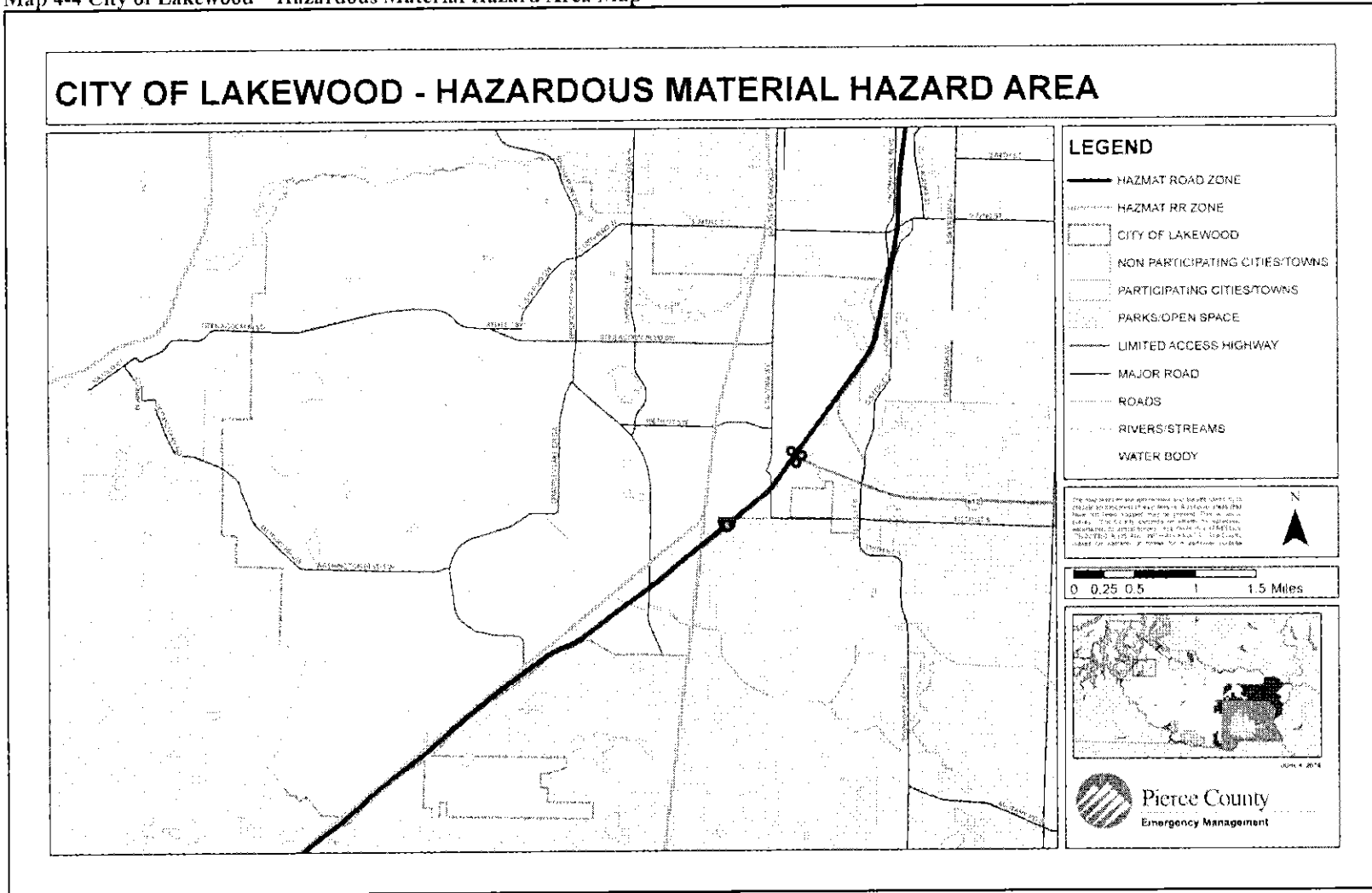
Map 4-2 City of Lakewood – Landslide Hazard Map



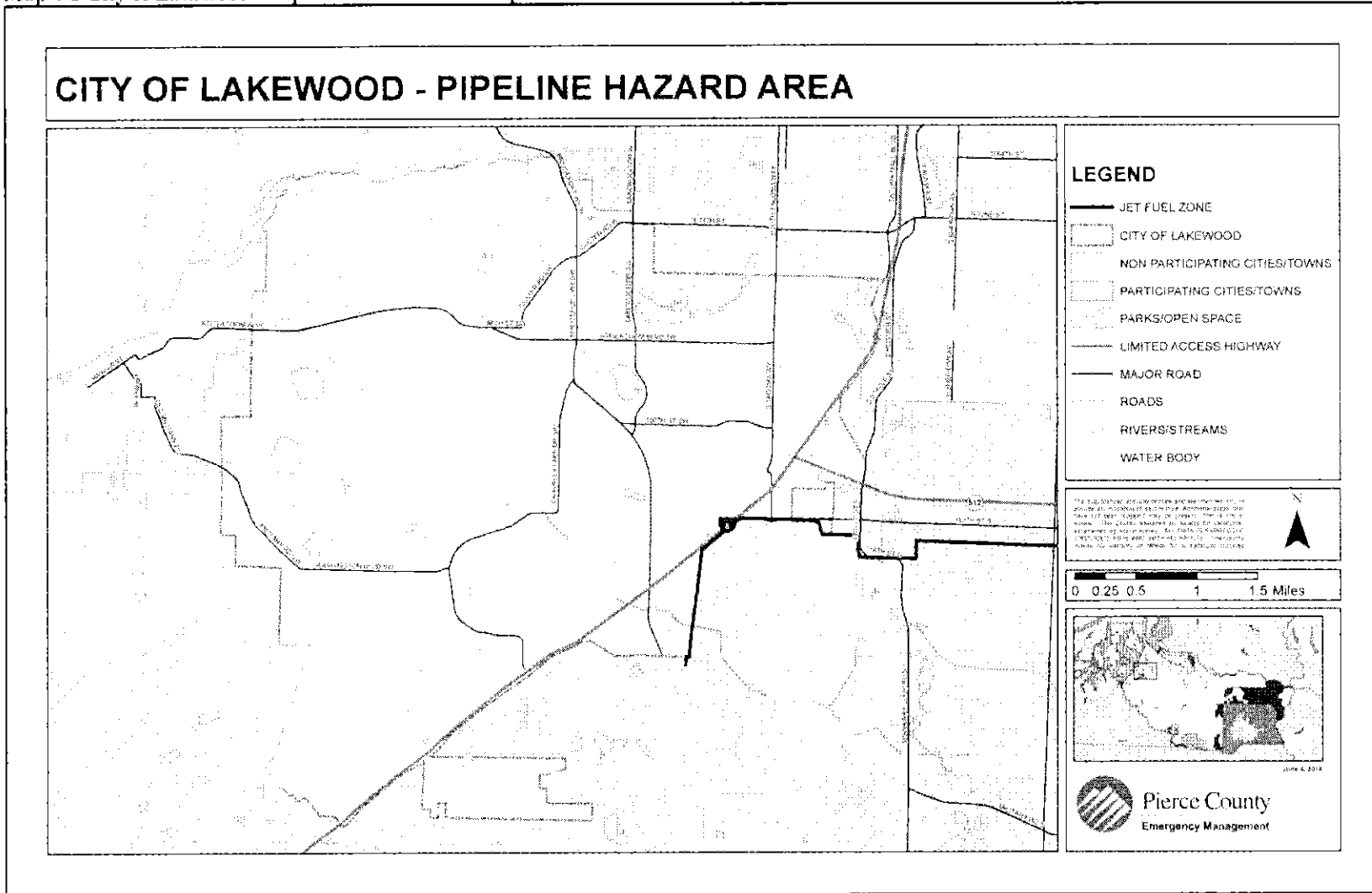
Map 4-3 City of Lakewood – Seismic Hazard Map



Map 4-4 City of Lakewood – Hazardous Material Hazard Area Map



Map 4-5 City of Lakewood – Pipeline Hazard Area Map



Map 4-6 City of Lakewood – Transportation Emergency Area Map

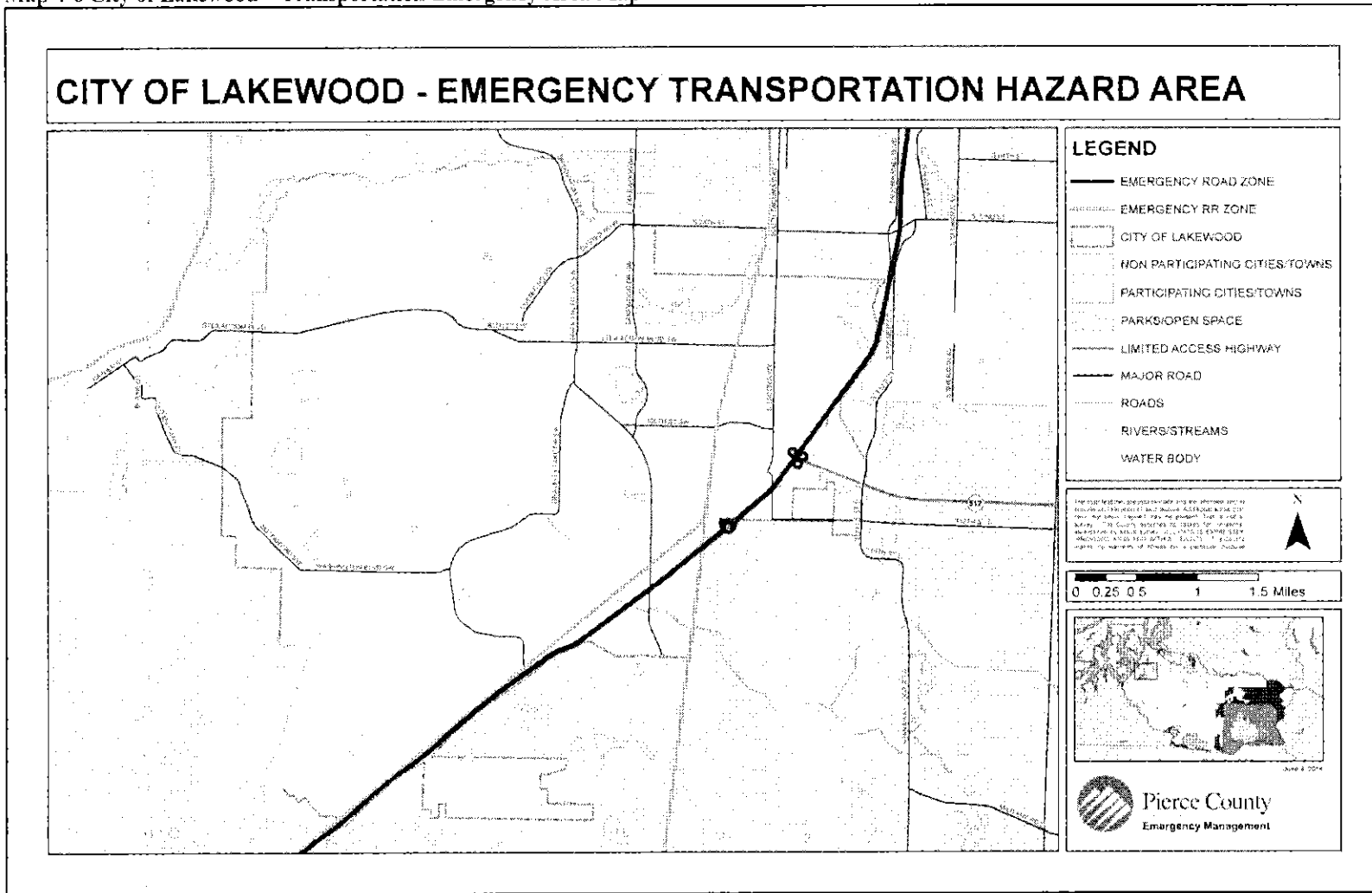


Table 4-2 Vulnerability Analysis: General Exposure¹

THREAT ²	AREA (SQ MI)		PARCELS		
	Total	% Base	Total	% Base	
BASE	19.03	100%	17,469	100%	
<i>Geological</i>	Avalanche ³	NA	NA	NA	
	Earthquake ⁴	.96	.05%	30	.2%
	Landslide	2.44	12.8%	1,072	6.1%
	Tsunami	NA	NA	NA	NA
	Volcanic ⁵	NA	NA	NA	NA
<i>Meteorological</i>	Drought ⁶	19.03	100%	17,469	100%
	Flood	4.22	22.1%	1,455	8.3%
	Severe Weather	19.03	100%	17,469	100%
	WUI Fire ⁷	NA	NA	NA	NA
<i>Technological</i>	Abandoned Mines ⁸	NA	NA	NA	NA
	Civil Disturbance ⁹	19.03	100%	17,469	100%
	Dam Failure ¹⁰	NA	NA	NA	NA
	Energy Emergency ¹¹	19.03	100%	17,469	100%
	Epidemic ¹²	19.03	100%	17,469	100%
	Hazardous Material ¹³	4.69	24.6%	3,977	22.8%
	Pipeline Hazard ¹⁴	.47	2.4%	142	.8%
	Terrorism ¹⁵	19.03	100%	17,469	100%
Transportation Accidents ¹⁶	4.69	24.6%	3,977	22.8%	

Table 4-3 Vulnerability Analysis: Population Exposure

THREAT ²	POPULATION			SPECIAL POPULATIONS (OF TOTAL EXPOSED POPULATION)				
	Total	% Base	Density (pop/sq.mi)	65+ yrs		20- yrs		
				#	%	#	%	
BASE	58,163	100%	4,055	7,735	13%	14,646	25%	
<i>Geological</i>	Avalanche	NA	NA	NA	NA	NA	NA	
	Earthquake	1,375	2%	1,434.32	345	4%	239	2%
	Landslide	9,875	17%	4,038.91	1,669	21.6%	2,129	14.5%
	Tsunami	NA	NA	NA	NA	NA	NA	NA
	Volcanic	NA	NA	NA	NA	NA	NA	NA
<i>Meteorological</i>	Drought	58,163	100%	4,055	7,735	13%	14,646	25%
	Flood	11,426	20%	2,705	1,517	20%	2,992	20%
	Severe Weather	58,163	100%	4,055	7,735	13%	14,646	25%
	WUI Fire	NA	NA	NA	NA	NA	NA	NA
<i>Technological</i>	Abandoned Mines	NA	NA	NA	NA	NA	NA	NA
	Civil Disturbance	58,163	100%	4,055	7,735	13%	14,646	25%
	Dam Failure	NA	NA	NA	NA	NA	NA	NA
	Energy Emergency	58,163	100%	4,055	7,735	13%	14,646	25%
	Epidemic	58,163	100%	4,055	7,735	13%	14,646	25%
	Hazardous Material	20,590	35.4%	4,389	2,266	29.3%	5,854	40%
	Pipeline Hazard	2,726	5%	5,846.65	151	2%	853	6%
	Terrorism	58,163	100%	4,055	7,735	13%	14,646	25%
Transportation Accidents	20,590	35.4%	4,389	2,266	29.3%	5,854	40%	

Table 4-4 Vulnerability Analysis: General Infrastructure Exposure

THREAT ²	LAND VALUE			IMPROVED VALUE			TOTAL ASSESSED VALUE			
	Total (\$)	% Base	Avg. Value (\$)	Total (\$)	% Base	Avg. Value (\$)	Total (\$)	% Base	Avg. Value (\$)	
BASE	\$1,742,549,000	100%	\$99,751	\$3,375,067,625	100%	\$193,203	\$5,117,616,625	100%	\$292,954	
<i>Geological</i>	Avalanche	NA	NA	NA	NA	NA	NA	NA	NA	
	Earthquake	\$33,651,300	1.9%	\$1,121,710	\$110,625,000	3.3%	\$3,687,500	\$144,276,300	2.8%	\$4,809,210
	Landslide	\$129,175,200	7.4%	\$120,499	\$378,125,325	11.2%	\$352,729	\$507,300,525	9.9%	\$473,228
	Tsunami	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Volcanic	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Meteorological</i>	Drought	\$1,742,549,000	100%	\$99,751	\$3,375,067,625	100%	\$193,203	\$5,117,616,625	100%	\$292,954
	Flood	\$410,241,700	23.5%	\$281,953	\$636,630,400	18.9%	\$437,547	\$1,046,872,100	20%	\$719,500
	Severe Weather	\$1,742,549,000	100%	\$99,751	\$3,375,067,625	100%	\$193,203	\$5,117,616,625	100%	\$292,954
	WUI Fire	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Technological</i>	Abandoned Mines	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Civil Disturbance	\$1,742,549,000	100%	\$99,751	\$3,375,067,625	100%	\$193,203	\$5,117,616,625	100%	\$292,954
	Dam Failure	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Energy Emergency	\$1,742,549,000	100%	\$99,751	\$3,375,067,625	100%	\$193,203	\$5,117,616,625	100%	\$292,954
	Epidemic	\$1,742,549,000	100%	\$99,751	\$3,375,067,625	100%	\$193,203	\$5,117,616,625	100%	\$292,954

Hazardous Material	\$621,626,200	35.7%	\$156,305	\$918,467,725	27.2%	\$230,945	\$1,540,093,925	30.1%	\$387,250.17
Pipeline Hazard	\$54,043,900	3.10%	\$380,591	\$65,794,100	1.95%	\$463,339	\$119,838,000	2.34%	\$843,929.58
Terrorism	\$1,742,549,000	100%	\$99,751	\$3,375,067,625	100%	\$193,203	\$5,117,616,625	100%	\$292,954
Transportation Accidents	\$621,626,200	35.7%	\$156,305	\$918,467,725	27.2%	\$230,945	\$1,540,093,925	30.1%	\$387,250.17

Table 4-5a Consequence Analysis Chart – Geological^{17,18}

THREAT		CONSEQUENCE	YES OR NO
<i>Geological</i>	Avalanche	Impact to the Public	No
		Impact to the Responders	No
		Impact to COG and/or COOP in the Jurisdiction	No
		Impact to Property, Facilities and Infrastructure	No
		Impact to the Environment	No
		Impact to the Jurisdiction Economic Condition	No
		Impact to Reputation or Confidence in Jurisdiction	No
	Earthquake	Impact to the Public	Yes
		Impact to the Responders	Yes
		Impact to COG and/or COOP in the Jurisdiction	Yes
		Impact to Property, Facilities and Infrastructure	Yes
		Impact to the Environment	Yes
		Impact to the Jurisdiction Economic Condition	Yes
		Impact to Reputation or Confidence in Jurisdiction	Yes
	Landslide	Impact to the Public	Yes
		Impact to the Responders	Yes
		Impact to COG and/or COOP in the Jurisdiction	No
		Impact to Property, Facilities and Infrastructure	Yes
		Impact to the Environment	Yes
		Impact to the Jurisdiction Economic Condition	No
		Impact to Reputation or Confidence in Jurisdiction	No
	Tsunami	Impact to the Public	No
		Impact to the Responders	No
		Impact to COG and/or COOP in the Jurisdiction	No
		Impact to Property, Facilities and Infrastructure	No
		Impact to the Environment	No
		Impact to the Jurisdiction Economic Condition	No
Impact to Reputation or Confidence in Jurisdiction		No	
Volcanic¹⁹	Impact to the Public	Yes	
	Impact to the Responders	Yes	
	Impact to COG and/or COOP in the Jurisdiction	No	
	Impact to Property, Facilities and Infrastructure	Yes	
	Impact to the Environment	Yes	
	Impact to the Jurisdiction Economic Condition	No	
	Impact to Reputation or Confidence in Jurisdiction	No	

Table 4-5b Consequence Analysis Chart – Meteorological

THREAT		CONSEQUENCE	YES OR NO
Meteorological	Drought	Impact to the Public	Yes
		Impact to the Responders	Yes
		Impact to COG and/or COOP in the Jurisdiction	No
		Impact to Property, Facilities and Infrastructure	No
		Impact to the Environment	Yes
		Impact to the Jurisdiction Economic Condition	No
	Impact to Reputation or Confidence in Jurisdiction	No	
	Flood	Impact to the Public	Yes
		Impact to the Responders	No
		Impact to COG and/or COOP in the Jurisdiction	No
		Impact to Property, Facilities and Infrastructure	Yes
		Impact to the Environment	Yes
		Impact to the Jurisdiction Economic Condition	Yes
	Impact to Reputation or Confidence in Jurisdiction	No	
	Severe Weather	Impact to the Public	Yes
		Impact to the Responders	Yes
		Impact to COG and/or COOP in the Jurisdiction	No
		Impact to Property, Facilities and Infrastructure	Yes
		Impact to the Environment	Yes
		Impact to the Jurisdiction Economic Condition	Yes
	Impact to Reputation or Confidence in Jurisdiction	Yes	
WUI Fire	Impact to the Public	Yes	
	Impact to the Responders	Yes	
	Impact to COG and/or COOP in the Jurisdiction	No	
	Impact to Property, Facilities and Infrastructure	Yes	
	Impact to the Environment	Yes	
	Impact to the Jurisdiction Economic Condition	Yes	
Impact to Reputation or Confidence in Jurisdiction	Yes		

Table 4-5c Consequence Analysis Chart – Technological²⁰

THREAT		CONSEQUENCE	YES OR NO
Technological	Abandoned Mines	Impact to the Public	
		Impact to the Responders	
		Impact to COG and/or COOP in the Jurisdiction	
		Impact to Property, Facilities and Infrastructure	
		Impact to the Environment	
		Impact to the Jurisdiction Economic Condition	
	Impact to Reputation or Confidence in Jurisdiction		
	Civil Disturbance	Impact to the Public	
		Impact to the Responders	
		Impact to COG and/or COOP in the Jurisdiction	
		Impact to Property, Facilities and Infrastructure	
		Impact to the Environment	
		Impact to the Jurisdiction Economic Condition	
	Impact to Reputation or Confidence in Jurisdiction		
	Dam Failure	Impact to the Public	
		Impact to the Responders	
		Impact to COG and/or COOP in the Jurisdiction	
		Impact to Property, Facilities and Infrastructure	
Impact to the Environment			
Impact to the Jurisdiction Economic Condition			
Impact to Reputation or Confidence in Jurisdiction			

Energy Emergency	Impact to the Public	
	Impact to the Responders	
	Impact to COG and/or COOP in the Jurisdiction	
	Impact to Property, Facilities and Infrastructure	
	Impact to the Environment	
	Impact to the Jurisdiction Economic Condition	
Epidemic	Impact to Reputation or Confidence in Jurisdiction	
	Impact to the Public	
	Impact to the Responders	
	Impact to COG and/or COOP in the Jurisdiction	
	Impact to Property, Facilities and Infrastructure	
	Impact to the Environment	
Hazardous Materials	Impact to the Jurisdiction Economic Condition	
	Impact to Reputation or Confidence in Jurisdiction	
	Impact to the Public	
	Impact to the Responders	
	Impact to COG and/or COOP in the Jurisdiction	
	Impact to Property, Facilities and Infrastructure	
Pipeline Hazards	Impact to the Environment	
	Impact to the Jurisdiction Economic Condition	
	Impact to Reputation or Confidence in Jurisdiction	
	Impact to the Public	
	Impact to the Responders	
	Impact to COG and/or COOP in the Jurisdiction	
Terrorism	Impact to Property, Facilities and Infrastructure	
	Impact to the Environment	
	Impact to the Jurisdiction Economic Condition	
	Impact to Reputation or Confidence in Jurisdiction	
	Impact to the Public	
	Impact to the Responders	
Transportation Accident	Impact to COG and/or COOP in the Jurisdiction	
	Impact to Property, Facilities and Infrastructure	
	Impact to the Environment	
	Impact to the Jurisdiction Economic Condition	
	Impact to Reputation or Confidence in Jurisdiction	
	Impact to the Public	

The City of Lakewood is located in the Western portion of Pierce County. The City is highly susceptible to six of the eighteen hazards we considered in this plan. The risks are Drought, Severe Weather, Civil Disturbance, Energy Emergency, Epidemic and Terrorism. The risks impact critical infrastructure located within the City of Lakewood including Interstate 5, St. Claire Hospital and the essential facilities of water, power, and emergency services. Additionally, the cross-county transportation is met by the conjunction of Interstate 5 and Highway 512 in this area is a high priority to remain functional but could easily be blocked by any number of hazards. Lakes Steilacoom, Gravelly, Louise and Waughop are in this area but would not threaten the City its self with flooding.

Endnotes

¹ Info obtained from Pierce County GIS application, CountyView Pro (12/09).

² Currently the expanding body of empirical data on climate change supports its basic premise that the long term average temperature of the earth's atmosphere has been increasing for decades (1850 to 2008). This trend is continuing and will create dramatic changes in the local environment of Pierce County. Today, questions revolve around the overall increase in local temperature and its long term effects. Climate change today refers to variations in either regional or global environments over time. Time can refer to periods ranging in length from a few decades to other periods covering millions of years. A number of circumstances can cause climate change. Included herein are such diverse factors as solar cycles, volcanic eruptions, changing ocean current patterns, or even something as unusual as a methane release from the ocean floor. Over the past 150 years good temperature records have allowed comparisons to be made of global temperatures from year-to-year. This has shown an overall increase of approximately 0.7° C during this period. An increasing body of scientific evidence implies that the primary impetus driving climate change today is an increase in atmospheric green house gases.

³ Jurisdiction is not vulnerable to this hazard, therefore it is marked NA or non-applicable.

⁴ It should be noted here that although all residents, all property and all infrastructure of the City of Lakewood are vulnerable to earthquake shaking, not all are subject to the affects of liquefaction and liquefiable soils which is what is represented here.

⁵ The threat of volcanic ashfall affects the entire Region 5 however some jurisdictions are specifically threatened by lahar flows directly from Mt. Rainier; an active volcano.

⁶ The entire jurisdiction is vulnerable to drought. There are three things that must be understood about the affect of drought on the jurisdiction: 1) Drought is a Region wide event. When it does affect Pierce County, it will affect every jurisdiction, 2) Drought will gradually develop over time. It is a gradually escalating emergency that may take from months to years to affect the jurisdiction. Initially lack of water may not even be noticed by the citizens. However, as the drought continues, its effects will be noticed by a continually expanding portion of the community until it is felt by all, and 3) Jurisdictions will be affected differently at different times as a drought develops. This will vary depending on the needs of each local jurisdiction. Some examples are: jurisdictions that have industry that requires a continuous supply of a large quantity of water; others have agriculture that requires water, but may only require it at certain times of the year; and, some jurisdictions have a backup source of water while others do not.

⁷ According to the most recent information from the Department of Natural Resources, the City of Lakewood while undergoing development does not have large areas of forested land that could develop into a wildland/urban interface fire. Further study is needed to determine the extent of the area that could be affected.

⁸ The definition of Abandoned Mines comes from the 2010 Pierce County HIRA: Abandoned mines are any excavation under the surface of the earth, formerly used to extract metallic ores, coal, or other minerals, and that are no longer in production.

⁹ The definition of Civil Disturbance comes from the 2010 Pierce County HIRA: Civil Disturbance (unrest) is the result of groups or individuals within the population feeling, rightly or wrongly, that their needs or rights are not being met, either by the society at large, a segment thereof, or the current overriding political system. When this results in community disruption of a nature where intervention is required to maintain public safety it has become a civil disturbance. Additionally, the Region 5 Strategic Plan includes Operational Objectives 3 & 4: Intelligence Gathering, Indicators, Warnings, etc; and Intelligence and Information Sharing.

¹⁰ The definition of Dam Failure comes from the 2010 Pierce County HIRA: A dam is any "barrier built across a watercourse for impounding water."¹⁰ Dam failures are catastrophic events "characterized by the sudden, rapid, and uncontrolled release of impounded water. The vulnerability analysis was based on the potential dam failure from Mud Mountain Dam and Lake Tapps using Pierce County's GIS data which originated from each of the dams emergency plans inundation maps.

¹¹ The definition of an Energy Emergency comes from the 2010 Pierce County HIRA: Energy emergency refers to an out-of-the-ordinary disruption, or shortage, of an energy resource for a lengthy period of time. Additionally the Region 5 Strategic Plan addresses Energy Emergencies in its Operational Objective 32, Restoration of Lifelines which addresses the restoration of critical services such as oil, gas, natural gas, electric, etc.

¹² The definition of epidemic comes from the TPCHD Flu Plan of 2005: A Pandemic is an epidemic occurring over a very wide area and usually affecting a large proportion of the population. Pandemics occur when a wholly new subtype of influenza A virus emerges. A "novel" virus can develop when a virulent flu strain that normally infects

birds or animals infects a human who has influenza; the two viruses can exchange genetic material, creating a new, virulent flu virus that can be spread easily from person-to-person. Unlike the flu we see yearly, no one would be immune to this new flu virus, which would spread quickly, resulting in widespread epidemic disease – a pandemic. (DOH Plan & U.S. Dept. of HHS).

¹³ The definition of Hazardous Materials comes from the 2010 Pierce County HIRA: Hazardous materials are materials, which because of their chemical, physical or biological properties, pose a potential risk to life, health, the environment, or property when not properly contained. A hazardous materials release then is the release of the material from its container into the local environment. A general rule of thumb for safety from exposure to hazardous material releases is 1000ft; the Emergency Response Guidebook 2008, established by the US Dept of Transportation, contains advice per specific materials. The vulnerability analysis was broken into two sub sections for a better understanding of the hazard using Pierce County's GIS data with a 500 foot buffer on either side of the railroads and major roadways.

¹⁴ The definition of Pipeline Emergency comes from the 2010 Pierce County HIRA: While there are many different substances transported through pipelines including sewage, water and even beer, pipelines, for the purpose of this chapter, are transportation arteries carrying liquid and gaseous fuels. They may be buried or above ground

¹⁵ The definition of Terrorism comes from the 2010 Pierce County HIRA: 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 thereof, in furtherance of political or social objectives." These acts can vary considerably in their scope, from cross burnings and the spray painting of hate messages to the destruction of civilian targets. In some cases, violence in the schools has also been labeled as a form of terrorism.

¹⁶ The definition of Transportation Accident comes from the 2010 Pierce County HIRA: Transportation accidents as used in this assessment include accidents involving a method of transportation on the road, rail, air, and maritime systems within the confines of Pierce County. The vulnerability analysis was broken into three sub sections for a better understanding of the hazard using Pierce County's GIS data; Commencement Bay to include inland rivers and streams, railroads, and roads. A 200 foot buffer was applied to all the shorelines and a 500 foot buffer on either side of the railroads and roadways.

¹⁷ In the Impact to Property, Facilities and Infrastructure, both Tables 4-5a and 4-5b, look at the impact to all property, facilities and infrastructure existing in the jurisdiction, not just to that owned by the jurisdiction.

¹⁸ The consideration for each of these hazards, in both Tables 4-5a and 4-5b, as to whether an individual hazard's consequences exist, or not, is based on a possible worst case scenario. It must also be understood that a "yes" means that there is a good possibility that the consequence it refers to could happen as a result of the hazard, not that it will. Conversely "No" means that it is highly unlikely that that consequence will have a major impact, not that there will be no impact at all.

¹⁹ While the major volcanic hazard from Mt. Rainier is from a lahar descending the main river valleys surrounding the mountain, it is not the only problem. Most jurisdictions could receive tephra in greater or lesser amounts, sometimes with damaging results. Consequence analyses in this section take into account the possibility of tephra deposition in addition to a lahar.

²⁰ The Technological Consequences are added herein to acknowledge the role of human-caused hazards in the health and safety of unincorporated Pierce County. The consequences noted are under the same criteria as natural hazards given their impacts to the departmental assets.

Section 5

Mitigation Strategy Requirements

Mitigation Strategy---Requirement §201.6(c)(3):

The plan shall include a strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

Local Hazard Mitigation Goals---Requirement §201.6(c)(3)(i):

[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

- Does the new or updated plan include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards?

Identification and Analysis of Mitigation Actions---Requirement §201.6(c)(3) (ii):

[The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance--Requirement §201.6(c)(3)(ii):

[The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

- Does the new or updated plan identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard?
- Do the identified actions and projects address reducing the effects of hazards on **new** buildings and infrastructure?
- Do the identified actions and projects address reducing the effects of hazards on **existing** buildings and infrastructure?
- Does the new or updated plan describe the jurisdiction(s) participation in the NFIP?
- Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?

Implementation of Mitigation Actions---Requirement: §201.6(c)(3) (iii):

[The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

- Does the new or updated mitigation strategy include how the actions are **prioritized**? (For example, is there a discussion of the process and criteria used?)
- Does the new or updated mitigation strategy address how the actions will be **implemented and administered**, including the responsible department, existing and potential resources and the timeframe to complete each action?
- Does the new or updated prioritization process include an emphasis on the use of **cost-benefit review** to maximize benefits?
- Does the updated plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (i.e., deferred), does the updated plan describe why no changes occurred?

SECTION 5

REGION 5 HAZARD MITIGATION PLAN 2014-2019 UPDATE CITY OF LAKEWOOD MITIGATION STRATEGY SECTION

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Table 5-1 City of Lakewood Mitigation Strategy Matrix

Implementation Mechanism	Mitigation Measure (Hazard(s)) ¹	Lead Jurisdiction(s) / Department(s)	Timeline (years)	Plan Goals					
				Life and Property	Continuity Operations	Partnerships	Natural Resources	Preparedness	Sustainable Economy
Startup	1. Existing Mitigation Actions (E,L,V,D,F,WUI,SW,MM)	Lakewood - Administration	Ongoing	✓	✓	✓	✓	✓	✓
	2. Plan Maintenance (E,L,V,D,F,WUI,SW,MM)	Lakewood - Administration	Ongoing	✓	✓	✓	✓	✓	✓
HMF	1. Pierce County Hazard Mitigation Forum (E,L,V,D,F,WUI,SW,MM)	PC DEM; Lakewood - Administration	Ongoing	✓	✓	✓	✓	✓	✓
City Government	1. Capability Identification and Evaluation (E,L,V,D,F,WUI,SW,MM)	Lakewood	1-2						
	2. Generator Retrofit of Park Operations Center (E,SW,MM)	Lakewood - Parks	1-2	✓	✓			✓	
	3. Illicit Discharge and Spill Response (MM)	Lakewood – Public Works	Ongoing	✓		✓	✓	✓	
	4. Seismic Review and Retrofit of all Bridges, Culverts, and Retaining Walls within and Through the City (E,F,SW)	Lakewood – Public Works	5	✓		✓			✓
	5. Accurate Mapping of All Roadways- Electronic and Hard Copy (E,L,F,SW,MM)	Lakewood - GIS	Ongoing	✓	✓				
	6. Traffic Control Devices for Setting Blockades and Detour Routes (E,L,F,SW,MM)	Lakewood – Public Works	1-2	✓	✓				
	7. Identify Critical Routes and Determine Alternate Routes (E,F,SW)	Lakewood – Public Works	5	✓	✓	✓			
	8. Develop Mutual Aid Agreements with Other Public Agencies to Support in Roadway Clearing and Repair (E,F,SW)	Lakewood – Public Works	1-2	✓	✓	✓			
	9. Battery Back-Up (Uninterrupted Power Supply (UPS)) for All Major Traffic Signals (E,F,SW)	Lakewood – Public Works	5	✓	✓				
	10. Radio Communications Set-Up Between all City-Owned Vehicles, Buildings, and EOC (E,F,SW)	Lakewood – Public Works	1-2	✓	✓				
	11. Structural Retrofit of Park Operations Center (E,SW)	Lakewood – Parks	1-2	✓	✓			✓	
	12. Significant Tree Pruning and Maintenance (E,D,SW)	Lakewood – Parks	Ongoing	✓	✓		✓	✓	
	13. Utility Coordination (E,L,V,F,SW,WUI,MM)	Lakewood – Public Works	Ongoing	✓	✓	✓			
	14. Complete, Distribute, Train Staff on Continuity of Operations Plan (COOP) (E,V,F,WUI,SW,MM)	Lakewood	Ongoing	✓	✓	✓		✓	✓
	15. Essential Records Protection (E,V,F,SW,WUI,MM)	Lakewood - General Services and City Clerk	1-2	✓	✓				✓
	16. Evacuation Plan Template for Multiple Events (E,V,F,SW,WUI,MM)	Lakewood - Police with Lakewood Fire	Ongoing	✓	✓	✓			

Implementation Mechanism	Mitigation Measure (Hazard(s)) ¹	Lead Jurisdiction(s) / Department(s)	Timeline (years)	Plan Goals					
				Life and Property	Continuity	Operations	Partnerships	Natural Resources	Preparedness
	17. Create an Emergency Operations Center in Lakewood City Hall (E, V, F, SW, WUI, MM)	Lakewood - Emergency Management	1-2	✓	✓	✓		✓	✓
	18. National Flood Insurance Program (F)	Lakewood (Community Development); PC PWU	Ongoing	✓	✓	✓	✓	✓	
<u>Public Education</u>	1. Flood Preparedness and Response (F)	Lakewood – Public Works	Ongoing	✓	✓	✓	✓		
	2. Disaster Preparedness Training (E, V, F, SW, WUI, MM)	Lakewood - HR and PC Health Department	1-2	✓	✓				

Startup Mitigation Measures

Existing Mitigation Actions

Hazards: E, L, V, D, F, WUI, SW¹, MM²

The City of Lakewood will integrate the hazard mitigation plan into existing plans, ordinances, and programs to dictate land uses within the jurisdiction. Further, Lakewood will continue to implement existing programs, policies, and regulations as identified in the Capability Identification Section of this Plan. This includes such actions as updating the Critical Area Regulations and any ensuing land use policies with best available science. It also includes continuing those programs that are identified as technical capabilities.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Increase Public Preparedness for Disasters; Preserve or Restore Natural Resources; Establish and Strengthen Partnerships for Implementation.
 2. **Cost of Measure** = TBD
 3. **Funding Source and Situation** = Funding could be accomplished with local budgets or grants.
 4. **Lead Jurisdiction(s)** = City of Lakewood - Administration.
 5. **Timeline** = Ongoing
 6. **Benefit** = City-Wide
 7. **Life of Measure** = Perpetual
 8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.
-

Plan Maintenance

Hazards: E, L, V, D, F, WUI, SW¹, MM²

Lakewood will adopt those processes outlined in the Plan Maintenance Section of this Plan.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Increase Public Preparedness for Disasters; Preserve or Restore Natural Resources; Establish and Strengthen Partnerships for Implementation.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budget.
4. **Lead Jurisdiction(s)** = City of Lakewood - Administration
5. **Timeline** = Ongoing
6. **Benefit** = City-Wide
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Hazard Mitigation Forum

Pierce County Hazard Mitigation Forum

Hazards: E, L, V, D, F, WUI, SW¹, MM²

Lakewood will work in conjunction with the County through the Pierce County Hazard Mitigation Forum (HMF). The Forum will continue as a means of coordinating mitigation planning efforts among all jurisdictions within the County that have completed a mitigation plan. This ensures efficient use of resources and a more cooperative approach to making a disaster resistant county. The HMF meets annually; every October. This is addressed in the Plan Maintenance Section of this Plan.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Increase Public Preparedness for Disasters; Preserve or Restore Natural Resources; Establish and Strengthen Partnerships for Implementation.
2. **Cost of Measure** = Minor
3. **Funding Source and Situation** = Funding could be obtained through local budget.
4. **Lead Jurisdiction(s)** = PC DEM; City of Lakewood
5. **Timeline** = Ongoing
6. **Benefit** = Regional
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

City Government Mitigation Measures

Capability Identification and Evaluation

Hazards: E, L, V, D, F, WUI, SW¹, MM²

Lakewood will develop a consistent and replicable system for evaluating the City's capabilities. A comprehensive evaluation will lead to specific policy recommendations to more effectively achieve disaster resistant communities. Further, a capability evaluation involves measurable variables so that capabilities may eventually be tracked in conjunction with the implementation of all mitigation measures. This is a key component in evaluating the success of the City's overall mitigation strategy.

1. **Goal(s) Addressed** = N/A. Goals addressed are contingent upon the mitigation measures resulting from this priority.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Jurisdiction(s)** = City of Lakewood
5. **Timeline** = Short-term
6. **Benefit** = City-Wide
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Generator Retrofit of Park Operations Center

Hazards: E, SW¹ MM²

As part of the electrical upgrades to the shop, a generator switch will be installed so in the event power is lost, the operations center will have power to operate the fueling station, and most power operations in the shop.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Increase Public Preparedness for Disasters.
2. **Cost of Measure** = Already implemented as electrical upgrades to operation center
3. **Funding Source and Situation** = Funding could be obtained through local budget and grants.
4. **Lead Jurisdiction(s)** = City of Lakewood - Parks Department
5. **Timeline** = Short-Term
6. **Benefit** = Parks Operation Center, City of Lakewood
7. **Life of Measure** = 30 years
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Illicit Discharge and Spill Response

Hazards: MM²

- Have trained personnel and materials on hand to respond to reports of illicit discharges and spills to surface and groundwater in the city.
 - Have contact information for spill response personnel from the state Department of Ecology and Pierce County.
 - Educate the public and target audiences (e.g., businesses with high potential for spills) regarding the impacts and consequences of illicit discharges.
1. **Goal(s) Addressed** = Protect Life and Property; Increase Public Preparedness for Disasters; Preserve or Restore Natural Resources; Establish and Strengthen Partnerships for Implementation.
 2. **Cost of Measure** = TBD
 3. **Funding Source and Situation** = Funding could be obtained through local budget or grants and state or federal grants.
 4. **Lead Jurisdiction(s)** = City of Lakewood - Public Works Department
 5. **Timeline** = Ongoing
 6. **Benefit** = Water bodies and groundwater in Lakewood/Citizens of Lakewood
 7. **Life of Measure** = Perpetual
 8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Seismic Review and Retrofit of all Bridges, Culverts, and Retaining Walls within and Through the City

Hazards: E, F, SW¹

All City bridges, culverts, and wall structures will be reviewed for seismic vulnerability and retrofitted as needed. These include WSDOT and RR bridges that are within City's jurisdictional boundaries.

1. **Goal(s) Addressed** = Protect Life and Property, Establish and Strengthen Partnerships for Implementation; Promote a Sustainable Economy.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budgets grants and federal BRAC funding.
4. **Lead Jurisdiction(s)** = City of Lakewood – Public Works
5. **Timeline** = Long-Term
6. **Benefit** = Traveling public and/or emergency vehicles over specific route.
7. **Life of Measure** = 100 years
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Accurate Mapping of All Roadways- Electronic and Hard Copy

Hazards: E, L, F, SW¹, MM²

Mapping of all Cities public and private roadways will be mapped accurately in order to track and communicate blocked and alternate routes. This will be available electronically via network computer access; local computer access; and hard copy (for redundancy) and in case of power loss.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Jurisdiction(s)** = City of Lakewood - GIS
5. **Timeline** = Ongoing
6. **Benefit** = ALL traveling public, emergency and utility responders
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Traffic Control Devices for Setting Blockades and Detour Routes

Hazards: E, L, F, SW¹, MM²

Obtain trailer and traffic control devices (barricades, barrels, signs, etc.) for setting blockades and detour routes in case of road hazard.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants and state or federal grants.
4. **Lead Jurisdiction(s)** = City of Lakewood - Public Works
5. **Timeline** = Short-term
6. **Benefit** = ALL traveling public, emergency and utility responders
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Identify Critical Routes and Determine Alternate Routes

Hazards: E, F, SW¹

The City is unique with its bodies of water and neighborhoods surrounded by other jurisdictional boundaries – effectively making them islands with one route in and out. Determine these isolated areas and determine alternate access routes (e.g. via through private property, via Fort/Base lands, etc.) and develop agreements as needed that can be implemented during an emergency.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Jurisdiction(s)** = City of Lakewood – Public Works
5. **Timeline** = Long-term
6. **Benefit** = Traveling public and/or emergency vehicles over specific route.
7. **Life of Measure** = 100 years
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Develop Mutual Aid Agreements with Other Public Agencies to Support in Roadway Clearing and Repair

Hazards: E, F, SW¹

The City has no equipment of its own at this time. Therefore, the City would need outside assistance of equipment and operators to assist in clearing and repairing roadways. Other public agencies within Lakewood have readily available equipment and could be utilized for local support. For example: Lakewood Water District, Lakeview Light and Power, Pierce County Public Works, WSDOT, Camp Murray, Fort Lewis.

1. **Goal(s) Addressed** = Protect life and property; Ensure continuity of operations; Establish and strengthen partnerships for implementation.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Jurisdiction(s)** = City of Lakewood – Public Works
5. **Timeline** = Short-term
6. **Benefit** = Traveling public and/or emergency vehicles over specific route.
7. **Life of Measure** = 100 years
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Battery Back-Up (Uninterrupted Power Supply (UPS)) for All Major Traffic Signals

Hazards: E, F, SW¹

Provide UPS (battery back-up) for all major traffic signals in the City.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budgets or grants and federal ITS grants.
4. **Lead Jurisdiction(s)** = City of Lakewood – Public Works
5. **Timeline** = Long-term
6. **Benefit** = Traveling public and/or emergency vehicles over specific routes.
7. **Life of Measure** = 100 years
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Radio Communications Set-Up Between all City-Owned Vehicles, Buildings, and EOC

Hazards: E, F, SW¹

Provide radios for back-up radio communication (when all of the cell phones go down). Determine if communication can also be set up with other public agencies providing mutual aid.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants and state or federal grants.
4. **Lead Jurisdiction(s)** = City of Lakewood – Public Works
5. **Timeline** = Short-term
6. **Benefit** = Traveling public and/or emergency vehicles over specific route.
7. **Life of Measure** = 100 years
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Structural Retrofit of Park Operations Center

Hazards: E, SW¹

Collar ties were added to the roof to strengthen the integrity of the Park Operations Center. Posts and walls were added to strengthen the loft inside the shop, and a sheer wall was added inside to add strength against side to side movement.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Increase Public Preparedness for Disasters.
2. **Cost of Measure** = Already implemented as part of upgrades made to the operations center.
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Jurisdiction(s)** = City of Lakewood – Parks Department
5. **Timeline** = Short-term
6. **Benefit** = Park Operations, City of Lakewood
7. **Life of Measure** = 30 years
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Significant Tree Pruning and Maintenance

Hazards: E, D, SW¹

Trees within the City of Lakewood Parks system will be pruned or removed according to a plan developed in 2005 to enhance the overall health and safety of the park trees.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Preserve or Restore Natural Resources; Increase Public Preparedness for Disasters.
2. **Cost of Measure** = \$15,000
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Jurisdiction(s)** = City of Lakewood – Parks Department
5. **Timeline** = Ongoing
6. **Benefit** = Park staff and City of Lakewood
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal would be endorsed by the entire community.

Utility Coordination

Hazards: E, L, V, F, SW, WUI¹, MM²

Facilitate coordination of utility emergency response contacts.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation; Ensure Continuity of Operations.
2. **Cost of Measure** = Staff Time
3. **Funding Source and Situation** = Funding could be obtained through local budgets or grants and state or federal grants.
4. **Lead Jurisdiction(s)** = City of Lakewood – Public Works Department
5. **Timeline** = Ongoing
6. **Benefit** = City Departments, staff and citizens
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Complete, Distribute and Train Staff on Continuity of Operations Plan (COOP)

Hazards: E, V, F, WUI, SW¹, MM²

The City of Lakewood will develop a COOP that enables staff to prepare for an emergency or disaster situation.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation; Increase Public Preparedness for Disasters; Promote a Sustainable Economy.
2. **Cost of Measure** = Staff time and materials
3. **Funding Source and Situation** = Funding could be obtained through local budget.
4. **Lead Jurisdiction(s)** = City of Lakewood
5. **Timeline** = Ongoing
6. **Benefit** = Residents and businesses of Lakewood, visitors and regional partners
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Essential Records Protection

Hazards: E, V, F, WUI, SW¹, MM²

Protect and/or provide a safe backup of essential records. This will be accomplished by developing an essential records protection schedule and records prevention response and recovery procedures.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Promote a Sustainable Economy.
2. **Cost of Measure** = Staff time and possible storage fees
3. **Funding Source and Situation** = Funding could be obtained through local budget general fund or grants or Washington State Archives.
4. **Lead Jurisdiction(s)** = City of Lakewood - General Services and City Clerk
5. **Timeline** = Short-term
6. **Benefit** = City Hall employees, Community and citizens, regional partners
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Evacuation Plan Template for Multiple Events

Hazards: E, V, F, WUI, SW¹, MM²

The police department will develop an SOP that will outline recommended techniques and procedures for conducting an evacuation of an area or complex in the event of different types of emergencies such as a train derailment, active shooter, bomb threat, or other events.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation.
2. **Cost of Measure** = Staff Time
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Jurisdiction(s)** = City of Lakewood - Police Department and Lakewood Fire
5. **Timeline** = Ongoing
6. **Benefit** = Residents and businesses of Lakewood, visitors and regional partners
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Create an Emergency Operations Center in Lakewood City Hall

Hazards: E, V, F, WUI, SW¹, MM²

The City of Lakewood will create an emergency operations center that has the necessary equipment for city EOC staff to operate effectively.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation; Increase Public Preparedness for Disasters; Promote a Sustainable Economy.
2. **Cost of Measure** = Time and Materials and special equipment
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Jurisdiction(s)** = City of Lakewood - Emergency Management Director
5. **Timeline** = Short-term
6. **Benefit** = Residents and businesses of Lakewood, visitors, community and regional partners
7. **Life of Measure** = 5-10 years
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

National Flood Insurance Program

Hazards: F

Lakewood will ensure that the City is compliant with the National Flood Insurance Program by updating floodplain identification and mapping, enforcing the flood damage prevention ordinance, and providing public education on floodplain requirements and impacts. The City of Lakewood will be an active participant in the Pierce County Flood Control District.

1. **Goal(s) Addressed** = Protect life and property; Ensure Continuity of Operations; Increase Public Preparedness; Increase and Strengthen Partnerships; Protect the Environment; Increase Public Preparedness
2. **Cost of Measure** = Staff time, special materials required, permits
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants
4. **Lead Jurisdiction(s)** = Lakewood (Community Development); PC PWU
5. **Timeline** = On-going
6. **Benefit** = City-wide; Regional
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Public Education Mitigation Measures

Flood Preparedness and Response

Hazards: F¹

- Have sandbags and sand on hand and placed at strategic locations throughout the city.
 - Have a stockpile of signs and barricades for warning of water over roadways or road closures.
 - Have maps, rakes, boots, rain gear and other equipment on hand for City staff to assist in flood response.
 - Coordinate with the Pierce County Lakewood Road Shop and DEM for their assistance with flood response.
 - Coordinate personnel resources for sandbagging parties.
 - Have contracts on hand to hire private contractors to assist as needed.
1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Preserve or Restore Natural Resources; Establish and Strengthen Partnerships for Implementation.
 2. **Cost of Measure** = TBD
 3. **Funding Source and Situation** = Funding could be obtained through local budget or grants and state or federal grants.
 4. **Lead Jurisdiction(s)** = City of Lakewood - Public Works Department
 5. **Timeline** = Ongoing
 6. **Benefit** = Areas of city affected by flooding (neighborhoods, businesses, etc.)
 7. **Life of Measure** = Perpetual
 8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Disaster Preparedness Training

Hazards: E, V, F, WUI, SW¹, MM²

Develop and implement training program for city employees on disaster preparedness.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations.
2. **Cost of Measure** = Staff time and materials
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants and state or federal grants.
4. **Lead Jurisdiction(s)** = City of Lakewood - Human Resources and PC Health Department
5. **Timeline** = Short-term
6. **Benefit** = City staff and citizens, visitors and regional partners
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

In comparison to the last update, the City of Lakewood has added the National Flood Insurance Program as a mitigation measure and is continuing all of the mitigation strategies as seen below in the table.

Mitigation Strategy	New	Continuing	Accomplished	Removed from update (if applicable)
Existing Mitigation Actions <i>(All)</i>		X		
Plan Maintenance <i>(All)</i>		X		
Pierce County Hazard Mitigation Forum <i>(E,L,V,D,F,WUI,SW,MM)</i>		X		
Capability Identification and Evaluation <i>(E,L,V,D,F,WUI,SW,MM)</i>		X		
Generator Retrofit of Park Operations Center <i>(E,SW,MM)</i>		X		
Illicit Discharge and Spill Response <i>(MM)</i>		X		
Seismic Review and Retrofit of all Bridges, Culverts, and Retaining Walls within and Through the City <i>(E,F,SW)</i>		X		
Accurate Mapping of All Roadways- Electronic and Hard Copy <i>(E,L,F,SW,MM)</i>		X		
Traffic Control Devices for Setting Blockades and Detour Routes <i>(E,L,F,SW,MM)</i>		X		
Identify Critical Routes and Determine Alternate Routes <i>(E,F,SW)</i>		X		
Develop Mutual Aid Agreements with Other Public Agencies to Support in Roadway Clearing and Repair <i>(E,F,SW)</i>		X		
Battery Back-Up (Uninterrupted Power Supply (UPS)) for All		X		

Major Traffic Signals (E,F,SW)				
Radio Communications Set-Up Between all City- Owned Vehicles, Buildings, and EOC (E,F,SW)		X		
Structural Retrofit of Park Operations Center (E,SW)		X		
Significant Tree Pruning and Maintenance (E,D,SW)		X		
Utility Coordination (E,L,V,F,SW,WUI,MM)		X		
Complete, Distribute, Train Staff on Continuity of Operations Plan (COOP) (E,V,F,WUI,SW,MM)		X		
Essential Records Protection (E,V,F,SW,WUI,MM)		X		
Evacuation Plan Template for Multiple Events (E,V,F,SW,WUI,MM)		X		
Create an Emergency Operations Center in Lakewood City Hall (E,V,F,SW,WUI,MM)		X		
National Flood Insurance Program (F)	X			
Flood Preparedness and Response (F)		X		
Disaster Preparedness Training (E,V,F,SW,WUI,MM)		X		

Endnotes

¹ Hazard Codes:

Where necessary, the specific hazards addressed are noted as follows:

A:	Avalanche
E:	Earthquake
F:	Flood
D:	Drought
T:	Tsunami
V(L OR T):	Volcanic (lahar or tephra-specific)
SW:	Severe Storm (wind-specific)
L:	Landslide
WUI:	Wildland/Urban Interface Fire
MM:	Manmade to include terrorism
ALL:	All hazards, including some man made. Where only natural hazards are addressed, it is noted.

² While this Plan is strictly a *Natural* hazard mitigation plan, where a measure stems from a facility recommendation (Infrastructure Section) that deals specifically with terrorism, the mitigation strategy will use that analysis. Other measures, such as those that deal with multi-hazard community preparedness or recovery planning, mitigate man-made hazards and are noted as such. It is not the intent of this notation to imply that all measures were analyzed with regards to man-made hazards or that measures were identified with that in mind. Rather, the notation merely illustrates the potential on this template for the inclusion of man-made hazard analysis.

Section 6

Infrastructure Requirements

Assessing Vulnerability: Identifying Structures---Requirement §201.6(c)(2) (ii)(A):

The plan **should** describe vulnerability in terms of the **types and numbers** of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

- Does the new or updated plan describe vulnerability in terms of the **types and numbers** of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?
- Does the new or updated plan describe vulnerability in terms of the **types and numbers** of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

Assessing Vulnerability: Estimating Potential Losses---Requirement §201.6(c)(2) (ii)(B):

The plan **should** describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

- Does the new or updated plan estimate **potential dollar losses** to vulnerable structures?
- Does the new or updated plan describe the **methodology** used to prepare the estimate?

SECTION 6
REGION 5 HAZARD MITIGATION PLAN
2014-2019 UPDATE
CITY OF LAKEWOOD
INFRASTRUCTURE SECTION

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The **Infrastructure** for the **City of Lakewood** is displayed in following tables and graphics:

- Table 6-1 Infrastructure Summary
- Table 6-2 Infrastructure Category Summary
- Table 6-3 Infrastructure Vulnerability – Dependency Summary
- Table 6-4 Infrastructure Vulnerability – Hazard Summary
- Table 6-5 Infrastructure Dependency Matrix
- Table 6-6 Infrastructure Table

The tables and graphics show the overview of infrastructure owned by the City of Lakewood. The infrastructure is categorized according to the infrastructure sectors as designated by the Department of Homeland Security. These tables are intended as a summary only. For further details on Department of Homeland Security infrastructure sectors, please see the Process Section 1.

Table 6-1 Infrastructure Summary

INFRASTRUCTURE SUMMARY¹	
TOTAL INFRASTRUCTURE (#)	1
TOTAL VALUE (\$)	\$14,000,000

Table 6-2 Infrastructure Category Summary

INFRASTRUCTURE CATEGORY SUMMARY²	
EMERGENCY SERVICES	0
TELECOMMUNICATIONS	0
TRANSPORTATION	0
WATER	0
ENERGY	0
GOVERNMENT	1
COMMERCIAL	0

Table 6-3 Infrastructure Vulnerability – Dependency Summary

DEPENDENCE	# DEPENDENT ON SERVICE	%
RELIANCE ON EMERGENCY SERVICES	1 of 1	100%
RELIANCE ON POWER	1 of 1	100%
RELIANCE ON SEWER	1 of 1	100%
RELIANCE ON TELECOMMUNICATION	1 of 1	100%
RELIANCE ON TRANSPORTATION	1 of 1	100%
RELIANCE ON WATER	1 of 1	100%

Table 6-4 Infrastructure Vulnerability – Hazard Summary

HAZARD	# IN HAZARD ZONE	%
DROUGHT	1 of 1	100%
EARTHQUAKE	1 of 1	100%
FLOOD	1 of 1	100%
LANDSLIDE	0 of 1	0%
VOLCANIC	1 of 1	100%
WEATHER	1 of 1	100%
WILDLAND/URBAN FIRE	0 of 1	0%

Table 6-5 Infrastructure Dependency Matrix

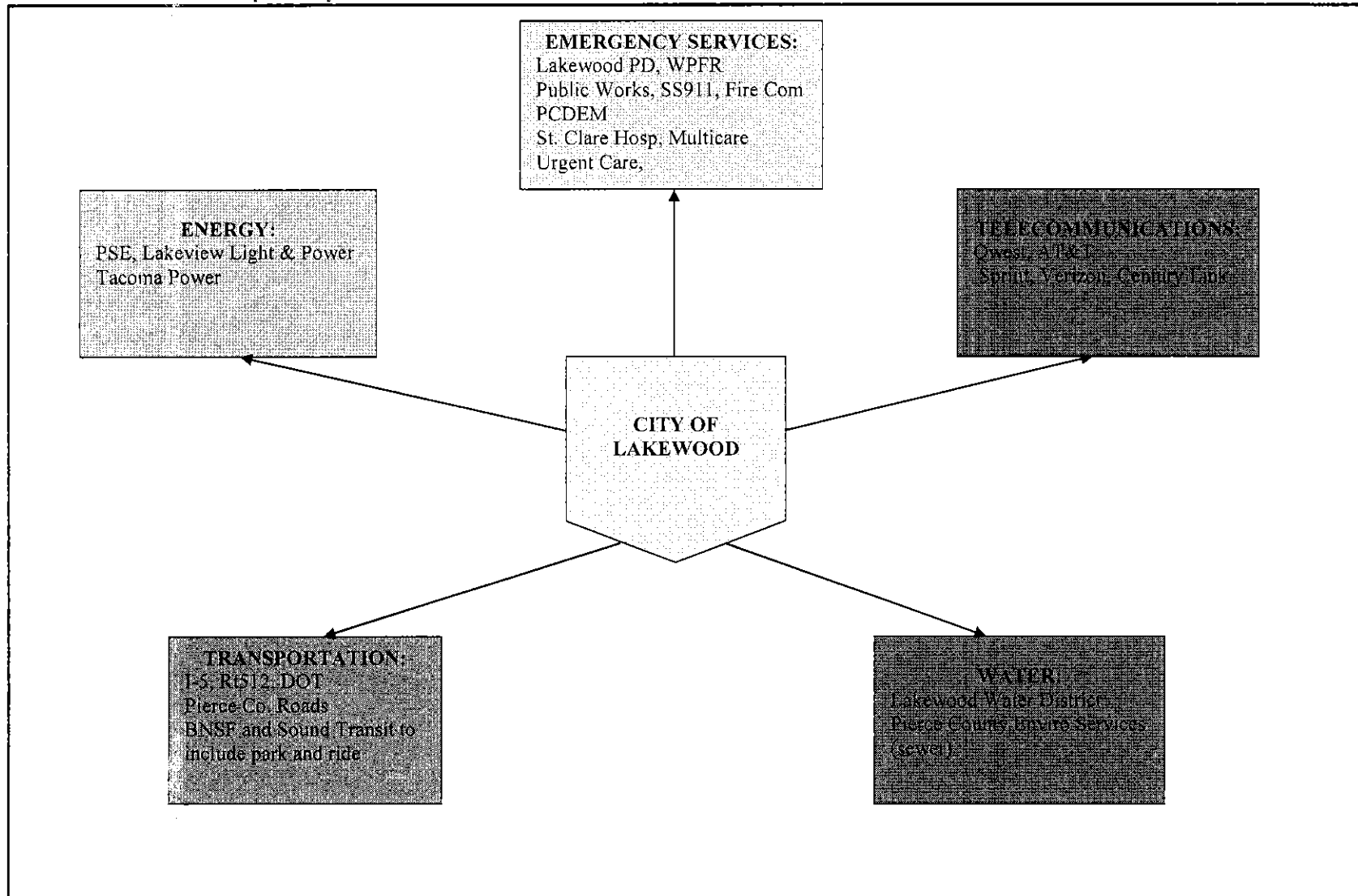


Table 6-6 Infrastructure Table

INFRASTRUCTURE ³	BUILT ⁴	FLOORS	UPGRADES ⁵	VALUE	OCCUPANCY	AVAILANCHE	DROUGHT	FAIRHOUSKE	WILDFIRE	FLOOD	LANDSLIDE	TSUNAMI	VOLCANIC	WEATHER	EMERGENCY	POWER	SEWER	LECOMM	TRANSPORT	WATER
City Hall for City of Lakewood (C,AP,9)	1999-2000	3 + B	None	\$14,000,000	75-2	0	1	1	0	1	0	0	1	2	1	1	1	2	1	2
Lakewood Police Department (C,AP)	2009	2	None	\$13,000,000	50	0	1	1	0	1	0	0	1	2	1	1	1	2	1	2
Lakewood Public Works (C,AP)	2013	1	None	\$300,000	38	0	1	1	0	1	0	0	1	2	1	1	1	2	1	2

Table 6-7 Infrastructure Table Key – Hazard Ratings

HAZARD CATEGORY	RATING	SELECTION FACTOR OR DESCRIPTION
Avalanche	0	The infrastructure is not located in a known avalanche prone area.
	1	The infrastructure is in an avalanche prone area but has no prior history of avalanche damage.
	2	The infrastructure is in an avalanche prone area and has experienced some limited avalanche damage in the past.
	3	The infrastructure is in an avalanche prone area and has experienced significant avalanche damage.
Drought	0	The infrastructure would not suffer any damage or operational disruption from a drought.
	1	The infrastructure could suffer some damage or minor operational disruption from a drought.
	2	The infrastructure has suffered damages or significant operational disruption from past droughts.
	3	The infrastructure has suffered damages or significant disruption from past droughts which has had serious community economic or health consequences.
Flood	0	The infrastructure is not located in a known flood plain or flood prone area.
	1	The infrastructure is in a flood plain or flood prone area but has no prior history of flood damage.
	2	The infrastructure is in a flood plain or flood prone area and has experienced some flood damage in the past.
	3	The infrastructure is in a flood plain or flood prone area and has experienced significant flood damage, or the property is an NFIP repetitive loss property.
Earthquake	0	The infrastructure is not located in an area considered to have any significant risk of earthquake
	1	The infrastructure is in an area considered as at risk to earthquakes but has no prior history of earthquake damage.
	2	The infrastructure is in an area considered as at risk to earthquakes, is located on soft soils, and has no history of damage OR In an area considered as at risk to earthquakes and has experienced some limited earthquake damage.
	3	The infrastructure is in an area considered as at risk to earthquakes, is located on soft soils and experienced significant earthquake damage.
Landslide	0	The infrastructure is not located in a known area considered vulnerable to landslides.
	1	The infrastructure is in area vulnerable to landslides but has no prior history of landslides.
	2	The infrastructure is in area vulnerable to landslides area and infrastructure has experienced some landslide damage.
	3	The infrastructure is in area vulnerable to landslides and infrastructure has experienced significant landslide damage.
Major U/I Fire	0	The infrastructure meets the current fire code, has adequate separation from other structures and good access, and is not close to heavily vegetated areas.
	1	The infrastructure meets the current code, is not close to heavily vegetated areas, but access and/or separation from nearby structures increase fire risk.
	2	The infrastructure does not meet current fire code, is in or adjacent to large vegetated areas, and has inadequate access and/or separation from other structures.

HAZARD CATEGORY	RATING	SELECTION FACTOR OR DESCRIPTION
Severe Weather	3	The infrastructure does not meet the current code, is in or adjacent to vegetated areas, with access limitations or structure separation making fire suppression difficult.
	0	The infrastructure would not suffer any damage or operational disruption from severe weather.
	1	The infrastructure could suffer some damage or minor operational disruption from severe weather.
	2	The infrastructure has suffered damages or significant operational disruption from past severe weather.
Tsunami/or Seiche	3	The infrastructure has suffered damages or significant disruption from past severe weather which has had serious community economic or health consequences.
	0	The infrastructure is not located in or near a known area considered to be a tsunami or seiche inundation area.
	1	The infrastructure is located at the edge of a designated tsunami or seiche risk zone.
	2	The infrastructure is located just inside a designated tsunami or seiche risk zone, but has no prior damage.
Volcanic	3	The infrastructure is located well inside a designated tsunami or seiche risk zone, and/or has experienced prior tsunami or seiche damage.
	0	The infrastructure is not located in or near a known area with significant risk from volcanic hazards.
	1	The infrastructure is in or near an area that could receive some ashfall, but has no structural features, equipment or operations considered vulnerable to ash.
	2	The infrastructure is in or near an area where heavy ashfall or a debris flow could occur.
	3	The infrastructure is in an area known to have experienced heavy ashfall, debris flow or blast effects from past volcanic activity.

Table 6-8 Infrastructure Table Key – Dependency Ratings

EXTERNAL DEPENDENCY CATEGORY	RATING	SELECTION FACTOR OR DESCRIPTION
Emergency Services	0	The infrastructure can maintain essential functions without emergency services.
	0	The infrastructure has ability to independently provide emergency services to all essential functions of infrastructure.
	1	The infrastructure would have to <u>curtail</u> operations somewhat without emergency services with <u>no</u> direct economic/environmental/safety/health consequences.
	2	The infrastructure would have to <u>curtail</u> operations somewhat without emergency services with <u>some</u> direct economic/environmental/safety/health consequences. OR <u>stop</u> operations with <u>no</u> direct economic/environmental/safety/health consequences.
	3	The infrastructure would have to <u>stop</u> its operations without emergency services and <u>significant</u> economic/environmental/safety/health consequences will occur.
Power Outage	0	The infrastructure can maintain essential functions without electricity or gas supply.
	0	Infrastructure has ability to independently provide power to all essential functions of infrastructure.
	1	The infrastructure would have to <u>curtail</u> operations somewhat without gas or electrical supply, with <u>no</u> direct economic/environmental/safety/health consequences.
	2	The infrastructure would have to <u>curtail</u> operations somewhat without gas or electrical supply, with <u>some</u> direct economic/environmental/safety/health consequences. OR <u>stop</u> operations with <u>no</u> direct economic/environmental/safety/health consequences.
	3	The infrastructure would have to <u>stop</u> its operations without gas or electrical supply and <u>significant</u> economic/environmental/safety/health consequences will occur.
Sewer Out	0	The infrastructure can maintain essential functions without sewer service
	0	The infrastructure has ability to independently provide wastewater or septic service to support essential functions.
	1	The infrastructure would have to <u>curtail</u> operations somewhat without wastewater service, with <u>no</u> direct economic/environmental/safety/health consequences.
	2	The infrastructure would have to <u>curtail</u> operations somewhat without wastewater service, with <u>some</u> direct economic/environmental/safety/health consequences. OR <u>stop</u> operations with <u>no</u> direct economic/environmental/safety/health consequences.
	3	The infrastructure would have to <u>stop</u> its operations without wastewater service and <u>significant</u> economic/environmental/safety/health consequences will occur.
Telecomm Failure	0	The infrastructure can maintain essential functions without telecommunications.
	0	The infrastructure has ability to independently provide phone service or alternate/redundant communications systems to support essential functions.
	1	The infrastructure would have to <u>curtail</u> operations somewhat without telecommunication service, with <u>no</u> direct economic/environmental/safety/health consequences.
	2	The infrastructure would have to <u>curtail</u> operations somewhat without telecommunication service, with <u>some</u> direct economic/environmental/safety/health consequences. OR <u>stop</u> operations with <u>no</u> direct economic/environmental/safety/health consequences.
	3	The infrastructure would have to <u>stop</u> its operations without telecommunication service and <u>significant</u> economic/environmental/safety/health consequences will occur.
Transportation	0	The infrastructure can maintain essential functions without transportation routes.
	0	Infrastructure has ability to independently provide alternate transportation, in the absence of transportation routes, to ensure all essential functions.
	1	The infrastructure would have to <u>curtail</u> operations somewhat without transportation routes with <u>no</u> direct economic/environmental/safety/health consequences.
	2	The infrastructure would have to <u>curtail</u> operations somewhat without transportation routes with <u>some</u> direct economic/environmental/safety/health consequences. OR <u>stop</u> operations with <u>no</u> direct economic/environmental/safety/health consequences.

EXTERNAL DEPENDENCY CATEGORY	RATING	SELECTION FACTOR OR DESCRIPTION
	3	The infrastructure would have to <u>stop</u> its operations without transportation routes and <u>significant</u> economic/environmental/safety/health consequences will occur.
Water Supply	0	The infrastructure can maintain essential functions without its water supply.
	0	The infrastructure has ability to independently provide water to support essential functions.
	1	The infrastructure would have to <u>curtail</u> operations somewhat without water supply, with <u>no</u> direct economic/environmental/safety/health consequences.
	2	The infrastructure would have to <u>curtail</u> operations somewhat without water supply, with <u>some</u> direct economic/environmental/safety/health consequences. OR <u>stop</u> operations with <u>no</u> direct economic/environmental/safety/health consequences.
	3	The infrastructure would have to <u>stop</u> its operations without its water supply and <u>significant</u> economic/environmental/safety/health consequences will occur.

Endnotes

¹ This is a total of infrastructure and the approximate value provided by the jurisdiction. If no value, then value was not provided or not available.

² These are the Homeland Security Infrastructure Categories which were used in completing the Infrastructure Tables in the plan.

³ The following table explains the codes used in this column:

Code	Explanation
C	Infrastructure critical in first 72 hours after disaster
AP	Infrastructure has auxiliary or backup power
(#)	Homeland Security Infrastructure Category Number
S	Infrastructure is a designated community shelter

⁴ The “built” column refers to the year in which the original infrastructure was constructed.

⁵ This column addresses major remodels, upgrades or additions to the infrastructure in dollar amount and/or year of changes.

Section 7

Plan Maintenance Procedures Requirements

Monitoring, Evaluating, and Updating the Plan---Requirement §201.6(c)(4)(i):

[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

- Does the new or updated plan describe the method and schedule for **monitoring** the plan, including the responsible department?
- Does the new or updated plan describe the method and schedule for **evaluating** the plan, including how, when and by whom (i.e. the responsible department)?
- Does the new or updated plan describe the method and schedule for **updating** the plan within the five-year cycle?

Incorporation into Existing Planning Mechanisms---Requirement §201.6(c)(4) (ii):

[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate...

- Does the new or updated plan identify other local planning mechanisms available for incorporating the mitigation requirements of the mitigation plan?
- Does the new or updated plan include a process by which the local government will incorporate the mitigation strategy and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate?
- Does the updated plan explain how the local government incorporated the mitigation strategy and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate?

Continued Public Involvement---Requirement §201.6(c)(4) (iii):

[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

- Does the new or updated plan explain how continued public participation will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)

SECTION 7
REGION 5 HAZARD MITIGATION PLAN
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CITY OF LAKEWOOD
PLAN MAINTENANCE SECTION

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The planning process undertaken in the last two years is just the foundation of breaking the disaster cycle by planning for a disaster resistant City of Lakewood and Pierce County Region 5. This Section details the formal process that will ensure the City of Lakewood Hazard Mitigation Plan remains an active and relevant document. The Plan Maintenance Section includes a description of the documentation citing the Plan's formal adoption by the Administration. The Section also describes: the method and schedule of monitoring, evaluating, and updating within a five-year cycle; the process for incorporating the mitigation strategy into existing mechanisms; and, the process for integrating public participation throughout the plan maintenance. The Section serves as a guide for implementation of the hazard mitigation strategy.

Plan Adoption

Upon completion of the City of Lakewood Plan, it will be submitted to Washington State Emergency Management Division (EMD) for a Pre-Adoption Review. The EMD has 30 days to then take action on the Plan and forward it to the Federal Emergency Management Agency (FEMA) Region X for review. This review, which is allowed 45 days by law, will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201.6. In completing this review there may be revisions requested by the EMD and/or FEMA. Revisions could include changes to background information, editorial comments, and the alteration of technical content. Pierce County Department of Emergency Management (PC DEM) will call a Planning Team Meeting to address any revisions needed and resubmit the changes.

The City of Lakewood Administration is responsible for the Cities adoption of the Plan after the Pre-Adoption Review is completed. Once the Administration adopts the Plan, the Program Coordinator of the Mitigation and Recovery Division of Emergency Management will be responsible for submitting it, with a copy of the resolution, to the State Hazard Mitigation Officer at the Washington State EMD. EMD will then take action on the Plan and forward it to the FEMA Region X for final approval. Upon approval by FEMA, the City will gain eligibility for both Hazard Mitigation Grant Program and Pre-Disaster Mitigation Grant Program funds.

Appendix A will list the dates and include a copy of the signed Resolution from the jurisdiction as well as a copy of the FEMA approval of the jurisdiction's Plan. In future updates of the Plan, Appendix C will be used to track changes and/or updates. This plan will have to be re-adopted and re-approved prior to the five year deadline of November 1, 2019.

Maintenance Strategy

The Cities maintenance strategy for implementation, monitoring, and evaluation provides a structure that encourages collaboration, information transference, and innovation. Through a multi-tiered implementation method, the City will provide its staff and students a highly localized approach to loss reduction while serving their needs through coordinated policies and programs. The method's emphasis on all levels of participation promotes public involvement and adaptability to changing risks and vulnerabilities. Finally, it will provide a

tangible link between staff, students and the various levels of government service, ranging from community action to the Department of Homeland Security. Through this strategy, the City will attempt to break the disaster cycle and achieve a more disaster resistant community.

Implementation

In order to ensure efficient and effective implementation, City of Lakewood will make use of its capabilities, infrastructure, and dedicated population. The City will implement its mitigation strategy over the next five years primarily through its annual budget process and varying grant application processes.

The Emergency Programs Office will work in conjunction with those organizations identified under each mitigation measure to initiate the overall mitigation strategy. Each department or office responsible for carrying out the measures will play a role in self-monitoring and evaluating achievement of measures and objectives. Because the City has no land use or regulatory authority, it must rely heavily on collaboration with neighboring jurisdictions. For example, for density-related issues the City will work with partners Pierce County, and the Hazard Mitigation Forum to implement recommendations into the existing Pierce County Comprehensive Plan. Other measures will be implemented through collaboration with the identified jurisdictions/departments listed under each measure's evaluation.

These efforts fall under a broader implementation strategy that represents a county-wide effort. This strategy must be adaptable to change while being consistent in its delivery.

The mitigation implementation strategy is a three-tiered method that emphasizes localized needs and vulnerabilities while addressing City and multi-jurisdictional policies and programs. The first tier is implementation through individual citizen level—existing public education programs in the City. For example, programs at the individual level through safety presentations and evacuation drills). The second is a City-wide mechanism for implementation comprised of City employees implementing strategies from the Emergency Programs Office, Construction Management Office, Facilities Management Office, and Computing & Telecommunications through an ambitious building construction and remodel plan. This perhaps offers the greatest opportunity to implement mitigation opportunities. The third tier is a more external and multi-jurisdictional mechanism, the Hazard Mitigation Forum (HMF).

This method ensures that implementation speaks to unique vulnerabilities at the most local level, allows for coordination among and between levels, and promotes collaboration and innovation. Further, it provides a structured system of monitoring implementation. Finally, it is a method that can adapt to the changing vulnerabilities of the City, the region, and the times. These three levels and their means of implementation and collaboration are described below.

Public Education Programs

At the individual citizen level, Public Education Programs provide the City with a localized mechanism for implementation. This approach to mitigation can adapt to the varying vulnerabilities and needs within a growing region. Public Education Programs are also a means for involving the public in mitigation policy development. Currently the City pursues a variety of mitigation-related programs that help students, staff and citizens to better prepare for and respond to disasters.

Jurisdiction-Wide: Emergency Programs Office

The Emergency Programs Office will coordinate the maintenance and implementation actions with those departments and offices that must carry out the mitigation measures. The Emergency Planning Team, consisting of departments or offices with emergency responsibilities will review the direction of the Plan's implementation. The Emergency Planning Team will ultimately provide a mechanism for coordination among those groups engaged in mitigation to ensure that a comprehensive and efficient approach be undertaken in the City's efforts at all-hazards mitigation. The Emergency Planning Team will be coordinated by the Emergency Programs Office.

The Emergency Programs Office will be responsible for the overall review of the plan and will designate mitigation measures to those departments responsible for their implementation. The Emergency Planning Team will monitor and evaluate the plan's implementation throughout the year. Recommendations will be made to coincide with the normal budgeting processes and provide an ample time period for review and adoption of any necessary changes to the implementation schedule. Members of the Emergency Planning Team and President's Council sit on the budgeting and projects committees and can advance mitigation measures through these annual processes.

The plan will be updated every five years with coordination from the Emergency Programs Office, participation by the Emergency Planning Team and approval from the Administration.

Hazard Mitigation Forum

The PC Hazard Mitigation Forum (HMF) represents a broader and multi-jurisdictional approach to mitigation implementation. The PC HMF will be comprised of representatives from unincorporated Pierce County and all jurisdictions, partially or wholly, within its borders, that have undertaken mitigation planning efforts. The PC HMF will serve as coordinating body for projects of a multi-jurisdictional nature and will provide a mechanism to share successes and increase the cooperation necessary to break the disaster cycle and achieve a disaster resistant Pierce County. Members of the PC HMF will include the

following jurisdictions who have completed, or who have begun the process of completing, DMA compliant plans:

- City of Bonney Lake
- City of DuPont
- City of Fife
- City of Gig Harbor
- City of Milton
- City of Roy
- City of Tacoma
- Town of Eatonville
- Town of Steilacoom
- Pierce County
- East Pierce Fire and Rescue
- Graham Fire and Rescue
- Orting Valley Fire and Rescue
- Pierce County Fire District 14
- Pierce County Fire District 27
- West Pierce Fire and Rescue
- Clover Park School District
- Eatonville School District
- Franklin Pierce School District
- Pacific Lutheran University
- Puyallup School District
- Sumner School District
- University Place School District
- Crystal River Ranch HOA
- Herron Island HOA
- Pierce Transit
- Raft Island HOA
- Taylor Bay Beach Club
- Firgrove Mutual Water Company
- Graham Hill Mutual Water Company
- Lakewood Water District
- Ohop Mutual Light Company
- Spanaway Water Company
- Tanner Electric
- Cascade Regional Blood Services
- Dynamic Partners
- Group Health
- MultiCare Health System
- 76 Jurisdictions in this effort
- City of Buckley
- City of Edgewood
- City of Fircrest
- City of Lakewood
- City of Orting
- City of Sumner
- Town of Carbonado
- Town of South Prairie
- Town of Wilkeson
- Central Pierce Fire and Rescue
- Gig Harbor Fire and Medic One
- Key Peninsula Fire Department
- Pierce County Fire District 13
- Pierce County Fire District 23
- South Pierce Fire and Rescue
- Carbonado School District
- Dieringer School District
- Fife School District
- Orting School District
- Peninsula School District
- Steilacoom School District
- Tacoma School District
- American Red Cross
- Crystal Village HOA
- Metropolitan Park District
- Port of Tacoma
- River Community Club
- Clear Lake Water District
- Fruitland Mutual Water Company
- Lakeview Light and Power
- Mt. View-Edgewood Water Company
- Peninsula Light Company
- Summit Water and Supply Company
- Valley Water District
- Community Health Care
- Franciscan Health System
- Madigan Hospital
- Western State Hospital

PC HMF will meet annually in August and will be coordinated by PC DEM. The City will be an active participant in the PC HMF, and will be represented by the Emergency Programs Manager. Only through this level of cooperation can these jurisdictions meet all of their mitigation goals.

Plan Evaluation and Update

It should be noted this planning process began in early 2012 following the then current CFR 201.6 Hazard Mitigation Planning Requirements. Based on new requirements in the Stafford Act, the City of Lakewood will evaluate and update the plan to incorporate these new requirements as necessary. Furthermore, if there are additional Stafford Act changes affecting CFR 201.6 in the coming years, the planning process will incorporate those as well.

The City of Lakewood Plan will guide the Cities mitigation efforts for the foreseeable future. City of Lakewood Representatives on the Planning Team has developed a method to ensure that regular review and update of the Plan occur within a five year cycle.

PC DEM will collaborate with the Emergency Programs Office and the PC HMF to help monitor and evaluate the mitigation strategy implementation. PC DEM will track this implementation through Pierce County's GIS database. Findings will be presented and discussed at the annual meeting.

The Emergency Programs Office will coordinate reporting of the Plan's implementation to the Emergency Planning Team which meets at least twice each year. Minutes of these meetings will be prepared and will include:

- Updates on implementation throughout the City;
- Updates on the PC HMF and mitigation activities undertaken by neighboring jurisdictions;
- Changes or anticipated changes in hazard risk and vulnerability at the City, county, regional, State, FEMA and Homeland Security levels;
- Problems encountered or success stories;
- Any technical or scientific advances that may alter, make easier, or create measures.

The Emergency Programs Office will decide on updates to the strategy based on the above information and a discussion of:

- The various resources available through budgetary means as well as any relevant grants;
- The current and expected political environment and public opinion;
- Meeting the mitigation goals with regards to changing conditions.

PC DEM will work with the Emergency Programs Office or the City to review the Risk Assessment Section to determine if the current assessment should be updated or modified

based on new information. This will be done during the regularly scheduled reviews of the regional partners' Hazard Identification and Vulnerability Analyses and their Comprehensive Emergency Management Plans.

Additional reviews of this Plan will be required following disaster events and will not substitute for the annual meeting. Within ninety days following a significant disaster or an emergency event impacting the City, the Emergency Programs Office will provide an assessment that captures any "success stories" and/or "lessons learned." The assessment will detail direct and indirect damages to the City and its critical facilities, response and recovery costs, as part of the standard recovery procedures that use EMD Forms 129, 130, and 140. This process will help determine any new mitigation initiatives that should be incorporated into the Plan to avoid or reduce similar losses due to future hazard events. In this manner, recovery efforts and data will be used to analyze mitigation activities and spawn the development of new measures that better address any changed vulnerabilities or capabilities. Any updates to the Plan will be addressed at the ensuing regularly City Council Meeting.

As per 44 CFR 201.6, the City of Lakewood must re-submit the Plan to the State and FEMA with any updates every five years. This process will be coordinated by PC DEM through the Pierce County Hazard Mitigation Forum. In 2019 and every five years following at the Hazard Mitigation Forum, City of Lakewood and the Emergency Programs Office will submit the updated plan to PC DEM. PC DEM's Mitigation and Recovery Program Coordinator will collect updates from the Region 5 Plan jurisdictions and submit them to the State EMD and FEMA.

Continued Public Involvement

City of Lakewood is dedicated to continued public involvement and education in review and updates of the Plan. The City will retain copies of the Plan and will post it on the City of Lakewood website.¹ Announcements regarding the Plan's adoption and the annual updates to the Plan will be advertised on the City of Lakewood website.

The three-tiered implementation method provides an opportunity for continuous public involvement. Public Education campaigns are a means of informing the public on updates and implementation activities. Further, prior to submitting the Plan to WA EMD and FEMA for the five year review, the Emergency Programs Office and the Emergency Management Team will hold public information and comment meeting. These meetings will be advertised in the City through a variety of media, including the City webpage Continued Public Involvement

The City of Lakewood is dedicated to continued public involvement and education in review and updates of this plan. The City of Lakewood Emergency Management Department and the Planning Department will retain copies of the plan and will make it available to the public.

Prior to submitting the plan to WA EMD and FEMA for the five-year review, the City of Lakewood will hold public information and comment meeting. This meeting will provide citizens a forum during which they can express their concerns, opinions, or ideas about the

City of Lakewood Hazard Mitigation Plan. This meeting will be advertised by the City through a variety of media, including the local newspaper and our City Town Topics and a posting on the website

The City of Lakewood will conduct a review on a yearly basis to ensure all elements of the mitigation plan are updated and accurate. Each of the 76 jurisdictions has been tasked with having to provide documentation on public involvement including a brief description for each public hearing held, a summary on attendance, any feedback received from the public and the an overall description of what was accomplished. Even further, the City of Lakewood will provide proof of their attempts for public involvement such as screenshots of websites including date ranges, flyers and other relevant material documenting the public involvement process. Lastly, the City of Lakewood will look for new innovative ways for public involvement.

Endnotes

¹<https://www.cityoflakewood.us/>

**APPENDIX B
REGION 5 HAZARD MITIGATION PLAN
2014-2019 UPDATE
CITY OF LAKEWOOD**

Region 5 Hazard Mitigation Planning Team

City of Lakewood

NAME	TITLE	JURISDICTION-DEPARTMENT
Christine Badger	Emergency Management Coordinator	City of Lakewood

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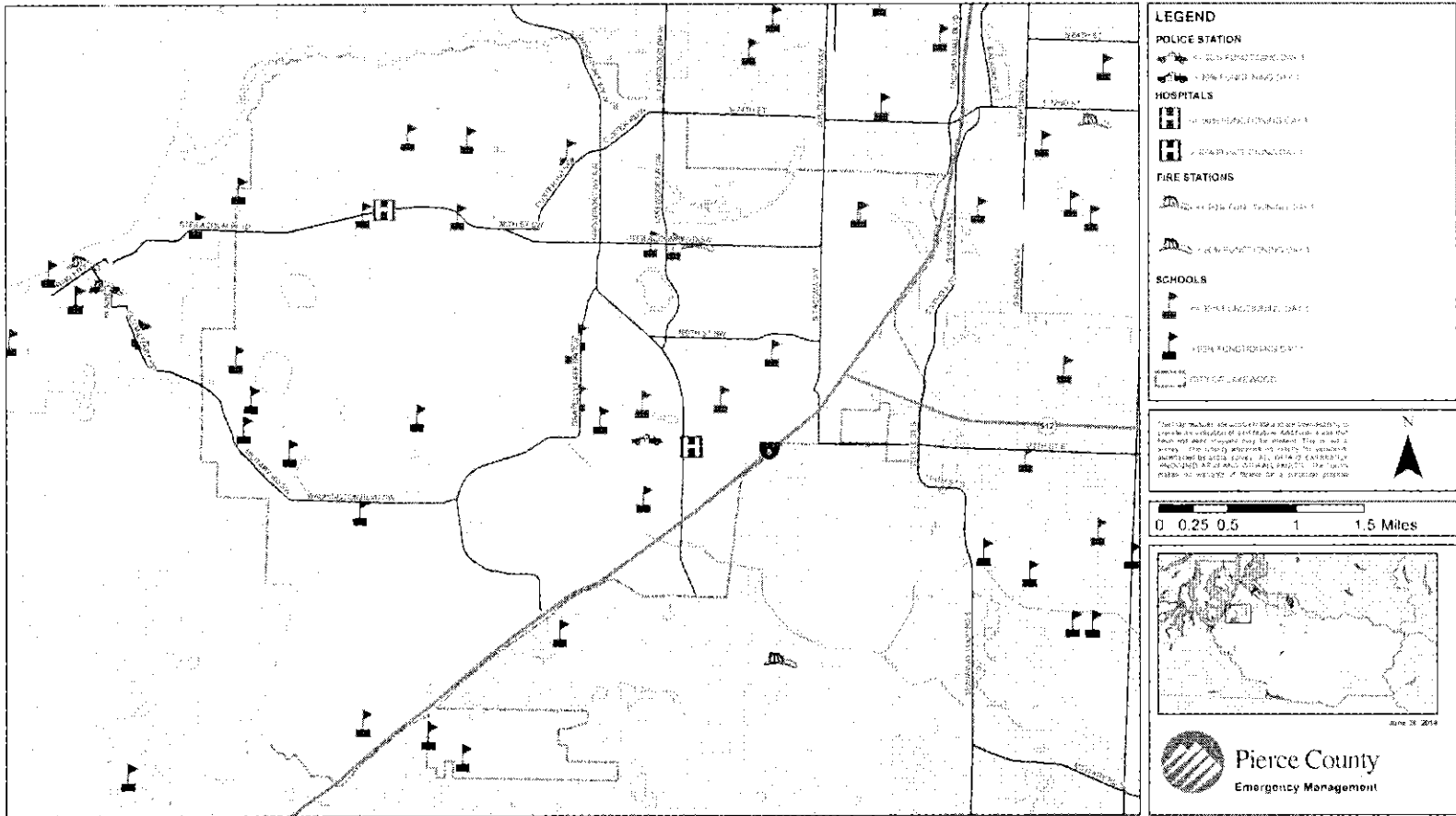
APPENDIX D

**REGION 5 HAZARD MITIGATION PLAN
CITY OF LAKEWOOD AND PIERCE COUNTY SCENARIO**

This appendix contains the spatial results from the Hazus Earthquake Scenario results showing the Essential Facilities for a 90% functionality for Day 1 and Day 7 following an earthquake event based on three earthquakes scenarios. Information was based on ShakeMaps developed by U.S. Geological Survey for a 7.1M earthquake occurring on the Tacoma Fault, 7.2M earthquake on the Nisqually Fault and a 7.2M earthquake on the SeaTac Fault. There was a total of four Essential Facilities that were modeled; fire stations, police stations, schools and hospitals. Additional information can be found in the Risk Assessment Section of the Pierce County All Hazard Mitigation Plan.

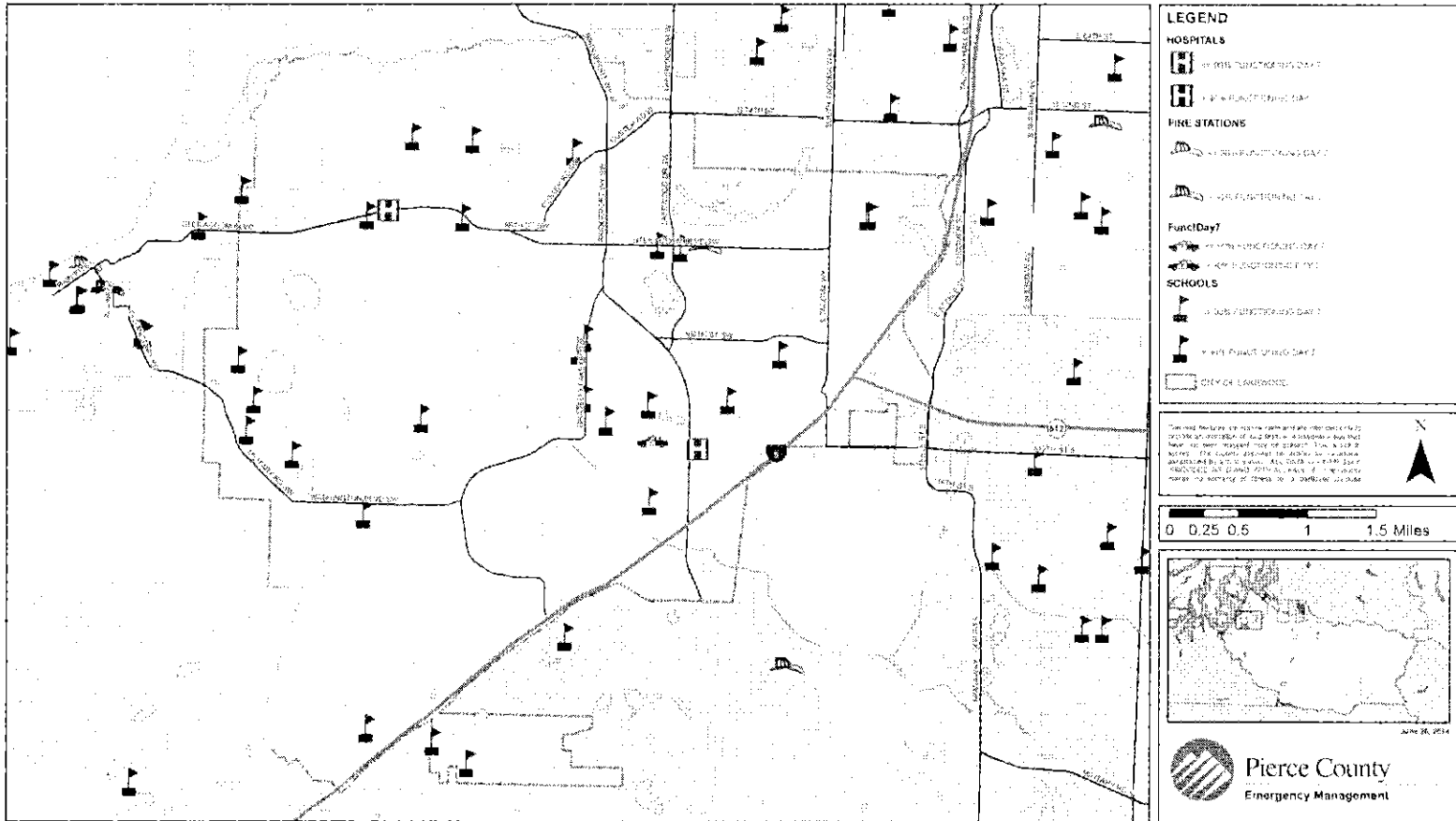
Map D-1 City of Lakewood Tacoma Fault Scenario Essential Facilities Day 1 Map

CITY OF LAKEWOOD - 7.1M TACOMA EARTHQUAKE SCENARIO - ESSENTIAL FACILITIES



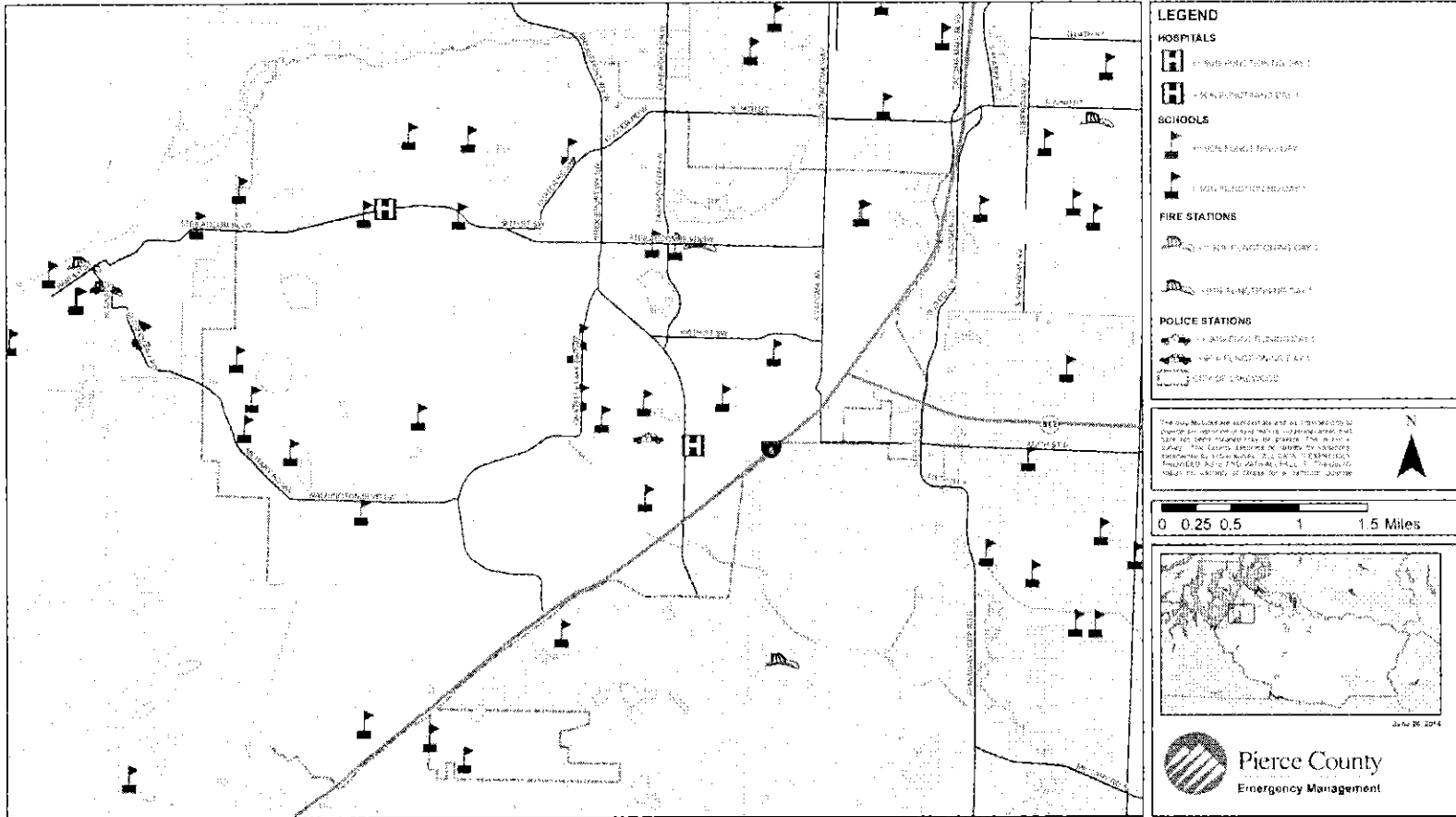
Map D-4 City of Lakewood Nisqually Fault Scenario Essential Facilities Day 7 Map

CITY OF LAKEWOOD - 7.2M NISQUALLY EARTHQUAKE SCENARIO - ESSENTIAL FACILITIES

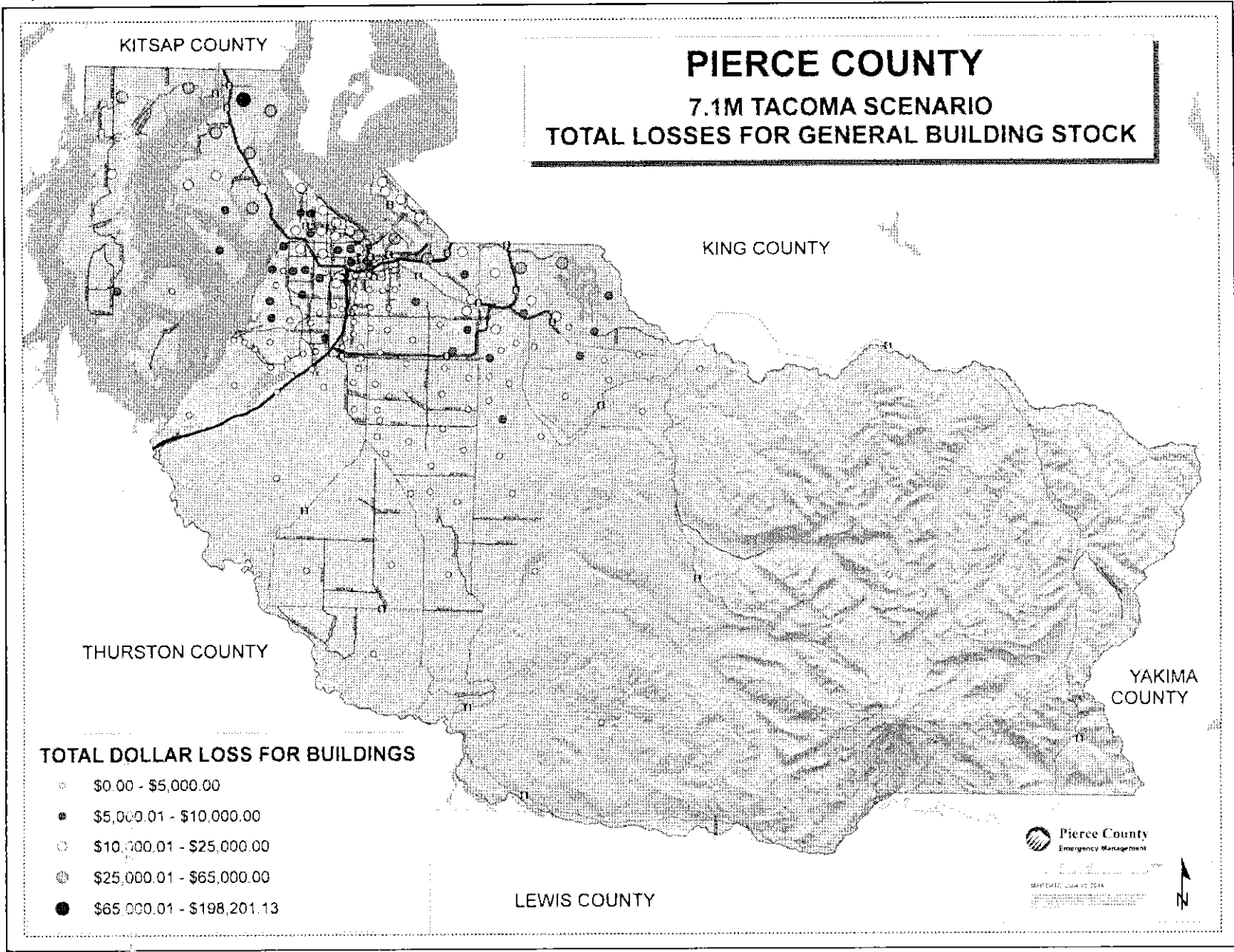


Map D-5 City of Lakewood SEATAC Fault Scenario Essential Facilities Day 1 Map

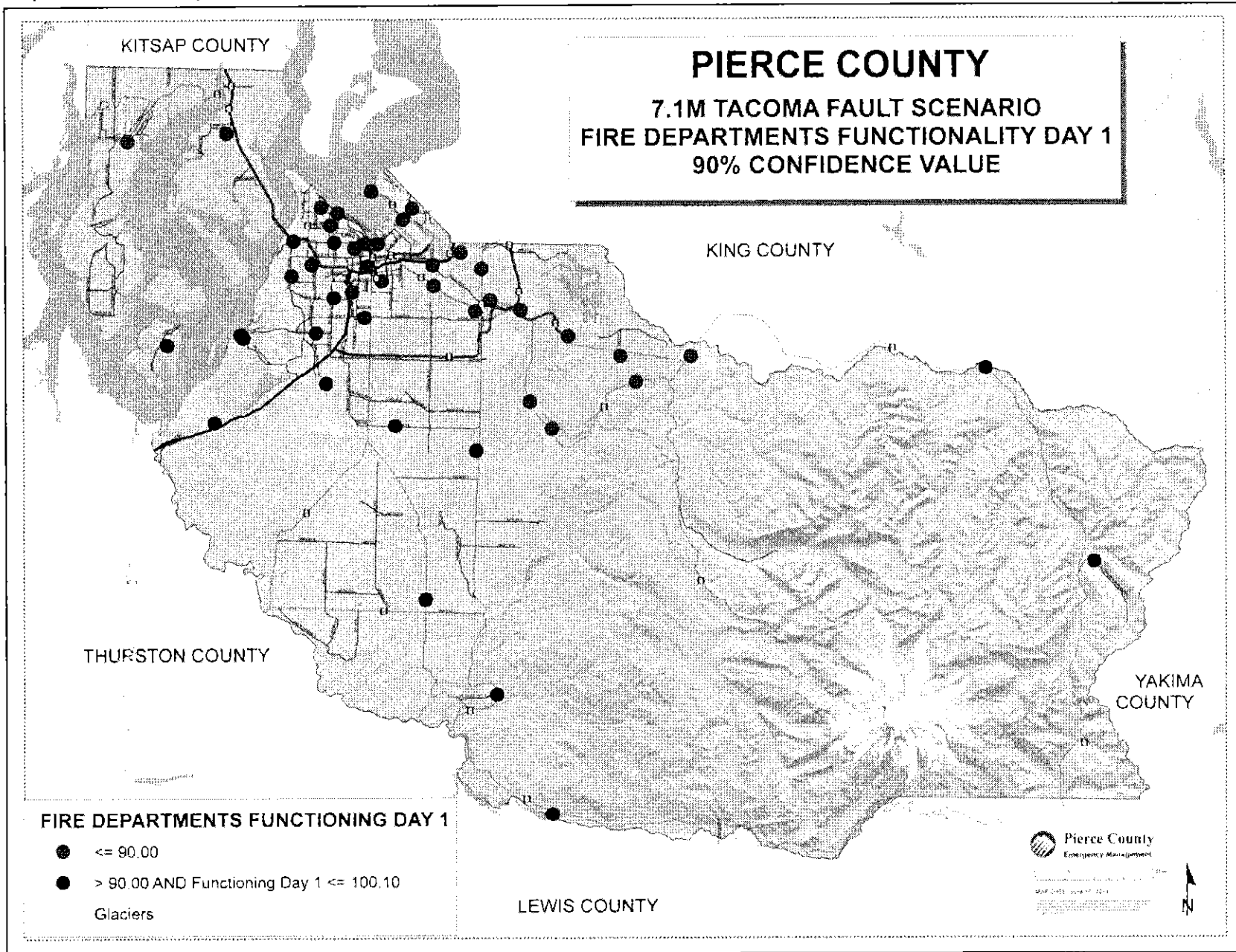
CITY OF LAKEWOOD - 7.2M SEATAC EARTHQUAKE SCENARIO - ESSENTIAL FACILITIES



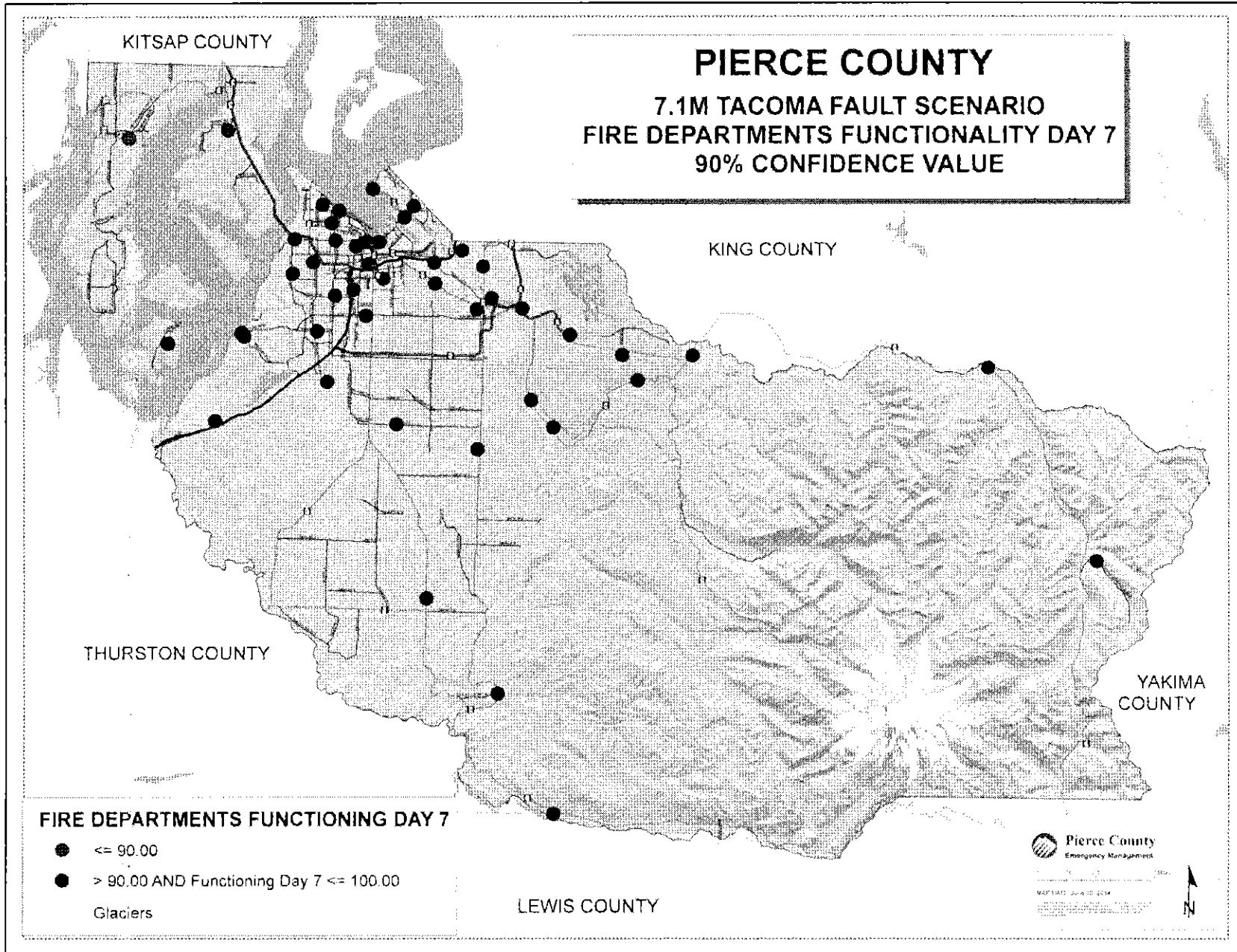
Map D-6 Pierce County Tacoma Fault Scenario Total Losses Map



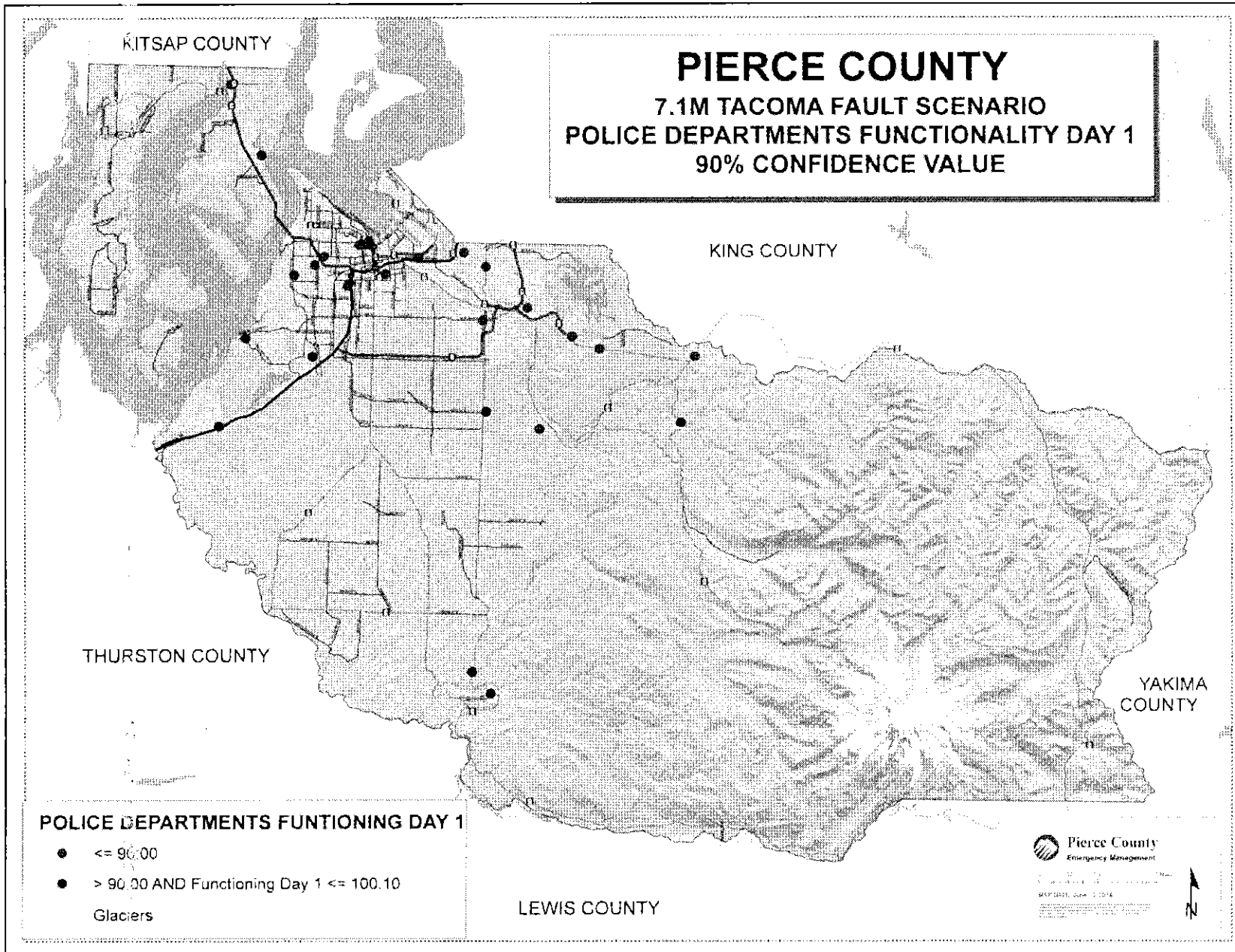
Map D-7 Pierce County Tacoma Fault Scenario Fire Department Functionality Day 1 Map



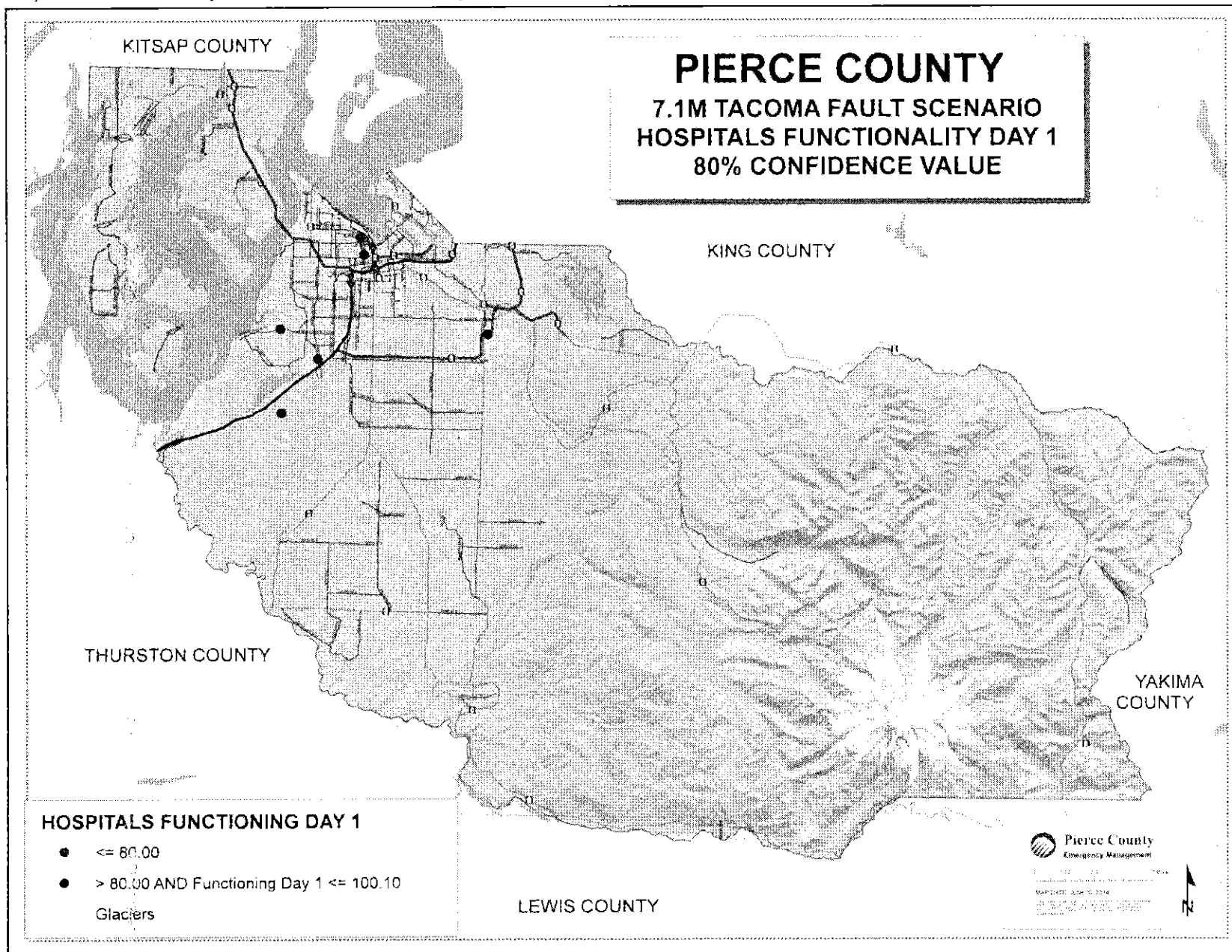
Map D-8 Pierce County Tacoma Fault Scenario Fire Department Functionality Day 7 Map



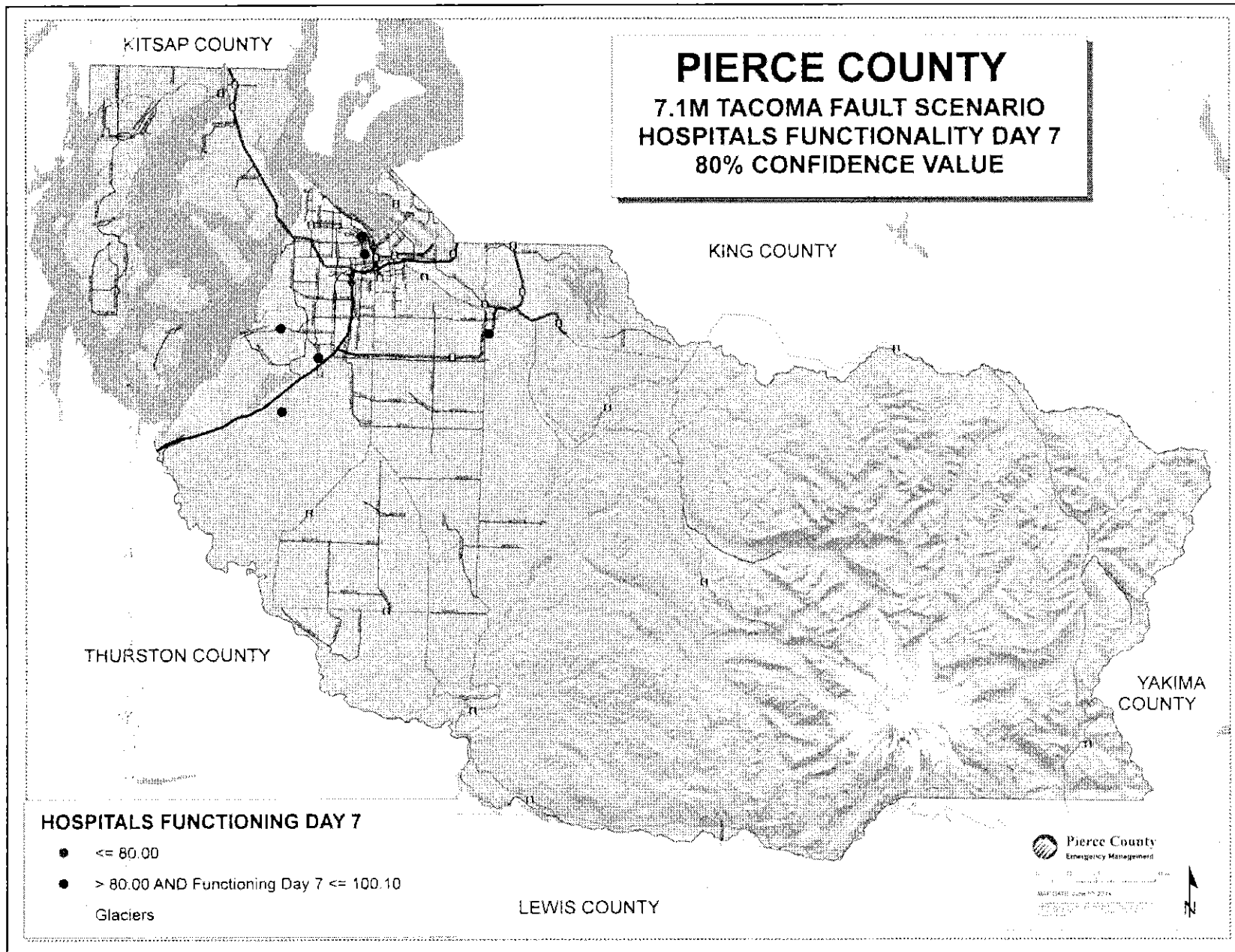
Map D-9 Pierce County Tacoma Fault Scenario Police Department Functionality Day 1 Map



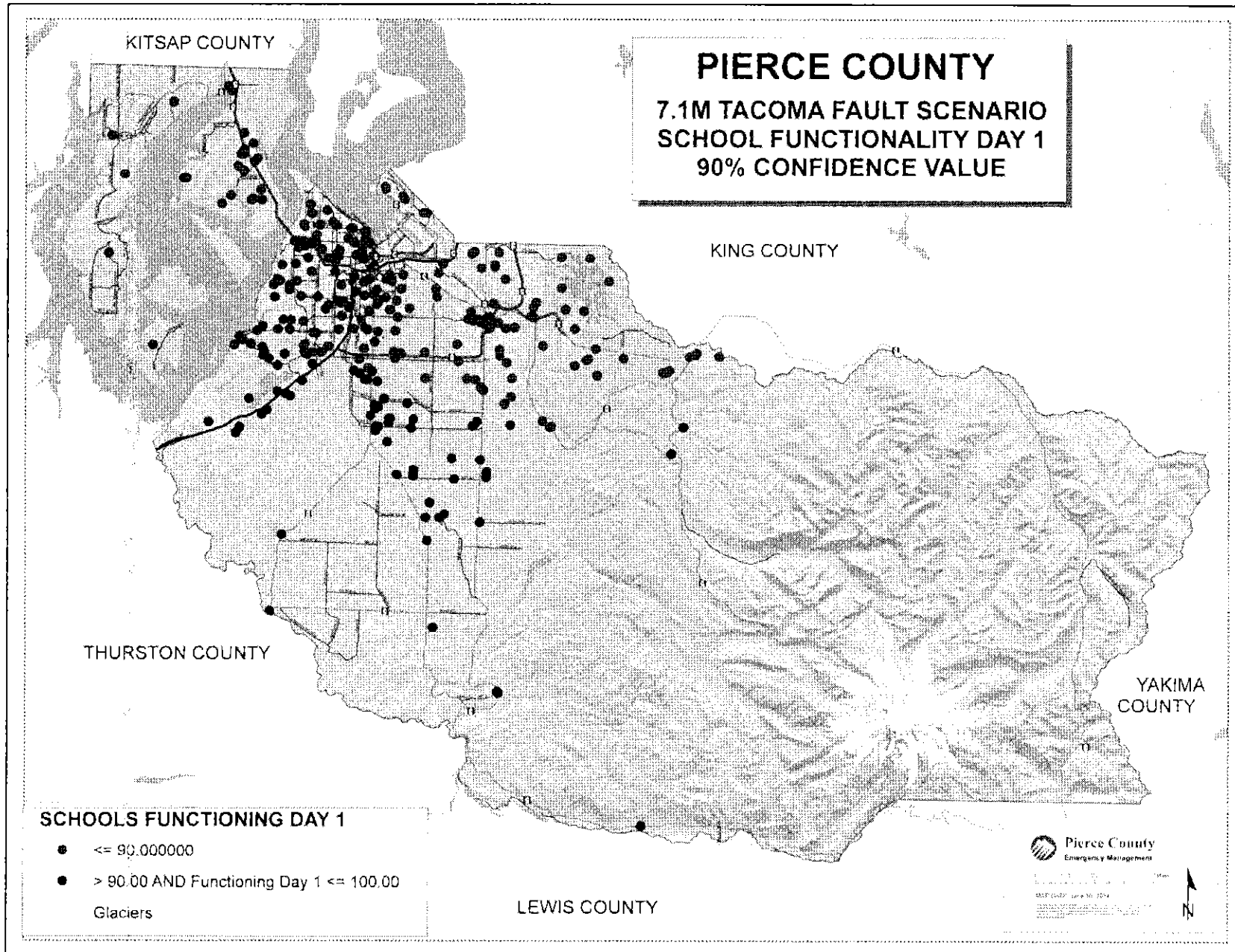
Map D-11 Pierce County Tacoma Fault Scenario Hospitals Functionality Day 1 Map



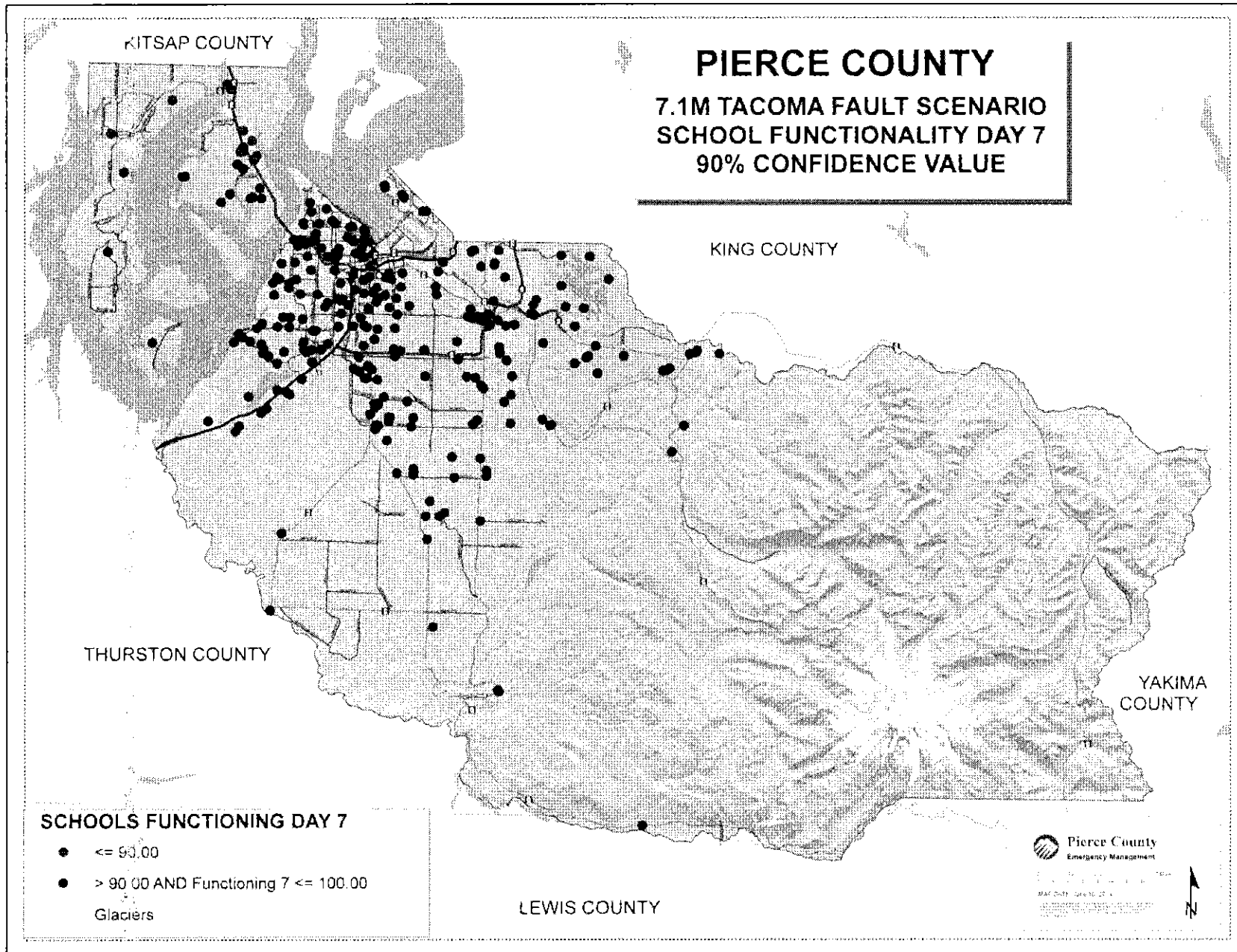
Map D-12 Pierce County Tacoma Fault Scenario Hospitals Functionality Day 7 Map



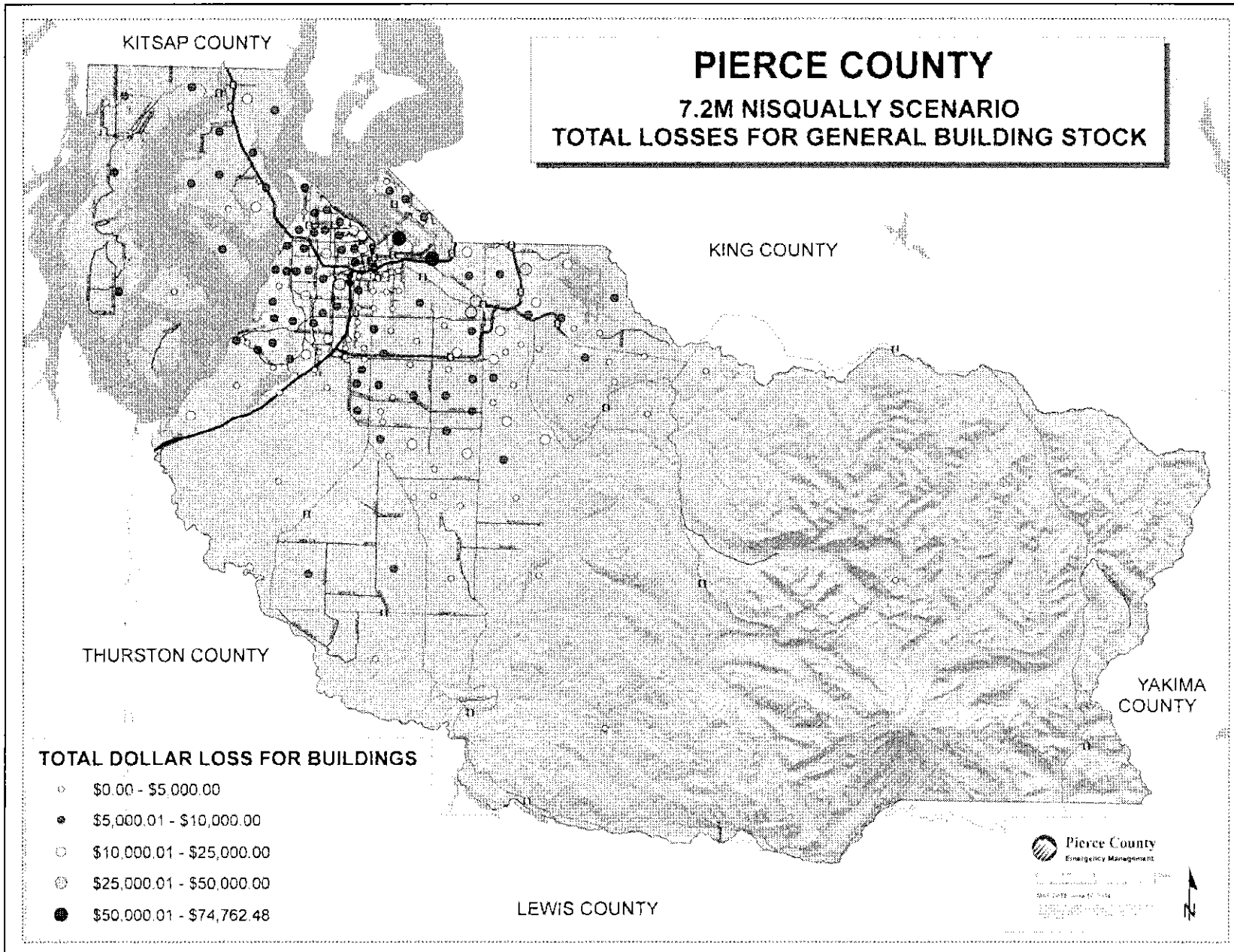
Map D-13 Pierce County Tacoma Fault Scenario School Functionality Day 1 Map



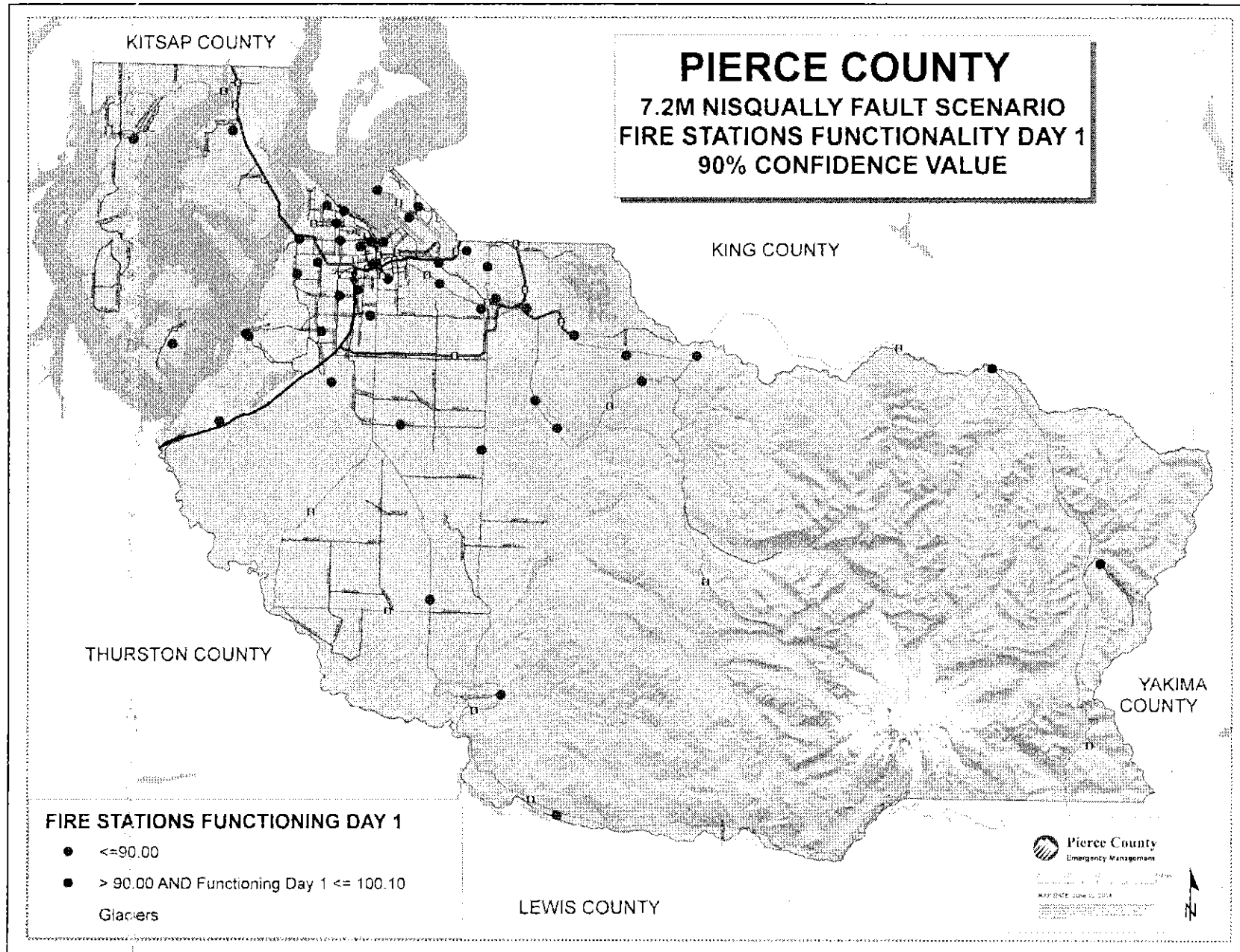
Map D-14 Pierce County Tacoma Fault Scenario School Functionality Day 7 Map



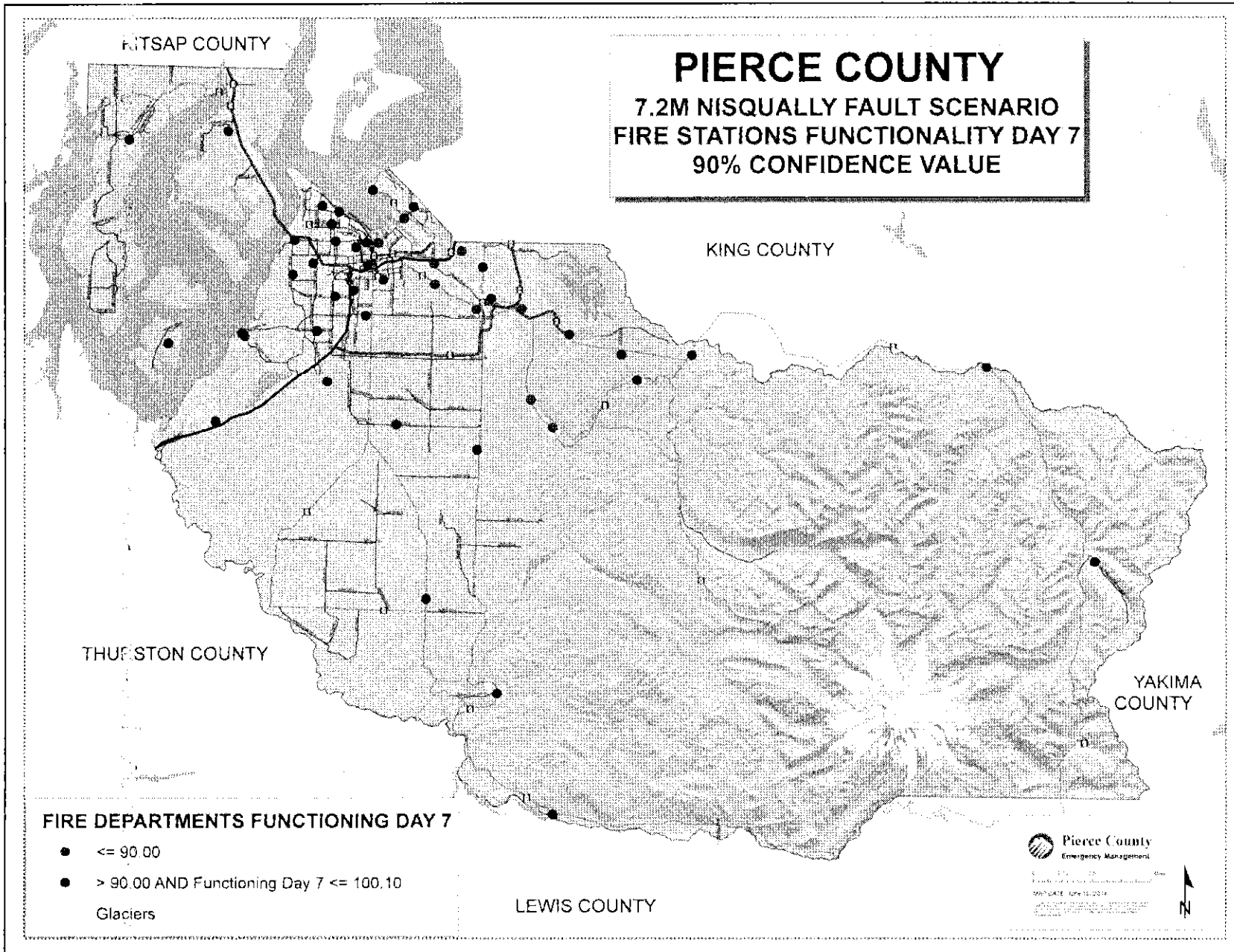
Map D-15 Pierce County Nisqually Fault Scenario Total Losses Map



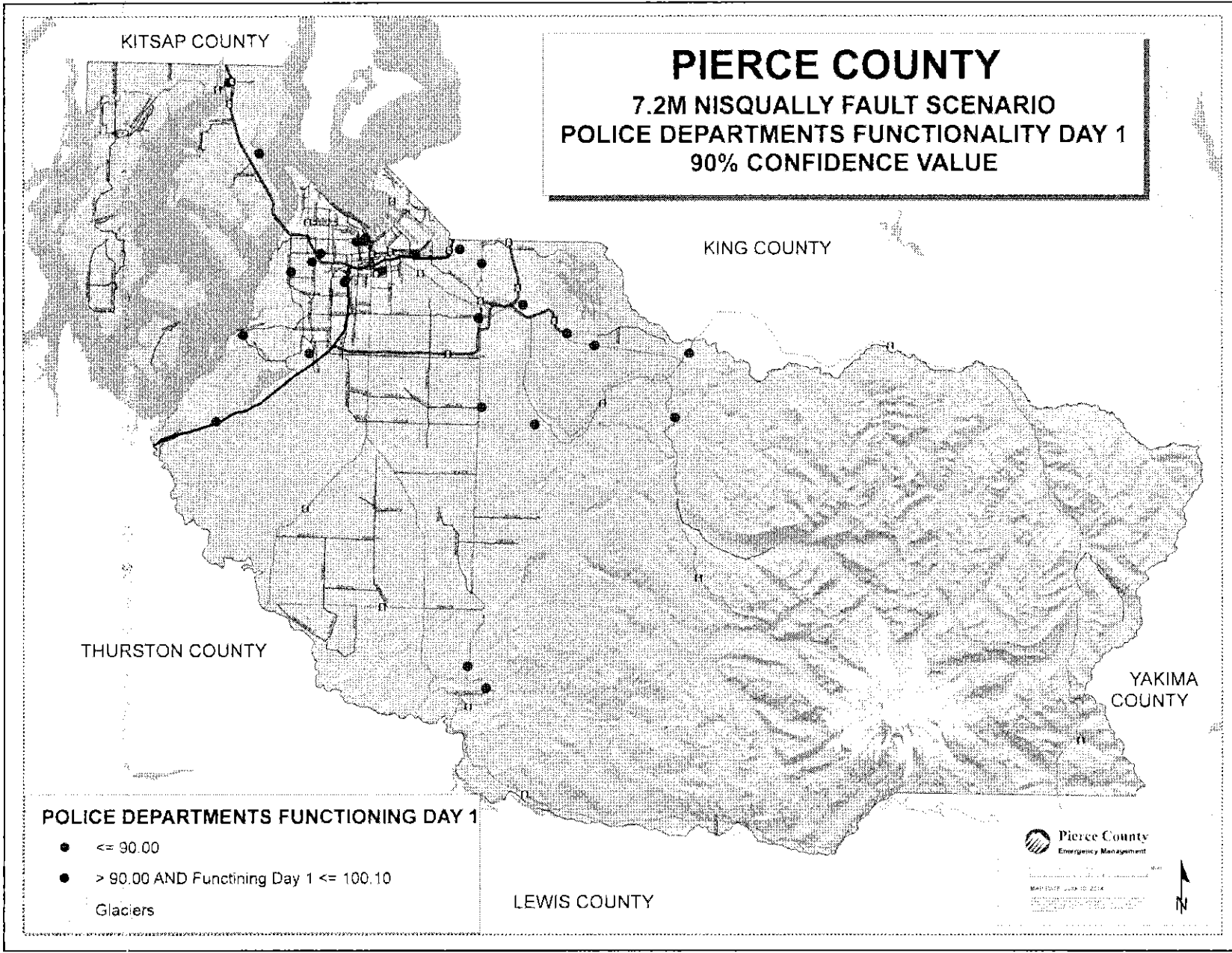
Map D-16 Pierce County Nisqually Fault Scenario Fire Stations Functionality Day 1 Map



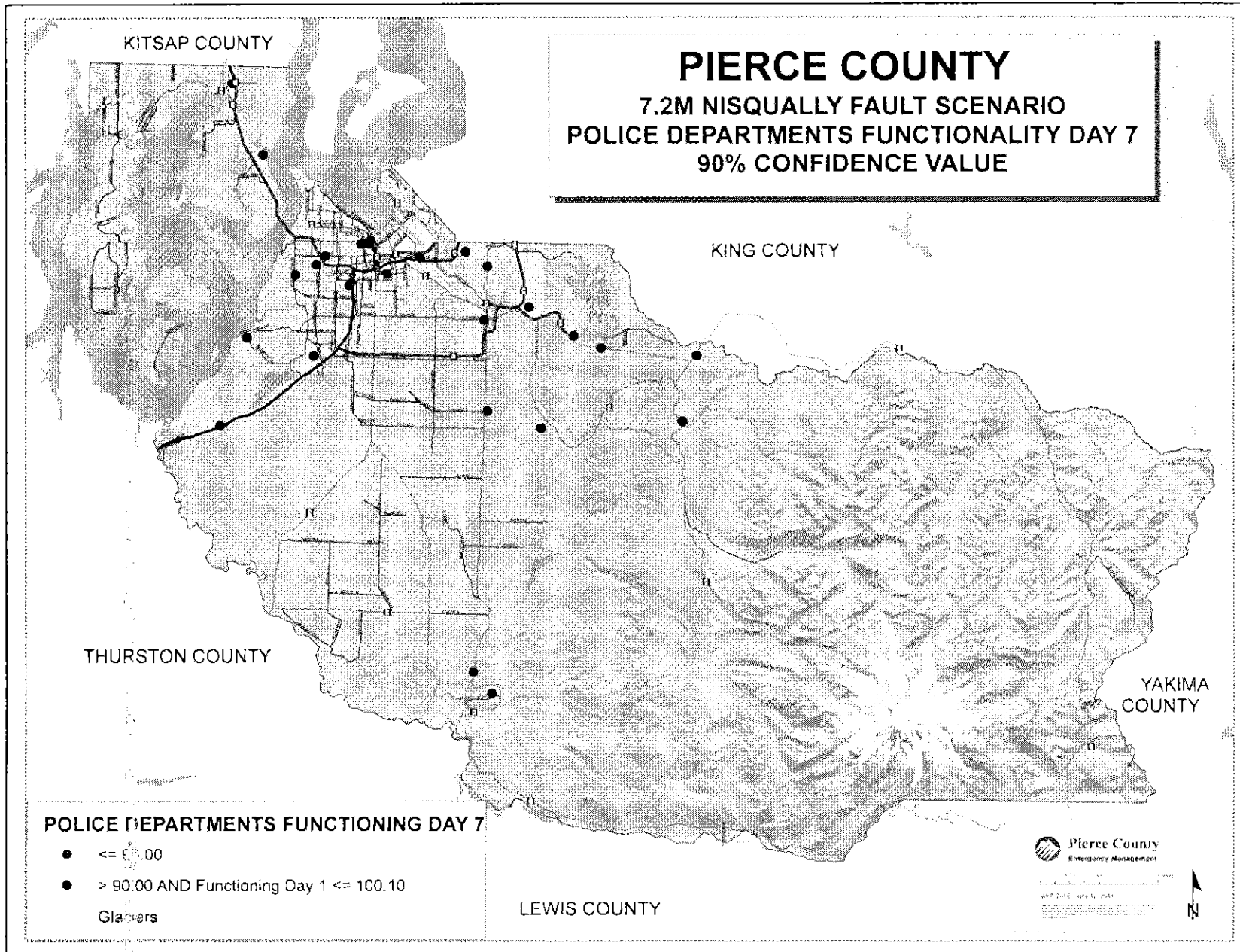
Map D-17 Pierce County Nisqually Fault Scenario Fire Stations Functionality Day 7 Map



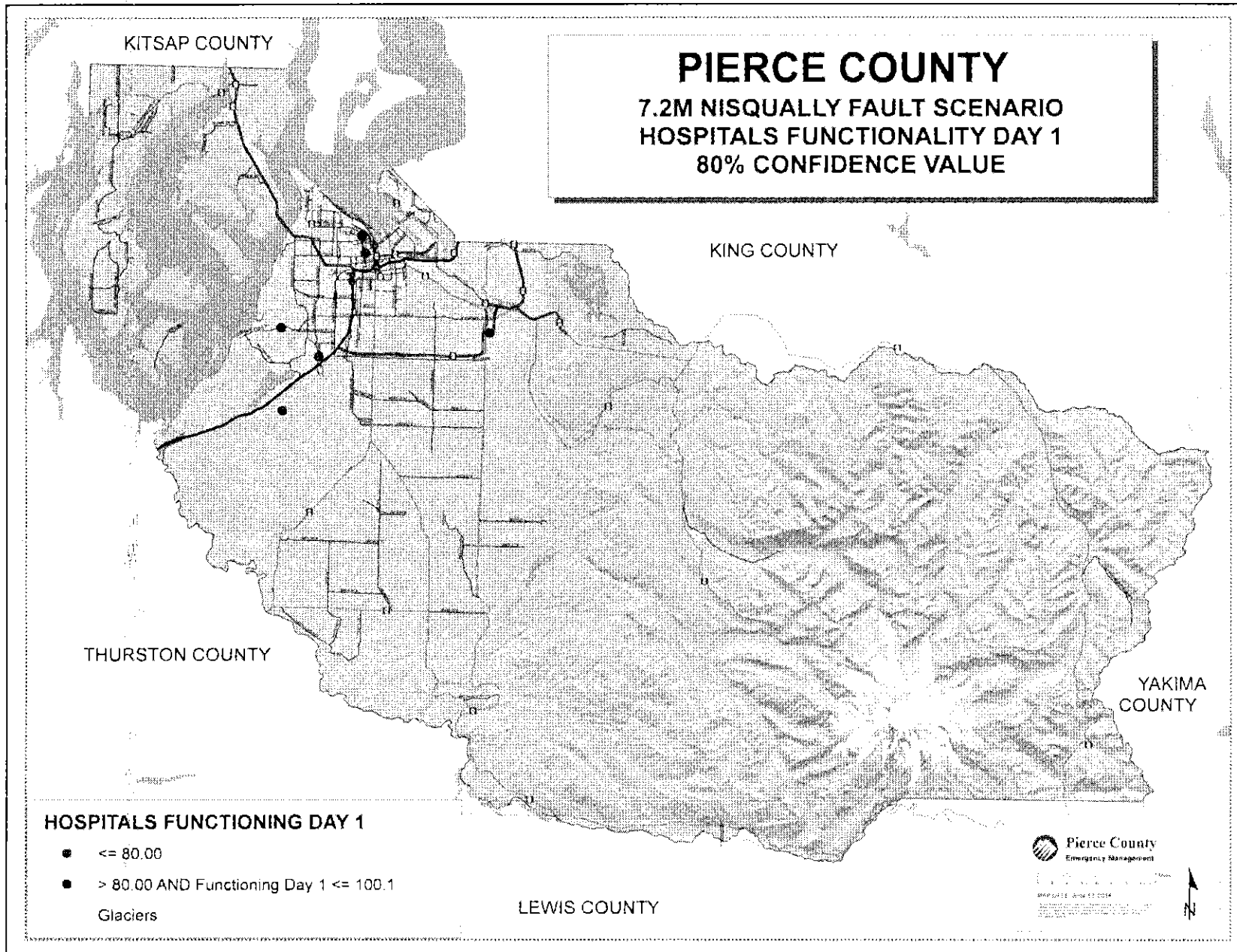
Map D-18 Pierce County Nisqually Fault Scenario Police Departments Functionality Day 1 Map



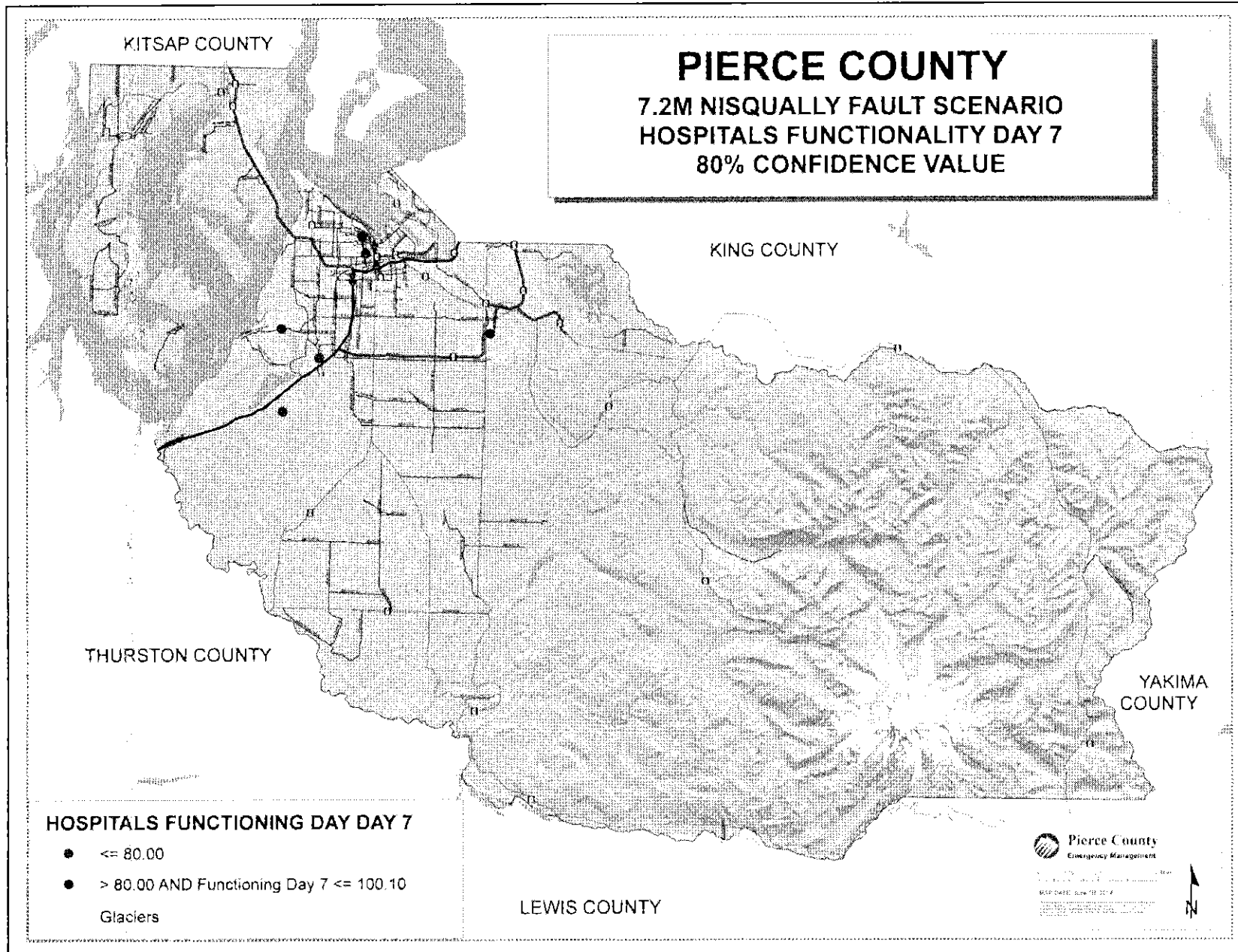
Map D-19 Pierce County Nisqually Fault Scenario Police Departments Functionality Day 7 Map



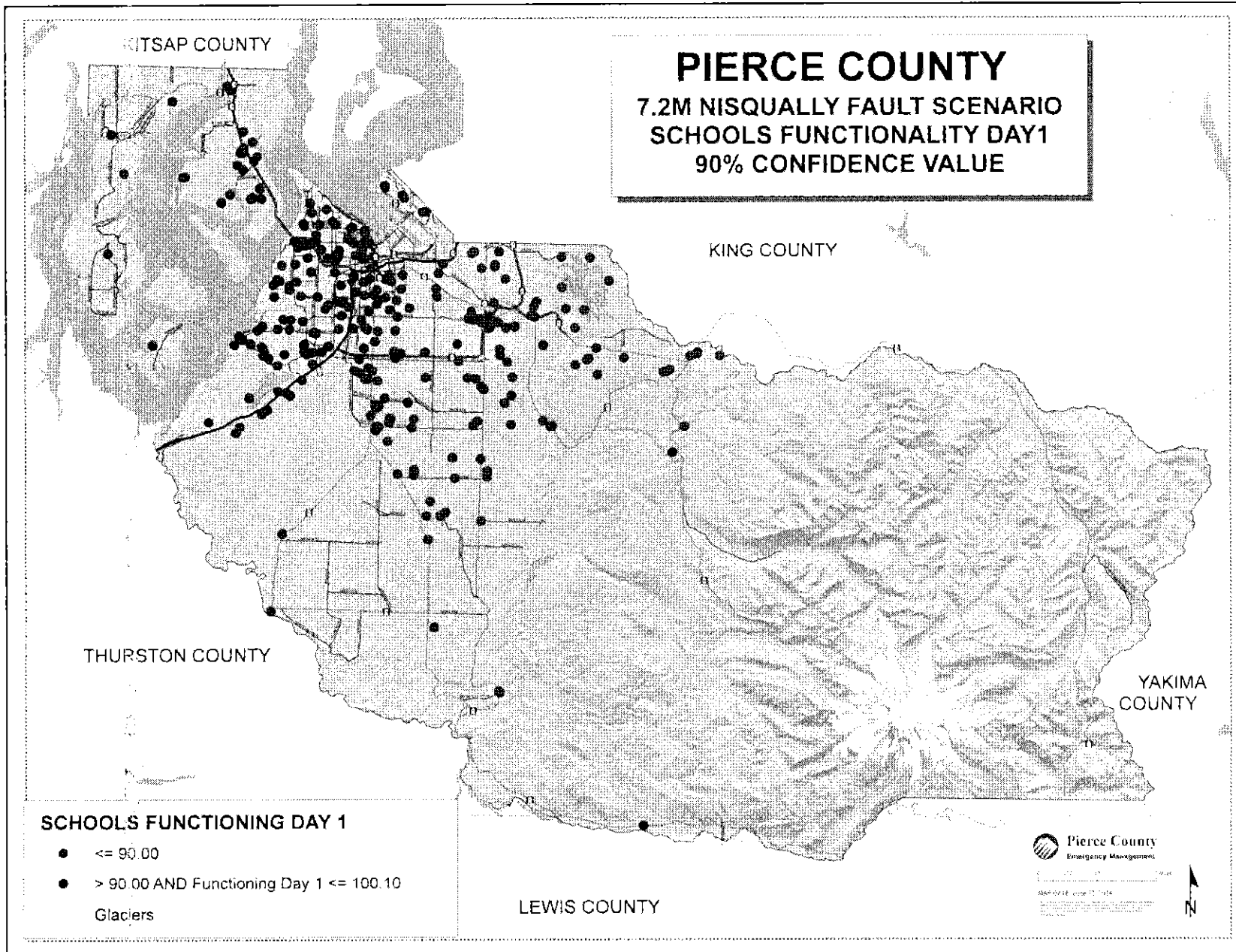
Map D-20 Pierce County Nisqually Fault Scenario Hospital Functionality Day 1 Map



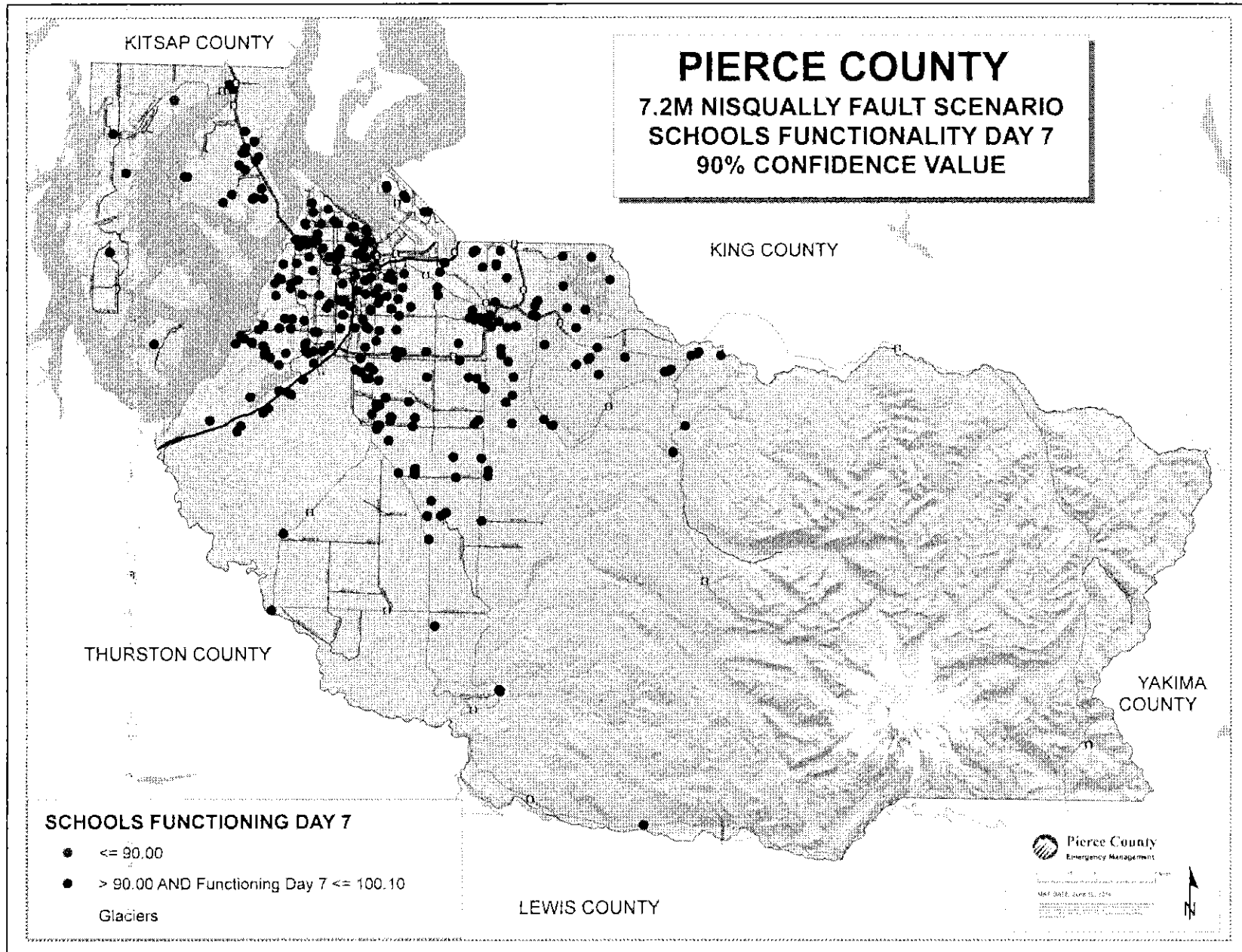
Map D-21 Pierce County Nisqually Fault Scenario Hospital Functionality Day 7 Map



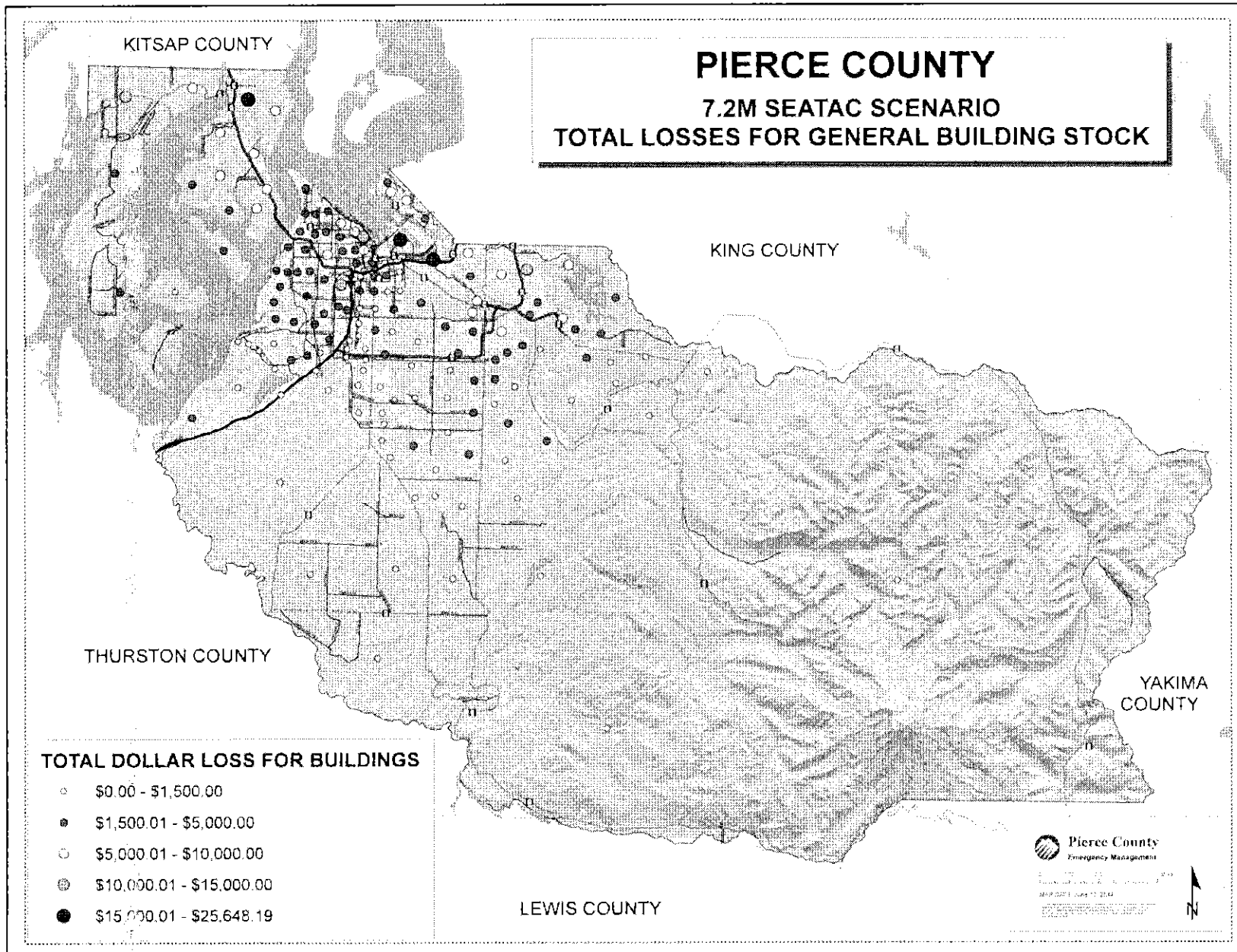
Map D-22 Pierce County Nisqually Fault Scenario Schools Functionality Day 1 Map



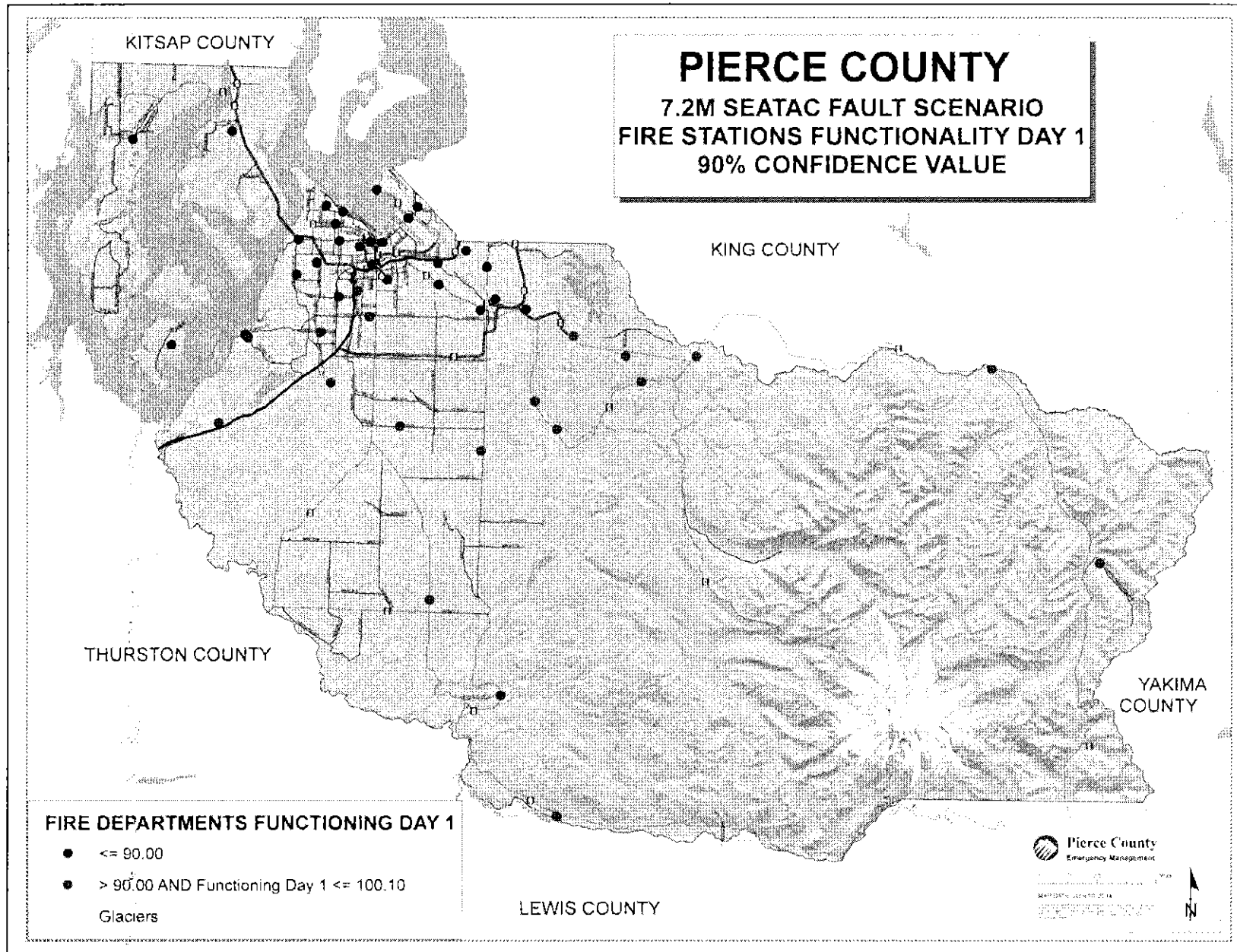
Map D-23 Pierce County Nisqually Fault Scenario Schools Functionality Day 7 Map



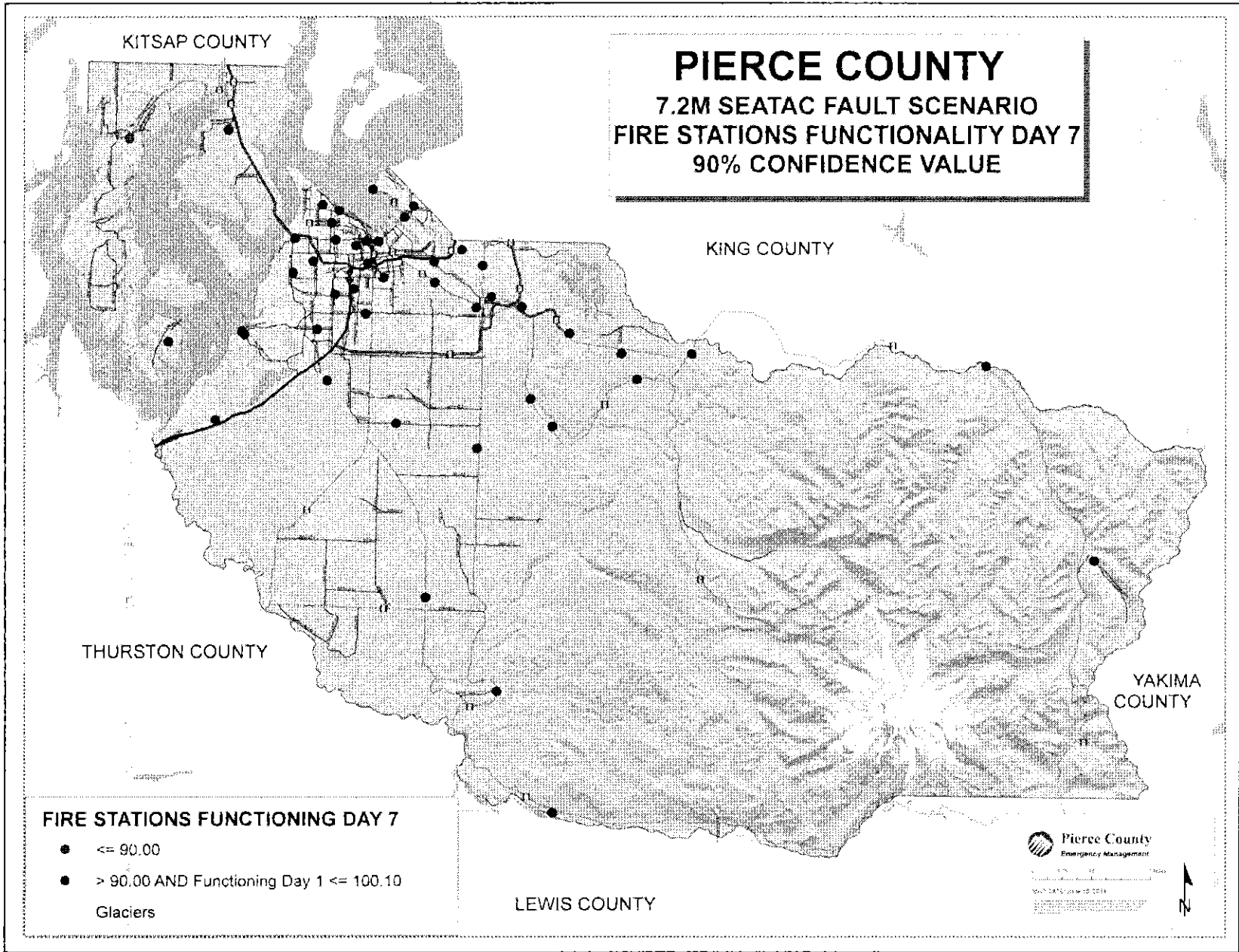
Map D-24 Pierce County SEATAC Fault Scenario Total Losses Map



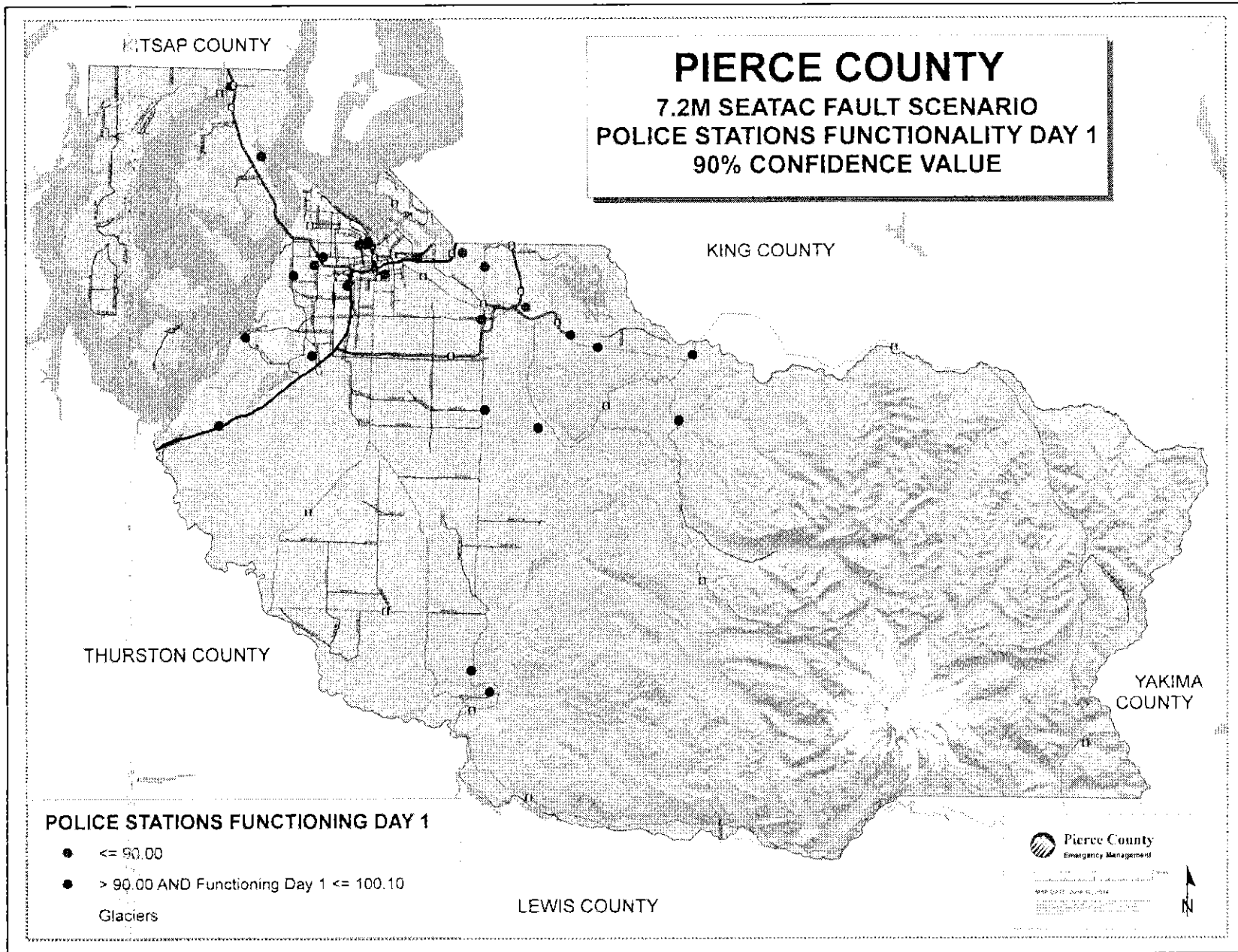
Map D-25 Pierce County SEATAC Fault Scenario Fire Stations Functionality Day 1 Map



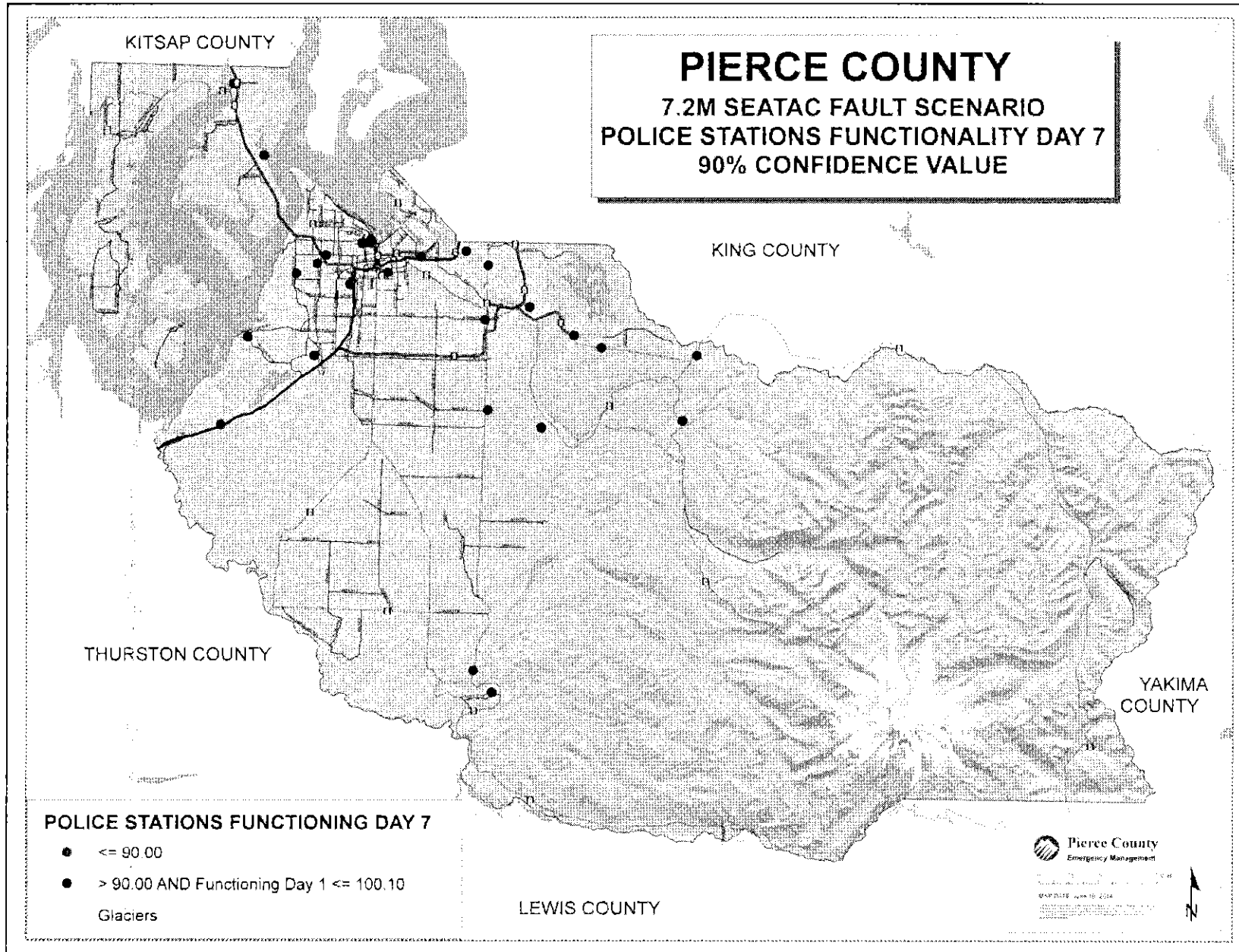
Map D-26 Pierce County SEATAC Fault Scenario Fire Stations Functionality Day 7 Map



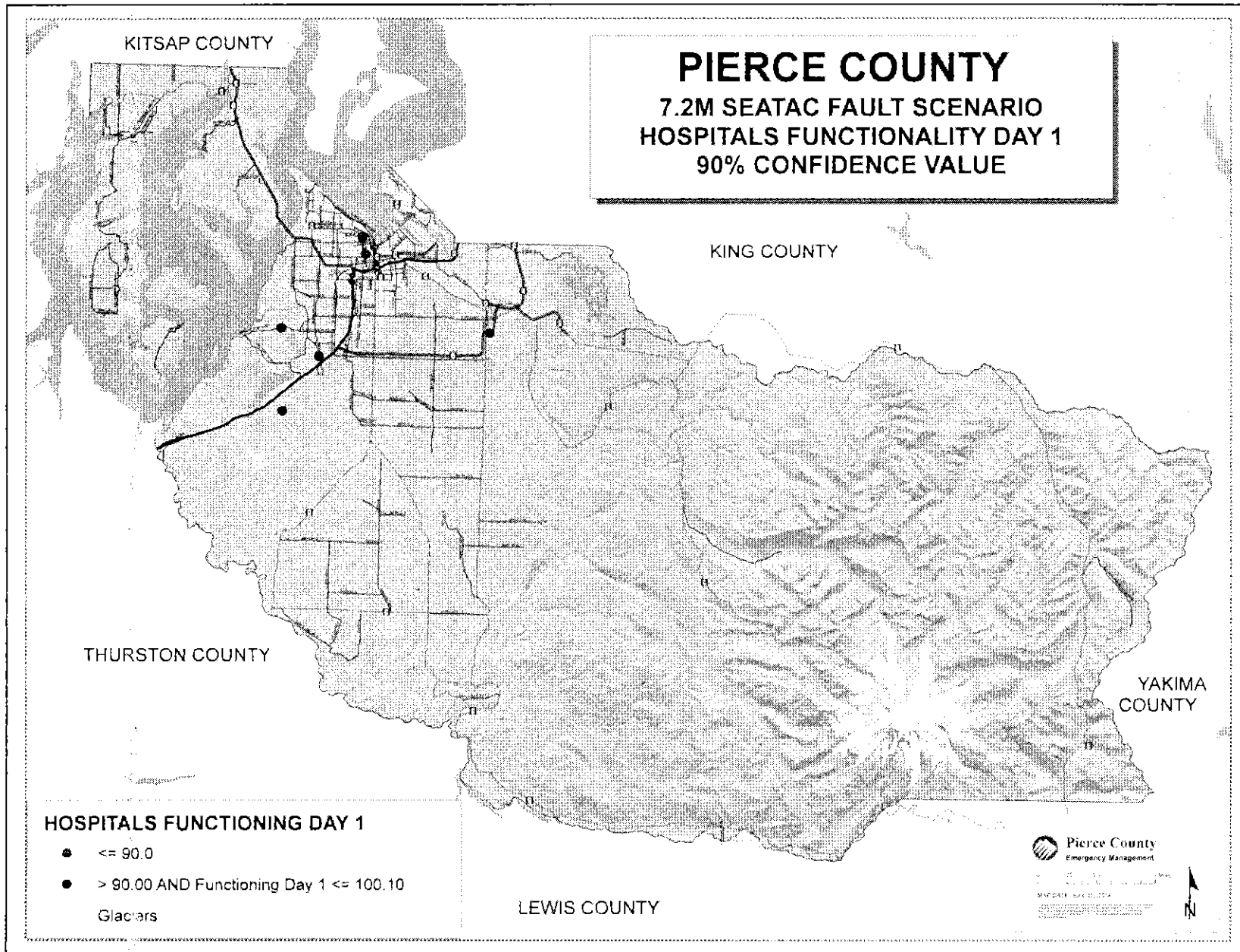
Map D-27 Pierce County SEATAC Fault Scenario Police Department Functionality Day 1 Map



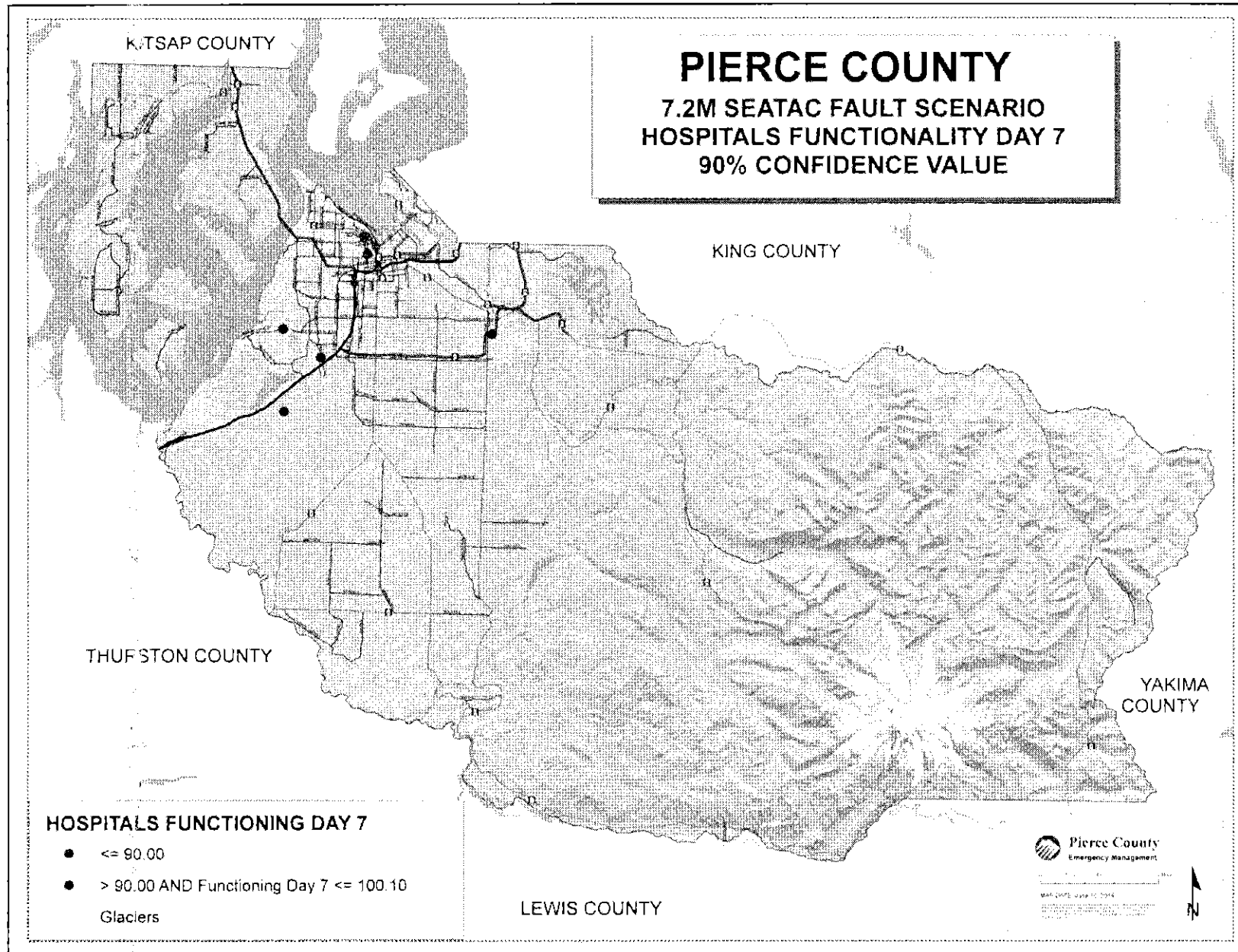
Map D-28 Pierce County SEATAC Fault Scenario Police Department Functionality Day 7 Map



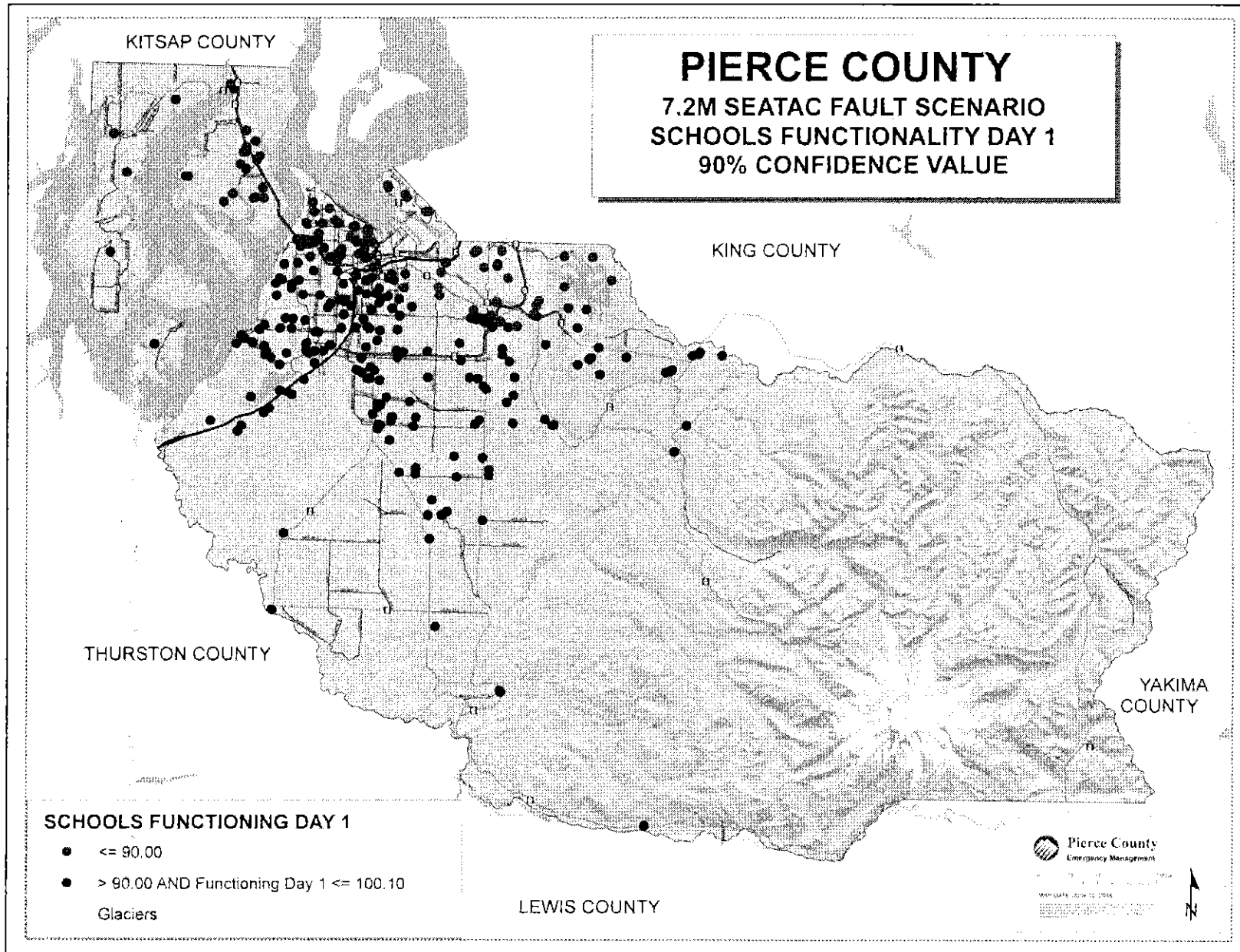
Map D-29 Pierce County SEATAC Fault Scenario Hospital Functionality Day 1 Map



Map D-30 Pierce County SEATAC Fault Scenario Hospital Functionality Day 7 Map



Map D-31 Pierce County SEATAC Fault Scenario Schools Functionality Day 1 Map



Map D-32 Pierce County SEATAC Fault Scenario Schools Functionality Day 7 Map

